TAKING THE MYSTERY OUT OF BUILDERS' HARDWARE

ADON H. BROWNELL

HARDWARE AGE

TAKING THE MYSTERY OUT OF BUILDERS' HARDWARE

By
ADON H. BROWNELL

FIRST EDITION

HARDWARE AGE
NEW YORK • PHILADELPHIA

•

Printed by the Chilton Company Printing Division
Philadelphia, Pa.

AN ACKNOWLEDGMENT

"TAKING THE MYSTERY OUT OF BUILDERS' HARDWARE" is a textbook that should be in the possession of and studied faithfully by every hardware dealer, clerk, and traveling salesman. It summarizes the detailed knowledge and experience acquired by its author during 30 years of closely specialized work in this one branch of the hardware industry. These articles, written by Adon H. Brownell, first appeared as a series in Hardware Age during the years 1937, 1938 and 1939. It is due to the generous financial cooperation of the firms listed below that this series has been made available in book form, and on behalf of the many thousands of hardwaremen who will profit from a close study of this textbook, the publishers of Hardware Age gratefully acknowledge the financial participation and cooperation of these manufacturers:

BOMMER SPRING HINGE CO., *Brooklyn, N. Y.*
CHICAGO SPRING HINGE CO., *Chicago, Ill.*
P. & F. CORBIN, *New Britain, Conn.*
LOCKWOOD HARDWARE MFG. CO., *Fitchburg, Mass.*
McKINNEY MFG. CO., *Pittsburgh, Pa.*
READING HARDWARE CORP., *Reading, Pa.*
OSCAR C. RIXSON CO., *Chicago, Ill.*
RUSSELL & ERWIN MFG. CO., *New Britain, Conn.*
SARGENT & CO., *New Haven, Conn.*
THE STANLEY WORKS, *New Britain, Conn.*
YALE & TOWNE MFG. CO., *Stamford, Conn.*

ADON H. BROWNELL, the author of "Taking the Mystery Out of Builders' Hardware," has manufactured, sold and installed builders' hardware for more than thirty years. For manufacturers, wholesalers and retailers he has conducted schools of instruction, equipping many young men to take their proper places in the builders' hardware field.

Mr. Brownell is numbered among the outstanding builders' hardware men of this country. He began his career in this field as a protege of C. E. Dudley, Providence, R. I., dean of builders' hardware men, and also known as one who trained many good men for this field.

Successively, Mr. Brownell was manager of the builders' hardware departments for J. Russell Co., Holyoke, Mass., Fort Pitt Hardware Co., Pittsburgh, Pa., The George Worthington Co., Cleveland, Ohio, H. D. Taylor Co., Buffalo, N. Y., and others. At one time he was assistant sales manager for Russell & Erwin Mfg. Co., New Britain, Conn.

From this rich background of practical experience, Mr. Brownell has drawn a wealth of helpful material for the series which comprise this book.

FOREWORD

ALL TRADES and professions have their text books, but in the profusion of books that are published each year for the help and guidance of retail merchants altogether too few have a special relation to the problems of the hardware dealer.

The retailing of hardware is a highly specialized calling, requiring a long apprenticeship in learning the application and uses of the wide diversity of tools for the mechanic; household devices for the housewife; equipment and supplies for the farmer, gardener and sportsman, etc., plus a working knowledge of a wide range of supplies and material that enter into the construction of homes and buildings.

The ingenuity and resourcefulness of the American mechanic and manufacturer find their highest expression in the day-by-day stock of the average American hardware store, and about all the tools and supplies for sale there the dealer is expected to have some knowledge of their construction, installation and uses, etc.—if he is to succeed.

"TAKING THE MYSTERY OUT OF BUILDERS' HARDWARE" is a text book that should be in the possession of and studied faithfully by every hardware dealer, clerk, and traveling salesman. It summarizes the detailed knowledge and experience acquired by its author during 30 years of closely specialized work in this one branch of the hardware industry. These articles, written by Adon H. Brownell first appeared as a series in HARDWARE AGE during the years 1937, 1938 and 1939. Keen interest in this series providing, we believe, the most complete treatise on the subject ever published, brought a demand for publication in book form.

When asked to write these articles, Adon H. Brownell pointed out that, in truth, there is no mystery in builders' hardware—folks only think there is. He stresses many times that a good Builders' Hardware department is the foundation of a good hardware business. Not only will such a department show a profit when properly managed, but a good stock and display of Builders' Hardware will also bring the dealer into profitable contact with every home owner in the neighborhood encouraging him to become a permanent customer for the store for all his other hardware requirements.

This series has been prepared with three definite stages of study in mind. Chapters No. 1 to No. 12 are the Elementary Course planned to instruct the reader in the proper procedure for securing small house contracts. Chapters No. 13 to No. 30 covering the Intermediate Course deal with Builders' Hardware for the larger homes. Chapters No. 31 to No. 60 provide the Advanced Course which treats the subject more technically and explains the outline of Builders' Hardware from the angle of the experienced Builders' Hardware Engineer. Every type of building construction is covered—from small homes to large public buildings.

It is the recommendation of the author that even the more experienced student of the subject read the Elementary and Intermediate Courses before taking up the Advanced Course. Much that is written in the Advanced Course necessarily parallels instruction provided in the Elementary and Intermediate Courses—thus the reader may follow more clearly the advanced subject if he has first considered the earlier chapters outlining the more simple phases of Builders' Hardware contract work.

All hardware stores, in fact the entire industry, need greater and more profitable distribution of Builders' Hardware to successfully compete for the consumer's dollar. If through this book more and better Builders' Hardware is sold, HARDWARE AGE will feel that this effort has been decidedly worth while.

—The Publishers

CONTENTS

CONTENTS

Chapter 1—*Elementary Course*

MODEL STOCK

AS we start the study of a stock of builder's hardware amounting to not more than $500, a large part of which may already be in your store, it will be well to consider a stock of merchandise which we are going to distribute before we think in terms of selling it. As a merchant you want to know how much your investment will be, the approximate amount of space it will take, how to keep proper stock records, get turn-overs and make profits.

The chart in this chapter outlines a stock totaling $500. I know many things that could be useful have not been included but I have kept in mind the fact that at this stage in the study we are making a beginning. No rough or construction hardware has been included. Garage hardware, thumb latches and common hinges are not listed. Practically every hardware store has these items already in their stock.

This chart has to do with finish hardware only. In it you will find practically everything that will be suggested in the following chapters that you have to sell including the build-up items.

I realize that there are not enough quantities specified to last long if many jobs are secured. It means constant checking of stock, ordering and reordering but that means turn over and turn over means profit.

Also I realize full boxes and cases have not been taken into consideration but any jobber or manufacturer who does not already have a dealer in your locality will welcome this opportunity to enter your order for these items, though split. The order as a whole, the distribution of their product by such an assortment, will be most welcome to any one of them.

The prices mentioned are fair allowances for each class of goods whether you buy them through the manufacturer, jobber or builders' hardware distributor. Anyone of these can fit you out for this amount or less.

Before ordering anything, sort out of your present stock such items as you already carry and segregate them for your Builders' Hardware Department. Cancel those items off the list you have to buy.

The finishes specified are United States Standard finishes. Decide what make you are going to carry. Get your source of supply to send a salesman in to give you the correct numbers for the goods and finishes in place of the general description I have had to give you. If your particular territory de-

TAKING THE MYSTERY OUT OF BUILDERS' HARDWARE —MODEL STOCK

ITEMS	*US2GxUS4	*US2GxUS11	*US2GxUS14	US4	US5	US11	US14	US19	
BUTTS AND HINGES									
Standard Butts 4x4	3 pr.	3 pr.	3 pr	6 pr.	....	3 pr.	3 pr.	....	.....
Standard Butts 3½x3½	3 "	3 "	3 "	50 "	....	25 "	12 "	6 pr.	.....
Standard Butts 3x3	3 "	3 "	3 "	10 "	....	6 "	6 "	....	.....
Light Butts 2½x2	....	....	6 "	36 "	....	2½ "	24 "	....	.....
Surface Hinges	....	....	....	24 "	....	2½ "	24 "	....	$73.00
FLOOR HINGES									
Standard	....	....	....	6 set	....	3 set	3 set	....	.....
Junior Checking	....	....	....	1 "	....	....	....	....	.....
RESIDENTIAL HANDLE SETS									
Colonial	....	....	....	1 set	....	1 set	....	....	16.00
English	....	....	....	1 "	....	....	....	....	.....
Forged Iron	....	....	....	....	....	....	....	1 set	.....
BROAD BEVEL DESIGN									33.00
Cylinder Front Door—Bronze	....	....	....	1 set	....	1 set	....	1 set	....
Bit Key Front Door—Bronze	....	....	....	2 "	....	1 "	....	....	.....
Bit Key Front Door—Steel	....	....	....	2 "	....	1 "	....	....	.....
Inside Bit Key—Bronze	....	....	....	6 "	....	3 "	....	1 set	....
Inside Bit Key—Steel	....	....	....	30 "	....	30 "	....	3 "	....
Bathroom Bronze (all sets US14 inside)	....	....	....	1 "	....	1 "	....	....	.....
Bathroom Steel (all sets US14 inside)	....	....	....	3 "	....	3 "	....	....	.....
French Door—Bronze	....	....	..	1 "	....	1 "	....	...	....
French Door—Steel	..	.	.	2 "	....	2 "	....	.	.

* *Similar to Stanley's Z*

Chart continued on next page

ITEMS	*US2GxUS4	*US2GxUS11	*US2GxUS14	US4	US5	US11	US14	US19	
COLONIAL DESIGN	....	....	....	....	....	....	....	....	90.00
Cylinder Fr. Dr.—Bronze (Metal Knobs)	....	....	....	....	1 set	1 set	....	....	.....
Inside Bit Key—Bronze (Metal Knobs)	....	....	....	....	6 "	3 "	....	....	.....
Inside Bit Key—Bronze (Glass Knobs)	....	....	....	....	6 "	6 "	....	....	.....
Inside Bit Key—Steel (Glass Knobs)	....	....	....	....	18 "	12 "	....	....	.....
Inside Bit Key—Steel (Metal Knobs)	....	....	....	....	18 "	12 "	....	....	.....
Bath Room—Bronze (Metal Knobs)	(All US14 inside)		....	....	1 "	1 "	....	....	.....
Bath Room—Bronze (Glass Knobs)	(All US14 inside)		....	....	1 "	1 "	....	....	.....
Bath Room—Steel (Glass Knobs)	(All US14 inside)		....	....	2 "	2 "	....	....	.....
Bath Room—Steel (Metal Knobs)	(All US14 inside)		....	....	2 "	2 "	....	....	.....
French Door—Bronze (Metal Knobs)	....	....	....	....	1 "	1 "	....	....	.....
French Door—Steel (Metal Knobs)	....	....	....	....	1 "	1 "	....	....	.....
MODERNISTIC DESIGN	....	....	....	....	....	....	....	....	101.00
Cylinder Front Dr.—Bronze (Metal Knobs)	....	....	....	....	1 set	1 set	....	....	.....
Inside Set Bit Key—Bronze (Metal Knobs)	....	....	....	....	6 "	3 "	....	....	.....
Inside Set Bit Key—Steel (Metal Knobs)	....	....	....	....	18 "	12 "	....	....	.....
Bath Room—Bronze (Metal Knobs)	(All US14 inside)		....	....	1 "	1 "	....	....	.....
Bath Room—Steel (Metal Knobs)	(All US14 inside)		....	....	2 "	2 "	....	....	.....
PUSH BUTTONS to match	....	....	....	....	....	....	....	....	48.75
Colonial Handle Set	....	....	....	....	1 only	1 only	....	....	.....
English Handle Set	....	....	....	....	1 "	....	....	....	.....
Forged Iron Handle Set	....	....	....	....	....	....	....	1 only	.....
Broad Bevel Design	....	....	....	....	1 only	1 only	....	....	.....
Colonial Design	....	....	....	....	1 "	1 "	....	....	.....
Modernistic Design	....	....	....	....	1 "	1 "	....	....	.....
MORTISE BOLTS									10.00
Round Type	....	....	....	....	¼ only	¼ only	....	....	.....
Cast Case Type	....	....	....	....	1/12 "	1/12 "	....	....	.....
SURFACE BOLTS									3.50
4"x⅜"—Plated	....	....	....	6 only	....	4 only	2 only	....	.....
4"x⅜"—Bronze	....	....	....	4 "	....	2 "	2 "	....	.....
9"x½"—Plated	....	....	....	4 "	....	4 "	....	....	.....
9"x½"—Bronze	....	....	....	2 "	....	2 "	....	....	.....
12"x½"—Plated	....	....	....	4 "	....	2 "	....	....	.....
12"x½"—Bronze	....	....	....	2 "	....	2 "	....	....	.....
ELBOW CATCHES									12.75
Cast Iron	....	....	....	....	....	....	....	24 only	.....
	....	....	....	....	....	....	....	....	1.00
CUPBOARD TURNS									
Wrought Steel	....	....	....	2 doz.	....	1 doz.	1 doz.	....	.....
Cast Iron	....	....	....	1 "	....	½ "	½ "	....	.....
Cast Bronze	....	....	....	½ "	....	½ "	½ "	....	.....
	....	....	....	....	....	....	....	....	19.25
DRAWER PULLS									
Cup Type—Steel	....	....	....	2 doz.	....	2 doz.	2 doz.	....	.....
Bar Type—Cast Iron	....	....	....	1 "	....	1 "	1 "	....	.....
Bar Type—Cast Bronze	....	....	....	1 "	....	1 "	1 "	....	.....
	....	....	....	....	....	....	....	....	13.00
CHAIN DOOR FASTENERS									
Wrought Steel	....	....	....	2 only	....	1 only	1 only	....	.....
Bronze Metal	....	....	....	1 "	....	1 "	1 "	....	.....
	....	....	....	....	....	....	....	....	4.40
CASEMENT FASTENERS									
Cast Iron—Plated	....	....	....	1 doz.	....	1 doz.	½ doz.	¼ doz.	.....
Cast Bronze	....	....	....	¼ "	....	¼ "	¼ "	....	.....
	....	....	....	....	....	....	....	....	8.75
SASH FASTS									
Cast Iron 2½"	....	....	....	4 doz.	....	2 doz.	1 doz.	½ doz.	.....
Cast Bronze 2¼"	....	....	....	1 "	....	1 "	1 "	....	.....
	....	....	....	....	....	....	....	....	18.00
C & H HOOKS									
Wire	....	....	....	....	....	....	....	12 doz.	.....
Cast Iron	....	....	....	6 doz.	....	6 doz.	3 doz.	....	.....
	....	....	....	....	....	....	....	....	6.50
LETTER BOX PLATES									
Bronze Metal	....	....	....	1 only	....	1 only	....	....	3.00
SASH LIFTS									
Hook Type—Steel	....	....	....	4 doz.	....	2 doz.	2 doz.	1 doz.	.....
Bar Type—Cast Iron 4"	....	....	....	3 "	....	2 "	1 "	....	.....
Bar Type—Cast Bronze 4"	....	....	....	2 "	....	1 "	1 "	....	.....
	....	....	....	....	....	....	....	....	14.75
PUSH PLATES									
Glass 12x3 (no finish)	....	....	....	6 only	....	....	....	....	.....
	....	....	....	....	....	....	....	....	1.50
DOOR STOPS									
Base Type—Cast Iron	....	....	....	3 doz.	....	2 doz.	1 doz.	....	.....
Base Type—Cast Bronze	....	....	....	¼ "	....	¼ "	¼ "	....	.....
Floor Type—Cast Bronze	....	....	....	½ "	....	½ "	¼ "	....	.....
Floor Type—Cast Bronze	....	....	....	¼ "	....	¼ "	¼ "	....	.....
	....	....	....	....	....	....	....	....	7.25
WINDOW BEAD SCREWS									
Wrought Steel—Plain type flat washer	....	....	....	6 doz.	....	6 doz.	6 doz.	....	.....
Bronze Cup—Steel Screws Cut Type	....	....	....	3 "	....	3 "	3 "	....	.....
	....	....	....	....	....	....	....	....	4.00
SHELF RESTS									
Wrought Steel	....	....	....	....	....	....	6 doz.	....	.....
TRANSOM HARDWARE									
Catches—Cast Iron	....	....	....	1 doz.	....	....	....	....	.....
Chains—12" Steel	....	....	....	1 "	....	....	....	....	.....
Chains—12" Steel with snap—no finish—	Galv.	....	....	½ "	....	....	....	....	.....
	....	....	....	....	....	....	....	....	5.00
DOOR KNOCKERS									
Colonial	....	....	....	1 only	....	1 only	....	....	.....
Forged Iron	....	....	....	....	....	....	....	1 only	.....
	....	....	....	....	....	....	....	....	5.00
								Total	$500.00

mands other finishes than those listed, the salesman can advise you and other finishes can be substituted.

In describing the designs it has been necessary to be quite general. Certain patterns or designs please you more than others. Guided by the salesman selling you the stock order I recommend your buying the design you prefer. You can always do a better selling job on designs you yourself are sold on.

Your judgment and the salesman's together with that of the owner of the business may warrant your increasing the order in quantities, designs or other items you wish to add or deduct.

The Chart As a Guide

The chart is merely intended as a guide. The pricing readily lends itself to allowing you to increase or decrease the order in these proportions and know about how much more or less you will spend.

The chart suggests only one glass knob design. Use your own judgment on this. Glass knob sets have been very popular.

Glass Knobs in kitchens, baths and bedrooms are very practical and in excellent taste. Don't overlook them in your stock.

Some folks save a few cents by buying split sets for exterior doors. that is having one side in bronze and the other side in steel but I have not considered this in the chart. Personally, I never considered it worth while.

In the case of doors having glass knobs one side of the door and metal on the other side, learn how to split these sets yourself from your stock. It will be cheaper and quicker than ordering the sets special from the factory or jobber.

When you study the chart, master it thoroughly as it is the basis of a good builders' hardware stock. Your stock in trade. Know your stock, examine each item. Do not be afraid to ask questions. The salesman who sells you your stock can be of tremendous help in your education as your order is placed and merchandise is received.

Finishes

Following is an outline of the $500 stock order. The finishes noted are U. S. Standard and generally described as follows:

U. S. 4—Dull Brass.

U. S. 5—Dull Brass oxidized and relieved.

U. S. 11—Dull Bronze oxidized and relieved.

U. S. 14—Polished Nickel.

U. S. 19—Imitation Barff.

Chapter 2—*Elementary Course*

STOCK ARRANGEMENT

NOW, your attention should be given to the arrangement of the stock on the shelves of your store. Particularly, I want you to note the order in which the stock schedule was arranged for that is the way I would suggest your stock be arranged on your shelves.

There are two schools of thought in this stock arrangement. Some prefer to put all butts together regardless of finish; likewise the lock sets and so on down the line. I suggest, wherever you can possibly find room, the stocking of every finish separately. This eliminates many errors in getting out orders. Which ever school of thought you choose to follow, the stock arrangement can be alike, except that in the latter suggestion you will carry this thought through for each finish repeating the process with each finish stocked.

Storing Stock

We will start out putting the stock away considering that we have the usual type of shelving—bins below the counter, then the counter and bins above the counter. Conditions often vary from this but the idea is the same regardless.

In the bins below the counter, which are deeper bins as a rule, you can put the inside lock sets

ITEM Butts — VENDOR Blank Mfg. Co. — ADDRESS New York City — CITY New York

DEPT Builders' Hardware — TERMS 2% E.O.M. - 30 days net F.O.B. Factory — SHIP VIA Freight

ACCOUNT NO. 67 — SECTION C

DESCRIPTION	NORMAL STOCK	DATE		ORDER NO.	DATE		ORDER NO.	DATE		ORDER NO.	DATE		ORDER NO.	DATE		ORDER NO.	DATE	
		STOCK	ON ORDER	TO ORDER	STOCK	ON ORDER	TO ORDER	STOCK	ON ORDER	TO ORDER	STOCK	ON ORDER	TO ORDER	STOCK	ON ORDER	TO ORDER	STOCK	ON ORDE
		2/1/37		67-IC	3/1/37		67-2C											
#111 - 4 x 4 Fin US4	6 Pr	4		2	3		3											
" - 3½ x 3½ " "	50 "	40		10	20		30											
" - 3 x 3 " "	10 "	7		3	6		4											
" - 4 x 4 " US11	3 "	2		1	3		0											
" - 3½ x 3½ " "	25 "	15		10	25		0											
" - 3 x 3 " "	6 "	4		2	6		0											
" - 4 x 4 " US14	3 "	2		1	1	1	1											
" - 3½ x 3½ " "	12 "	6		6	3	6	3											
" - 3 x 3 " "	6 "	4		2	4	2	0											
" - 3½ x 3½ " US19	6 "	4		2	6		0											
#119 - 2½ x 2 " US4	36 "	18		18	12		24											
" - " x " " US11	24 "	12		12	24		0											
" - " x " " US14	24 "	10		14	6	14	4											

This suggested stock card prevents running your builders' hardware stock by guess. It tells you how much you sell, what you sell find it described in

in order as listed. Be very careful to separate the bronze goods from the steel to insure against costly errors. There should be room for all your inside lock sets below the counter.

Immediately above the counter I would arrange the butts and hinges. They are the most frequently required items and should be in the most accessible place.

Then, way up at the top, I would put the residential handles —front door sets and French door sets. Being least called for, they take the least accessible place. The rest of the upper part of the bins between the butts and front door sets I would suggest your arranging all the rest of the hardware on your list in alphabetical order as they have been arranged on the suggested stock order in Chapter 1.

Using this arrangement where it is broken down by finishes, there will be just about room enough for your hardware in the usual type of hardware shelving. Repeating each finish with the same arrangements would give you four sections for the four finishes. Once you become accustomed to this arrangement you will find things quickly and know what you have.

Stock Records

Neat stock arrangement is a very worthy objective of a good builders' hardware man. He will not only arrange it properly, but what is much more important, he will *keep* it that way.

Now comes another important item—STOCK RECORDS. Never try to run your ordering of stock "by guess and by gosh." Know what you sell, how much you sell and how often you need to order. Do not wait until you are all out to order your goods. That's enough of what *not* to do. Here's what *to do*.

Stock Cards

Secure standard stock cards or have some printed for your requirements. They should be large enough to hold a year's records.

In the left hand column insert all the necessary number information which you will require to order more goods from the factory. In the next column show your normal stock requirement. In another column put the market price. Keep this up to date regardless of what you paid for the goods. This makes your stock record very valuable not only as a stock record but as a price book.

Let me give you, right here, another suggestion along this line —instead of using code figures for cost, take your cost and double it showing the doubled figures in plain figures. Then if you want

ORDER NO.	DATE	ORDER No.	DATE	ORDER No.	DATE	ORDER No.	DATE	ORDER No.	DATE	ORDER No.	DATE	ORDER No.	DATE PRICE	YEAR
TO ORDER	STOCK	ON ORDER / TO ORDER	STOCK	ON ORDER / TO ORDER	STOCK	ON ORDER / TO ORDER	STOCK	ON ORDER / TO ORDER	STOCK	ON ORDER / TO ORDER	STOCK	ON ORDER / TO ORDER	List Price	Recap. Year's Sal
													48 Pr.	
													35 "	
													35 "	
													65 "	
													49 "	
													49 "	
													77 "	
													61 "	
													60 "	
													53 "	
													24 "	
													30 "	
													36 "	

and how often you need to order. It should be large enough to hold a year's records. This one is printed both sides. You will detail in this chapter.

to sell at 25 per cent off the list you have made 50 per cent on your cost. If you want to sell a large contractor at 33 1/3 per cent discount you have made 33 1/3 per cent on your cost. If you have particularly tough competition and want to give 40 per cent off you have made 20 per cent on your cost and, always, you quickly have the cost itself because it is just half of the figure shown.

Following these columns should come twelve other columns so the stock can be taken every month of the year. Each of these columns should be in three parts, first figure to show amount of stock on hand. Second figure should show the amount on order not filled and the third column should show the amount to order for the month to bring your stock back to normal considering the other two columns.

A final word about stock cards. If your normal stock is not sufficient and you are constantly running out of goods, do not hesitate to increase your normal stock figure. Likewise, if your normal stock is not showing you at least a four times turn over, do not hesitate to reduce your normal stock figure.

At the end of the year, total your sales of each item from that figure and you will readily see what your normal requirements are. Dead or slow moving stock will stand out like a sore thumb and you can do something about it to move such items.

Too much emphasis cannot be given as to the importance of having every bit of information necessary to order goods from your source of supply on the stock cards, number, size, finish, etc. This will eliminate errors, delays and needless correspondence.

Do the job right in the first place, check your orders against the information on the cards and your problem is solved.

The sample card shown with the chapter will illustrate what I mean. If you have both sides of the card printed you can keep two years record on one card. With this record all you need to do is fill in the quantities and your stenographer can make up the orders directly from the card.

Now you have learned how to stock your merchandise and how to keep stock records.

Chapter 3—*Elementary Course*

BUTTS and HINGES of the ORDINARY HOUSE

IN this chapter we begin to study the vital and basic "taking off plans" from an actual blueprint of a modest home. The blueprint is prepared in a form convenient for ready reference. Room by room, opening by opening, these chapters will help the interested builders' hardware student become capable in specifying hardware. The house selected for an example is typical and the blueprint exactly as an architect, builder or home owner would present it when you seek the hardware order.

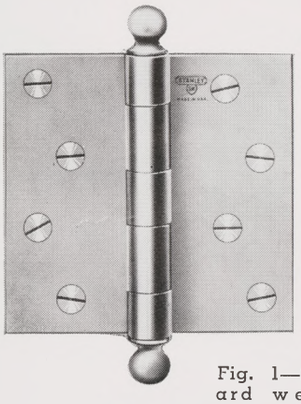


Fig. 1—Standard weight butt for mortising into edge of door and frame.

In this chapter we present a plan of a small house. Study it carefully for as we equip it with the proper hardware you will naturally learn many things which are typical in every house.

This house of modest construction is a rather typical home for one of limited means. It has been said "God must have loved the common people, he made so many of them." If this is so, they have to have homes in which to live—the type we are now studying.

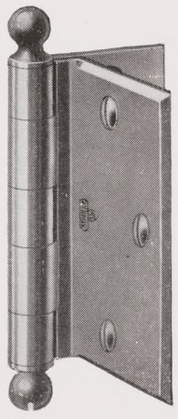


Fig. 2—Standard weight half-surface butt, surface application on door mortise into frame.

Every opening whether door, cupboard or window must have hardware, so first let us list the various openings for which hardware will be required:

HOUSE—Basement

1 Batten Door Fruit Closet
1 Clothes Chute Door
4 Basement Windows Steel Sash

GARAGE—

1 Pr. Exterior Doors Open out 1¾″
1 Side Entrance Door Open out 1¾″
2 Double Hang Windows

HOUSE—First Floor

1 Front Entrance Door 1¾″
1 Rear Entrance Door 1¾″

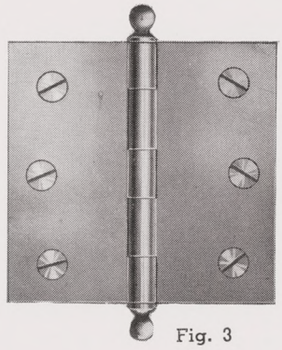


Fig. 3

Finishes are U. S. Standard and generally described as follows:

U. S. 4—Dull Brass.

U. S. 5—Dull Brass oxidized and relieved.

U. S. 11—Dull Bronze oxidized and relieved.

U. S. 14—Polished Nickel.

U. S. 19—Imitation Barff.

Fig. 3—Light weight butt—full mortise type for cupboards.
Fig. 4—Light "T" hinge.
Fig. 5—Light strap hinge.
Fig. 6—Full surface cupboard hinge.

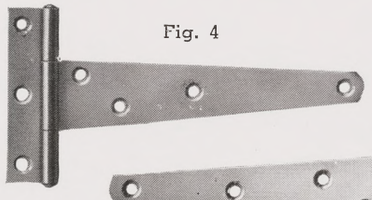


Fig. 4

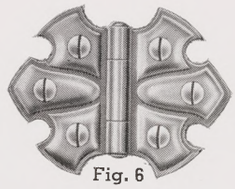


Fig. 6

Fig. 5

1 Pair Interior French Doors 1⅜″
1 Double Acting Door 1⅜″
5 Other Interior Doors 1⅜″
1 Cupboard Door in Living Room 1⅛″—3 Adjustable Shelves Over
1 Clothes Chute Door ⅞″

Kitchen Cupboards

2 Pr. Doors—4 Sgle. Doors ⅞″—5 Long Drawers—4 Short—8 Adj. Shelves
1 Package Box—Metal
1 Pr. Casement Windows over Kitchen Sink 1⅜″
7 Double Hung Windows

HOUSE—Second Floor

1 Bath Room Door 1⅜″
1 Medicine Cabinet—Metal
1 Double Hung Window in Bath
5 Other Interior Doors except Bath 1⅜″
1 Clothes Chute Door ⅞″
1 Scuttle Door to Attic
6 Double Hung Windows except Bath

ATTIC HOUSE—

1 Bottom Hung Casement Window 1⅜″

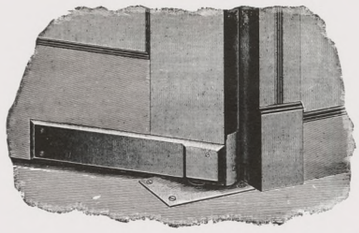
OUTSIDE HOUSE & GARAGE—

7 Prs. Shutters (or Blinds)

These are the openings in this rather simple house to be equipped with hardware.

The first goods that will be required are the hinges. You must learn trade names. For practically all of the doors in this house we shall use butts.

Butts (Fig. 1) are really butt hinges to be mortised into the edge of the door and the frame for the door. All the butts we shall use are to be five-knuckle butts, loose pin. Take an ordinary 3½ x 3½ butt out of stock. Study it. Now do you understand what we mean by "knuckle" and "loose pin?" It is so much better for you to study these terms in light of the goods actually in your hand that I shall not attempt to go into a long description of the terms where it is so obvious upon viewing the merchandise.



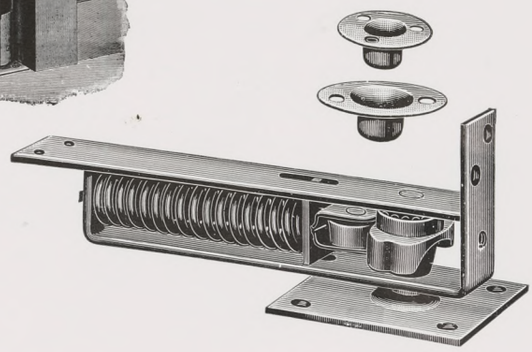


Fig. 7—A surface floor spring hinge. Below, the working parts.

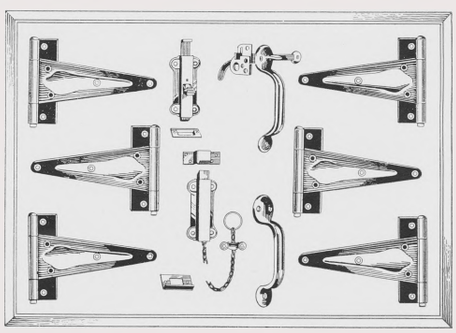
For this type of house using standard doors and frames we do not need to concern ourselves particularly with "throw of the hinges—reveals, etc.," which come up later.

For all practical purposes now the following schedule will be found ample:

1¾″ Doors take	4 x4″	Butts
1⅜″ " "	3½x3½″	"
1⅜″ Windows take	3 x3″	"
1⅛″ Doors take	2½x2″	"
⅞″ " "	2½x2″	"

You will find some carpenters prefer to use half surface butts (Fig. 2) and for the cupboard doors full surface hinges (Fig. 6).

If full mortise butts are used on the cupboards they should be loose pin as illustrated in Fig. 3.



A garage door set for pair of doors opening out, complete except lock.

This house we are now equipping is to be done very economically, so we shall use plated butts. That is a steel butt, electroplated to match the finish of the lock set selected.

Here are two suggestions regarding building up value of sales that even on this house you can try.

Suggestions on Selling

First, for all the exterior doors, sell three butts for each door. Explain the necessity of this to the owner or builder because exterior doors are exposed to the temperature and weather conditions outdoors and the often greatly contracting temperature inside the house. Three butts will help keep the door from warping due to these conditions.

Secondly, try and sell sheradized or electro galv. before plating butts on the exterior, bath and medicine cabinet doors. Explain to the owner or builder the value of this additional expense, how it will greatly retard rusting where so much moisture occurs as it does on exterior doors and in the bath rooms. But let me give you this warning! Never tell your customer this process will absolutely prevent rust, because even these butts will rust eventually if exposed to sufficient moisture.

If you want to make sure there will be no rust, sell bronze or brass butts. Ordinarily, in the class of construction now under

consideration the customer will not pay the difference.

T Hinges

For the Batten Door in the basement we will use a pair of 5-inch Light T Hinges.

T hinges (Fig. 4) are so called because of their appearance—strap hinges (Fig. 5) for the same reason. They are applied on the surface of the door and frame so never call them butts.

A great many dealers find it to their advantage to stock strap and T Hinges a single pair to a box packed with screws. Many dealers, on the other hand, use the cheaper way of buying them in bulk without screws.

In case your stock is the latter, let me give you here and now a word of warning! Be sure screws are added to the hinges when they are shipped to the job and that they are the proper length and diameter. Never send out any goods to a job that are not complete and fully equipped to install. Nothing will so build up goodwill upon the part of the contractor as the strict observance of this rule. Nothing will so quickly tear down a contractor's goodwill as your failure in this respect.

Delays Are Costly

Place yourself in the contractor's position. He has high-priced mechanics at work. Screws, bolts or other parts are missing. These men are delayed perhaps $5.00 worth of time lost while the contractor or his carpenter chase out to your store for 5 cents worth of screws you forgot to send. How would you feel under similar circumstances?

On the Double Acting Door we will use a surface floor spring hinge (Fig. 7), such as is manufactured by several spring hinge manufacturers. It has the hold back feature incorporated in the hinge.

Extra Business

Perhaps you can get some extra business by selling a checking floor hinge, particularly if the owner is selecting the hardware. Explain how the speed of the door is controlled by the check. One accident to a tray of dishes, due to the speed of a regular spring hinge, might be far more costly than the difference in price. Then the quietness with which the door closes is well worth the difference. Try these various profit raising hints. You will not always sell the better goods, but you will at times, and after the house is completed, the owner will appreciate your suggestions even if he doesn't buy at the time.

For the garage doors of this type of house, I would suggest one of the complete sets with hinges, bolts and latches manufactured by several companies. Here, too, one can build up the sale. Explain to the customer the hard usage these doors receive and try and sell them the larger size hinges, bolts and latches which are available. Sell them, in addition, over-head garage door holders to hold the doors open.

Master this chapter on butts and hinges of the ordinary house. It is an important chapter in your Builders' Hardware education.

Chapter 4—*Elementary Course*

FRONT DOOR LOCKS

BEFORE discussing locks, let us point out another good hint in the matter of service. Send all the Butts and Hinges to the job before you send anything else out. Then run out to the job and check it over before you send the balance of the hardware to the job. In this way you can check your hardware list as to its correctness of quantities, changes which may have been made since your list was compiled and especially see that your hardware will fit the doors and windows as they actually are on the job.

Now, to return to the matter of the hardware itself. We have taken care of only the hanging of the doors. Next we must consider the locks.

Front Door Lock

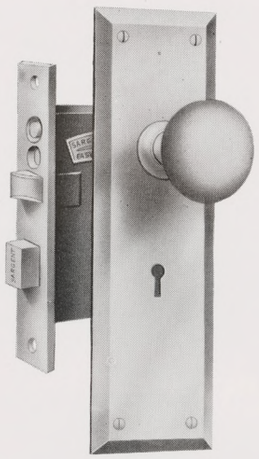
The first thing to consider is the lock for the front door. When I start to show builders hardware for a residence of any value I always start my presentation of samples with the front door lock. I believe it is a good thing to do. The front door lock is the first bit of hardware a guest sees on visiting the home, particularly in the type of house we are now considering. It is the most used exterior door. Folks will spend more money for this piece of hardware than anything else in the house, so it is well to settle that subject first in the selection of finish hardware.

You should have at least four types of trim to show and sell to the customer regardless of how many designs or finishes you carry in stock. Let us lead up from the cheapest to the most expensive and discuss each as you would present it to the customer. Type No. 1 is the Bit Key Front Door Set Latch and Dead Bolt with buttons in the face of the lock to control the outside knob. Cut No. 1 illustrates what I mean, but again let me suggest that you go to your own stock and examine the actual goods.

This is the cheapest type of front door lock. It can be secured in steel plated, wrought brass or bronze, although I am going to make this comment: Never, unless you have to, sell any lock sets for exterior doors in Steel Plated. Whether or not you can step your customers up to the higher priced locks we shall later discuss. At least, do this—Sell brass or bronze lock sets for exterior doors if you have any pride at all in your ability to be a builders' hardware salesman.

Knobs or escutcheons of steel will quickly rust on exterior doors often before the house is ready to turn over to the owner from the contractor. Imagine what the owner would think if his outside locks were rusty before he even moved into his new house. It wouldn't make any difference how little he paid, every time he entered his home he would remember that "cheap" hardware he got, not what he paid for it. To make matters worse, if his woodwork were painted in any light color there soon would appear streaks of rust down the face of the door.

The illustrations we are giving in the early chapters do not deal particularly with designs or finishes. They illustrate a plain universally used broad bevel design. Later on will be discussed the whole subject of design and finish, but, for the present, I want you to learn, in as simple a way as possible, the fundamentals of the business.



Bit Key Front Door Set
Type No. 1

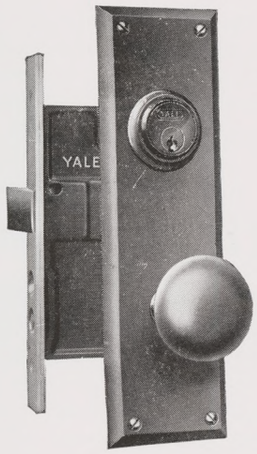
Step-Up

The first step-up in sales from the illustration in Fig. No. 1 is to use a three tumbler instead of a one tumbler lock, which gives additional security but still requires the owner to carry a cumbersome key. Let us not stop now to consider lock tumblers but quickly pass to Type No. 2 Front Door Lock.

Cylinder Lock

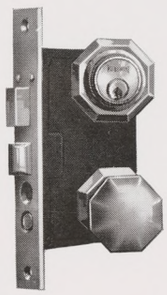
This is a Cylinder Lock which operates with a thumb turn inside-buttons in the face, has a latch and dead bolt. What warrants any owner to invest this additional money is the security he receives from a Cylinder Lock and the great convenience of carrying a much smaller key. We shall again discuss a further value when we come to the other exterior doors.

This shows the third type of front door hardware. This is no



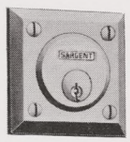
Cylinder Front Door Set
Type No. 2

more expensive than Type No. 2, but many owners prefer it because it does not show so much hardware on the door. In hardware terms we call it "sectional trim."



Sectional Front Door Set
Type No. 3

The Lock and its functions are exactly the same as in Type No. 2. Use of either Type No. 2 or No. 3 is optional at the customer's taste, except that Type No. 3 should never be sold on doors of less than 1¾ in. in thickness and front doors are seldom less than that. The reason this warning is given is because on doors of less than 1¾ in. in thickness there is very little wood left after the carpenter has cut the door to receive the lock at the point where the rose under the knob is applied and the screws for the rose do not have sufficient wood left to properly hold them. The result is that the screws work loose, knobs rattle and the result is quite unsatisfactory.



Residential Cylinder Front Door Handle Set
Type No. 4

The highest type of lock used in this class of home is that of the Sectional Residential Handle. This type of front door lock can be secured with a bit key lock but real builders' hardware men seldom show it. It can also be secured from some manufacturers with wrought brass or bronze plates but the difference is so small I would never recommend it. When you have an owner to the point of putting enough money into his front door lock to buy a Type No. 4 Lock, don't fool with the difference in price of 50 cents to $1.00 between wrought and cast bronze or brass back plates. Stock and sell only cast brass or bronze.

On this type Lock, a cylinder lock with all the outside trim of cast brass or bronze, the handle bolted right through the door, you have sold the customer something he will always appreciate.

The Lock itself is much the same as in Types No. 2 and No. 3 —the buttons in the face control the outside thumb piece. The Lock has a latch and a dead bolt, the dead bolt being operated by a thumb turn on the inside of the door as well as by the key on the outside.

These four types of locks, then, should be shown and the customer tactfully led to buy a quality lock for the front door.

Just one more hint on the subject of front door locks. Display attractively your samples of front door locks and you can often sell these sets on old homes as well as new. Many sets have been sold for this use by attractive display.

Chapter 5—*Elementary Course*

OUTSIDE DOOR and GARAGE LOCKS

IN this chapter we will study the locks for the other outside doors of the house and garage.

First the rear entrance door to the house—The cheapest lock we should consider using is a wrought brass or bronze set (Fig. 1) as illustrated. If you must sell a steel plated set remember what I told you in the last chapter about this kind of goods. Tell your customer about this type of hardware rusting, when you sell it, so there will be no kick-back.

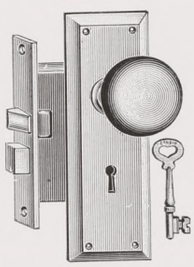


Fig. 1—Bit Key Lock Set

Now, on the house we are equipping with locks we will say the rear door gets comparatively little use. You can put in, as a build up, a three tumbler lock, but on a door like this, I prefer a mortise dead bolt (Fig. 2) which gives more security—is always ready to use. Try again for plus business by selling a better bolt (Fig. 3) where possible.

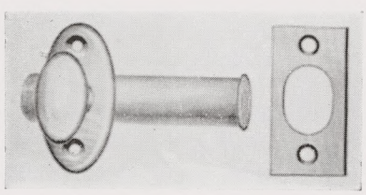


Fig. 2—Mortise Tubular Door Bolt

Then we come to the side entrance door to the garage. It is used a great deal. Use the same lock set as described for the rear door of the house, but instead of a mortise dead bolt suggest a cylinder rim night latch like Fig. 4. Explain to your customer that he will use the door a great deal.

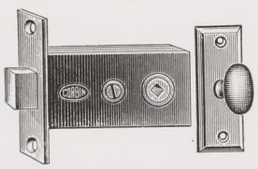


Fig. 3—Heavy Cast Case Mortise Door Bolt

Keyed Alike

Then comes your biggest selling argument. At no additional charge you can have the same key operate both the front door lock and this lock. Factories do not charge anything extra for keying alike, so it doesn't cost you anything to make this suggestion and it always makes a hit with your customer.

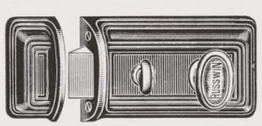


Fig. 4—Cylinder Rim Night Latch

Having gotten that far, you may be able to build the sale up further by explaining the better appearance of a mortise cylinder latch like Fig. 5 or better still, sell a complete cylinder knob lock set such as described in the last chapter with long plates or sectional trim as therein illustrated.

Then comes the pair of large garage doors. These are just a pair of hinged doors opening out. It was suggested in chapter 3 that you sell a complete set as made by several manufacturers. I should have said "complete, except for a lock."

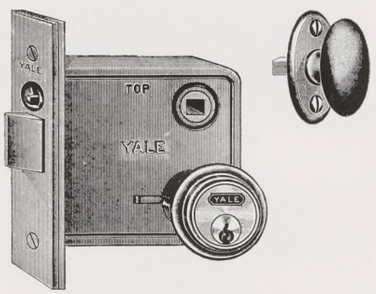


Fig. 5—Cylinder Mortise Night Latch

Here again you have a chance to be of service to the owner. You can sell him a padlock that will fit in the padlock eyes furnished in the door set. You can again suggest to the owner that you will have this padlock keyed to the same key as the front and side door. Less keys to carry, as one key will fit the three doors.

Of course, with this system, it will be necessary to order the three locks from the manufacturer or jobber keyed alike in which case there will be no extra charge.

If it is a rush job your local locksmith or someone in your store, if he knows how, can reset your stock locks to one key. If the owner is in a great hurry an extra charge is in order and it will also be well to tell the customer only

three keys are available unless, he purchases extra keys; whereas if he will wait until the locks come from the factory he will have eight keys instead of three at no extra charge whatsoever.

Now, if you have sold a padlock, remember it must be a cylinder padlock of the same make as your house locks and it should be a chain padlock (Fig. 6), so the lock can be fastened to the door insuring against loss or theft.

Another very popular lock for this type of door is one brought out by several manufacturers, similar to Fig. 7. It is a splendid lock for garage doors, allowing for considerable sag in the doors, which often occurs in doors of this type.

Fig. 6—Cylinder Brass Padlock with Chain

While considering the exterior doors for locks, a natural step to take next is to present the accessories many homes will need. On the front door a door knocker may be sold to good advantage. Sell an electric push button in the same design and finish as the front door

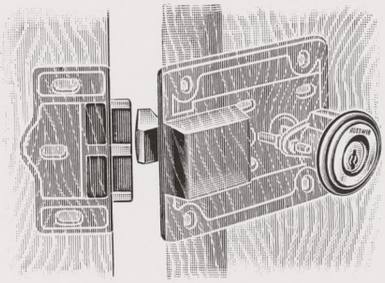


Fig. 7—Garage Rim Lock for Doors Opening Out

lock. Explain to your customer the improved appearance such an inexpensive item makes to the front entrance over the type an electrician would put on as part of the wiring. Letter Box Plates are necessary requirements, or an ornamental letter box. Have these in the finish that matches the front door lock.

House Numbers

Then, there are house numbers. In Buffalo, N. Y., a recent city ordinance requires every home owner to have house numbers 4″ high so they can be seen from the street. Not a bad idea! Hardware Dealers in Buffalo have been happy over that ordinance.

A timid housewife will appreciate a chain door fastener on every outside door like Fig. 8.

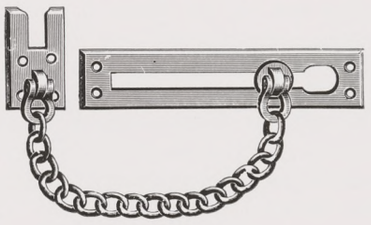


Fig. 8—Chain Door Fastener

Occasionally you may even sell a door closer, but these require a chapter for discussion in themselves and will be dealt with later.

Knowing what this plus business can mean in increased sales, it is my hope that these suggestions will be tried with every prospective customer. No high pressure methods need be used. The power of suggestion is much better. Even if they do not buy the accessories when buying the Builders' Hardware they will remember them and often come back to your store and purchase them later.

Chapter 6—*Elementary Course*

INTERIOR DOOR LOCKS

NOW, let us move to the interior doors of our house which you must equip with lock sets of suitable type.

First, we have a pair of interior French doors. When I speak of French doors I mean doors with glass, usually square panes of glass held in place by wood muntins and a stile around the edges.

"Backset"

The stile of the door in which the lock is inserted is the deciding factor as to the type of lock you shall use. Let us say on this job the stile is 3 in. That means you have 3 in. from the edge of the door to the glass. Half of 3 in. being 1½ in., you will use a lock with an inch and one-half backset.

"Backset," a common term in builders' hardware, is the distance from the front of the lock to the center of the lock hub for the knob spindle. Getting a lock as near as possible to the center of the door stile for the knob is one of those niceties that distinguishes the work of a real builders' hardware man.

On this house, let us say that the doors have a flat edge on which you will use a flat or regular-faced lock. With this kind of a door you can equip the active operating door with a French door lock set made by all manufacturers, similar to the illustration here noted (Fig. 1).

Keep in mind that this opening is not a single door, but a pair of doors. You have put a French door lock set on the active door but there remains the problem of fastening the inactive door. It must be bolted.

For an inexpensive job I suggest the use of two surface bolts as illustrated. (See Fig. 2.)

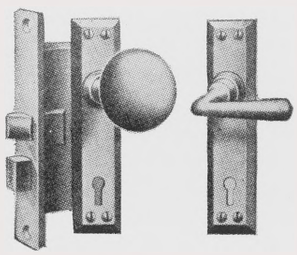


Fig. 1—French Door Set

Consider the height of the door. Let us say on this job the door is 6 ft. 8 in. high. Practically everyone can reach to a height of 6 ft. without trouble. Therefore, an 8 in. or 9 in. bolt is long enough for the top. On the bottom a 12 in. bolt will eliminate the necessity to stoop low to operate the bolt. Some may prefer to make both bolts the same length.

Double Acting Door

Next, we have the double acting door. It is seldom locked and it is the general practice to trim this door with two 12 in. glass push plates. That, therefore, in addition to the floor hinge already discussed in Chapter No. 3, is all the hardware required for this opening.

If you prefer, you can, of course, use metal push plates in design and finish to match the door locks.

Now we will take up the matter of the bath room door lock. Of all the interior doors in the house the bath room door is the most frequently locked. Again, it is a general practice to equip this door with a lock having no key hole on the inside, but locking the door with a thumb turn instead. This type of set illustrated here is called a bath room set (Fig. 3).

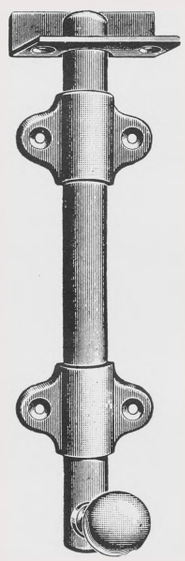


Fig. 2—Surface Door Bolt

It has certain distinct advantages. The thumb turn, being attached to the door, is always ready for use, whereas a lock depending upon a key to lock it is apt to have the key missing when it is required, especially where small children are around.

Emergency Key

Just another little hint, right here, that costs little but adds to the service you can render your customer also: Sell the bath room

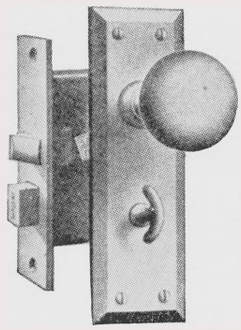


Fig. 3—Thumb Turn Bathroom Set

set with an emergency key. It adds only a couple cents to the cost of the set but a dollar's worth of value in service. Explain to your customer that children often lock themselves in a bath room but cannot unlock the door unaided. Even older people occasionally become ill and cannot unlock the door. In either case entrance can be quickly made by use of the emergency key. Suggest to your customer putting the key on the top of the door casing and leaving it there for just such emergencies.

While I shall not discuss at any great length, here, the subject of hardware finishes, I do want to touch on it by saying that nickel plate is universally used on the type of lock on the bath room side of the door to match the nickel of the pipes and fittings installed by the plumber. Your butts, medicine cabinet and window hardware should be all nickel plated to match the door trim. Then come the other interior doors, ten including the three closet doors. Some folks use closet door sets that are half trim

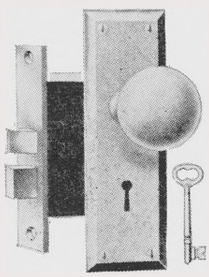


Fig. 4—Bit Key Inside Lock Set

sets, but if you will take the time to figure the difference in cost for this economy, I believe you will agree with me that on inexpensive jobs, particularly, it isn't worth the trouble. Most manufacturers make a difference on steel inside sets of 50c. a dozen or only 12c. difference for the three closet doors. From the standpoint of the department, it is another item to stock—which is unnecessary. From the standpoint of the customer that 12c. would be saved the first time a knob went wrong on any door by replacing the door knob with a knob from the inside of one of the closet doors. Let us, therefore, on all of these ten interior doors, use a standard inside lock set as illustrated (Fig. 4).

Keep in mind the illustrations are based on a broad bevel design, but we shall discuss other designs later on.

Build Up

As a build-up for the sale, the plus business that we are trying to make and considering the fact that this house is a modest one, you will first figure steel-plated inside sets.

The first step up, if you can't get any further with the customer, is to sell him a brass metal bath room lock instead of steel, for the same reason you tried to sell them sheridized or brass butts. Moisture in the bath room and the white or ivory finish of the door warrant this insurance against rust in such an important place.

The next step will be to try and sell the customer brass metal instead of steel-plated lock sets for the balance of the interior doors. This step achieved, you have added nice volume to the sale.

In addition to the argument of insurance against rust, you have another strong argument to present for the increased expenditure. Take the lock out of both sets, steel and brass, just as it comes in your stock and show the customer how much heavier the lock front is in the brass set. The extra time is worthwhile to both your customer and yourself to be a builder upper—sell brass or bronze.

Chapter 7—*Elementary Course*

DOOR STOPS and CUPBOARD HARDWARE

IN Chapter 1 of our $500 stock, ample for the small store, we outlined, in addition to the broad bevel sets in three finishes, a Colonial design in two finishes, with metal and glass knobs and a modern design in two finishes, which give your customer quite a range of selections.

Regardless of what design you sell, the locks will be typical as outlined in Chapter 6.

Before we leave the subject of doors, there is one more detail to consider, namely: door stops which keep the door knobs from hitting the plaster work or the woodwork. The common practice is to send a metal door stop with a rubber bumper like Fig. 1.

Fig. 1—Metal Base Door Stop

If you will take the time, however, to check this small matter, either on the plans or at the job, you will find occasions where the regular door stop cannot be used. There may be a radiator or something of the kind in the way to make it necessary to use a floor stop like the one illustrated by Fig. 2.

At times you will find, too,

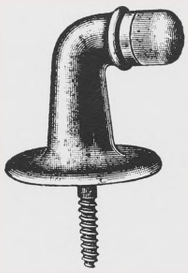


Fig. 2—Metal Floor Door Stop

neither type is suitable. The door may hit the bath tub or a shelf in the kitchen and, in such a case, a stop like Fig. 3 is the answer.

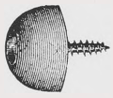


Fig. 3—Rubber Bumper

Remember to sell a stop of brass or bronze metal nickel plated in the bath room. Note particularly, here, that the floor or base may be of tile, requiring a lead shield for the screw end. Carefulness in matters of this kind greatly increase your prestige with the architect and contractor.

Smaller Doors

Next we come to the smaller doors—book cases, kitchen cabinets and clothes chutes. The inexpensive and quite useful elbow catch does for one side of the pair of doors (see Fig. 4) with a cupboard turn similar to the one shown as Fig. 5 on the other door of each pair of doors and also on each single door.

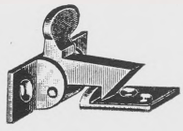


Fig. 4—Cast Iron Elbow Catch

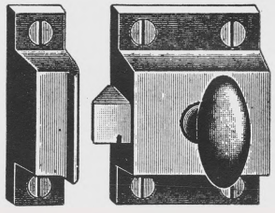


Fig. 5—Cast Cupboard Turn

It has always been a hobby of mine, and I hope you will see it that way too, to sell a cast iron cupboard turn instead of wrought steel. It costs a little more, yes; but it is a great deal better from the point of service. By this time, however, I am sure it is hardly necessary to suggest that plus business rests in selling a cast brass or bronze cupboard turn wherever possible.

There are many other ways of trimming these small doors practically as reasonable as the standard cupboard turn, using friction catches like Fig. 6 or Fig. 7.

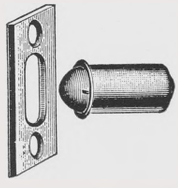


Fig. 6—Mortise Friction Catch

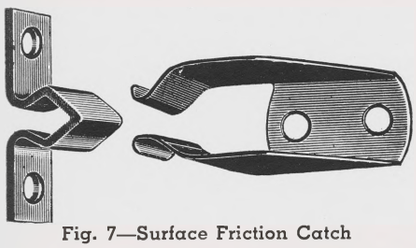


Fig. 7—Surface Friction Catch

with a knob pull like Fig. 8.

Fig. 8—Knob Drawer or Drawer Pull

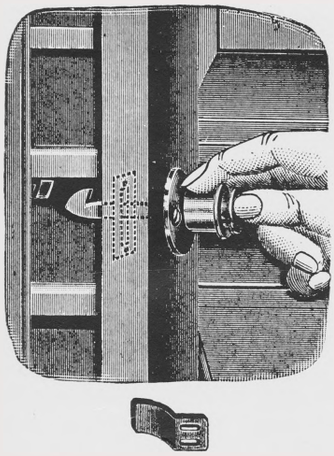


Fig. 9—Push Pull Catch

Then there is the matter of drawers. On narrow drawers one pull is used, but if the drawers are over 18 inches wide, you should use two pulls to a drawer. The type of drawer pull is here illustrated by Fig. 10.

Fig. 10—Cup Drawer Pull

Some folks, as an intermediate step-up, use a bar sash lift, which will be described in the next chapter but I suggest the proper step-up from the common drawer pull to the drawer pull shown in this illustration (Fig. 11) which is fastened to the drawer from the back with two machine screws. It is by far the most satisfactory type of pull. These can be purchased also in glass. As a final build-up of sale, of course, you will try to sell Brass or Bronze metal.

Fig. 11—Bar Drawer Pull

You will note on the plans several of the cupboards have adjustable shelves. The common nickel plated shelf rests (Fig. 12) made for this use by a number of manufacturers do nicely for this purpose.

Fig. 12—Shelf Rest

The Medicine Cabinet and Package Cabinet being of metal will come complete with hardware installed.

On the scuttle door to Attic besides the hinges a door pull or bar sash lift should be furnished to be applied on the attic side in case anyone got up there and accidentally closed the scuttle so they could open it by pulling it up by the handle.

On the batten door in the basement an ordinary Japd. Thumb Latch will serve the purpose.

All through these studies I have spoken of Nickel Plating. That is the finish that the suggested stock carried.

Chrome Plating

However, I am not unmindful of the fact that the public is fast being educated to demand chrome plating and you can easily in many cases get an extra for chrome. In most cities, if you are pressed for time, you have a plating works which will refinish your nickel to chrome or you can order it special from the manufacturer if you have time. The latter will cost you less and you will usually get a better job.

Don't overlook this chance to cash in on all the educational advertising that has been paid for to get Mr. & Mrs. John Public to use Chrome Plated goods where formerly they thought of nothing but nickel.

Because of the modest investment you have in your model suggested stock, chrome has not been included. It will not cost a great deal, however, to add that finish if you wish.

Chapter 8—*Elementary Course*

WINDOW and CLOSET HARDWARE

DOUBLE HUNG, generally called "D.H.," windows have the widest use and usually on residences. In the home you are equipping, you will note there are sixteen such windows—one in the bathroom, two in the garage and thirteen others.

As far as type of hardware used is concerned, they can all be trimmed the same. The usual crescent sash fastener, as here illustrated in Fig. 1

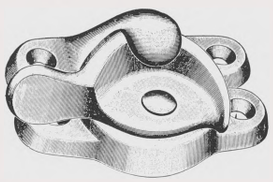


Fig. 1—Sash Fastener

has become the universally accepted type for the home. Take one out of your stock, examine it and you will see why this is so. Note how, by its sweep, it pulls both sash together tightly, eliminating rattle and closing the opening between the upper and lower sash, keeping out the exterior atmosphere.

On the lower sash of all but very narrow windows, two sash lifts are generally applied. The cheapest are called hook sash lifts, as illustrated in Fig. 2.

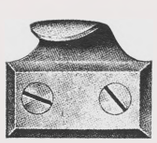


Fig. 2—Hook Sash Lift

Bar sash lifts, like this (Fig. 3)

Fig. 3—Bar Sash Lift

are preferred by many. Made of cast iron, their additional cost is very little. Bar lifts give a better grip to the hands in helping to raise the window.

If you elect to sell a hook sash lift because it is neater and less conspicuous, at least try to sell one made of cast iron as your first step-up in sales. Anyone who ever tried to raise a window that stuck a bit will quickly understand why a cast lift is preferable to wrought which easily bends.

Here again, our next plus business comes in selling the window hardware in the bathroom made of solid brass or bronze nickel plated for the same reasons mentioned before—insurance against rust in this moisture producing room.

The next step will be to sell, wherever you can, all the window hardware in brass or bronze for every window except the garage. Dead black iron is good enough for these windows.

Then comes the question of bead screws for the window strips. In many modest homes they are nailed in. A clever salesman can often sell the owner on having the window stops screwed in with bead screws like this (Fig. 4)

Fig. 4—Window Bead Screw

keeping in mind that they or the adjustable type like this (Fig. 5)

Fig. 5—Adjustable Window Bead Screw

should be of the same metal and finish as the rest of the hardware.

Next you will note that you have to furnish window hardware for one pair of casement windows 1⅜ inches thick, opening in. For one sash I suggest using two surface bolts similar to those used on the French doors, but lighter in construction, as you will consider this small window a 4-inch x ⅜-inch bolt as Fig. 6 illustrated will do.

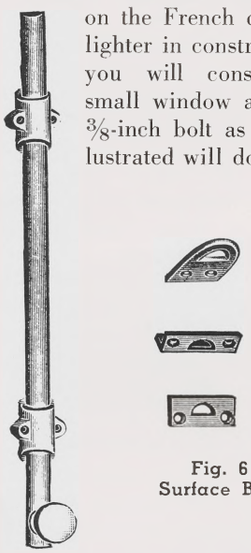


Fig. 6
Surface Bolt

For the other sash, a casement fastener with a rim strike such as Fig. 7.

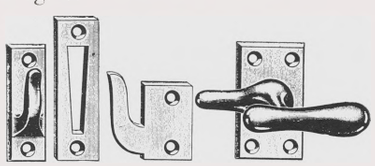


Fig. 7—Casement Fastener

will prove satisfactory. It should be unnecessary, by this time, to mention the step-up from iron to brass or bronze for both bolts and casement fasteners.

Friction casement adjusters of steel galvanized for painting such as shown in Fig. 8

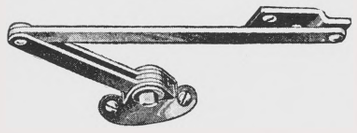


Fig. 8—Galv. Friction Casement Adjuster

or bronze ones like Fig. 9

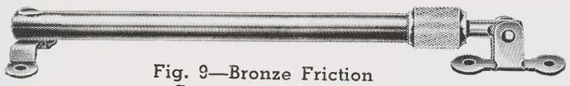


Fig. 9—Bronze Friction Casement Adjuster

increase the sales volume, hold the window open on windy days and are well worth trying to sell to your customer.

Next you have listed six steel cellar sash. On these windows you have no hardware to sell, as they come equipped with hardware which does the builders' hardware man out of any hardware for these openings. Many smart builders' hardware men, however, beat this item by getting a line of steel sash to sell the contractor so they will sell the sash, hardware and all.

In the attic is one bottom-hung casement which, from the outside appearance, resembles a circular window. It is hung, however, on a pair of butts. Then a transom catch in iron (Fig. 10), with one transom chain, as illustrated (Fig. 11), is required.

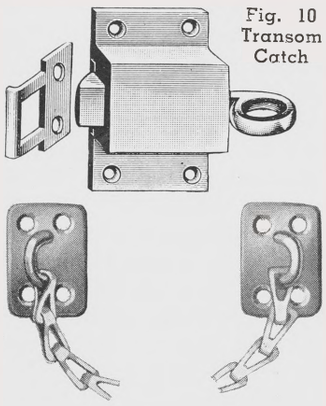


Fig. 10 Transom Catch

Fig. 11—Transom Chain

Had the window been a wider one, two chains would have been required.

On windows of this kind, I have always recommended to my customers galvanized chains to be applied outside and painted with the woodwork. I always like to sell a chain with a snap like Fig. 12

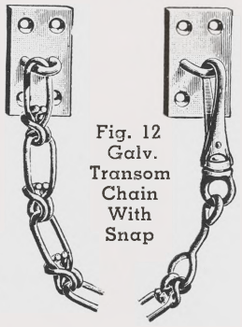


Fig. 12 Galv. Transom Chain With Snap

so when the windows are to be cleaned they can be unfastened and let down for easy cleaning.

Then come the shutters (or blinds) on the outside of the house. You will note on the plans that this house is of wood construction and a cast iron shutter hinge as illustrated (Fig. 13) will do for all the shutters.

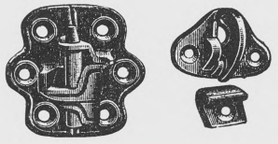


Fig. 13—Shutter Hinge and Catch

Also try to sell shutter dogs (or turnbuckles) such as Fig. 14

Fig. 14—Shutter Dog

as another build-up item. They add to the appearance of the house and keep the shutters from blowing shut on a windy day.

Under miscellaneous items come coat hooks for the closets. Usually a dozen to a closet are enough. Wire hooks (Fig. 15) are the cheapest, but it is good business to sell cast iron ones (Fig. 16).

Fig. 15 Wire C & H Hook

Fig. 16 Cast C & H Hook

They are much more substantial, don't bend and hold more clothes. You should easily get the difference in price.

You will note, on the plans, that the closets are to be equipped with rods. Sometimes these are of wood, furnished by the lumber man, but a lot of plus business may be secured by selling metal ones like Fig. 17.

Fig. 17—Adjustable Metal Clothes Rod

You now have received a general outline of the hardware for the house. It would be interesting to know how closely you have followed the trim suggestions.

Before closing this opening study, I wish to call your attention to a detail of selling builders' hardware that you may have overlooked. Much emphasis has been placed on trying to sell better goods, brass wherever possible instead of steel, etc. You will note that this was not suggested, however, for the garage, attic or basement openings. The reason that I call your attention to this is that steel goods are good enough for these openings and the point I am trying to make is this: In being a "builder-upper" don't overdo. Where you can honestly recommend the value and service of better goods in proper places, do so, but never be guilty of loading a job just to increase the sale. Give value where value is required.

With this chapter we have completed our study of the modest home hardware in exactly the fashion we should present it to our customers when they come into the store to select their finish hardware.

Chapter 9—*Elementary Course*

ARCHITECT and CONTRACTOR

NOW that you are ready to sell Builders' Hardware, how shall you go about it to get your prospects? The answer to that question varies with the size of the town or city in which you operate, but some of the following suggestions will, I am sure, fit your case wherever you are located.

Know every architect and builder in your community. Make it a practice to call upon them regularly. Many manufacturers send building reports of all construction contemplated in your locality and many times it pays to subscribe to such services yourself.

Keep your eyes open for every new building construction started while out on your business calls, even on a Sunday drive for pleasure. Watch the building reports in your newspaper. These are inexpensive ways of getting prospects for the builders' hardware you are out to sell.

When calling on an architect you have quite a different problem from that of calling on the contractor. The architect is strictly a professional man. He is the owner's representative. It is his duty to see that the house is properly and harmoniously designed, that the proper materials are specified, suitable for the owner and in good taste. As the owner's representative it is his duty to see that the materials specified are actually put into the building.

In my long experience working with the architectural profession I can remember only two cases where an architect ever intimated he wanted a commission on the sale of the hardware. Such a practice is plain graft. The architect is paid by the owner to represent his interests. A commission to him therefore is unthinkable.

At this stage of the building progress you can sell building paper, nails, steel cellar sash, sash weights, pulleys, cord or chain, roofing, shingles, roofing nails, etc., besides the regular bill of builders' hardware. Watch every opportunity for making additional sales.

The Architect's Favor

Perhaps when you first start out and you find an architect prefers to place his business with your competitor you may feel the architect is unfair, receiving money or having some other reason for not giving you a fair break. Such is not the case, the exceptions are so few as to be practically nil. The reason the architect favors your competitor is because he has confidence in him, a confidence you, in some fair way, must win. Consider the architect's viewpoint. Builders' hardware is about 1 per cent of the value of his job, but if the hardware isn't right it often causes him 10 per cent of his troubles on the job. When he finds a builders' hardware man who can eliminate this 10 per cent trouble, he naturally favors that man, and honestly so, in the interest of the owner, the contractor and himself. Your job therefore is to gain the same confidence of the architect that your competitor now has. Call regularly but not to the point of boredom. Whenever you have something new, show it to him. Offer to be of service.

The architect generally follows

one of two procedures on the finish hardware, either making an allowance or specifying what shall be used. In either case you can render service while the architect is drawing his specifications. If he is making an allowance, offer to figure roughly an allowance price adequate to furnish the building. If he is specifying the hardware in the general specifications, offer to write the specifications for him. Architects will usually freely admit they are not posted on builders' hardware and that they get a builders' hardware man to write the specifications for them.

Do A Job

When you get the opportunity to render this service to the architect, do an honest, fair, clean job of it. Make that specification so that your competitor can figure it and know what is required. Architects will respect you and fight for you to get the job if you have been above board in writing the specifications. The confidence placed in you by the architect demands that you do the best kind of a job you can, for, when the specification is incorporated in the rest of the specifications, it is the architect's specification, not yours.

When calling on the contractor the situation is somewhat different. The contractor wants to buy the hardware as cheaply as he can, granted that, at the same time, he wants to live up to the architect's specification. He may only consider price but, particularly if he is an experienced man, he knows that the cheapest price is not always the cheapest in the long run. As has been pointed out in previous chapters, carpenters' time is valuable, the builders' hardware man who renders uniformly the better service often gets the business even though his price may be higher.

The contractor purchases the hardware if it is part of the general specification for him to do so.

The more common practice, though, is for an allowance to be made and the hardware purchased by either the architect or the owner.

It's a wise plan to find out who really is going to place the order.

On the matter of building reports—It does not pay to spend much time chasing up those marked "contemplated." Wait until the architect is selected, then call on him offering your services as suggested in this chapter. When the contract is actually let is the time for you to really get busy. Once you know who the contractor is you should be Johnny-on-the-Spot.

In an early chapter I said "Builders' hardware is the foundation of a good hardware business." Watch now your opportunity to prove this statement. The contractor may not yet be ready to talk about the finish hardware. you may not even be able to land that contract, perhaps because of an architect's favoring a competitor or because of the owner's preference for someone else, but the contractor has so much other business to place that it will pay you to call regularly and often. The excavation starts and he needs shovels and wheelbarrows. The forms are started requiring nails, screws and bolts. When the frame-work goes up he needs building paper and some more nails and steel cellar sash. He will need sash weights, sash pulley, sash cord or chain when the window frames go in. When the roof is put on you may find it profitable to carry a line of roofing, shingles, etc. At least you can sell the roofing nails.

Do not overlook this: Make yourself acquainted with the mechanics on every job. They need tools and your store has tools to sell, so isn't it natural that you should sell them their tools when you are on the job. This means more "plus" business for you.

Many a mechanic becomes a contractor, so never overlook a man because he isn't the boss on the job—he may be some day and you will be glad you knew him when perhaps you only sold him a 6-ft. rule he wanted.

Often in the bath room, steel medicine cabinets are installed. Get a line of these, only a sample line, but sell them.

Kitchen Cabinets

More and more built-in kitchen cabinets are being used. You can get an agency and sell these from a catalog or sample. Why shouldn't you? If it is fair for the lumber dealer to sell many items formerly secured from the hardware dealer then turn about is fair play. Sell all the steel sash, kitchen cabinets and kindred items you can. You do not need to carry in stock many of these profitable items. Overhead garage doors are another good item.

The house is to be painted. See the painting contractor, as he will need putty, brushes, paints, enamels and varnishes.

Therefore, you can see that builders' hardware really is the foundation of a good hardware business. Sell all the rough hardware and kindred items you can but constantly keep in mind the finish hardware. The man who sells that usually has the inside track with the owner, architect, contractor and sub-contractor alike. That is the foundation of a good hardware business.

Chapter 10—*Elementary Course*

SELLING THE FINISH HARDWARE

IN the last chapter you considered the position of the architect and the contractor. You saw the possibilities in every job for larger sales opportunities than even the finish hardware contract. As was pointed out to you, the builders' hardware man who secures the finish hardware contract is on the "inside track" for the remainder of the business.

Finish hardware is so named because it is part of the finishing trim of the house. With the exception of the butts, it should not be applied until the painting is completed. Many a fine job of finish hardware has been spoiled by a painter and his brush. The hardware should be fitted, then removed until the painting is completed. See to it that it is done that way on all your jobs.

The modest house nears completion

Residence Work

On residence work particularly the owner makes a selection of the hardware wanted. Always try to get the owner interested whenever possible—he is buying the hardware for his own home and is vitally interested. Where there is an architect, he should also view the selection to be sure it fits in with his scheme of design and finish for the building.

A detail often overlooked is that of furnishing the electrician and those putting in other items of metal such as base plugs, light switches, etc., with a sample of the hardware finish so that all these items will match. Nothing jars my sense of harmony in a home so much as to see an antique copper light switch, a dull brass base plug and perhaps a dull bronze lock set. The architect and the owner will appreciate your checking up on this detail.

With the owner and architect having an appointment to come in and select the hardware, you are now faced with the problem of showing the samples for selection. As we are still thinking in terms of the modest home and modest stock, so we must consider the modest sample display. Consequently, we will not visualize a complete sample room. Perhaps we can get a small section of the office of the store where the owner and architect can sit down at a table and have the samples shown. This occasion doesn't happen every hour, or every day for that matter. The table may be your desk but in any case it should be removed from the open store, the noise and confusion where your customers can make their selection without being disturbed.

Of course, even in this modest store we are considering, you will have mounted on sample boards a complete display of every design and finish you stock. Manufacturers make special price concessions for such samples and they help you tremendously to sell the goods

as the customer gets a better idea as to how they look when mounted. It is well to have each type of lock mounted on a block so you can show how the locks operate, as well as the boards showing the different designs and finishes. For example, have a complete line of lock sets in the broad bevel design mounted on blocks, all locks operating as they will on the doors in the house where they are to be installed.

Sample Boards

On the other designs and all finishes, even in the broad bevel design, except the one finish shown on the blocks, use only sample boards. Select and always order uniform size boards so that as your business grows and you finally develop a sample room, such as will be considered later on in our study, you can use these samples you have secured.

Consult your friend the salesman from whom you purchase your stock. Together you may decide it is wise to have some samples of designs you do not stock. A small investment along this line may be a good thing to have.

Now, with your customer seated at the table you are prepared to sell the finish hardware. Proceed exactly as outlined in chapters three to eight, inclusive.

Try first to satisfy your customer with samples of the goods you stock. It is always best to sell stock goods. Service is better, changes are easier, the return goods problem is not as serious. It is better in every way and much more profitable.

If you cannot satisfy the customers with stock goods, then show the samples you have, but on which you carry no stock. Explain that these goods must be obtained from the factory and, when you can, lead the customer by sound selling back to your stock goods.

Now here's a rule I have always followed in showing samples for selection. *Never show any more samples than necessary.* It merely confuses the customer. Satisfy him as quickly as you can with as few samples as possible and attend to the details of miscellaneous small items such as elbow catches, shelf rests, cellar hardware, etc., without even mentioning these matters to the customer.

Do your building up of sales volume on the major items but do not delay the customer over unimportant details. I do not mean by this to rush the customer, become impatient or make any such mistakes. Have your customer completely sold that you are sincerely interested in his problem, but do not waste time where it is not necessary.

After the selection is made and you know the quality, design and finish required, it will be necessary for you to take off the plans and specifications and submit a bid. Actually, in figuring a job you should list only the necessary information required to quote. Do not worry about detailing all the information. Just be sure you know all that is required and cover everything in your bid. Make your bid complete for the job, carefully omitting any items you may not have included.

The following is a good form to use. We will suppose a selection has been made.

"Dear Mr. Smith:

"We are pleased to quote on furnishing all the finish hardware required to fully complete your residence according to plans and specifications dated ..... as per selection made at our store as follows:

Butts for Exterior and Bath Room Doors Sheridized Before Plating.

Three Butts to all exterior doors.

Cylinder Cast Bronze Hdle set on Front Entrance Doors with Cylinder locks on Garage Doors. All cylinder locks keyed alike.

All locks for Exterior Doors Brass Metal.

All cupboard Window Hardware in Bath Room. Brass metal, except Butts.

Using Bar Sash Lifts Metal Brass Knobs.

Cast Cupboard Turns and Cast Coat and Hat Hooks.

Finish in Bath — Nickel.

Basement, Attic and Garage—Dead Black.

Balance Dull Bronze in Design Colonial as selected.

"Please note this bid does not include any rough hardware, stair rail brackets, hardware for cellar sash, medicine cabinet or package box.

"Because of the market conditions this bid is for early acceptance. Thanking you for the opportunity to figure and hoping to be favored with your order.

"Very truly yours,"

Altogether, too often the next step is that the customer comes in and wants a list of the hardware. He often says to check it. Ninety-nine times out of a hundred he wants to take it to someone else to get a price.

Don't Give Lists

Years ago I made it a rule never to give out such a list. Religiously maintaining that rule has brought me far more business than it lost me. Having gone all over the work, assumed responsibility for quantities, stated in your bid just what quality is figured, why should you spend all your time and in addition give your work over to a competitor who then does not have to do any work but figure the list you have prepared? Long ago I stopped handing over my work for my competitor to cash in on. Many may not agree with my recommendation but I am strongly convinced it is the thing to do. Done tactfully, you will save many a job you might otherwise lose.

After the bid has been in your customers' hands a day or two, follow it up and try to close the sale. Point out the little niceties you have figured. Keep him sold and come home with the order. Don't let the old cry—"your price is too high"—scare you out. Stress the day in and day out importance of buying good hardware. Point out how little, in the total cost of the building, it would mean if your price were double.

Sell that job by keeping right after the customer until he says "Yes."

Chapter 11—*Elementary Course*

SCHEDULING MARKING— SERVICING the FINISH HARDWARE

THIS chapter has to do with scheduling, marking and servicing the business you have secured. Now that you have the order your work really starts. First, you should schedule the job.

Consider again the modest house you have been studying. The illustrations show how I would schedule the order.

Make Four Copies

It is a good idea to have four copies made of the hardware schedule. Keep the original and check off your deliveries from it. Send one copy to the architect, another to the office of the contractor and personally deliver the fourth copy into the hands of the carpenter foreman on the job, calling his attention to the fact that the hardware will come all properly marked with the item numbers exactly as per schedule. Ask him to particularly note the instructions to carpenters which are marked on the schedule.

Now that the schedule is done, the next step will be to assemble and mark the goods. A great many concerns have gummed stickers which are inexpensive but have to be typed. Others merely use a big black pencil and mark the item number in large figures on each package. There is merit in this plan other than economy. It forces the carpenter to refer to the schedule to see where the hardware goes.

When you take out the schedule to the carpenter foreman find out just when he will need the butts. As soon as they are de-

John Smith Residence
105 Pine Street,
Brownsville, N. Y.

Geo. A. Jones, Architect,
Black & Stevens, Contractors

FINISH HARDWARE

1 Front Entrance Door		1 3/4"		
Item	1.	1-1/2	Pr. Butts #,	4 x 4
	2.	1	Set Locks #	
	3.	1	Push Button #	
	4.	1	Letter Box Plate #	
	5.	3	House Numbers #	Figures 1-0-5
	6.	1	Door Knocker #	
	7.	1	Chain Door Fastener #	
1 Rear Entrance Door		1 3/4"		
Item	8.	1-1/2	Pr. Butts #	4 x 4
	9.	1	Set Locks #	
	10.	1	Mortise Bolt #	
	11.	1	Chain Door Fastener #	
1 Pr. Interior French Doors		Hall to D. R. 1-3/8"		
Item	12.	2	Pr. Butts #	$3\frac{1}{2}$ x $3\frac{1}{2}$
	13.	2	Surface Bolts #	
	14.	1	Set French Door Locks #	
1 Double Acting Door		1-3/8"		
Item	15.	1	Set Floor Hinges #	
	16.	2	Glass Push Plates #	
1 Bath Room Door		1-3/8"		
Item	17.	1	Pr. Butts #	$3\frac{1}{2}$ x $3\frac{1}{2}$
	18.	1	Set Bath Locks and Emergency Key #	
	19.	1	Door Stop #	
10 Other Interior Doors		1-3/8"		
Item	20.	10	Prs. Butts	$3\frac{1}{2}$ x $3\frac{1}{2}$
	21.	10	Set Locks	
3 Clothes Chute Doors				
Item	22.	3	Pr. Butts #	$2\frac{1}{2}$ x $2\frac{1}{2}$
	23.	3	Cupboard Turns.	
1 Cupboard in Living Room - 3 Adjustable Shelves				
Item	24.	1	Pr. Butts #	$2\frac{1}{2}$ x 2
	25.	1	Cupd. Turn #	
	26.	12	Shelf Rests #	
1 Scuttle				
Item	27.	1	Pr. Butts #	3 x 3
	28.	1	Pull #	
1 Medicine Cabinet - Steel				

1 Package Box - Metal
No hardware included.

Kitchen Cabinet - 2 Pr. - 4 Single Doors 1-1/8" - 5 Long Drawers - 4 Short - 8 Adj.Shelves

Item 29.	8	Pr. Butts # 2½ x 2
30.	2	Elbow Catches #
31.	6	Cupboard Turns #
32.	14	Drawer Pulls #
		Carpenter note: - 1 Pull only on 4 Short Drawers
33.	32	Shelf Rests

1 Double Hung Window in Bath

Item 34.	1	Sash Fast #
35.	2	" Lifts #
36.	1	Dz. Bead Screws #

13 Other Double Hung Windows in House

Item 37.	13	Sash Fasts #
38.	26	" Lifts #
39.	13	Dz. Bead Screws #

1 Pr. Casement Windows 1-3/8" Open In.

Item 40.	2	Pr. Butts # 3 x 3
41.	2	Surface Bolts #
42.	1	Case Fast. #
43.	2	Casement Adjusters

1 Batten Door in Basement

Item 44.	1	Pr. T. Hinges 5" & Screws
45.	1	Japd. Thumb Latches #

4 Steel Cellar Sash
No hardware included.

1 Bottom Hung Attic Casement 1-3/8"

Item 46.	1	Pr. Butts # 3 x 3
47.	1	Trans. Catches #
48.	1	" Chain with Snap #
		Carpenter Note: - Place chain outside to be painted.

1 Pr. Garage Doors 1-3/4" Open Out

Item 49.	1	Set Garage Door Hdwe. #
50.	1	Garage Door Lock #
		Keyed Alike to Front Entrance Door.

1 Side Entrance Door in Garage 1-3/4"

Item 51.	1-1/2	Pr. Butts # 4 x 4
52.	1	Set Locks #
53.	1	Rim Night Latch
		Keyed Alike to Front Entrance Door.

2 Double Hung Windows in Garage

Item 54.	2	Sash Fasts #
55.	4	" Lifts #

Miscellaneous

Item 56.	10	Door Stops #
57.	2	Floor " #
58.	3	Closet Bars #
59.	3	Dz. Coat & Hat Hooks

7 Pr. Shutters

Item 60.	7	Set Shutter Hinges & Catches #
61.	7	Pr. Shutter Dogs #

livered, stop at the job and check your list with him in order to be sure that it is complete. Look at the doors and windows, which will by that time be on the job, so that you know the hardware you have scheduled fits in all cases. Then send out the rest of the hardware. If you do not have it all, be sure and advise the carpenter foreman and, if possible, give him a lock to cut by in case the proper goods have not yet arrived. Then he can go ahead and fit the doors cut for the hardware and need not delay the painter in finishing his work. It's a real service, too, to stop in and see if the hardware is working properly. I have always found it advisable at this time to give the carpenter foreman a simple little gift such as a rule, pocket knife, sharpening stone or some equally inexpensive item. It pays big dividends to do this. And always be sure to praise his workmanship for the hardware is bound to be working properly when turned over to the owner.

On the opposite page and at the top of this page are shown reproductions of the typical schedule for the order of builders' hardware.

Gummed stickers provide one efficient means of marking the hardware.

H. D. TAYLOR CO.
Builders Hardware
BUFFALO, N. Y.
Phone: Seneca 5304

1 Front Entrance Door

1½ Pr Butts

B. C. No.

ITEM No. 1

Chapter 12—*Elementary Course*

CULTIVATING OWNER AFTER POSSESSION

IF builders' hardware is the foundation stone of a good hardware business, and I contend it is just that, this last chapter of the elementary course is of vital importance.

Contacts, personal contacts, with the owners of new homes, are the most valuable business builders I know. As soon as the owner has moved into his new home be sure to contact him immediately.

Just drop around as a matter of service. Inspect the hardware which has been installed. Be sure that both the home owner and his wife understand the convenience of the keying arrangements you have worked out for his benefit. Note whether the emergency key for the bathroom lock has been put in an easily accessible place in case of need. Any little services, cheerfully rendered, will give you an entree into the home for future business.

Express Admiration

Be sure to express admiration for the unusual features of the present day home. Be enthusiastic about them. Such interest cannot help but increase your personal prestige with the owner.

The new home is the greatest pride and possession of its owner at this particular time. The more you see and the more you praise the better you will be liked. That's just human nature.

While you are thus putting yourself in solid with the owner you have an unusually fine opportunity to use your eyes. Observe what is still needed in the way of items your store has for sale.

Sales Opportunities

Start your thinking along these lines before you ever enter the new house at all. Perhaps you overlooked the house numbers when they bought the builders' hardware. It is not too late to sell them when you call.

The new lawn will need a lawn roller. Do they happen to have a good lawn mower, grass shears, garden hose and sprinklers? How about the garbage can, paper burner and clothes reel? At the back of the lot there should be some fencing. That new hedge will need shears for trimming. Promise yourself "Some day I am going to sell Mr. Owner electric door openers for those garage doors when he has caught up a bit on his expenditures."

These are a few of the opportunities for sales you will see before you get inside the house at all. You will find many others.

As you push the electric button and hear the loud ring of the bell you will again be reminded of another possible sale. The builders' hardware allowance did not permit you to include chime door bells but here is a fine chance to make another early sale.

Once you have explained your mission, expressed your sincere admiration for the new home and rendered possible services to the owner, he will proudly show you through the house. You undoubtedly will have so many additional sales opportunities hitting you right between the eyes that you will fairly itch to take advantage of them. But don't rush into them too fast.

Let's start in the basement. Mr. Owner perhaps has shown you his work room. Wood working may be a hobby with him. Tell him about the wood working equipment your store sells. Try to make an appointment with him to see it at your store some day.

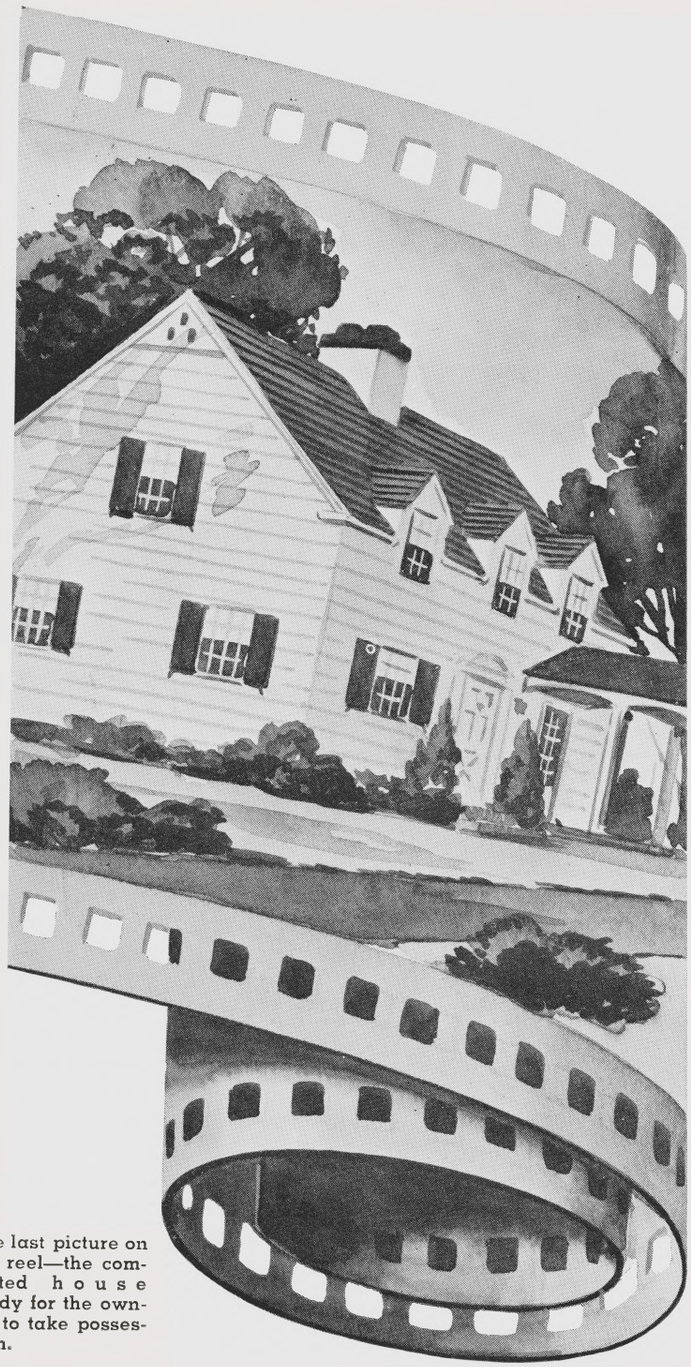
Whether he has such a hobby or not he will need some tools around the place. Hammer, saw, screw driver, nails and screws. These are just a few of the many items by way of suggestion.

As you return to the first floor, you will probably note that Mrs. Owner requires many things for her kitchen—pots, pans, cutlery and other essentials. Who has as fine an opportunity to secure this business as you?

Sell Mrs. Owner

The new linoleum floor will need wax. Here is a chance for you to tell Mrs. Owner how important it is to keep her linoleum properly waxed. It will make her work easier and will make the linoleum last years longer. Your store has just the wax for this purpose.

Does your store carry major appliances? You are not a house-to-house bell-pusher. You are inside that home with the grandest opportunity in the world to learn Mrs. Owner's needs along these



The last picture on the reel—the completed house ready for the owners to take possession.

lines. A new refrigerator, electric sweeper, washer, ironer or dish washer may be yours for the selling.

In the living room you may notice the fireplace needs a screen or fireplace utensils. No one else has a chance like yours to find all the needs of this home.

In the bathroom you may notice that there is no bathroom scale. Almost every housewife will tell you that she does not have closet room enough. Suggest more gadgets for the closets —garment hangers, tie holders, shoe racks and similar articles.

Your sporting goods department may fit right into Mr. Owner's pet hobby. It does not require you to be a Sherlock Holmes to find out his hobby. Let him talk; he will tell you soon enough himself.

Mrs. Owner probably likes to paint and your paint department can fill her every need along this line.

Why, Mr. Builders' Hardware man, you can sell Mr. and Mrs. Owner many, many times the amount of the entire builders' hardware contract if you will only follow these suggestions.

Remember, though, it was builders' hardware which gave you these contacts. Builders' hardware is therefore the foundation of our business. Make the most of these opportunities it gives you.

Elementary Course Completed

This installment completes this elementary course. These past 12 chapters have been, as the name implies, simple fundamental discussions which will prepare the way for the student who has mastered them to proceed further.

From now on the course will require more concentration and that spirit of stick-to-itive-ness mentioned in the earlier chapters. It will pay dividends, however, to those who master it.

Much thought and research have been given in the succeeding chapters so that, even though you are only a beginner, you will be able to develop into a real builders' hardware engineer.

It might be said that in these 12 chapters you had completed your grade school course. Now comes your high school education in "Taking the Mystery Out of Builders' Hardware."

Chapter 13—*Intermediate Course*

BASE METALS

THE first 12 chapters of our study of builders' hardware resembled a course of instruction in a grade school. You undoubtedly found it easy and, I hope, instructive. If you go no farther in the course, however, you will be like the grade school graduate who in looking for a job finds that he has decided limitations. Please do not misunderstand me. I am casting no reflection on grade school boys. As a matter of fact, that's all I ever graduated from myself. But higher knowledge and education are always helpful and knowledge and application determine the size of your pay check.

With this chapter we begin the high school or intermediate course. The first lesson of this course is rather a simple one. It's like coming back from a summer vacation when the first day's lesson only serves to get you into the groove again. But be sure to get this first lesson firmly fixed in your minds. It will come in handy as we proceed.

In the elementary course we mentioned cast iron, steel, brass and bronze in a general way. With the intermediate course, however, we should go into a more intimate discussion of the various metals which are used in the manufacture of builders' hardware.

The accompanying chart lists the comparatively few metals with which you must be familiar. In it are included the various base metals from which practically all builders' hardware is made. Suppose we start off at the head of the list with cast iron.

Cast iron derives its name from the fact that as a general rule the molten iron is poured into a mold, the shape of which is the same as that of the finished article. Save for machining, it is generally used with no further form of treatment. Cast iron consists of about 92 per cent iron, the remainder being carbon, silicon, manganese, phosphorus and sulphur. As cast, this type of iron is weak and brittle which, of course, limits its use to articles where strength and resistance to shock are not particularly essential.

Cast iron, however, has a number of good features. It will not rust as quickly as will steel and it will wear much longer than steel. For these reasons, as I pointed out in a previous chapter, it is a better metal than steel to use on such items as cupboard turns, sash locks and lifts, drawer pulls, door stops, etc.

Malleable iron is little used in residential hardware, but in this chapter we are learning about all the base metals and should therefore consider it. It has all the characteristics of cast iron with the exception that the iron content is from 96 to 97 per cent. It is given a special baking or annealing treatment which leaves the casting extremely tough and resistant to shock. Malleable iron, when properly cast and annealed, can be severely bent and sometimes tied into knots without fracturing.

Colonial Types

Forged iron, as we think of it in connection with residential building, is used principally with colonial reproductions of early American hand-forged hardware, a study of which will be made later on in our course.

What we are considering now, however, are the base metals themselves. For forging purposes the iron is generally over 99 per cent. Iron forgings are, as a rule, produced by hammering a red hot bar of iron into the desired shape.

Wrought steel is, I am sure, a familiar name to everyone in the hardware business. Wrought steel sheets are obtained by rolling billets of steel between a series of rollers to the desired thickness. It is a metal used for countless articles from small screws to automobile bodies. Most of the builders' hardware items made out of wrought steel are formed out of flat sheets by dies in heavy presses.

Wrought brass is like wrought steel save that the sheets instead of being steel are of brass. Wrought brass contains from 60 to 80 per cent of copper and 20 to 40 per cent zinc. Wrought brass, unlike wrought steel, will not rust.

Wrought bronze is similar to wrought brass and is made and used in the same manner, the only difference being in the composition of the base metal which is 90 per cent copper, about 10 per cent tin, and perhaps some zinc to improve casting characteristics. The higher copper content of the bronze imparts a reddish color to the metal as compared to the yellow of the brass.

It might be well to get out of your stock a piece of brass and a piece of bronze so you will be able to fix in your mind the difference and always know which metal is which. Manufacturers usually make no difference in price between brass and bronze builders' hardware items.

Cast brass is obtained by the

The Base Metals

Cast Iron	**Cast Brass**
Malleable Iron	**Cast Bronze**
Forged Iron	**White Metal**
Wrought Steel	**Forged Brass**
Wrought Brass	**Cast Aluminum**
Wrought Bronze	

same general methods employed in the production of cast iron. The molten metal is poured into molds of the desired shape. A typical analysis of a brass casting is as follows:

Copper, 67 per cent
Zinc, 30 per cent
Tin, 1 per cent
Lead, 2 per cent.

Cast bronze like wrought bronze differs principally in the larger amount of copper and has less amount of zinc. A typical analysis of a bronze casting is given as follows:

Copper, 90 per cent
Zinc, 2 per cent
Tin, 6 per cent
Lead, 2 per cent.

Cast bronze is stronger and has better wearing qualities than brass. Cast brass and cast bronze, unlike cast iron, cause little if any trouble from breakage.

White metal, a base metal, is obtained when nickel is introduced into brass metal in amounts varying from 10 per cent to 20 per cent. A typical analysis of white metal follows:

Copper, 62 per cent
Zinc, 19 per cent
Lead, 2 per cent
Nickel, 17 per cent.

The introduction of the nickel causes the brass to lose its yellow color and to assume a whitish appearance. This metal is also found on the market under the name of german silver, white bronze, nickel brass or nickelene. It can be produced in the form of castings, bars or wrought sheets. The chief advantages of white metal over brass or bronze lies in its superior resistance to wear and corrosion.

Forged brass is coming to the fore in builders' hardware. Brass forgings are obtained by methods similar to those used in forging steel. The metal is hammered or forced into dies or forms while it is hot, but not hot enough to be in the liquid state.

Cast aluminum has little if any use in residential hardware. It is specified on some government work, in sewage disposal plants, etc., where acid fumes corrode other metals and it has been used to some extent on offices and buildings, particularly those belonging to aluminum companies. On the whole, it has not proved satisfactory to date for lock parts because it is not as strong as brass or bronze.

Cast aluminum is obtained by the same general methods used in producing cast iron, cast brass or cast bronze. The molten metal is poured into molds of the desired shape. A typical analysis of cast aluminum is as follows:

Aluminum, 91.5 per cent
Copper, 8 per cent
Other elements, 0.5 per cent.

Chapter 14—*Intermediate Course*

HARDWARE FINISHES

PRACTICALLY all builders' hardware is made from one of the base metals described in the previous chapter.

If you have mastered this chapter you are now ready to take up the subject of finishes. The majority of all builders' hardware is finished in some color or other.

The first group we shall consider can logically be called natural finishes. The base metal such as wrought or cast brass, wrought or cast bronze and nickelene metal has the surface ground smooth to eliminate all roughness in the surface of the metal. At times that completes the finishing process and is called a wheel finish. Next the surface is polished by buffing on rag wheels to a mirror-like finish.

If it is desired to retain this bright finish for a time, it is then lacquered which is usually applied by dipping, spraying or occasionally brushing and is then dried in an oven.

Lacquer is a protection but only a temporary one. It is subject to and affected by various conditions, particularly on door knobs which are constantly handled. It soon wears off, the finish underneath tarnishing or, in the case of iron and steel, rusting.

Natural Finishes

Ordering the hardware unlacquered is considered by many builders' hardware men an excellent practice, particularly where natural finishes are used. Where this is done the natural metal can be polished and with care kept in its original state. Many architects and owners prefer not to polish it but let it tarnish. If it is unlacquered it will tarnish to a more uniform color than will a lacquered job where one waits for the lacquer to wear off because the result then is that the door knob, for example, soon has the lacquer off while the rose or escutcheon plate underneath the knob remains bright because it has not worn off. When using natural finishes, I would recommend usually specifying that it be unlacquered.

Plated Finishes

The second group of finishes are called plated finishes, usually applied on iron or steel. For example a steel knob is plated with a coating of brass (called brass plating).

To give longer life to the plating sometimes the metal is sprayed with sand. This process is called sand blasting. This is not nearly as popular a finish as it was ten years ago. After the metal is sanded it is plated with a coating of brass, bronze or nickel as may be desired.

The plating is usually done by an electro process, the coating being deposited on the base metal then buffed in order to bring out the desired color. Many of the better grades of steel hinges are plated with a coat of copper plating before the final desired finish is plated over the copper plating.

In the case of chromium plating, steel copper plating is first applied, then nickel plating and finally the chrome plating is often put on the base metal. In the case of brass or bronze metal base the need of copper plating is eliminated.

Plated finishes, particularly on iron or steel, are then generally lacquered.

Many of these plated goods, particularly where the designs are at all ornamental, are oxidized. Oxidizing is also a plating process whereby a compound of sulphur and other chemicals are used to relieve the plainness of the finish.

The newer and more popular finishes called for in the trade today are oil and wax finishes. Oil and wax finishes require the same preparation up to the step of lacquering. If an oil finish is required instead of applying lacquer the metal is heated, dipped in paraffin and rubbed down with a flat pad. Where wax is desired a special preparation of wax having beeswax as a base is applied, the color in this case then being brought out by rubbing.

There is one other distinctive hardware finish. It is called "Bower-Barff" and is used only on iron or steel. Properly done on cast iron it makes a remarkably durable finish, far better on cast iron than steel. Bower-Barff is a rust-resisting finish, taking its name from its originators, a Mr. Bower and a Mr. Barff. The metal is heated in a special furnace to a temperature of 1000 deg. F. Coal gases and live steam are then forced into the furnace causing a black coating to form over the surface of the metal. When the metal is brought out of the furnace it has a bluish color. After the metal has cooled it is dipped in oil which turns it black. I have seen buildings in which this finish has been used that were built over 25 years ago and the finish is still in excellent condition. A practical but not a particularly attractive finish.

Other Finishes

Most of the miscellaneous finishes, such as antique copper, japanned, galvanized, etc., are familiar to everyone who has the slightest knowledge of the hardware business and further explanation seems unnecessary.

In compiling the chart of the most widely used finishes for residence work in these days, we did not attempt to make the list unusually long. The list as furnished will show most all of the popular finishes you ever need to know.

Statuary bronze has passed rapidly out of use since oil and waxed bronze finishes came into use. Verde antique, a mottled green effect, is seldom used. Dame Nature can put on a polished unlacquered bronze metal the prettiest verde antique you could desire when the metal is exposed long enough to the weather.

Silver plating once popular is another little used plating. It has the tendency to turn black quickly so where that effect is required many builders' hardware men are now using dull chromium, or dull nickel.

In connection with this article we are giving you a very valuable chart of comparatives, one that every builders' hardware man in the country will find useful.

Chapter 15—*Intermediate Course*

DOOR BUTTS FOR RESIDENTIAL WOOD DOORS

NOW that you have gained a knowledge of the base metals used in the manufacture of builders' hardware and the various finishes of these base metals, we will take up first the study of butts and hinges as we did before when first we hung the doors of the modest home.

It is not enough to know that 3½ by 3½ butts are generally used on 1⅜ inch doors but why they are used. In this chapter on butts a number of questions will be answered that may be in your mind.

In order that you may understand what sized butt is required for various sized doors a schedule is copied in this chapter as recommended by various manufacturers. This schedule will probably do in 90 per cent of the cases. However, it is well to know how to meet 100 per cent of the cases.

In school we learned that 360 degrees make a circle. On a hinged door the maximum number of degrees we usually consider is half the circle or 180 degrees. In many cases doors are only opened 90 degrees because a wall or other obstruction prevents their opening wider.

The closer the center of the pin can be to the center of the radius on which the door is swinging the better. There is less wear on the hinge and strain on the screws and the appearance is better.

The rule of twice the thickness of the door plus the thickness of the trim less ½ inch for doors opening 180 degrees is a simple one to memorize. If the doors are particularly heavy, are used a great deal or have door closers requiring stronger butts than standard either use ball-bearing butts, heavier gage butts or butts higher, but not wider, than regular.

Schedule A

THE CORRECT SPECIFICATIONS FOR BUTTS ON WOOD DOORS

Two butts should be used for doors measuring 5′ or less in height. Doors of a greater height require one butt for each 2½′ or fraction thereof in height.

Extra heavy butts should always be used on doors where high frequency service is expected.

In using the table, whenever the door is of such a size as to call for butts of regular weight, but is of such a character as to come into the high frequency classification, then extra heavy butts of the same length and width are to be substituted.

Butt sizes given refer to length of joint.

Door Dimensions	Size of Butts
¾″ and ⅞″ Cupboard Doors up to 24″ wide	2½″
⅞″ and 1⅛″ Screen Doors up to 36″ wide	3″
1⅛″ Doors up to 36″ wide	3½″
1¼″ and 1⅜″ Doors up to 32″ wide	3½″
over 32″ to 37″ wide	4″
1 9/16″, 1¾″ and 1⅞″ Doors up to 32″ wide	4½″
over 32″ to 37″ wide	5″
over 37″ to 43″ wide	5″ extra heavy
over 43″ to 50″ wide	6″ extra heavy
2″, 2¼″ and 2½″ Doors up to 37″ wide	5″
over 37″ to 43″ wide	5″ extra heavy
over 43″ to 50″ wide	6″ extra heavy

Schedule B

EXPECTED FREQUENCY OF OPERATION OF DOORS

[Number of operations of one leaf of door, opening and closing = 1 cycle]

Type of Building and Door	Expected Frequency Daily	Expected Frequency Yearly	
Large department store entrance	5,000	1,500,000	High frequency
Large office building entrance	4,000	1,200,000	
Theater entrance	*1,000	450,000	
Schoolhouse entrance	1,250	225,000	
Schoolhouse toilet door	1,250	225,000	
Store or bank entrance	500	150,000	
Office building toilet door	400	118,000	
Schoolhouse corridor door	80	15,000	
Office building corridor door	75	22,000	
Store toilet door	60	18,000	
Dwelling house entrance	40	15,000	
Dwelling house toilet door	25	9,000	
Dwelling house corridor door	10	3,600	
Dwelling house closet door	6	2,200	

Schedule C

GENERAL INFORMATION

On butts where two dimensions are given the first always indicates height (not including the tips) and the second width. Thus a 6″ x 5″ butt is 6″ high and 5″ wide when open.

To determine the proper width of butt for a door, take twice the thickness of the door, plus the thickness of the trim, and deduct one-half inch for doors up to 2¼″ in thickness; deduct three-quarter inch for doors 2½″ to 3″ in thickness.

The following table gives the clearances of regular stock size butts for wood. The clearance is estimated on butts set back ¼″ for doors 1⅜″, 1 9/16″, 1¾″, 1⅞″, 2″ and 2¼″ in thickness and ⅜″ for doors 2½″, 2¾″ and 3″ in thickness.

Thickness of Door (Inches)	Size of Butt (Inches)	Maximum Clearance (Inches)	Thickness of Door (Inches)	Size of Butt (Inches)	Maximum Clearance (Inches)
1⅜	3 x 3	¾	2	4½ x 4½	1
	3½ x 3½	1¼		5 x 5	1½
	4 x 4	1¾		6 x 6	2½
			2¼	5 x 5	1
1 9/16	4 x 4	1⅜		6 x 6	2
	4½ x 4½	1⅞		6 x 8	4
	5 x 5	2⅜			
	6 x 6	3⅜	2½	5 x 5	¾
				6 x 6	1¾
1¾	4 x 4	1		6 x 8	3¾
	4½ x 4½	1½	2¾	6 x 6	1¼
	5 x 5	2		6 x 8	3¼
	6 x 6	3			
			3	6 x 6	¾
1⅞	4½ x 4½	1¼		6 x 8	2¾
	5 x 5	1¾		8 x 6	¾
	6 x 6	2¾		8 x 8	2¾
				8 x 10	4¾

The detail shown in Fig. 1 of a door, frame and trim will give you a good idea of the terms and usual conditions in connection with hinging doors on butts. Use, under most conditions, only such sizes of butts as are standard with

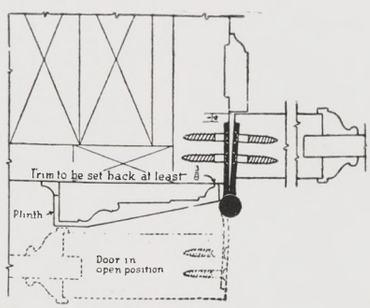


Fig. 1

the manufacturer from whom you are buying. Making special size butts is expensive and unnecessary.

On the steel butts several of them should also be stocked in sherardized before plating.

There are several hardware terms used with butts that you should know. Here illustrated are three of the types of tips used with butts. These are in Fig. 2.

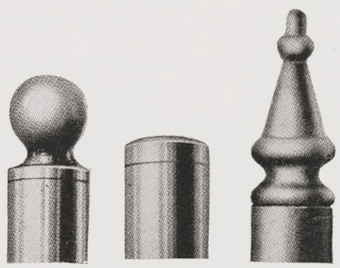


Fig. 2

Modernistic and other design tips can also be secured on special order.

On loose removable pin butts you will find such terms as "non-rising," "self-retaining," which are two methods used by manufacturers to stop the loose pins from working upwards out of the leaf of the butt.

Then you will occasionally have use for loose joint butts as shown

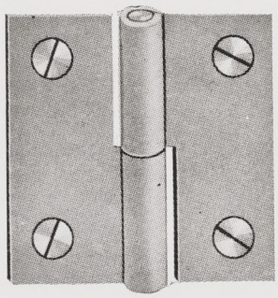


Fig. 3

in Fig. 3, particularly on shutters (blinds).

Tight (non-removable) pin butts have the pins riveted solid

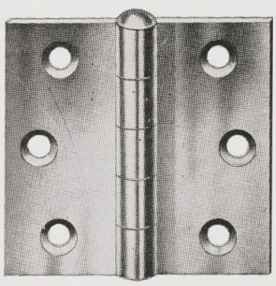


Fig. 4

as indicated in Fig. 4. These are often used on casement windows and doors opening out as the pins cannot be removed.

Visible and invisible ball bearings, special composition bronze washers and other methods have been used at different times in order to eliminate the wear of the butt at the joints. This method adds greatly to the life of the butts.

Fig. 5

For heavy doors, doors with door closers or doors getting exceptionally heavy use (see door frequency list) the type of butt shown in Fig. 5 is highly recommended.

HARDWARE AGE Comparative Butt Chart for B

Metal	Weight	Bearing	Pin	Finish	Joints	Width	Type	[9]American Cabinet Hardware Corp.	Champion Hardware Co.	P. & F. Corbin
Wrought Bronze	Extra Heavy	Ball	Loose	Polished	[8]Bevelled[5]	Regular	Full Butt			282
Wrought Bronze	Regular	Ball	Loose	Polished	Bevelled	Regular	Full Butt			280
Wrought Bronze	Regular	Steel Bushed	Loose	Polished	Bevelled	Regular	Full Butt			275
Wrought Steel	Regular	Ball	Loose	Planish Plated	Regular	Regular	Full Butt			
Wrought Steel	Regular	Plain	Loose	Polish and Plated	Bevelled	Regular	Full Butt			
Wrought Steel	Regular	Plain	Loose	Polish and Plated	Regular	Regular	Full Butt			
Wrought Steel	Regular	Plain	Loose	Planish Plated	Regular	Regular	Full Butt		44	
Wrought Steel	Regular	Plain	Loose	Planish Japd.	Regular	Regular	Full Butt			
Wrought Steel	Regular	Plain	Loose	Planished	Regular	Regular	Full Butt			
Wrought Steel	Regular	Plain	Loose	Planish Plated	Regular	Ornamental	Half Surface			
Wrought Steel	Regular	Plain	Loose	Planish Plated	Regular	Bevel Edge	Half Surface		303	
Wrought Steel	Regular	Plain	Tight	Planish Plated	Regular	Regular	Full Butt			
Wrought Brass	Light	Plain	Loose	Polished	Regular	Regular	Full Butt			
Wrought Steel	Light	Plain	Loose	Polish Plated	Regular	Regular	Full Butt			
Wrought Steel	Light	Plain	Loose	Planish Plated	Regular	Regular	Full Butt			
Wrought Steel	Light	Plain	Loose	Planish Plated	Regular	Narrow	Full Butt		304	
Wrought Steel	Regular	Plain	Loose	Planish Plated	Regular	Special	Parliament			
Wrought Steel	Regular	Plain	Loose	Planished	Regular	Broad	Full Butt		305	
Wrought Steel	Regular	Plain	Loose (Brass)	Hot. Galv.	Regular	Broad	Full Butt			
Wrought Steel	Light	Plain	Loose	Planished	Regular	Broad	Full Butt			
Wrought Steel	Regular	Plain	Tight	Planished	Regular	Broad	Full Butt		307	
Wrought Steel	Regular	Plain	Tight (Brass)	Hot. Galv.	Regular	Broad	Full Butt			
Wrought Steel	Regular	Plain	Tight	Planish	Regular	Narrow	Full Butt	★	308	
Wrought Steel	Light	Plain	Tight	Planish	Regular	Narrow	Full Butt	★		
Wrought Steel	Light	Plain	Tight	Planish	Regular	Narrow	Full Butt	★	306	
Wrought Steel	Light	Plain	Tight	Planish Plated	Regular		Full Surface		324	
Wrought Steel	Light	Plain	Loose	Planish Plated	Regular		Full Surface			

★ This manufacturer makes these butts but uses different numbers for each size.

Butts Commonly Used on Residence Work

Note—While every care has been taken, we assume no responsibility for correctness of these comparisons furnished by the manufacturer.

Champion Hardware Co.	P. & F. Corbin	Frantz Manufacturing Co.	Griffin Mfg. Co.	C. Hager & Sons Hinge Mfg. Co.	Lawrence Bros.	McKinney Mfg. Co.	National Mfg. Co.	Reading Hardware Corp.	Russell & Erwin Mfg. Co.	Sargent & Co.	Sharon Hardware Manufacturing Co.	Shelby Metal Products Co.	Stanley Works	Yale & Towne Manufacturing Co.
	282			BB1502	BB5050A	4B3386			BB081	2558			BB181	BB681
	280			BB1500	BB5000A	B3313			BB30	2538			BB180	BB680
	275			1500	1800A	3313			80	2541			175	675
			BB220	BB1241	BB4000	B2714							BB241	
				1239	2415	3713							239	
			220½	1241½	2412	3714	500 Pol.	P059¼					241½	
44		441	220	1241	2410	2714	500	059¼			142		241	
		441 Japd.	120	1731	7310	714J	500 Japd.	J09¼			137		731	
		441 Brt. S.	20	1823	8230	714	500 Brt. S.	09¼			328		823	
		360	480	1100	1357	2740	420				600		160	
303		365	485	1150	344	2745	450				210		165	
			225	1291	8080	2705		215¼					291	
				1589	2400A	3318				2834			189	689
			490½	1289½	2402	3718		P0272¼					289½	
		389	490	1289	2400	2718	628	0272¼			982		289	
504		395	390	1295	240	2722	528	0283¾			592		295	
			780	1260	244	2716	650						260	
505		904 Brt. S.	255	1804	8040	703	504	9¼			408		804	
		904 Galv.	1255G.	1334	8040GBP	Sc703GBR	504GBP	119¼			408½		1334	
		934 Brt. S.	280	1834	830	717	608	72¼			438		834	
507		908 Brt. S.	225	1808	8080	705	505	15¼			880		808	
		908 Galv.	1225G.	1319	8080GBP	Sc705GBR	505GBP	115¼			880½		1319	
508		938 Brt. S.		1800	850	700		85¾					800	
		938 Brt. S.	260	1838	810	719	518	80¾			388		838	
506		940 Brt. S.	265	1840	820	721	508	83¾			048		840	
524			460	1000	1245	2726	485					81	1478	
			430	1033	1352		455				640		1472	

Note—Where no manufacturing number is given it means that the firm does not make that particular butt.

One manufacturer recently developed a new bearing for butts called "Oilite." The claim is made for this bearing that it will never squeak, that the metal is a remarkable oil-impregnated metal and can be furnished at the same price as ball-bearing.

The higher quality type butts are manufactured with bevelled joints, that is, the inner edges of the leaves are bevelled, making a closer fitting joint. These butts are fully polished to a high finish and are heavily plated. The outer edges are true and the corners are square. The shoulders of the tips fit flush with the barrel.

On steel butts the next step down in price is the polished butt. These butts are polished and plated but do not have the other refinements described in the preceding paragraphs.

If you have sold any butts at all you are quite familiar with the regular planished and plated steel butt, which is the most com-

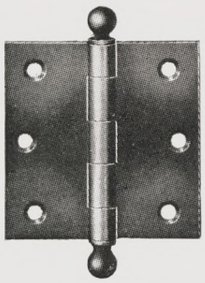


Fig. 6

monly used type. It is shown in Fig. 6. The steel has a fine cold rolled finish but it is not polished before plating.

In the comparative list (pages 34-35) a number of butts are mentioned in plain steel and hot galvanizing. These are the same quality steel butts as the planished butts but are not plated in the case of plain steel. There are many uses, however, for hot galvanized butts, particularly on casement windows opening outward. Hot galvanizing is a better rust resistant than electro galvanized but hot galvanized butts cannot be plated after galvanizing as can electro galvanized.

Hot galvanized butts can be painted though and that brings up one other feature on butts often used in residential work, the milled back leaves for butts that are to be painted where it is desired to paint the butts to match the woodwork. See Fig. 7.

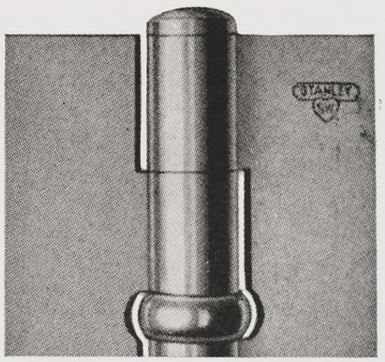


Fig. 7

There are two other standard rules regarding butts with which you should be familiar. First, they are made in three weights—extra heavy, regular and light weight. Second, on smaller butts the widths are generally described as broad, middle and narrow.

Olive knuckle butts such as are shown in Fig. 8, are often used in fine residential work. Although expensive to apply, they are ex-

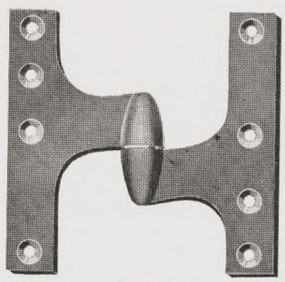


Fig. 8

ceedingly attractive in appearance and consequently architects often demand them on their better work.

The schedule described in this chapter has dealt with wrought brass or bronze and wrought steel butts.

One of our leading hardware manufacturers has advised us of the increasing use of cast bronze and cast iron butts. These are manufactured by almost all the larger hardware firms, and I take the liberty of quoting from that manufacturer's letter, in part, as follows:

"Our sales on cast iron, loose joint butts, have increased wonderfully in the last few years, owing to the prevalence of the colonial type of residence. We have also had an increase in the sales of our regular cast iron butts, mostly, however, with button tips instead of ball tips.

"All the old houses, of course, are equipped with cast iron butts and all through this section, they are mainly of the colonial type; some of them being hundreds of years old with the butts still operating perfectly."

As author, it was not my desire to overlook cast butts. I had planned to discuss them in the advanced course, but, in respect to this letter, it gives me pleasure to mention them now. Sizes, trade descriptions, etc., apply equally well in cast butts as they do in wrought.

There has been no attempt in this chapter to discuss anything but standard butts for more or less general use. It is not the easiest chapter in the series to master but when you have mastered it you will have a general knowledge of butts that will stand you in good stead for all your builders' hardware lifetime.

In a later chapter we will take up individually special kitchen cabinet hardware, shutter hardware and screen hardware, which studies will include butts and hinges for these types of openings with the other hardware required.

Chapter 16—*Intermediate Course*

JAMB-FLOOR and CHECKING-FLOOR HINGES

IN the preceding chapter you learned about the various types of butts. Continuing the same general outline, we will now consider other types of hinges used commonly in residence work.

Inasmuch as a complete chapter will be devoted to kitchen cabinet hardware, shutter hardware and screen hardware we will discuss hinges for those types of openings later.

Right now let us take up doors hung on spring hinges. First let us consider single (Fig. 1) and double acting spring hinges (Fig. 2) of these types. They are manufactured but seldom stocked in

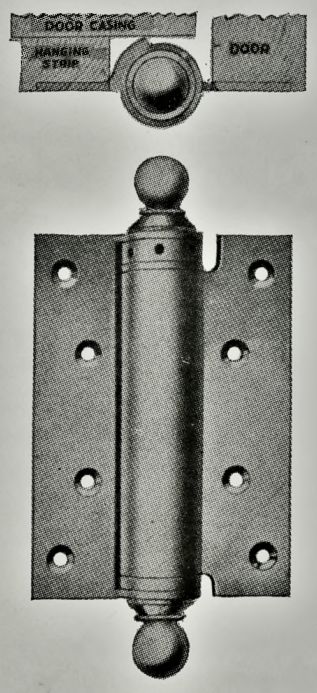


Fig. 1

brass and bronze. All larger dealers do stock them in the more popular sizes in black and plated steel finishes.

These types require a hanging strip and the detail illustration will show just what I mean by

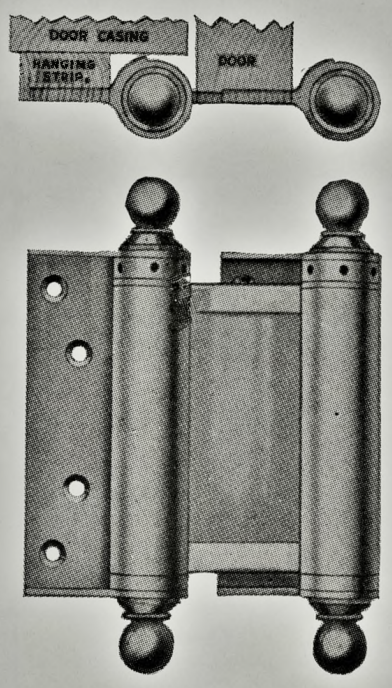


Fig. 2

hanging strip. The springs are encased in the knuckle or barrel of the hinge. The amount of spring power is adjustable by turning up the spring tension to the desired power.

In later years manufacturers

Fig. 3

developed the type of hinge shown in Fig. 3 to eliminate the need of a hanging strip as shown below. It made for simpler application

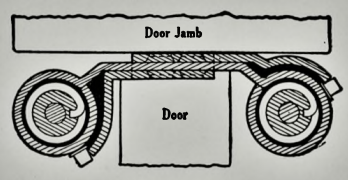


Fig. 3A

and widened the openings. A great many dealers then discontinued the old style from their stocks.

Of lesser use among most dealers are the spring butt hinges, Fig.

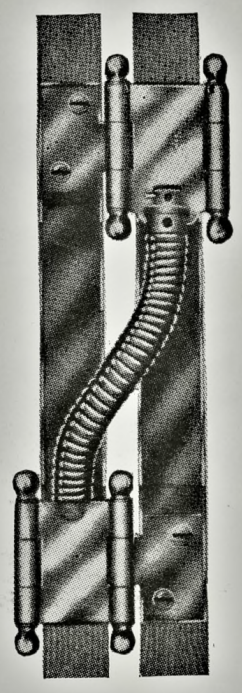


Fig. 4

4, and the pivot hinge shown in Fig. 4A.

As space permits only describing in detail the more popularly

HARDWARE AGE Comparative List

Type Hinge	Action	Require Hanging Strip	Controlled Action	Bommer Spring Hinge Co.	Champion Hardware Co.	Chicago Spring Hinge Co.	P. & F. Corbin	Frantz Manufacturing Co.
Jamb Hinge	Single	Yes	Adjustable Spring	0		2002		
Jamb Hinge	Double	Yes	Adjustable Spring	29		2001		
Jamb Hinge	Single	No	Adjustable Spring	3000		9002		
Jamb Hinge	Double	No	Adjustable Spring	3029		9001		
Floor Hinge	Double	No	No	4200	5050	17001	400	
Floor Hinge	Double	No	Adjustable Spring	4000	5010	8001	400	204
Floor Hinge	Double	No	Adjustable Spring	15		4001	401	
Floor Hinge	Double	Cement Plate	Adjustable Spring	15J		J4001	401X0400	
Light Floor Hinge	Double	No	Checking					
Medium Floor Hinge	Double	No	Checking	H71				
Heavy Floor Hinge	Double	No	Checking	H72				
Medium Floor Hinge	Single	No	Checking	88				
Heavy Floor Hinge	Single	No	Checking	88½				

★ This manufacturer makes these hinges but uses different numbers for each size.

used items, I would suggest that each student use the catalog of the manufacturer from whom his firm is buying in order to more thoroughly study the merits of these various types.

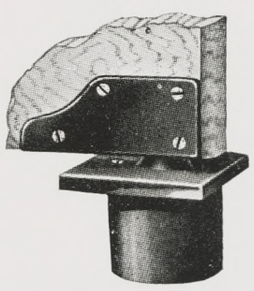


Fig. 4A

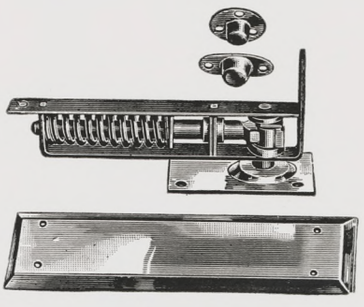


Fig. 5

As you can quickly observe from the comparative list of manufacturers in this chapter, a great many of them make a floor hinge like the one shown in Fig. 5. It is inexpensive and practical. Every hardware store I imagine carries some for sale. You should carry them in your stock in the various finishes you sell.

There are many intermediate grades of this type from the cheapest to the most expensive. In fact, there are too many grades for most dealers to stock. Many suc-

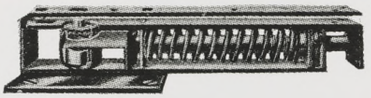


Fig. 6

for Jamb-Floor and Checking-Floor Hinges

Note—While every care has been taken, we assume no responsibility for correctness of these comparisons furnished by the manufacturer.

Lawrence Bros.	Lawson Spring Hinge Co.	National Manufacturing Co.	Oscar C. Rixson Co.	Russell & Erwin Manufacturing Co.	Sargent & Co.	Shelby Metal Products Co.	Shelby Spring Hinge Co.	Stanley Works
	★						No. 48-14	
	★						No. 49-14	
	★							
	★							
220	62D			411	2470		E-00-2	155
	800			412		9		155
	600	240		12			Chief	BB156—BB157
	600J	240 X Jamb Plate					Chief X Jamb Plate	BB156½—BB157½
			Junior					
			No. 10				10	
			15				11	
			18				8	
			20				18	

Note—Where no manufacturing number given, they do not make that particular hinge.

cessful dealers stock the lowest price type and the highest price type. Fig. 6 shows one of the higher priced models. Also in this best grade it is well to stock them

Fig. 7

too with jamb plates (Fig. 7) where it is desired to screw them to the jamb rather than the floor. Another word of warning. On doors over 1¾ inches thick it requires a larger size hinge—refer

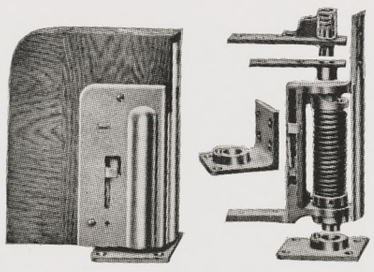


Fig. 8

to your manufacturer's catalog for sizes.

Floor type hinges, such as are shown in Fig. 8, are sometimes used.

Several suggestions were made in Chapter 3 of the Elementary Course as to the value of selling

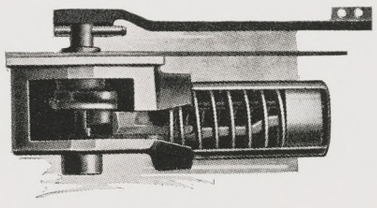


Fig. 9

checking floor hinges such as is shown in Fig. 9. These are made

in both single and double acting. The hinge just recessed into the floor contains the spring and a liquid controlling device which regulates the speed with which the door closes. This speed can be adjusted to faster or slower closing by means of an adjusting screw in the floor plate.

The more popular sizes for residence use are given in the comparative list accompanying this chapter. This type of hinge is more extensively used in larger sizes for public buildings and will be discussed later.

However, the next hinge we

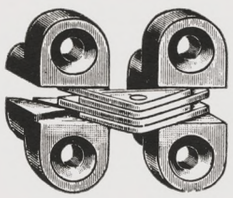


Fig. 10

want to study is only made by one manufacturer so certainly no one

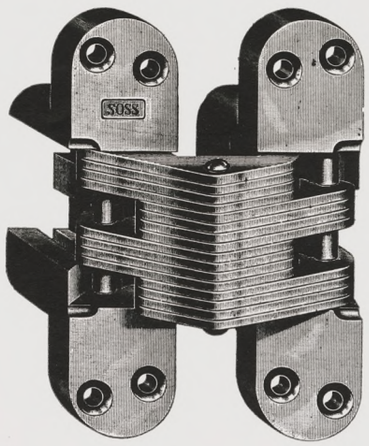


Fig. 11

can complain that we are showing partiality in mentioning that manufacturer's name. It is the Soss Manufacturing Company, Roselle, N. J., makers of invisible hinges. Examples of the hinges are shown in Figs. 10, 11 and 12.

These hinges are absolutely invisible when the door is closed and give a most desirable effect under many conditions. Sagging is eliminated as is the usual unsightly crack at the hinge side of the door. They have no projecting parts. Ordinarily they are stocked in one finish and in about six sizes. The smaller sizes for cabinet work are most often called for. The Soss Mfg. Co. also makes invisible hinges for special conditions and I recommend your referring to their catalog for further information.

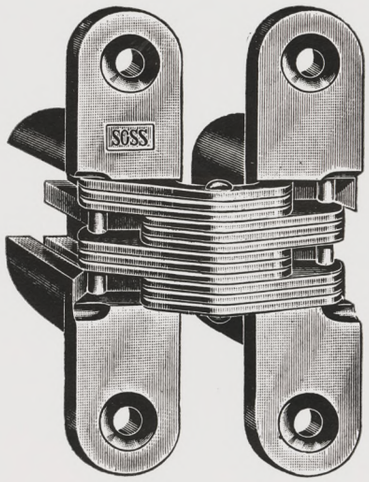


Fig. 12

Chapter 17—*Intermediate Course*

MORTISE BIT KEY LOCKS and LATCHES

HAVING completed our study of butts and hinges for residential work, we will now take up the study of locks.

First, I want you to acquaint yourselves with the three standard types of lock construction used on interior door locks. For your easy reference I have called them types A, B and C.

CHART SHOWING PRINCIPAL PARTS OF LOCKS

- **Front or Face**
  - Flat
  - Beveled
  - Adjustable
  - Rabbeted for Pairs of Doors
  - Rounded for Double Acting Doors
  - Selvedge
- **Strikes**
  - Rim
  - Rim—Reverse Bevel
  - Mortise
  - Mortise Box
  - Mortise Protected
- **Bolts**
  - Latch—(by Knob)
  - Dead by Key on Thumb Knob
  - Slide or Thumb Bolt
  - Auxiliary or Guard
- **Springs**
  - Flat or Stiff
  - Soft
  - Layer Easy
  - Compression Easy
- **Hubs**
  - Solid 5/16-3/8
  - Swivel 6 mm.-8 mm.
- **Keys**
  - Bit Key
    - Cast Iron
      - Tinned
      - Nickeled
    - Forged Steel
  - Flat Keys
  - Folding
  - Cylinder
- **Cylinders**
  - Rim
  - Mortise
- **Bracket** — Distance Front to Center of Knob Hole
- **Spacing** — Distance Center Knob Hole to Center Key Hole
- **Reverse Bevel**
  - Rim
  - Mortise
- **Knob Stop**
  - Rim
  - Mortise
- **Tumblers** — Mortise
  - 1 =
  - 3 =

With slight variations, most of the manufacturers use similar construction in these types of locks. Type A, the cheapest, is used only on modest commercial work. Type B is the medium-priced, generally called, easy spring type of lock. It is popularly used as a middle grade lock where something of a better grade is desired but where one cannot afford to buy the best.

Type C, the double-compression spring lock comes only in the higher grades of locks. This type of construction has for years been generally accepted as outstanding in lock construction. The best way I know for you to learn why these types vary in price and general satisfaction, is to take one of each and try them for yourself. Note the improved latch and knob action as you step up the grades and also note the better workmanship. As a youngster you probably liked to take a watch apart to see what made it go. Do the same with these three types of locks. Take each one all apart and then put it together again. Let me warn you though to have another like it that hasn't been taken apart, so that you will have a pattern to show how it goes together just in case you get stuck. Most of these locks are reversible. That is, they can be used on a door swinging either to the right or to the left by reversing the latch bolt. Learn how to reverse the lock—it will be good practice.

Although, as I have stated, most of these locks are reversible, they

HARDWARE AGE Comparative List

Lock Number	Description	Construction	Case Width	Backset	Face	Tumbler	No. Bolts	Barrows Lock Co.	Champion Hardware Co.	J. Chesler & Sons Co.
A	Mortise Steel—Bit Key	Type A	3½″	2½″	Flat	1	1	P610	S290	S
B	Mortise Brass—Bit Key	Type A	3½″	2½″	Flat	1	1	810	A290	CB
C	Mortise Brass—Bit Key	Type B	3½″	2½″	Flat	1	1	831	A350	
D	Mortise Brass—Bit Key	Type B	3½″	2½″	Flat	3	1	833	A350¾	
E	Mortise Brass—Bit Key	Type C	3½″	2⅝″	Flat	3	1	853	A318¾	
F	Mortise Brass—Bit Key	Type C	4¼″	2¾″	Flat	3	1	873	A418¾	
G	Mortise Brass—Bit Key	Type C	5″	2¾″	Flat	3	1	973	A453¾	
H	Mortise Brass—Bit Key	Type Spec.	4″	1½″	Flat	3	1	536	A352¾	
I	Mortise Brass—Bit Key	Type Spec.	4″	1½″	Rabt.	3	1	536R	RA352¾	
J	Mortise Brass—Thumb Turn	Type Spec.	4″	1½″	Flat		1	535	A356	
K	Mortise Brass—Thumb Turn	Type Spec.	4″	1½″	Rabt.		1	535R	RA356	
L	Mortise Brass—Thumb Turn	Type B	3½″	2½″	Flat		1	825	A353	SB
M	Mortise Brass—Thumb Turn	Type B	3½″	2½″	Flat		2	975	A255	
N	Mortise Brass—Thumb Turn	Type C	4″	2¾″	Flat		1	875	A413	
O	Mortise Brass—Thumb Turn	Type C	4″	2¾″	Flat		2	980	A357	
P	Mortise Brass—Bit Key	Dead Bolt	2¼″	2¾″	Flat	3	1	1163		
Q	Mortise Brass—Latch only	Type A	1½″	2½″	Flat					L
R	Mortise Brass—Latch only	Type B	1⅝″	2¾″	Flat			1176		
S	Mortise Brass—Latch only	Type C	2¼″	2¾″	Flat			1177	A240	

Note—General Description—Sizes vary with manufacturers.

are not always so. This being the case, the present would perhaps be as good a time as any to learn about the "hands of doors." There are four "hands" or swings on locks and it has been confusing to many beginners who have attempted to distinguish them. They are as follows: right hand, left hand, right hand reverse bevel and left hand reverse bevel. These swings are illustrated at the bottom of page 44.

You will note that the hand of a door is always determined from the outside. "Outside" may be the outside of the building, the hall side of a door leading to a bedroom, the room side of a door from a closet. In the case of a communicating door between rooms the outside is the side from which the butts or hinges are not visible when the door is closed.

If the butts are not visible when you are standing outside and the door swings away from you to the right, it is a right hand door—if away from you to the left, it is a left hand door.

If, when you are standing outside, the butts are visible and the door swings toward you to the right, it is a right hand reverse bevel door. If it swings toward you to the left, it is a left hand reverse bevel door. Study the sketches until you have mastered this.

There are many terms you should learn in lock construction. The "front," the "case," the "strike," the "latch," the "bolt," the "tumblers," and the "hub." These terms require no explana-

for Mortise Bit Key Locks and Latches

Note—While every care has been taken, we assume no responsibility for correctness of these comparisons furnished by the manufacturer.

Clinton Lock Co.	P. & F. Corbin	Dudley Lock Co.	Earle Hdwe. & Mfg. Co.	Lockwood Hardware Mfg. Co.	Norwalk Lock Co.	Penn Hardware Co.	Reading Hardware Corp.	Russell & Erwin Mfg. Co.	Sager Lock Co.	Sargent & Co.	Skillman Hdwe. Mfg. Co.	Yale & Towne Mfg. Co.
4081	13271	413		3109	9420	2327	858¾	01001	270	5161	5003	808
4080	1284	412	400	3126	8421	2355	1159	0389	260	5164	5012	802
4070	785		401	3610	8414	2363	01256	0370	300	5234	6012	1821
4070¾	785¾		403	3611	8424	2369	01257	0370¾	300¾	5249		1820
4020¾	1364	4020		3601	8471	2398	1257	380¾	320¾	5269	5230	1620
4030¾	1365	448		4656	8531	2478	1222	382¾	370¾	5639	5030	1500
1260¾S	233			5534	8549	3558M	1188	0022¾	355¾	6215		1449
4000¾	01365	414A		4644	8273	1185	001222	G381¾		5039	480	1509G
R4000¾	02365	R414A		4632	R8273	R1185	01212	G391¾		5069R		1509½GA
550	0174	416A		4625	8272¼	1196	001122	G231		4660		1539G
R550	0174½	R416A		4626	R8272¼	R1199	002222	G291		4660R		1539½G
500	159		407	3130	8340	3169	01179	233	480	4663½	549¼	1819
520	159¼		408½	5539	8575	3359	1181	233½		4371	5231	1824
510	159½	414T	408	5549 X Key	6570	3189	1282	236	450	4665	5233	1535
530	159¾	414T		5538	6587	3369	1182	236½	452	4675	5031	1525
960¾	132	420		2165	8184	3958	1092	078¾		4949	5082	275
3000	045			1034	3049		1038	042		4624	59	1023
3030	049	440		1048	8025½	1667		026	130	4643		1016
3010	090			1084	8065		01025¾	025	140	4645	60	1000

Note—Where no mfg. number is given, they do not make that particular lock.

tion as the names themselves signify what they are.

The types of locks we are studying are made with from one to five tumblers, each additional tumbler giving more protection from easy picking of the locks. However, locks having one or three tumblers are popular and in general use.

Then come some other terms which are not so easily understood and it is tremendously important as you learn builders' hardware that you know what they are. The most important word to know and understand is the "back set of the lock."

"Back set" is the distance from the front to the center of the knob or keyhole. It is important that you understand this in order that you may be able to order the proper back set lock. This is one of the finer details that distinguishes a good builders' hardware man. For example—if you had a French door with a stile of 3 in. you should order a lock having a 1½ in. back set which would center your handle trim on the center of the door stile. Watch the architect's detail for the width of the stile or rail of the door.

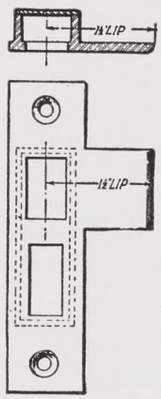
It would also be well to discuss another mark of a good builders' hardware man—the length of the lip on the strike of the lock. Have you ever torn your clothes on a lock strike where the lip of the strike extended too far beyond the casing of the door? Or have you ever noticed a door casing that had been all chewed up by the latch of the lock because the

lip of the strike was not long enough?

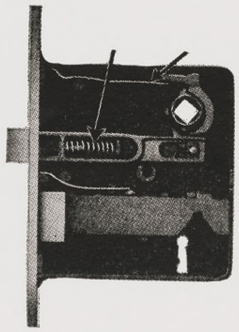
The lip of the strike should reach ⅛ in. beyond the casing. Watch this carefully on fine residential work as it will help you gain the respect of your customers if you are able to take care of this detail. On commercial work of course, one does not generally pay so much attention to this. On really fine homes a box strike similar to the one shown in the accompanying illustration is used which adds considerable refinement to the job.

The "spacing" of the lock is another term you should understand. This means the distance from the center of the knob hub to the center of the keyhole.

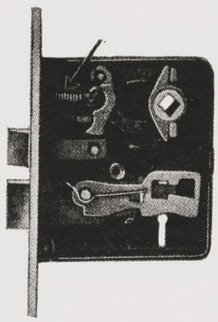
The accompanying list of more or less frequently used terms regarding locks should be studied, particularly the different types of fronts as detailed in this chapter.



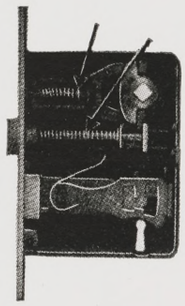
Box strike of the type used in fine residential work.



Type A



Type B



Type C

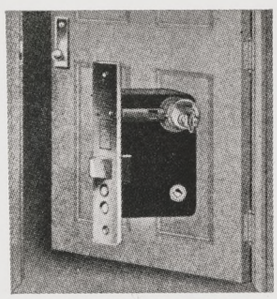
Continuing our comparative lists of finishes, products, etc., you will find in this chapter a list of most of the more popular locks used in residential work.

In this chart of comparisons, I have listed the numbers that I have stocked in my own stocks. I realize that from the literally hundreds of locks manufactured many good men would pick other locks than I have chosen, so again I say consult your own source of supply and be guided by its representative's good judgment.

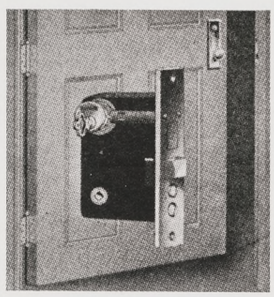
The first six locks listed are standard type, bit key locks operated by knobs and locked by key from both sides. The seventh lock used principally on bedroom doors from halls and occasionally on bathroom doors is operated by knobs both sides, locked by a key on the outside and by thumb bolt on the inside. The next four locks are narrow, back set locks for French doors—flat face locked by key, rabbeted face locked by key, flat face operated by thumb turn and rabbeted face locked by thumb turn.

Following the French door locks are the bath and communicating door locks operated by knobs on both sides. The bath locks by means of a thumb turn on one side, the communicating locks by thumb turns on both sides.

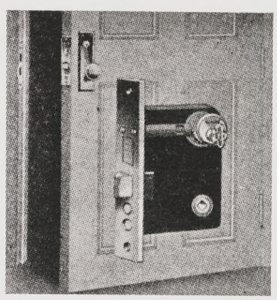
The list closes with a bit key dead lock with no latching feature and three latches with no locking feature.



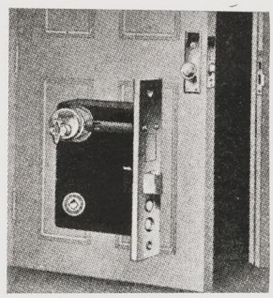
Right hand



Left hand



Right hand reverse bevel



Left hand reverse bevel

Chapter 18—*Intermediate Course*

MORTISE CYLINDER LOCKS and LATCHES

WE will now pass on to the study of the various types of locks for exterior doors of residences.

Several of the locks mentioned in the last chapter are used on exterior doors of residences, particularly the locks mentioned for French doors. Where bit key French door locks are used on exterior doors, always add the following instruction to the carpenter on your hardware schedule: "Do not bore the keyhole outside." Then, too, the standard bit key front door lock discussed in one of the early chapters of the elementary series is used quite generally.

In this chapter we will think in terms of cylinder locks. There are a number of different types of these you should know.

First, there is the cylinder lock for doors using a handle and thumb piece operating the latch from the outside and a knob operating the latch on the inside. The dead bolt is operated by a key outside and a thumb turn inside.

Different Weights

Locks, like butts, come in different weights. In each case, with the exception of French door locks which are listed in only one weight, I have given first the lighter or standard weight lock and next the heavy weight lock. If you learned your lesson well in the elementary course, you will, of course, want, wherever you can, to sell the better grade of lock.

Following the lock for handle sets comes the standard cylinder, front door lock, the latch bolt of which is operated on both sides by knobs. The dead bolt is operated by a key outside and by a thumb turn inside. This is listed in two weights.

Then we have the two weights of locks for vestibule doors. These locks have no dead bolt as is the case with the front door locks. Knobs on both sides operate the latch bolt and, when the outside knob is rigid, by pushing the button in the face of the lock making it possible for the key to operate the latch bolt. The door is never locked from the inside.

Another popular type is the auxiliary, dead locking, latch bolt lock. This is listed in the comparative list in two weights.

What happens is that the small or auxiliary latch above the regular latch has no hole in the strike to engage it. This being the case, every time the door is closed, the auxiliary latch is pushed back into the front of the lock throwing a lever down dead locking the regular latch. This makes it impossible for anyone to put a knife or other thin tool in the crack between the door and frame or back of the strip that is acting as a stop for the door, release the latch and open the door without a key as can be done on an ordinary vestibule latch.

I have listed two cylinder French door locks, one for flat face and the other for a rabetted face door. The operation on each of these is similar to the cylinder front door lock. These types of locks are made in several back sets, but for stocking I am inclined to think that the 1½-in. back set is the one most in demand. Naturally, on account of the narrow back set, one side at least must be operated by a lever handle instead of a knob.

The suggested mortise cylinder latches are often necessary where the regular front door lock set is not required and where something better than a rim night latch is desired. The second of these latches has the same auxiliary feature which has been previously described.

Types

Two types of cylinder dead locks are listed to complete the schedule. One type is key-operated from the outside and is worked from the inside by means of a thumb turn. The other type is key-operated on both sides. Each comes in two different weights.

In the bit key locks we studied in the last chapter the security of the locks from picking is controlled by the number of tumblers used and by the wards or projections in the lock case which guard the entrance in the keyhole from the wrong key. Bit key locks can be master keyed so that in a fine residence the owner has a bit key master key which permits him to

HARDWARE AGE Comparative List

Cylinder Lock For	Trim	Approx. Back Set	Thumb Piece	No. Cyls.	Bolts	Face	Barrows Lock Co.	J. Chesler & Sons Co.	Clinton Lock Co.	P. & F. Corbin
Front Door	Handle Set	2½"	Inside	One	Latch & Dead	Flat	165	★	7010	1348½
Front Door	Handle Set	2¾"	Inside	One	Latch & Dead	Flat	495	★	8010	1349½
Front Door	Knob Set	2½"	Inside	One	Latch & Dead	Flat	340	★	7000	1343
Vest. Door	Knob Set	2½"	No	One	Latch	Flat	340V	★	V7000	1323
Vest. Door	Knob Set	2¾"	No	One	Latch	Flat	540V		V7000½	1839
Front Door	Knob Set	2¾"	Inside	One	Latch & Dead	Flat	540		8000	1343
Office Door	Knob Set	2½"	No	One	Aux. Latch	Flat	378		7030	01839
Office Door	Knob Set	2¾"	No	One	Aux. Latch	Flat	991			01339
Front Door	Knob Set	1½"	Inside	One	Latch & Dead	Flat	445		4000 Cyl.	1341
Front Door	Knob Set	1½"	Inside	One	Latch & Dead	Rabt'd.	445R		R4000 Cyl.	2341
Mortise Latch	No	2½"	Inside	One	Latch	Flat			SV7000	0558
Mortise Latch	No	2¾"	Inside	One	Aux. Latch	Flat			S7030	0548
Mortise Dead Lock	No	2½"	Inside	One	Dead Bolt	Flat	1143	★	8050½	138¾
Mortise Dead Lock	No	2½"	No	Two	Dead Bolt	Flat	1142	★	8050	138¼
Mortise Dead Lock	No	2¾"	Inside	One	Dead Bolt	Flat		★	7050½	6013
Mortise Dead Lock	No	2¾"	No	Two	Dead Bolt	Flat		★	7050	6012

Note—General description—sizes vary with manufacturers. ★—This manufacturer makes these locks, but uses different numbers.

operate all the bit key locks. Particularly in the case of bit key locks master keying, it is well to consult with the salesman selling you the line in order to be sure that the locks specified are all of one class or type in the system. Bit key, master keyed locks should be at least of the three-tumbler type.

However, when we consider the cylinder locks of the present chapter, master keying or keying alike as discussed for the exterior doors, which was outlined at some length in the elementary series, is the common practice.

Linus Yale of the Yale & Towne Mfg. Co. first invented and patented the cylinder lock which has commonly become known to the general public as the Yale lock. The name "Yale lock" has become almost a general term for cylinder locks of this type due to the prominence of the man whose name it bears and the widespread and consistent advertising of its manufacturer, the Yale & Towne Mfg. Co.

Russell & Erwin and Corbin use ball bearings in their cylinders. Sargent furnishes balling cylinders to special order. Aside from that difference, all manufacturers use practically the same type of cylinder construction as is shown in the accompanying illustration.

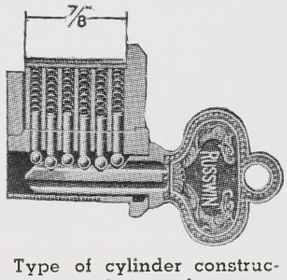
Beginners, in ordering their cylinder locks, should be sure to specify the thickness of the door

for Mortise Cylinder Locks and Latches

Note—While every care has been taken, we assume no responsibility for correctness of these comparisons furnished by the manufacturer.

Dudley Lock Co.	Earle Hdwe. Mfg. Co.	Francis Keil & Son	Lockwood Hdwe. Mfg. Co.	Norwalk Lock Co.	Penn Hardware Co.	Reading Hardware Corp.	Russell & Erwin Mfg. Co.	Sager Lock Works	Sargent & Co.	Skillman Hardware Mfg. Co.	Yale & Towne Mfg. Co.
	7000		T8702¾	716	6840	1594	11213	630	761	5551	7428
402			8702¾	706	6850	1582	1213	595	961	7771	428
	7100		T5000	4210	9300	01602	11248	670	6745	4442	7750
	6100		T5000½	4211	8305	01602½	11248½	670V	6745½	4442½	7790
438			5000	2411	9500	1605	1248½	650V	6845½	7772½	790
400			5000½	2410	8505	1600	1248	660	6845	7772	750
			L5100¾			001711	11456	781	6705½		7656
			L5000¾	X4412	7243	01711	1456	792	6805½		656
			5002	2616	9157	001700	F1247	680	68451		731¼ Series
			5002½	R2616	R9207	001710	F1277	680R	68451½R		731¾ Series
	6103		1210	8430	7040	1657	1294		4781x1620Fx30F		66
			1215¾	4382	7051	1654	1454		4789x1620Fx30F		62
468	6104	206194-20623	2217½	8392	7321	1621	1203	966T	4861	6361	325
466	6204	20620-20624	2218	8392½	7322	1616	1203½	966½	4865	6363	324¼
464		20666	2228		7341	1620	1205		4881		
462		20667	2229		7342	1622	1205½		4885		

Note—Where no Mfg. Number given, they do not make that particular Lock.



Type of cylinder construction used

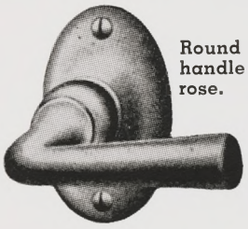
on which these locks are to be used. Russell & Erwin a number of years ago invented an adjustable cylinder which overcame, to a large degree, the necessity of specifying the thickness of the wood. I would suggest that in order to be on the safe side, however, that you always specify the thickness of the door.

Cylinder locks, in addition to the security of the five or six pins guarding the tumblers, have key ways which add greatly to the security of the locks.

Henry R. Townes, in his book "Locks and Hardware," comments on the anti-picking feature of locks as follows: "No lock has ever been invented or probably ever will be invented that is operated by a key that cannot be picked." The cylinder lock we are now discussing probably comes as close to being pick-proof as any lock operated by a key.

The master keying of cylinder locks is done by splitting the pins. Cylinder locks are for a practical purpose, unlimited in the number of key changes possible.

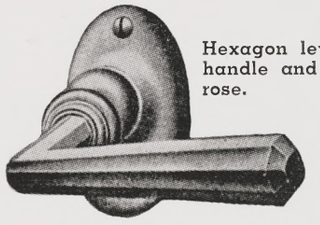
receiving the spindle and fastening to the top of the knob, is also made in various different ways. You will find some knobs with wrought tops and wrought shanks, others



Round lever handle and rose.

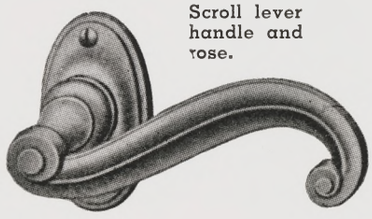
with wrought tops and cast shanks and the highest type of all — the cast top with cast shanks.

In the comparative schedule accompanying this chapter there has been no attempt made to describe all kinds of knobs. It would be



Hexagon lever handle and rose.

too difficult to understand and too long to publish. Only the more commonly used knobs are listed in this schedule. Consult your sources of supply for those

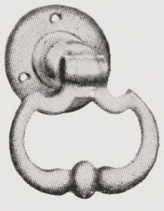


Scroll lever handle and rose.

types most commonly used in your territory.

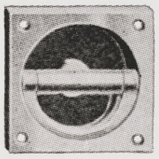
One of the best builders' hardware men I ever knew described lever handles as "a necessary evil in the builders' hardware business." They are, I think, just that. On narrow style doors nothing else can be used, at least on one side of the door, to carry the hand away from the casing. On some jobs they are used because of the period or design of the room.

Fastened to the spindles in about the same manner as are the



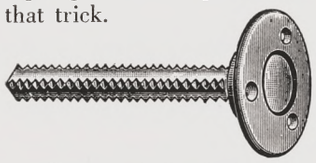
Drop ring.

knobs previously described, they give the good builders' hardware engineer one more detail to watch. The springs in the locks must be



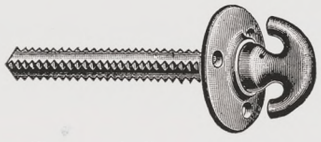
Flush cup.

heavy enough to throw the lever handles back into place or auxiliary springs must be provided to do that trick.



Closet spindle flush.

Occasionally drop rings and flush cups are required where there is not sufficient room for a knob or lever handle. Closet spindles are used on the closet



Closet spindle turn handle.

side of closet doors, very often for the sake of economy.

"Sectional trim" is a term you should know. It means using a knob with a knob rose under it and a separate key escutcheon. I think the illustrations in this

Key escutcheon, plain.

Key escutcheon, drop.

chapter will amply describe what I mean. The knob rose is usually screwed directly to the wood but some types used have the screws concealed.

The escutcheons (key plates) are either plain or drop type. The drop type covers the keyhole when

Thread escutcheon.

the key is not inserted. Another type, seldom used, is called a thread escutcheon. This is really a brass rim around the keyhole.

Last in this group we have the thumb knob or thumb turn used to throw the dead bolt from one side or the other on some types of locks.

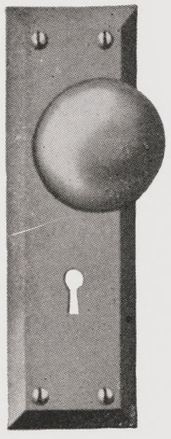
Our final consideration for this chapter is the long escutcheon which combines the rose and escutcheon in one piece either with keyhole or thumb piece as

Thumb turn.

Thumb knob.

the case may require. We discussed this type of escutcheon when we studied the broad bevel sets in the preliminary course.

Older hardware men well remember the many designs of long



Elongated escutcheon with keyhole.

escutcheon patterns produced by all lock manufacturers. Even the newcomers have by this time come to notice the hardware in the homes they visit. If the house was built some 20 years ago you will note the perfectly grotesque designs of hardware which were called for in many cases in those days.

The following period used as little hardware design as possible. Knobs of 1½ in. to 1¾ in. size took the place of the 2¼ in. and 2½ in. knobs formerly used. Sectional trim replaced the long escutcheons.

A happy medium, especially on the more inexpensive jobs, has since developed. Knobs of 2 in. size have been found better to use. Combined rose and escutcheon plates long enough to span the lock case but narrow and far less conspicuous have come into common use. Modernistic and Colonial designs along these lines have also come into use.

HARDWARE AGE Comparative Chartor

Type	Metal	Size	Shank	Spindle	Top	Barrows Lock Co.	J. C. Chesler & Sons Co.	Clinton Lock Co.	
Door Knobs	Wrt. Steel	2¼″	Wrought	Straight	Two Piece	P1320		1-9	15
Door Knobs	Wrt. Steel	2¼″	Wrought	Straight	One Piece	P01326		1-11	014
Door Knobs	Wrt. Brze.	2¼″	Wrought	Straight	One Piece	01326		1-10	14
Door Knobs	Wrt. Brze.	2¼″	Wrought	Threaded	One Piece	01326C	95	T1-10	14
Door Knobs	Wrt. Brze.	2¼″	Cast	Threaded	One Piece	01326½C		T9-20	14
Door Knobs	Cast Brze.	2¼″	Cast	Threaded	One Piece	1326		T9-20	15
Door Knobs	Wrt. Brze.	2″	Wrought	Threaded	One Piece	01328C	97	T2-10	14
Door Knobs	Wrt. Brze.	2″	Cast	Threaded	One Piece	01328½C		T43-20	14
Door Knobs	Cast Brze.	2″	Cast	Threaded	One Piece	1322		T43-20	1921
Door Knobs	Glass	2″	Wrought	Threaded	Round	0213C	406	GK56	4
Door Knobs	Glass	2″	Wrought	Threaded	Octagon	0217C	606	GK44	4
Door Knobs	Glass	2″	Wrought	Threaded	Fluted	0115C	906	GK54	4
Lever Handles	Cast Brze.	2½″	Cast	Threaded	Round	31		T46 LH	21
Lever Handles	Cast Brze.	2¾″	Cast	Threaded	Hexagon	49		T44½LH	100
Lever Handles	Cast Brze.	3¼″	Cast	Threaded	Scroll			T54 LH	1(
Flush Cups	Cast Brze.	2½″		Threaded		1688		2½ Flush Cup	
Closet Spindles	Cast Iron	5/16″		Threaded	Flush	P32	23	B515W	(
Closet Spindles	Cast Iron	5/16″		Threaded	T. Hdle.	P33		515W	
Key Escutcheons	Wrt. Brze.	1⅝″			Oval	2501	50	41-26	2
Key Escutcheons	Cast Brze.	1⅝″			Oval	1506		C41-26	2(
Key Escutcheons	Cast Brze.	2″			Drop	2512D		C41-26 Prot.	2(
Thumb Knobs	Wrt. Brze.	1⅝″		T. Hdle.	Oval	01513X22		411C26TP	2
Thumb Knobs	Cast Brze.	1⅝″		T. Hdle.	Oval	1533X22	79	C411C26TP	2
Thumb Knobs	Cast Brze.	2⅛″		Oval Hdle.	Oval	2100R		C411C26 Knob TP	02

Note—General description—sizes vary with manufacturers.

t on Trim for Mortise Locks

Note—While every care has been taken, we assume no responsibility for correctness of these comparisons furnished by the manufacturer.

P. & F. Corbin	Dudley Lock Co.	Earle Hardeware Manufacturing Co.	Lockwood Hardware Manufacturing Co.	Norwalk Lock Co.	Penn Hardware Co.	Reading Hardware Corp.	Russell & Irwin Manufacturing Co.	Sager Lock Works	Sargent & Co.	Skillmann Hardware Manufacturing Co.	Yale & Towne Manufacturing Co.
1523½	9-9	52¼	9222	9610¼	92¼	P822¼	7385	02122¼	1342	S25	SKS22¼
01419½	9-11	51¼	9267	9536	93¼	P622¼	7334	02112¼	1462	HS25	SKS12¼
1419½	9-10	71¼		8536	93¼	P2622¼	386	2112¼	1762		SK12¼
1419½PW		74¼	9174½	8536F	63¼	P4422¼	2386	2112¼C	1762F	H25	SK12¼C
1419PY	9-10 Threaded		9174¾	8535F	64¼	P3322¾	2387	2182¼	1622F		D035
1519½	14-750	77¼	9174	8650F	52¼	P2122	2376	2142¼	1842	3585	G35
1420PW	8-10	74½	9173½	8532F	62	P4421¼	2382	2112C	1772	H26	SK12
1422						P3321¾	C2382	2182			D034
1921X1118			9174¼		PC52	P2121	21375	2142	1620	3584	G34
412	K9	133	9950	2180	9062	306¼	2112	PF2202	3214	47	DG0341
440		138	9939	2164	262	149¼	2136	DF2202	3233	42	DG0540
418	K7	132	9946	2170	362	206¼	2152	JF2202	3243	45	DG0542
2119			9742	4485	1324	P2682	2061	2304	1159	104	913
1001X1117½			9741	4723	1924	2561	2076	2316	1129	107	
1018		455		4702	1938	2462	2772	2322	1154		XP953
			894	8341⅝		P1437	052	2711	83		1018
047	703B	5C	264	4	17		7035	01929	P12	13½	285
44	705W	T05	266	9117	27	P027	7039	01933	13F	13	283
2560	14-62	W4	1444	4753	DT601⅝	P1113¼	66½	2501	710	F	D812
2660	14-62D	C4	1508	8773	DN501⅝	P1128	66	2506	810	A	G812
2663		0118	1539	8891	501D	P1117	032	2512D	817	C	XE823
2140	TP10	CB-4	9867	1109	DT662	P1468¼	066½	2403B	118	36	DY1305½
2145	TP10C	CB-7	9871	1113½	DN562	P1486	066	2423B		37	G1205½
02148¼	TP20C	TB-7	9876	1102	DT678	P1473	1294	2100R			G564½

Note—Where no manufacturing number given they do not make that particular trim.

Chapter 20—*Intermediate Course*

LOCK SETS

THIS chapter will be in the nature of a general discussion of the subject of lock sets. There will be no comparative lists.

The beginner in builders' hardware, and especially his customer, will undoubtedly experience considerable confusion regarding the matter of lock sets. I am sure, however, that those of you who studied the model stock list in our elementary series know what the term "lock set" means. It is a lock with the complete accompanying set of trim, knobs and escutcheons or handle as the case may be. The set is packed complete in a box with the screws.

It is particularly confusing to the beginner and the customer to be able to buy a complete lock set, including the lock, cheaper than they can buy the lock by itself without the rest of the set. It just doesn't seem to make sense to them.

It would pay every builders' hardware man to spend some time in a builders' hardware manufacturing plant for they would soon learn the answer to this seeming inconsistency. One hundred lock sets are probably sold to every single lock that is sold. Locks by themselves require special handling and the cost to the manufacturer in time for handling a special order for a lock far overshadows the actual cost of material going into the production of a lock set manufactured in a commercial way.

This is also true in the case of all kinds of special goods. The overhead expense of getting out special hardware is out of all proportion to manufactured standard merchandise.

I'm sure I speak for all regular manufacturers when I urge you to use standard hardware wherever possible, especially on lock sets. Manufacturers just cannot add the proper charge to which they are entitled for this type of special work.

All manufacturers use a simplified numbering system for their lock sets. They have symbols which signify the type of knobs, escutcheons, etc., required in a given set. It is therefore well to study carefully the numbering system your manufacturer employs.

In reading over various manufacturers' catalogs as I have done in preparation for this particular chapter I ran across the following rules which are good to follow:

Fig. 1 — Entrance handle lock set in a black and polished brass combination.

1—Specify the number of the lock required.

a—If master keyed, add the symbol "M" to the lock number. (I have always found it helpful to give a complete explanation of the master keying system and specify the number of master keys required before writing the order for the hardware itself.)

b—If the lock has to be other than a regular back set, so specify with the lock.

c—If bevelled front is required and is not regular with lock, specify bevel (⅛ in. 2 in. is standard.)

d—If lock is not reversible, specify hand.

2—Specify trim — Knobs first, escutcheons second, design third and finish fourth.

Note if trim is wanted on one side different from the other. Always specify the outside trim first, then the inside, following the same method as noted above. The face of locks and strikes are finished the same as the inside trim except on reversed bevelled or doors opening out, in which case they are finished the same as the outside trim unless otherwise specified.

3—Any special instructions, such as special strikes or strike with longer or shorter lip than regular, extra keys, etc., should also be noted.

When you order your lock sets and give all the information with the order you are saving an endless amount of time for everybody with respect to correspondence, postage, delays and dissatisfied customers.

Ordinarily a builders' hardware

stock of lock sets for residential work consists of the following:

A—Front door handle sets.

Colonial, forged iron and modernistic seem to be in the greatest demand. For years in the hardware stores I have purchased for, I used two sets which were more or less standard with most manufacturers as illustrated in this chapter. Fig. 1 is finished with the back plate and cylinder collar in sanded dead black and the grip, thumb piece and cylinder in polished brass. On Fig. 2, however, I had the back plates and cylinder collar in statuary bronze and the grip, thumb piece and cylinder in polished brass.

Of course I stocked many other handle sets but these were just finished differently and appealed to the customer. They made another plus item because I could always get more money for them.

B—Cylinder front door knob sets in all designs regularly stocked.

C—Cylinder vestibule door sets.

With the decrease in the use of vestibule doors this set perhaps can be omitted.

D—Bit key front door knob sets.

E—Bit key inside knob sets.

F—Bit key closet knob sets.

These are often omitted, store stocking closet spindles and making up their own closet sets when required.

G—Bathroom door knob sets.

H—French door knob and lever handle sets.

You should learn how to split your own sets, that is, where you have one kind of trim outside the door and another inside you can often save money by buying your sets complete and changing the trim yourself. It is an economy in many cases.

Under closet sets I suggested the possibility of buying closet spindles and making up these closet sets yourself. In this way you frequently can put to good use odd locks or knobs in your stock which would otherwise be wasted.

I would like to emphasize the importance of watching to see that

Fig. 2 — Entrance handle lock set in a combination of statuary bronze and polished brass.

the same kind of knob mounting is used on both sides. For example, a threaded set screw type knob could not be used on one side and the ordinary side knob screw on the other side unless you used a special spindle.

There is no way that I know of to adequately describe the information that this particularly important chapter requires. The few suggestions that I have made will, I trust, be of assistance. Putting them into practice and consulting with the representative from whom you purchase your goods will all add to your knowledge.

One of the lock manufacturers showed me a new development in builders' hardware that will mean much in the way of increasing the numbers of different design knobs that can be used with practically little additional investment.

This particular manufacturer has redesigned his locks in order to use forged instead of cast brass on the lock fronts, bolts and latches of his locks. The lock construction remains the same as described in a previous chapter and has been found universally satisfactory for many years.

He also made another change which is the one to which I particularly refer. The knobs, instead of being of cast brass or bronze, are of forged brass or bronze, and the top of the knob can be taken off and changed to other patterns by means of a special arrangement of a screw through the shank.

The dealer could carry his lock sets in this manner and, by buying additional tops only, could change to several different patterns at little cost.

This same idea has been carried out in a combination of brass and composition colored knobs which give the dealer a wide selection of colors without the necessity of any large additional investment.

Chapter 21—*Intermediate Course*

SCHOOLS OF DESIGN

WE now turn our attention to the subject of schools of design.

What a headache this subject was to the builders' hardware beginner of 25 years ago! How I used to pore over the pages of Russell & Erwin's No. 10 catalog while studying this subject. If you can get hold of a copy of that particular catalog or of Henry R. Towne's book, "Locks and Hardware," which was published in 1904, you will arrive at a better understanding of the difficulties encountered by the beginner who attempted to gain a knowledge of schools of design a quarter of a century ago.

Fig. 1—Italian Renaissance

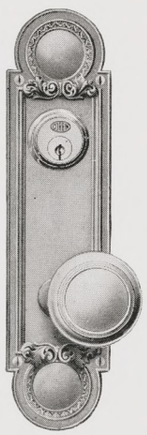


Fig. 2—French Renaissance Design

Mr. Towne devoted nearly 400 pages to a complete description of the subject. I know of no book that covered the subject so fully. Unfortunately, his book has been out of circulation for a long time and you will be exceedingly lucky if you can find a copy to use.

There is a tremendous difference in this end of the business today as compared to it 25 years ago and, in order to give you some idea of that difference, I will give a comparison between two schools of design. At the time his book was published, Mr. Towne listed 38 different patterns in Italian Renaissance manufactured by Yale & Towne alone. The firm's present catalog shows only one pattern for this period. In 1904, Mr. Towne listed 75 patterns in Colonial design manufactured by Yale & Towne. The firm's present catalog shows only 10 examples of this period. What is true of Yale & Towne is true of all other manufacturers. The World War brought standardization to the fore and wiped out the old ideas of hardware design. What a difference! And what a break for you present day beginners.

Despite the large numbers of designs, the architects of that day delighted in evolving special designs for particular buildings. This practice, however, has passed out of the picture to a considerable degree.

The subject of schools of design is intensely interesting. After having studied from the above mentioned sources as well as Mr. Thomas' presentation of the subject in his book, "Builders' Hardware from the Ground Up," which was published serially in HARDWARE AGE several years ago, I have found that it will be a decidedly difficult matter to present the subject adequately in the limited amount of space occupied by this series.

Fig. 3—Louis XVI Design

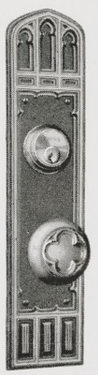


Fig. 4—Gothic Design

Periods of architecture or schools of design cannot be properly covered in this manner. Let me urge every student of this course to go to the local library or talk with a friendly architect and borrow his books on the subject. No matter how or where you get the information, the important point is to get it!

Architects will have greater confidence in you if you are able to discuss the subject with some degree of familiarity and authority. From the earliest periods of history to the latest developments in the Modernistic School of Design. such a study will be a real education.

So, after much thought, I have decided to stick strictly to hardware and in the description that follows will pick out only a portion of those more generally used periods of design hardware.

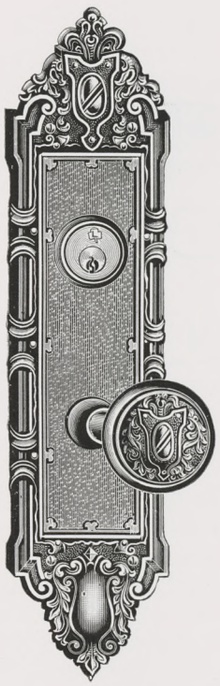


Fig. 5—
Elizabethan
Design

This chapter contains illustrations of nine different schools of design which have been selected as examples of particular periods. By way of explanation, it may be said that most manufacturers make suitable designs for all of these periods. Study your own manufacturer's catalog and familiarize yourself with the designs as classified by periods.

Fig. 1, for example, shows the only remaining pattern of Italian Renaissance shown in Yale & Towne's catalog, undoubtedly the best of the 38 they used to manufacture. Italian Renaissance followed closely after the Gothic and produced many beautiful, but also many frightful, results.

Fig. 2 shows a popular French Renaissance design manufactured by P. & F. Corbin. French Renaissance sprang from the Italian and the beauty of the designs of that day is still felt and admired.

Fig. 3, to continue the French designs, shows one of the more popular designs of Louis XVI manufactured by Sargent & Co. If you will study the history of design from Louis XIV through Louis XV and Louis XVI, I think you will agree with me that in picking this particular design we have chosen one of the richest but far from the most ornate of that period.

Fig. 4 is Russell & Erwin's Gothic design, Warwick, also manufactured by several other manufacturers. In my opinion it is one of the best of the Gothic designs. In our modern day the use of Gothic period hardware has been identified largely, although not entirely with churches and other religious buildings.

Fig. 5 shows a Lockwood Elizabethan design, a period hardware quite popular for a time in American homes. The Elizabethan period is really a cross between Gothic and the Renaissance and was developed during the reign of Queen Elizabeth from 1558 to 1603.

Fig. 6 gives us a Greek design as manufactured by Penn Hardware Company. The Greek ornaments featured the lotus and the egg and dart. This school is one of dignity, simplicity and beauty.

Fig. 7 is among the best of the

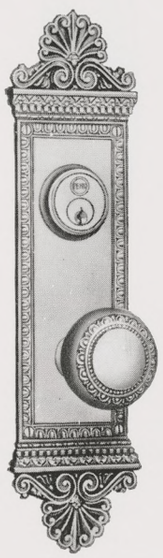


Fig. 6—
Greek
Design

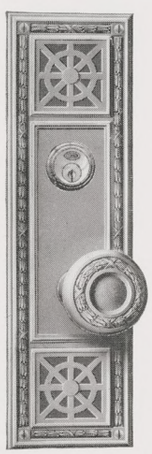


Fig. 7—
Roman
Design

Roman period and is another Corbin design. Does not this pattern in its ruggedness, simplicity and strength make you sense the glory that was Rome?

Fig. 8 presenting a Mission pattern of Yale & Towne and Fig. 9 from the same school of design made by Russell & Erwin are two splendid examples of this type.

There are many places where the Mission school of ornamentation lends itself most expressively, particularly on the West Coast and in Florida where this design is decidedly popular.

In a course of this kind one can only suggest the importance of a more complete study of such an interesting matter as schools of design. It has been my endeavor to illustrate some of the more generally used schools, particularly older and ornamental periods.

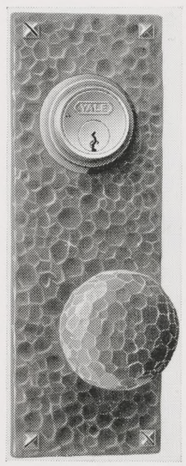


Fig. 8—
Mission
Design

All manufacturers make many more designs in most all of the periods mentioned as well as a number which I have not discussed. If you desire to become a real student of this subject you

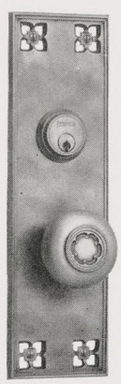


Fig. 9—
Mission
Design

will obtain a great deal of knowledge for your builder's hardware career and you will also acquire a much deeper appreciation of the arts.

Remember that these illustrations show only a few items. There are many items made by various manufacturers which include not only lock trim for outside locks but for inside locks as well. And also bear in mind the fact that these period designs are frequently carried out to considerable length, even to the cabinets and windows of a home.

Chapter 22—*Intermediate Course*

COLONIAL and MODERN SCHOOLS of DESIGN

IN the preceding chapter we gave considerable thought to schools of design, turning our thinking to those particular schools of ornament that had their birth in the development of the arts of Greek, Roman, French and English creation. As was pointed out in that chapter, use of these schools of ornament has passed in a large degree from our modern thinking. To use one of them particularly on residential work has become rather the exception than the rule.

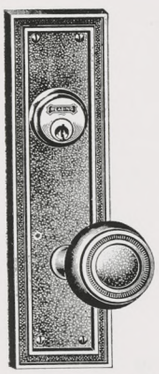


Fig. 1—Modern Design

Here in America at least, we have turned to schools of design more typically our own. Many of the more popular designs used today are those termed "modern" by many manufacturers, such as Fig. 1 (Reading Hardware Corp.). This type of hardware as produced by the foremost designers has filled a particular need in our scheme of modern American architecture.

Modern hardware design must not be confused with our latest product of school of design known as "modernistic." Much has been produced in the way of modernistic hardware by American manufacturers, some really beautiful and some of extremely poor design. Fig. 2 (Penn Hardware Co.) shows one of the fine products of this school.

The growing use of modernistic design is apparent to anyone who is at all posted on the trend of recent years in rugs, furniture, hardware and the buildings themselves. Space does not permit us to adequately handle each design. To those who really want to follow up this interesting subject, I recommend the public libraries or those books mentioned in our last chapter.

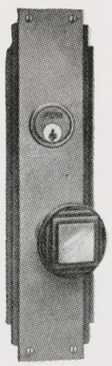


Fig. 2—Modernistic Design

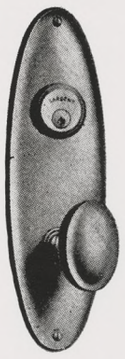


Fig. 3—Colonial Design

So, we come to the closing school of design in our review, one of the most popular in hardware—"Colonial"— a truly American production.

When we think of Colonial design we really think in terms of four divisions:

First Type Colonial—Colonial designs predominate among all the leading hardware manufacturers, brass and bronze metal with polished brass being the predominating finishes. Such designs as Fig. 3 (Sargent & Co.) in long escutcheon and Fig. 4 (Russell & Erwin) in sectional design typify the Colonial style of many manufacturers.

Second Type Colonial—in later years most of the leading hardware manufacturers, as well as a number of specialty manufacturers, have created large numbers of Colonial designs made in white bronze metal. Fig. 5, a Corbin design, and Fig. 6, an Earle design will show what I mean. They have been among the leaders in creating popular demand for these types. Other interesting designs not only in Colonial but in early English, Spanish and other schools have been developed with the use of white bronze metal.

Fig. 4—Sectional Colonial Design

Third Type Colonial—It has been well said that "Necessity is the mother of invention." Back in the early 1920's while in Pittsburgh, I used to play handball quite regularly with the late John Farr, whose father, W. C. Farr, was then president of the McKinney Mfg. Company. In those days he was giving considerable thought to building a new home and he often talked with me about it. John Farr died quite suddenly before he could move into his new home, but before that happened he had developed a new idea in hardware.

It was his idea to develop

wrought iron hardware in a way that would bring it within modest price limits. I had the privilege of discussing the first designs with

Fig. 5—White Bronze Colonial Design

Fig. 6—White Bronze Colonial Design

him. I'm willing to admit at this late date that John Farr had a great vision. I just could not see at the time a large field, but he did and he was right. McKinney first made three Colonial designs "Heart," "Curley Lock" and "Tulip" as well as "Etruscan," a Spanish design.

Overcoming many unforeseen manufacturing problems McKinney soon found an acceptance beyond their own expectations. Replacing steel square head stud screws with ones of a special aluminum alloy was one of their early improvements. Later on they brought out other designs. When they started they thought 10 years would be about the limit of popularity, but after 12 years the line has shown no let up in demand.

Figs. 7 and 8 are two of the popular designs used extensively on Colonial work as manufactured by McKinney. This firm has also been very successful with zinc coating, thereby rust-proofing, their goods.

Fourth Type Colonial—Of the four divisions of Colonial hardware the last, the most expensive and undoubtedly the truest reproductions of early American Colonial hardware, is produced by those manufacturers' foundries and specialty producers who hand forge their real Swedish iron and reproduce the real hand-wrought hardware of early American history.

What real hardware man does not get a thrill when he has the opportunity of seeing in old New England or Virginia houses hand-wrought Swedish forged iron of those historical days? Fig. 9 shows one of these typical front door handles manufactured by Russell & Erwin.

Let me again suggest the value to you of a more complete study of those designs manufactured by your sources of supply. In as brief a course as this one necessarily must be, I can only sketch an outline for your further study. It is my hope that you will follow this outline, in further detail, on the matter of schools of design.

Fig. 7—Colonial Wrought Iron Design

Emphasis has been placed on front door hardware only by way of example. A careful study of the kindred items which can be sold will, however, greatly add to your dollar sales volume. Selling the front door handle and forgetting the hinge plates, door knockers, foot scrapers and many other accessory items which are really called for with the front door handle should never be overlooked.

On the last three Colonial types especially, hinge plates for example are usually required by the architect. Watch for them on the detail of the front door or front elevation.

H. and L. hinges are popular in certain types of interior doors and cabinets and sometimes these are made as complete hinges. At other times and on less expensive work, plates screwing tight to the regular door butts are considered adequate as shown in Fig. 10. The catches and pulls should be in the same design, metal and finish, on the cabinets where these kinds of plates are required.

To go through all the trim used with this type of hardware

Fig. 8—Colonial Wrought Iron Design

Fig. 9—Hand-Forged Colonial Design

would be unnecessary for whether it be knobs, thumb latches, drop handles, escutcheons, etc., the same sort of description would be necessary as has been fully described in previous installments.

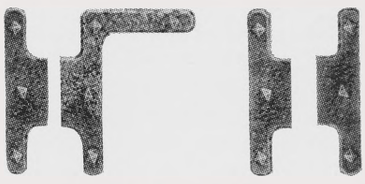


Fig. 10-L and H section of hinge plate

Lever handles, for example, would be subject to the same caution given in a previous chapter regarding spring power to keep them in proper position and in using the right spindle. All of these points must be watched with extreme care. Speaking of lever handles, care must be used to specify whether they are for locks with hubs on the square, such as Yale & Towne use, or on the diamond, such as are used by most of the other manufacturers.

In closing this chapter, let me again caution you new men in builders' hardware. Watch the architect's details, be sure your hardware will fit and specify all necessary information in your orders to the factories.

Chapter 23—*Intermediate Course*

CYLINDRICAL LOCKS

THERE have been in recent years two developments in lock construction of a radically different nature from the standard type of lock construction which we have been studying. On Government specifications

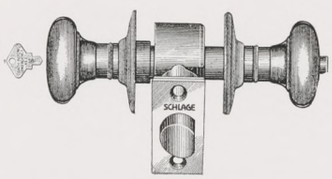


Fig. 1—Type F button lock set for interior door.

these two types are described under two distinct classifications—tubular and cylindrical.

It was my intention to discuss both of these types in this chapter, but recent developments in the tubular line, particularly, compel me to break this subject into two chapters instead of one. In this chapter we shall, therefore, turn our attention to the cylindrical lock and postpone consideration of the tubular line until the next chapter.

About 1924, as I understand it, there developed on the west coast cylindrical locks with different patented features. One covering the Reed Patents was purchased by the McKinney Mfg. Co. who greatly developed the line and aggressively pushed it for a few years. Later, however, McKinney sold its entire lock line to the American Hardware Corporation who have not, to the best of my knowledge, brought it out again into the market up to this time.

Practically every large lock manufacturer through one or more of its executives has at different times told me that they are prepared to meet the cylindrical lock

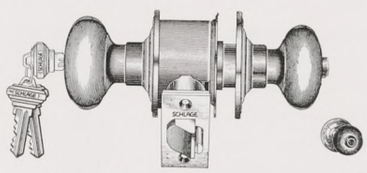


Fig. 2—Type A front door cylinder lock set

competition by similar locks of their own, many of them already patented.

We know, of course, as already mentioned, that the American Hardware Corporation, which owns both P. & F. Corbin and Russell & Erwin, has fortified its position by purchase of the Reed Patents with the McKinney lock line.

To date, however, only one manufacturer has, as far as I know, established in a broad national way a general distribution and acceptance of the cylindrical lock.

Because the line is so different from that of the lock lines we have discussed in recent chapters it did not seem fair to compare it with the comparative locks of other manufacturers we have studied. Therefore I have chosen to make a separate chapter of the subject.

In so doing it is not my idea to over- or under-emphasize this particular company's products, but rather to present it as part of the educational series to stand on its own merits.

The Schlage Lock Co., San Francisco, Calif., started in 1924 the development of the Schlage lock, a cylindrical lock. Originally the line comprised locks for residential work only and gradually locks for all types of buildings were added.

The principal mechanical features are fully covered by United States and foreign patents. As is the fact of every manufacturer's products, there has been a constant improvement made in the

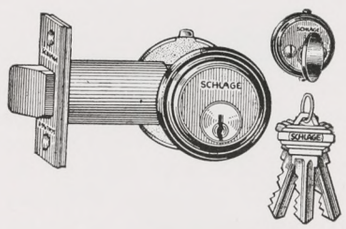


Fig. 3—Type B mortise cylinder night latch

lock and particularly in the matter of designs and finishes. The early Schlage lock was rather large and some mechanical im-

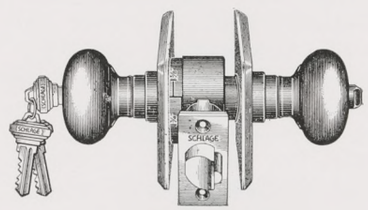


Fig. 4—Type C cast bronze office door lock

perfections were exposed by use and corrected.

As time went on, however, new designs, smaller knobs and the basic values of the line increased its popularity until the Schlage lock has established itself throughout the country. How true this statement is may be explained by its evident popularity in Florida and speaking lightly, of course, when Florida will accept anything from California as being good, there must be something to it.

Outstanding among the claims of the company for this type of lock are the following: convenient locking by means of a push button on inside knob (Fig. 1); automatic unlocking on most types by turn of inside knob; unit built —eliminates knob binding and easier installations—the manufacturer states it can be applied in about ten minutes—just boring two holes.

This course of study, of course, is to instruct you in builders' hardware, so for the rest of the features claimed by the manufacturer I would refer you to their catalog.

The line of locks covers the functions which you have already learned.

- Front door handle and knob sets
- Inside sets
- Bath room sets
- Closet sets
- French window sets
- Screen door locks
- Mortise night latches and dead locks

The pin tumbler cylinder, as well as the wafer type cylinder, is used in various types of locks. All keys are inserted in the knob. The locks can be master-keyed as any other cylinder lock can be so arranged.

An outstanding fact about the development of Schlage locks is

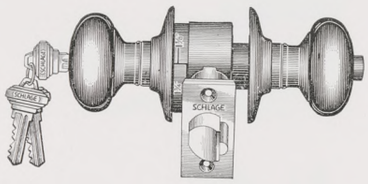


Fig. 5—Type D wrought bronze hotel lock

that the original idea of hollow spindles has made it possible to add locking functions for every kind of door control. Further, the original idea of cylindrical construction to provide easy and quick round hole installation has been maintained throughout this development.

Practically every type of lock described in previous chapters of this series is duplicated as to locking function in the Schlage line. Several of their locks have the auxiliary latch locking feature used on some of the locks we have already discussed in the earlier chapters.

The locks can be furnished with metal knobs, glass knobs, and one of their most interesting developments has been the hand-painted china knobs and other china and pottery knobs in various pastel shades. The original locks of "A" type are still used a great deal with all the functions listed before in this chapter (Fig. 2).

Schlage Type B locks were a development of the mortise cylinder latches and dead locks used separately and also used in connection with front door handles (Fig. 3).

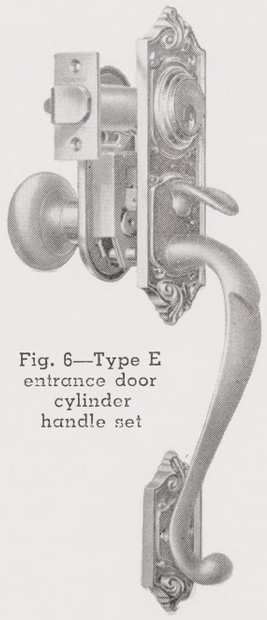


Fig. 6—Type E entrance door cylinder handle set

Schlage Type C locks have many functions not yet discussed in our course of study which will be covered in the advance course and are used in hotels, schools, churches and other public buildings. All type C locks are with cast brass or cast bronze trim (Fig. 4). Their Type D locks are the same type of heavy duty locks used in type C, but the trim is of wrought brass or bronze (Fig. 5). Their Type E locks are strictly entrance door handle sets (Fig. 6).

For their Type F locks note the residential small knob lock set described previously (Fig. 1). This is the type set on which the china knobs are used as well as interesting designs of metal and glass. Their Type G completes the line, their other types being locks and latches for screen, storm and cupboard doors. Fig. 7, shown below, is an example.

We have not attempted to cover the matter of designs or finishes. It has simply been our endeavor

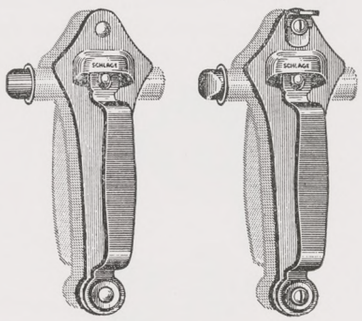


Fig. 7—Type G screen door latch

to outline your further course of study through reading the manufacturers' catalogs or talking with the salesman who sells you the line. This may be their own salesman, a jobber's salesman who sells you the line or a contract builders' hardware man who sells this particular line to you.

Chapter 24—*Intermediate Course*

TUBULAR LOCKS

As was pointed out in our last chapter there have been in recent years two developments in lock construction of a radically different nature from the standard type of mortise bit key construction which, prior to Chapter 23, had been studied in considerable detail. In the last chapter we discussed cylindrical locks. We shall now take up the study of tubular locks.

Again I wish to state, as I did in Chapter 23, that it is not the desire of HARDWARE AGE or myself to either over or under emphasize the importance of either cylindrical or tubular locks or the products of any other manufacturers in these chapters.

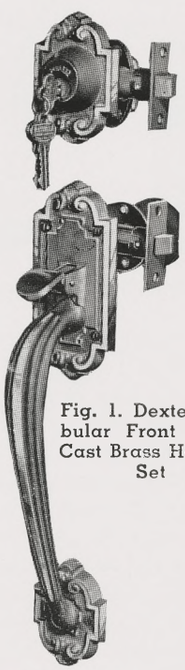


Fig. 1. Dexter Tubular Front Door Cast Brass Handle Set

Like cylindrical locks, the tubular lock has a distinct specification on government work. Because it is so different from the standard lock lines we have discussed, it seemed only fair to present the lock as part of the educational series to stand on its own merits. There are several tubular locks on the market, each one claiming certain distinctive merits.

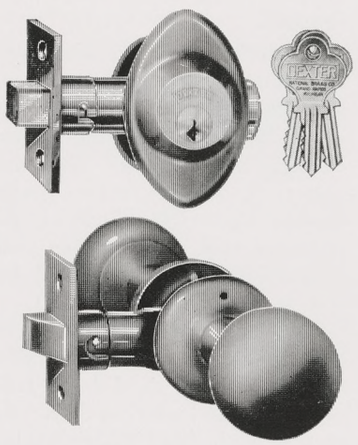


Fig. 2. Dexter Tubular Front Door Metal Knob Set

Tubular means "round," that is, it is housed in a round case. Installation, therefore, requires the boring of only round holes, eliminating the deep mortising necessary with standard mortise locks.

The tubular lock, I believe, was first introduced to the hardware trade by the National Brass Co., Grand Rapids, Mich. The record of its invention, so far as I have been able to find out, is not quite clear. Credit is usually given to L. A. Dexter, president of the National Brass Co., for he at least brought the perfected tubular lock to the market. "Dexter Tubular," as it is commonly known, takes its name from Mr. Dexter.

It would seem, therefore, quite proper to first consider the Dexter Tubular Lock, for which the manufacturer claims among other features the following: economy of application, die cut parts, round coil springs, smoothness of latch action, resilient sound knob action and positive latch action.

It may be well, also, to note the locking device used on the Dexter Tubular Latch, since it is different from that of the mortise or of the cylindrical types. The thumb turn operates independently of the latch and entirely within the escutcheon holding the spindle rigid by means of a slide on the back of the escutcheon.

Fig. 1 shows a Dexter front door handle set. You will note in

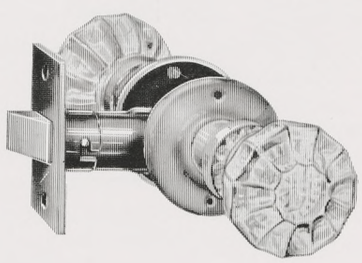


Fig. 3. Dexter Tubular Glass Knob Inside Latch Set

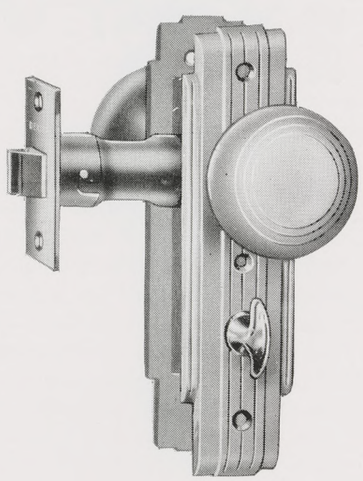


Fig. 4. Dexter Tubular Plastic Knob Inside Set

this cut that the dead lock is a separate installation and locks independently from the latch, permitting them to be mounted in any desired distance from each other on the door. The dead lock is optional with the night latch—by that I mean if your customer prefers a spring night latch instead of a dead lock it can be so ordered. This method applies on all their cylinder lock installations throughout the line.

Fig. 2 is a plain knob set for entrance doors. The National Brass Company offers a selection of designs, but, as has been our custom through the series, most of our illustrations are on plain goods. We would refer you to the manufacturer's catalog for more complete information.

Fig. 3 is a fluted glass knob latch set with a locking rose feature when desired.

Fig. 4 illustrates an inside latch set with keyhole escutcheon on one side and thumb turn on the other. The finish of the face plate and strike are usually matched to the brass screws and the thumb turn. This particular line is being offered the trade in plastic trim, in a selection of eight colors. These new trends in color by hardware manufacturers will be watched with considerable interest by the

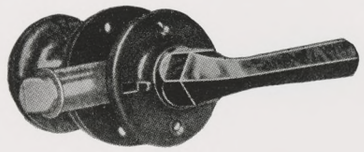


Fig. 5. Dexter Tubular Screen Door Latch

industry as a whole. It is interesting to note in passing that the National Brass Co. was among the first to introduce the use of Bakelite for hardware trim several years ago.

Fig. 5 shows the Dexter tubular screen door latch. This latch is suitable used also on combination and French doors.

Fig. 6 pictures the Dexter tubular cabinet latch. Thus we bring to a close a brief study of Dexter tubular locks and latches.

It is my understanding that two tubular lock lines have been developed on the West coast and sold principally in that territory. One is called "Ry Lock," the other the "Hilgren Lock."

Save for those which I shall discuss in closing this chapter, the only other ones I personally know of are the Ry and Hilgren tubular locks just mentioned and as I know these by name only it would not be fair to attempt any discussion of them here.

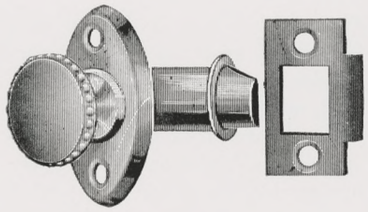
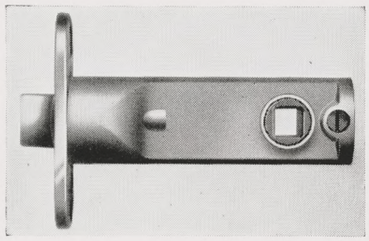


Fig. 6. Dexter Tubular Cabinet Latch

Fig. 7 shows the Lockwood tubular latch. The case and parts are drop forgings. One screw holds the cap to the case. All parts are



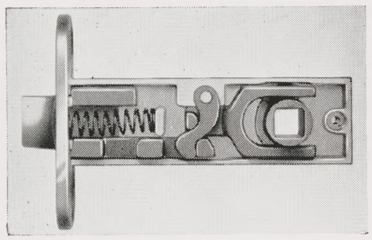


Fig. 7. Lockwood Tubular Latch

interchangeable. It is made now in two backsets for narrow and standard stiles. These are among the merits of the lock, claimed by this manufacturer.

Fig. 8 shows the complete Lockwood (tubular type) Latch. This set can also be furnished with locking device as shown on the Lockwood bathroom set, which is Fig. 9. The lever itself, which locks the knob on the spindle is quite inconspicuous. Fig. 9 shows the bathroom set with the locking device and this set is furnished with an emergency key to operate the latch from the outside, when necessary.

Lockwood, our readers will remember, was among the first to

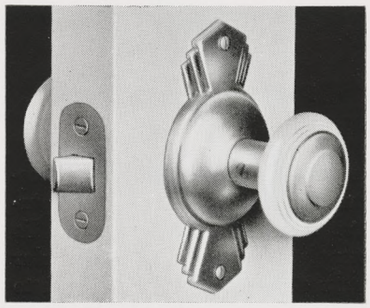


Fig. 8. Lockwood Tubular Plastic Knob Inside Set

develop and introduce to the trade plastic trim with interchangeable knob tops. These same developments have been carried into Lockwood tubular line, in all the color combinations offered to trade in recent months.

Up to the time of writing this chapter I have given you an outline, to the best of my knowledge and ability, of the subject of cylindrical and tubular locks. In a very few months this chapter may be sadly out of date, but the fundamental principles of cylindrical and tubular locks probably will not change materially—though they may.

* * *

The story of tubular locks as written while this course was being published serially closed with the prediction mentioned in the preceeding paragraph. How true that prediction proved is best shown by the developments of sev-

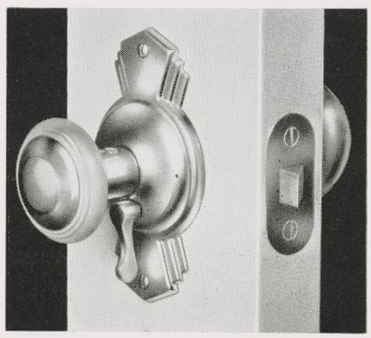


Fig. 9. Lockwood Bathroom Set With Latch

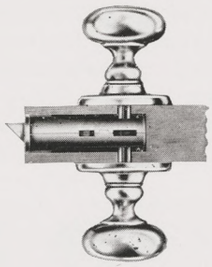


Fig. 9—Corbin Tubular Latch Set

eral leading manufacturers subsequent to the publishing of this particular chapter of the series. To complete our study of tubular locks at the time this book goes to

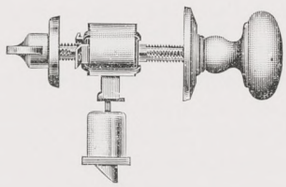


Fig. 10—Yale Tubular Closet Set

press, we find four more prominent manufacturers now aggressively in the field for this business.

P & F Corbin, Russell & Erwin,

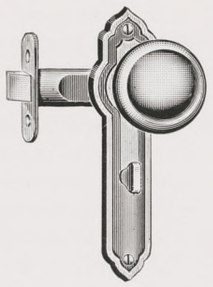


Fig. 11—Russwin Tubular Bath Set

Sargent and Yale & Towne have introduced practical and attractive tubular lock lines to the trade. Each one of these four companies present certain exclusive features in its individual line. I shall leave the reader the duty of learning from his own manufacturer what the details of these features are.

Fundamentally, all manufacturers mentioned in this entire chapter are aiming at the same goal. Easier, more economical installation costs, attractive designs and simple locking mechanism.

Fig. 9 is an inside latch set showing one of the items by P & F Corbin.

Fig. 10 is still a different set in the tubular family made by Yale & Towne.

Fig. 11 shows a bath set of similar type from Russell & Erwin's line of tubular sets.

Fig. 12 is an insider door lock. one of the many manufactured by Sargent & Co.

All these manufacturers together with others who may be on the market shortly plan, I am sure, to develop their lines to include many other sets and designs in all standard hardware finishes.

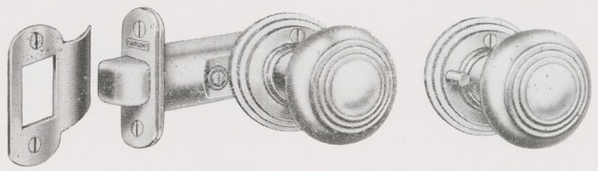


Fig. 12—Sargent Tubular Lock Set

Chapter 25—*Intermediate Course*

CUPBOARD HARDWARE

NOW that several chapters have been devoted to locks, lock sets, trim for locks, etc., I am sure you have acquired a comprehensive knowledge of how to handle the problems of trimming almost any kind of door with hardware. This being the case, we will follow the general trend of thought adhered to in the elementary series and will discuss the smaller doors to be found in a residence. We fully covered the matter of standard types of butts and hinges for

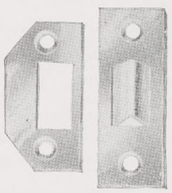


Fig. 1—Friction catch

doors, both small and large, in Chapters 15 and 16.

It will not be out of line to again remind the reader that our thoughts are directed toward residential builders' hardware in this intermediate course.

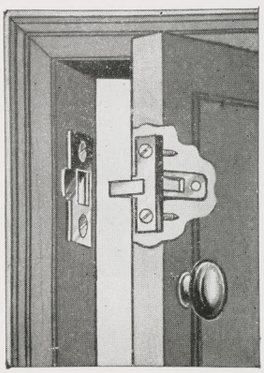


Fig. 2—Mortise friction latch

The usual types of smaller doors found in residential buildings are used on book cases, china closets, access doors, clothes chutes, kitchen cupboards, broom closets, linen closets and other cupboards.

Let me warn the beginner of the importance of carefully checking details. If you are taking off the builders' hardware requirements for a building you cannot be too careful in noting every reference of any kind on any open-

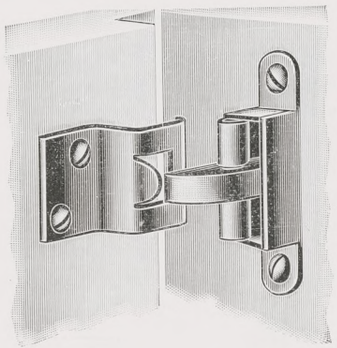


Fig. 2-A—Rim friction catch

ing on the plans. Every mark on a plan means something and many a job has been secured that might better have been lost because the estimator did not check the plans and details with sufficient care.

An architect will often indicate that cupboards are to be installed

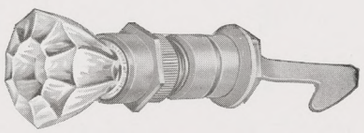


Fig. 3—Tegco patented cupboard latch

and that details are to follow and then will not attend to the details until the construction is under way. It is best not to include any hardware for such notations, but to specifically state the exact conditions in your bid on the work. If you try to guess how many doors and drawers an architect will detail you will frequently guess too few and your estimated profit will be wiped out. If you will guess too many your bid will be out of line.

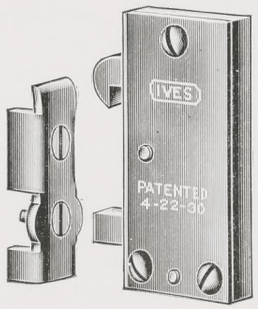


Fig. 4—Secret door latch

It is important not only to know how many doors and drawers a cupboard will have, but how thick the wood is and how wide the stile. Get all the essential information.

As rather lightly touched on in a previous chapter, cupboard hard-

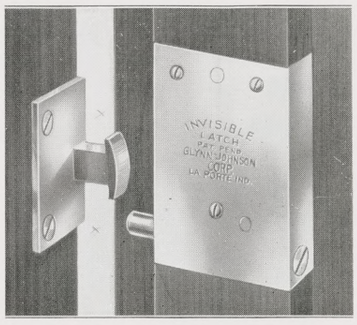


Fig. 4-A—Invisible latch

ware, particularly in living rooms, dining rooms and bedrooms, is often finished in design to match the large door hardware, particularly in cases where forged iron is used or in bedrooms where colored knobs are used.

There are many other types of

friction catches, for example such as Figs. 1 and 2, which can be used. Fig. 2 has been known to the builders' hardware trade for years as a Haegstrom catch, but recently the patents were purchased by the H. B. Ives Co. and will be manufactured by them in the future. This particular mortise catch is made in three sizes and a new rim catch (Fig. 2-A) is now being introduced by the manufacturer to the trade. Placing catches both top and bottom on each door is a good idea where doors are in pairs or even on single doors. It keeps the doors in shape better and incidentally you sell two catches instead of one.

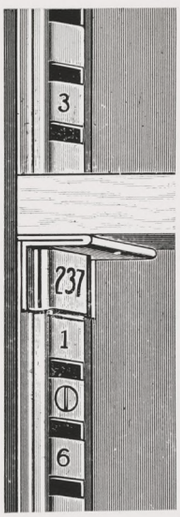


Fig. 5—Adjustable shelf standard and support

The Technical Glass Company has developed a nice line of glass cupboard hardware as have other manufacturers. This particular company has quite an assortment of colored glass pulls. They also make a door catch (Fig. 3) which has proven quite popular.

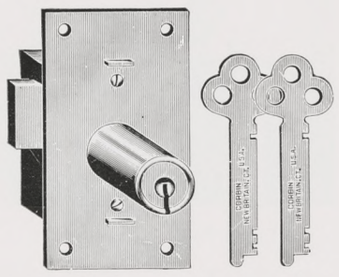


Fig. 6—Wardrobe or cupboard lock

On the better type of residential work there will often be secret panels where special hardware is required. The Soss Invisible Hinges, particularly their new improved line, are very free acting and permit the door to operate very smoothly, which is a desirable feature when used with a secret catch such as is shown in Fig. 4. In cases of this kind where there is no hardware showing the door is released by means of a push on the panel.

As far as I know, only two manufacturers make this type of secret catch, Ives, who has purchased the Haegstrom patents, and Glynn Johnson Co. Even these two operate in slightly different fashion so be sure to study each manufacturer's catalog. They are made in four sizes for various sized doors.

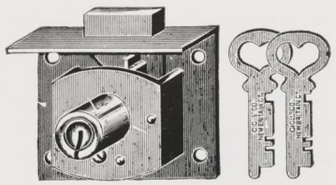


Fig. 7—Drawer lock

Perhaps it will seem that I have given too much space to secret panels for they are used only on rare occasions. However, when they are used you should know how to handle the work. Until recently there was not available as simple a catch but, now that it is available, secret doors or panels are no longer difficult to handle.

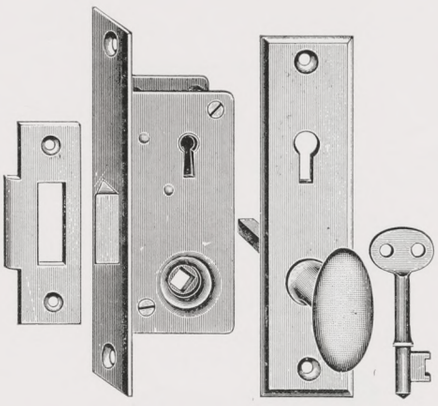


Fig. 8—Mortise cupboard lock. Latch similar without key.

It is often possible to sell shelf supports similar to Fig. 5 in place of the ordinary shelf rest for the shelves in the better class of residences. This will give you more "plus" business.

Fig. 9—Sliding door track for cupboards

Occasionally owners will insist on locking cupboard doors and drawers. The usual type of lock, such as is shown in Fig. 6, is suitable for the door and lock while that shown in Fig. 7 is used for the drawers.

When locks of this type are used do not overlook the importance of suggesting to the owner that the locks for both drawers and door be keyed alike or master-keyed. On doors of this type this service will be doubly appreciated. Warnings should be given to beginners of the necessity of being sure the door and drawer locks are of the same manufacture and same key class, otherwise they cannot be keyed alike or master-keyed in one set.

The type of locks shown is only one of many types which can be used. We will go into a more detailed study of cabinet locks in the advanced course.

There may be times you may have a call for half mortise latches and locks, such as is shown in Fig. 8, for cupboard doors. Sliding doors in cupboards are sometimes used and these require track and sheaves. Those shown in Figs. 9 and 10 are the more common types used. As a beginner it will be well to keep in mind that the track comes in standard lengths. In figuring the job figure the nearest standard length, even if it is longer than the amount required for the rest will be waste anyway.

Fig. 10—Sheave for sliding door track

Unfinished wood knobs for pulls on doors and drawers are still popular in many places.

In preceding chapters we discussed period architecture or schools of design. There is a type

of cabinet hardware used more particularly on furniture, but often sold in hardware stores, called "period hardware." It is an impossibility for the average hardware dealer to carry anywhere near the stock needed to fill all the calls or to nearly match the various samples brought in, and I would not recommend that he try to do so.

Desk slides, table leaf supports and braces of various kinds might not be considered necessary in talking about builders' hardware and yet items of this type are generally found in the builders' hardware department of the average good hardware store. Review these items in your manufacturers' catalogs.

In our next chapter we will discuss kitchen cabinet hardware. When the elementary series covering this subject was published one of the manufacturers commented on the fact that much prominence was given to elbow catches, the old standby cupboard turn, etc., and asked if we did not realize the fact that kitchens had gone modern. We fully realized this fact and accordingly will discuss this sort of modern kitchen cupboard hardware in our next chapter.

Many of the despised elbow catches and cupboard turns are still being used despite the fact that kitchens have gone modern. I'll venture to say almost every hardware store in the country sells them regularly. This being the case it was right, I believe, that our beginners should know about them.

Modern kitchen cabinet hardware is a great forward step and in the next chapter we will discuss the subject in detail.

Chapter 26—*Intermediate Course*

KITCHEN CABINET HARDWARE

KITCHEN cabinet hardware is worthy of a chapter by itself. So much has been done in the way of modernizing kitchens in recent years that modernizing the hardware that goes in the kitchen just naturally had to take place.

The major electric refrigerator people had much to do with making the public "kitchen-minded" just as the manufacturers of plumbing supplies have made the public realize the need of modern bathrooms.

Modern Kitchens

Major electrical appliances and smart linoleum manufacturers' advertising has resulted in another development by popular demand—modern kitchen cabinets.

Many companies have made these cabinets in units, ready to be set up. Whether they were made of wood or steel made no difference to the builders' hardware man, because in either case, they were sold in units complete with all essential hardware.

Only when the kitchen cabinets are made by the carpenter on the job does the builders' hardware man get a chance to sell his hardware. You will perhaps remember that I suggested in one of the chapters of the elementary series that it would be a good idea for you to secure an agency for kitchen cabinets so that you could sell the cabinets as well as the hardware.

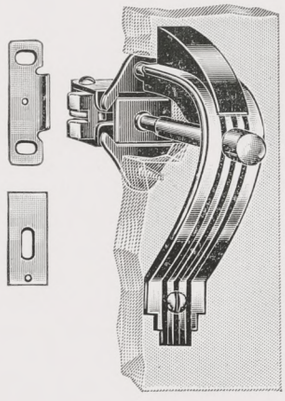
For quite a while after kitchen cabinets were on the market, their hardware was far more modern than anything the builders' hardware man was able to obtain and it has been only within a comparatively recent time that hardware manufacturers have made available as fine a line of kitchen cabinet hardware as could be obtained on complete jobs of kitchen cabinet installation.

The illustrations used with this chapter will give you some idea of how splendidly hardware manufacturers have come to the support of the hardware dealer by making available so distinctive a line of kitchen cabinet hardware.

A Real Market

There is a real market for the hardware store in old, remodelled kitchens where the owners cannot afford to buy new cabinets and are repainting (don't forget to sell the paint!) and putting on this modern kitchen cabinet hardware.

Some manufacturers have made up assortments with display panels to put on the show case and are creating a lot of consumer demand as a result of their efforts. Display panels, many of which are illustrated herewith, are sold with assorted stocks well-labeled and price-tagged on the back of the panel for easy selling.



Lift latch cabinet catch

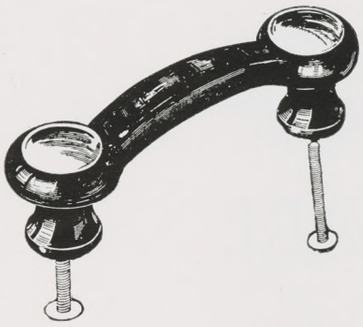
Note how the modern kitchen cabinet hardware really matches with hinges, catches and pulls of the same design.

Modern kitchens have brought forth another detail which has become quite common, the overlapping door requiring what we call in hardware terms "offset hinges." When you sell this type of hardware be sure to find out whether the doors overlap the frame or are flush with it. Modern kitchen cabinet hinges can be secured for either type.

The same problems of catches for the doors and pulls for the drawers that we discussed in our previous chapters have to be considered in these kitchen cabinets. In this modern kitchen cabinet hardware, however, all the pieces can be matched to the same design and finish.

Modernistic door pull

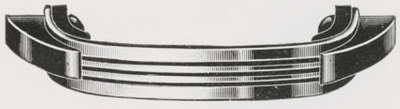
There are also different kinds of catches. Again let me warn you of the necessity of knowing whether the doors overlap or are flush. This is particularly important where you have to trim a single door with hinges and a



Glass drawer pull and knob

catch where you have an offset strike for overlapping doors.

The excessive cost of color printing prohibits us from showing what really beautiful color combinations have been worked out to appeal to the consumer.



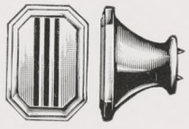
Modernistic drawer pull

Much has been done to add to the attractiveness of this hardware by introducing color, particularly on many of the pulls and catches.

One manufacturer, at least, has helped the dealer solve the problem of large stocks by furnishing celluloid strips in many colors so that only one stock of metal parts is required, the strips being furnished in any of the colors desired, all fitting the single metal stock.

Manufacturers who specialize in glass pulls and catches have not been slow to introduce many new colors and patterns to the trade to compete with metal hardware. Indeed, these manufacturers of glass pulls and catches first introduced color into the kitchen by their earlier developments.

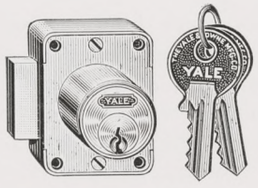
I would not in my enthusiasm



Modernistic knob pull

for this modern matched type of kitchen cabinet hardware have you think that this is the only type of hardware to match modern kitchens.

Many manufacturers make and sell large quantities of cabinet hardware to fit these modern cabi-



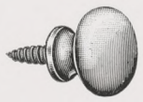
Dead lock for package door

nets in plain design. Plain design, kitchen cabinet hardware is in perfectly good taste and will always have popular demand. Drawer pulls of plain design have been discussed before and we need not remind you of their everyday demand in every hardware store.

Many kitchens are equipped with broom closets. Sometimes a full size, 1⅜ in., is used, requiring regular, full-sized door hardware to match the other large doors in the kitchen. Frequently, however, they are comparatively narrow, made of 1⅛ in. wood, and the hardware must match the hardware of the cabinets.

A milk and package delivery door is used in many kitchens. Many of these are of metal and you can sell them complete with their hardware as you sell a steel sash or coal chute. Do not overlook these extra volume productory items.

Many of these milk and package doors, however, are made of wood and you must furnish the



Knob for bread board

builders' hardware. Usually a pair of butts and a casement fastener for the outside as well as the inside door will do.

Occasionally the owner will want the outside door locked and the key hidden where those who should have access to the package space can deliver their milk or packages. Usually a small dead lock like the one shown at the left will do for such doors.

Then there are bread boards which often have grooves on the lower surface to be used when they are pulled out. Occasionally, however, these boards are in flush and require a knob pull. On such boards you must use a screw end such as shown, commonly called shutter knobs.

Chapter 27—*Intermediate Course*

WINDOW HARDWARE

AN indispensable and frequently used form of knowledge, insofar as it affects the builders' hardware man, is that concerning the various types of windows.

Windows are divided into two particular classifications. The first and most commonly used of these includes double-hung windows which we will discuss first.

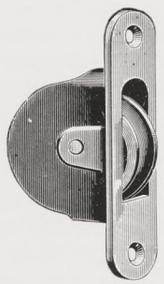
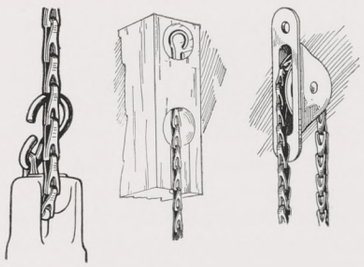


Fig. 1—Frame or sash pulley

On double-hung windows we have both rough and finish hardware. This course so far has concerned itself only with finish hardware but I think that this is the proper place to discuss rough hardware, insofar as it is used with double-hung windows.

Different practices with respect to rough hardware are followed in different cities. In Buffalo, pulleys, sash weights, sash cord or chains are generally estimated and purchased by the contractors together with other rough hardware. During my years of hardware service in Pittsburgh, I noticed that it was customary for the contractor to ask for estimates or bids on the rough hardware as well as the finish and award the rough hardware on a lump sum basis. Learning how to estimate rough hardware will be well worth your time, however, irrespective of the practice which may exist in your locality.



A B C

Method of applying sash chain. A—shows chain hooked in two-hole sash. B—chain attached to sash weight. C—chain on sash pulley.

The frame pulleys are generally specified by the architect on cheaper construction and are usually furnished and installed with the frames by the mill man. On better grade work the frame pulleys are often specified with the finish hardware. Always consult the specifications to see how they are specified and who is to furnish them. If it is the mill man, go after that business too by selling them to the mill man.

Fig. 1 is a frame pulley. There are several things to watch out for in connection with their specifications. First and most important is the matter of the proper size, so that the cord or chain will be centered into the middle of the weight pocket and the weight will raise and lower freely without dragging on the side of the pocket. Secondly, are plain, roller or ball-bearing pulleys specified? Finally, what type of face is specified—lacquered, plated or bronze metal front? Brass or bronze metal faces on pulleys are usually of wrought metal rivetted to the cast iron of the pulley proper. Pulleys come with a round groove for cord, square groove for chain and combination groove for either.

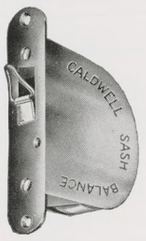
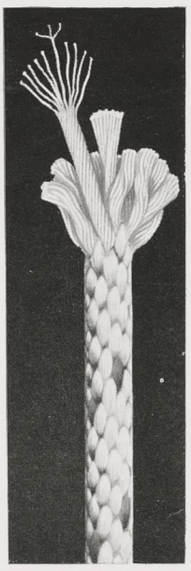


Fig. 2—Side spring sash balance



Typical first grade solid, braided sash cord.

The author urges all builders' hardware men to specify first grade sash cord avoiding cheap, loaded "clothesline" misnamed "sash cord."

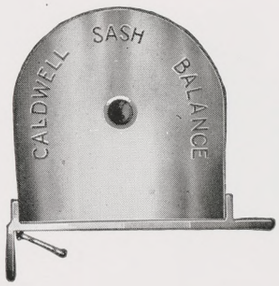


Fig. 3—Top spring sash balance

Next come the weights themselves. In order to estimate the size of weight required on a given window, you must first know whether double-strength or plate glass is to be used in the windows. You will find this information under the glass specification.

Having determined that, the following rules will apply for estimating, but before sending the weights to the job, the sash should be actually weighed because there will be variations in sash and glass as to weight.

For 1¾ in. sash multiply the number of square feet of glass by 1½ for double-strength glass and by 2½ for plate glass. Thus, a sash with one light 20 in. by 30 in. or 2 by 2½ ft. contains 5 sq. ft. and would require two weights, each 7½ lbs. for double-strength or two weights each of 12½ lbs. for plate glass. Always remember that there are two sash in each window and that each double-hung window requires four weights, otherwise you might figure just half enough.

Now comes another thing to watch! Will the cast iron weights in your larger windows be so long that they will not go through the pocket in the frame, or will they be too long to travel the full distance to permit the window to open its full length?

If round weights are too long, then you must estimate square weights or sectional square weights. Square weights, sectional square weights or weights of any special size such as 2 by 2½, etc., cost more than round weights and due allowance must be made for that.

Occasionally, even a square or sectional weight may be too long for a short, wide plate glass window and lead weights may be required. As lead weights will cost at least five times as much as cast iron weights, I always stated in my bid on rough hardware—"Please note this bid does not include the furnishing of any sash weights of lead." It is then up to the architect or contractor to see that sufficient room is made in the pockets for cast-iron weights.

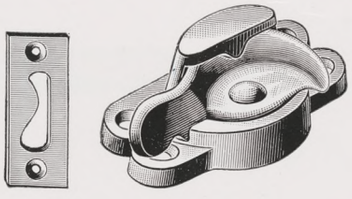


Fig. 5—Sash fastener with narrow strike

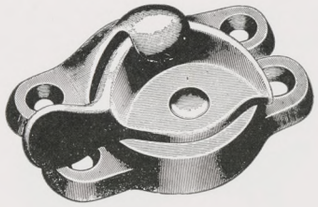


Fig. 4—Sash fastener for double-hung windows

Next comes the matter of sash cord or chain. Where sash cord is specified the architect usually calls for certain brands and sizes. Here again is where the architect can be helped when writing his specifications by having the builders' hardware man advise him regarding the proper cord or chain to use.

In the case of sash chain, you must know the size of the chain required and whether the architect wants steel, galvanized or bronze chain. A set of sash chain fixtures must be estimated with every window using chain.

On both sash cord and sash chain, the height of the sash will determine the amount of chain or cord required. In the ordinary residence 20 ft. to a window is ample, but unusually high windows will require more.

In localities where sash weights are expensive to furnish, due to freight rates from the nearest foundry, sash balances, such as Fig. 2, are specified. Some architects prefer them anyway. Where these spring sash balances are used, pulleys, weights, cord or chain are not required.

Most sash balance manufac-

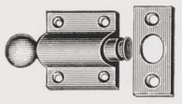


Fig. 6—One type of ventilating sash lock.

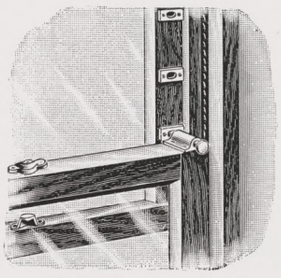
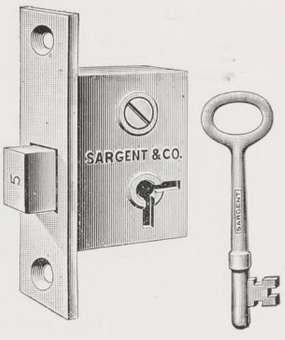


Fig. 6A—Showing its window application

Fig. 7 — Mortise ventilating sash lock with spring bolt.



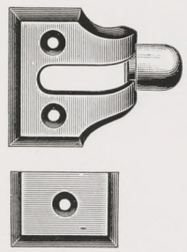
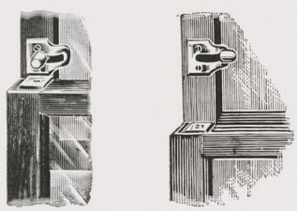


Fig. 8—Patent window ventilating lock. Application shown below.



turers have standardized the mortise required for inserting sash balances into a comparatively few sizes. To arrive at the proper size balance for a given window, use the same rules for estimating size as were outlined in figuring sash weights.

In addition to this, architects often specify overhead balances, similar to Fig 3, instead of the side balance previously shown.

So much for the rough hardware for double-hung windows. Now comes the finish hardware.

Sash fasts of the type described in our elementary chapter are so universally used that it hardly seems necessary to mention them again. Just to refresh your memory, it may be said that Fig. 4 illustrates the type. They are made in several sizes. Watch the width of your upper sash rail to the glass to be sure you do not use too large a one. In case a large one is specified you can order

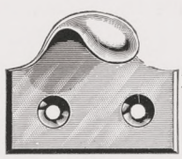


Fig. 10—Cast hook sash lift.

Fig. 11—Cast bar sash lift.

Fig. 13—Sash pull pole.

them with narrow plates, such as are shown in Fig. 5, where necessary.

On the first floor windows especially, on windows over porch roofs and particularly in sleeping rooms, many types of ventilating sash locks have been devised in order to permit opening the window to admit air but not enough to enable a person to enter from the outside. Figs. 6, 7 and 8 show three popular types. Here is "plus" business for you if you will only show them and sell them.

There are three general types of lifts—flush (Fig. 9), hook (Fig. 10) and bar (Fig. 11). They are made in a variety of sizes and designs. Extremely narrow windows require only one lift, but any fair-sized window should be equipped with two.

Windows which are very high from the floor may require sash pull plates, similar to Fig. 12, for the top rail of the upper sash together with sash pole and hook

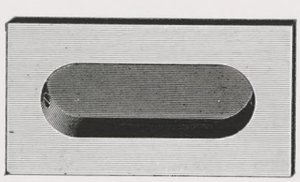


Fig. 9—Flush sash lift

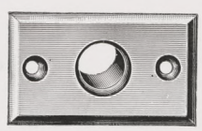


Fig. 12—Sash pull plate.

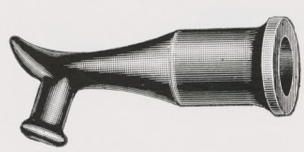


Fig. 14—Sash pull hook.

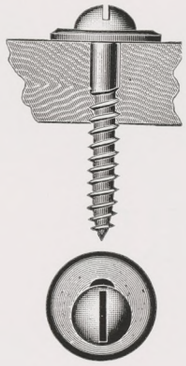


Fig. 15—Stop bead screw round head and washer.

such as are shown in Figs. 13 and 14.

Window beads should always

Fig. 16 — Flush stop bead screw and washer.

be screwed in on the better type of work and one of the three types illustrated by Figs. 15, 16 and 17 are generally used. Window beads which are nailed in are never satisfactory to an owner due to the fact that they have to be removed whenever it becomes

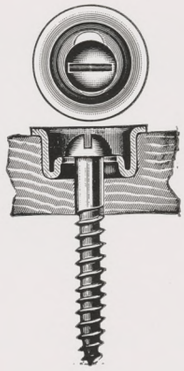


Fig. 17—Adjustable cup bead screw and washer

necessary to replace a broken cord. So sell this "plus" item every time in a finish to match the rest of the window hardware.

Chapter 28—*Intermediate Course*

WINDOW HARDWARE

CASEMENT windows, the accepted term for window sash hinged at the side to open in or out, are, next to double-hung windows, the most commonly used type of window in residence work. This type of window offers many problems to the builders' hardware man and you should master this subject thoroughly if you desire to be able to intelligently discuss the problems of your clients.

We have already discussed butts and accordingly it will be well to review a few points as they effect casement window openings.

In case the sash open out, butts should be of brass or bronze where the job will stand the cost. If brass butts bring the cost too high hot galvanized butts with brass pins to be painted should be used.

Check carefully for the throw required to properly open the windows and never use butts of a larger size than is necessary. Also take into consideration the weather-stripping. Most of the better grade homes now use weather-stripping on all windows.

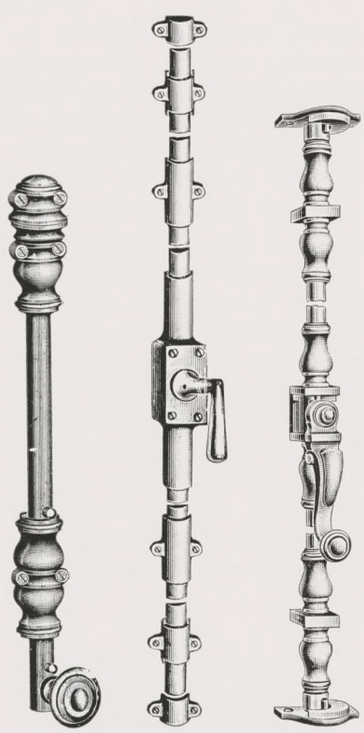


Fig. 1 Fig. 2 Fig. 3

Fig. 1—Heavy surface bolt.
Fig. 2—Cremorne bolt.
Fig. 3—Espangolette bolt.

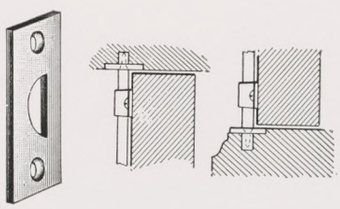


Fig. 4—Flat strike for bolts with application at right.

Casement windows come singly or in pairs. If in pairs, they are usually rabbeted at the meeting rail. The sash that closes first must be fastened when closed. As outlined in our elementary chapter, surface bolts top and bottom often serve for this purpose. Fig. 1 shows the type which is a better grade than was previously discussed.

The next step up is the Cremorne bolt shown in Fig. 2. Care must be taken in ordering this bolt to bring the handle operating the bolt to the proper height from the floor in order to operate easily without stretching or using a step ladder.

The Espagnolette bolt, shown in Fig. 3, is a further step-up in sales. This bolt acts as a lock for both sash of the pair and the same care must be taken on this with respect to the position of the handle.

Details of window construction must be carefully noted to see that the correct strikes are used for the frame and sill on all three types of bolts. There are three general types for all these bolts. Fig. 4, the flush type, as used with Fig. 1 bolts, is used mostly on the sill of windows opening out. Fig. 5, the surface type, as used with Fig. 2, is used mostly on windows opening in where the frame permits its use. It is the best type from the standpoint of appearance as is the box strike on a lock, but so many conditions in architect's details prevent its use that Fig. 6, the universal type, has come into use probably more generally than either of the other types.

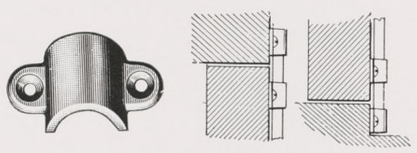


Fig. 5—Rim strike for bolts with application at right.

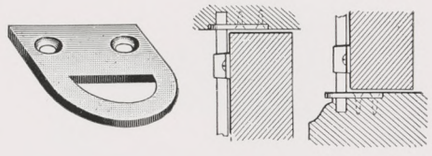


Fig. 6—Flat lip strike showing application at right.

Fig. 7 — Casement window fastener with surface strike at top, rim strike lower left, and mortise strike at lower right.

Having bolted the sash, which closes first, by one of these methods the next problem is that of fastening the other sash and this, except for the type of strike required, is identical with single casements.

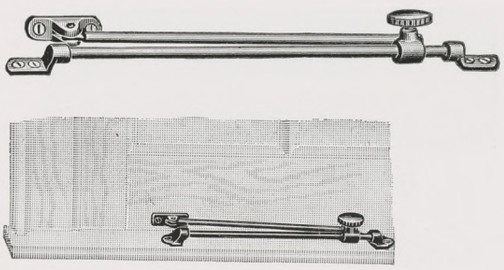
As we have already illustrated the three general types used on casements in Chapter 8 of the elementary series, I am sure that you have these types well in mind. The same method regarding strikes for bolts described in detail in that chapter holds good for the casement window fasteners. On all single sash opening out, mortise strikes must be used. On pairs of sash opening in or out the surface strike can be used, but the universal strike is by far the most popular. Fig. 7 shows a better quality casement fastener with all three types of strike.

Cremorne or Espagnolette bolts are often used instead of casement fasteners on both the last closing sash of the pair and on single sash.

Another problem presents itself with the casement window hung on butts, bolted and fastened. That is holding the window partly or all the way open so that a light wind will not blow it shut or flap the windows back and forth.

During the elementary course we discussed friction casement adjusters both galvanized and brass. These can be put at the head of the window, preferably on the outside, so there is no interference with the curtains and drapes. Care must also be taken to see that they will fit into the detail of the window frames. Fig. 8 shows a concealed type of friction adjuster which has the advantage of appearance over the surface type. All these friction adjusters have various methods of adjusting the friction in order to take up wear and varying wind conditions.

The standard casement adjuster made by window hardware manufacturers for years, illustrated by Fig. 9 for sash opening out and by Fig. 10 for sash opening in, are still used on occasion though they have lost some popularity with the advent of friction adjusters. Appearance and window screen conditions have had much to do with this.



Right — Fig. 9 — Surface adjuster for windows opening out.

What builders' hardware display room of any of the older firms is not filled with mounted samples of concealed casement window adjusters? It seemed that the making and sampling of various types would never end. Many of them were not very rigid and allowed the sash to rattle with the wind. They required special details of frame construction which had to be built into the house when it was being erected which were expensive and served to curtail their use.

Do not misunderstand me, there is a place for good concealed casement window adjusters and fortunately through the years there have been developed some excellent concealed adjusters which have overcome the problems, look attractive and eliminate the necessity of opening screens to operate the casement windows. These are distinct advantages which you as a builders' hardware man should cash in on whenever possible. Selling these types of adjusters adds greatly to the sales volume and profit so many overlook.

Fig. 11 shows an adjuster with worm gear operation, suitable for installation on the top of the sill, permitting the screen to be fitted over it or installed under the sill with only the handle showing as is seen in Fig. 12.

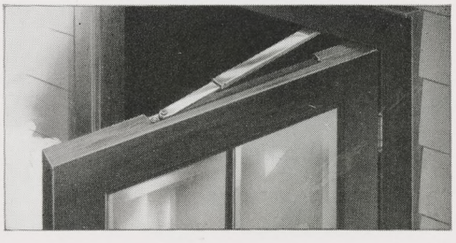
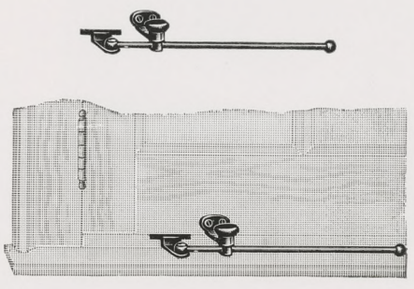


Fig. 8—Concealed friction casement adjuster.



Right — Fig. 10 — Surface adjuster for windows opening in.

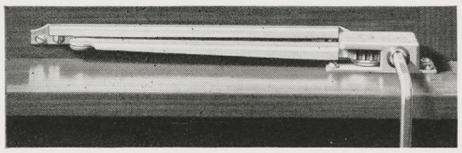


Fig. 11—Casement adjuster to operate through screen.

Another problem encountered with single casement windows is that of cleaning especially where they occur on a second floor window. The same manufacturer whose adjuster is shown in Fig. 11 makes a special hinge shown in Fig. 13 to use with his adjuster, Fig. 14, to accomplish this purpose.

One manufacturer has developed a combination adjuster which does the same trick, eliminates the use of any butts and permits the cleaning of the outside of the windows from the inside of the house. This is shown in Fig. 15.

While considering windows we can properly describe another type—the pivoted sash. Fig. 16 shows a typical type of friction center for this purpose. It will swing over far enough to permit cleaning the outside of the window from the inside of the building. I well remember one church job that I furnished in Pittsburgh 20 years ago that used over 100 sets of these in its Sunday School building with good results.

Then there is the problem of the large pivoted sash which, although seldom found in residential work, fits naturally into this chapter. Fig. 17 shows the lifting pivot used for this type of window.

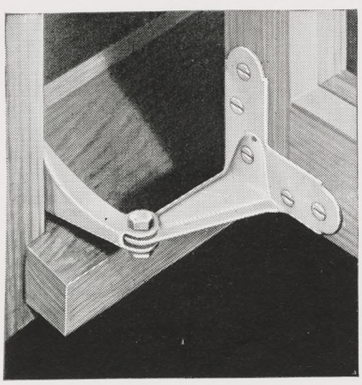
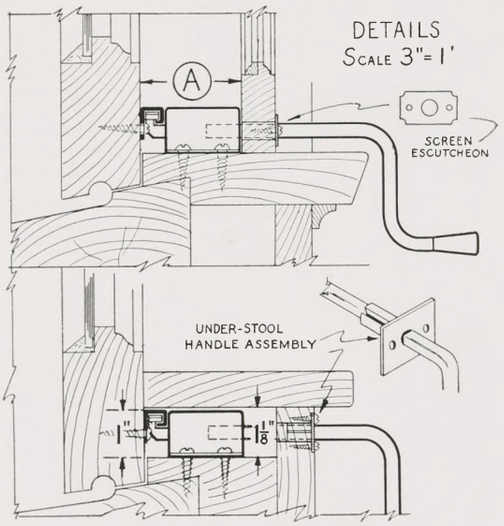


Fig. 13—Extension cleaning hinges.



Right — Fig. 12 — Adjuster, Fig. 11, applied below sill.

Transoms used with catches and chains were discussed in our elementary series. However, they are not nearly so much used as in former years. The adjuster, as shown in Fig. 15, and surface or

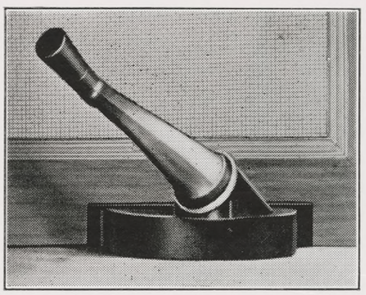


Fig. 14—Adjuster for use with extension cleaning hinge.

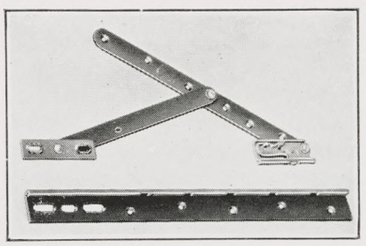


Fig. 15—Semi-reversible sash fixture.

mortise friction adjusters as in Fig. 8 are now more commonly used.

The usual surface transom lift, shown in Fig. 18, is used on transoms over doors. Care must be taken to see that the arms are of the proper size for the recess of the transom sash, if there is any. In case there is no place on the trim within 2 in. of the edge of the transom on which to place the guides for the lifter the bracket must have a greater offset. The amount of the offset depends on the extra distance you will have to set the guides back on the trim.

Keep in mind the recess and offset required when ordering transom lifters. The height from floor (lifts should come within 4 ft. from the floor) and the thickness of the lift. Use ¼-in. only on extremely light transoms, 5/16-in. on medium transoms and ½-in. or ⅜-in. on heavy transoms. Also order for top-hung, bottom-hung or pivoted transoms. This is important.

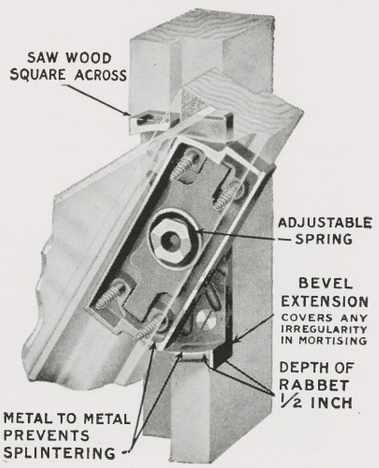


Fig. 16—Friction sash center.

Concealed transom operators, Fig. 19, are sometimes used, but

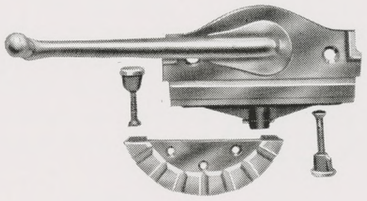
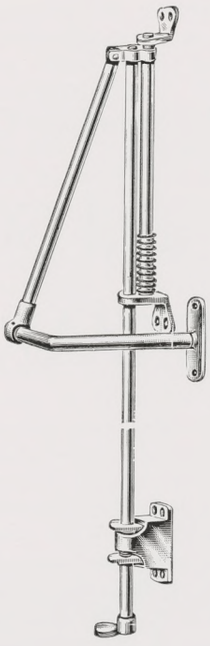


Fig. 17—Elevating sash fixture for vertically pivoted sash.

Application is shown below.

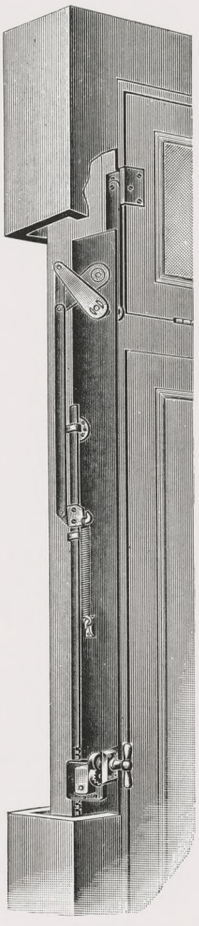


Left—

Fig. 18—Surface transom lift.

these are mostly used on larger public buildings and very seldom on residences.

If you have stored away an understanding of these last two chapters you will have a good foundation for understanding window hardware problems.



Right—

Fig. 19—Concealed transom operator.

Chapter 29—*Intermediate Course*

SHUTTER and SCREEN HARDWARE

THE subject of shutter or blind hardware is closely identified with that of window hardware. In some sections of the country they are known as "shutters" while in other sections they are known as "blinds." The term "shutter" will be used throughout this chapter.

During the early days of this country shutters were used primarily for keeping out the winter weather and, incidentally, for the purpose of obtaining added security. This was particularly the case with colonial homes. At the present time, with weather-stripped windows and the danger of intrusion having been reduced to a minimum, shutters are used largely for ornamental purposes or for excluding the sun's rays in hot weather.

Fig. 1—Shutter turnbuckle (or dog).

Fig. 5—Shutter hinge.

Fig. 6—Shutter hinge for recessed windows.

The problem of shutter hardware, however, is one that continues to demand the attention of builders' hardware men. Occasionally shutters are screwed directly to the walls so that they can never be closed. Such shutters are used only for ornamental purposes. In such cases it is often customary to use shutter turnbuckles (or dogs) such as are shown in Fig. 1—primarily for the purpose of ornament. Most architects, however, detail them to operate. This being

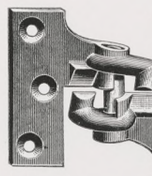


Fig. 2—Lull & Porter shutter hinge and catch.

Fig. 3—Offset shutter hinge strap.

Fig. 4—Straight shutter hinge strap.

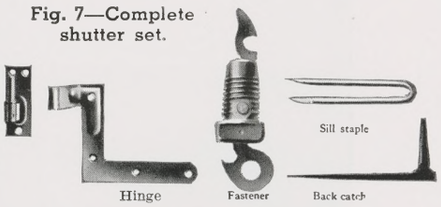


Fig. 7—Complete shutter set.

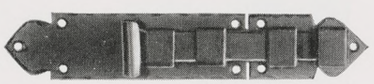


Fig. 8—Shutter bolt.

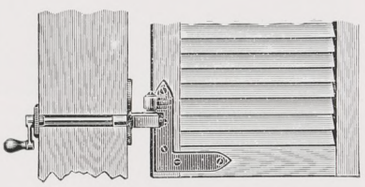


Fig. 9—Shutter worker.

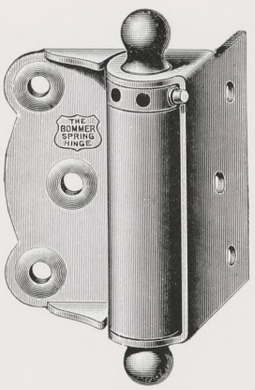


Fig. 10—Half surface screen hinge.

the case, we will first consider hanging them so that they will open and close.

The problem of hinging on frame houses when the frame and the shutter are flush is comparatively simple. In our elementary course we showed the old-fashioned Lull & Porter shutter hinge

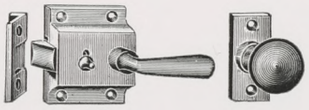


Fig. 11—Rim screen door set.

which is used for such a condition.

Lull & Porter shutter hinges—a cast iron hinge embodying a hold-back feature—have been used for a great many years. They are available not only for flush frame and shutter but for shutters that do not come flush with the frame but are recessed.

In knowing what type to use

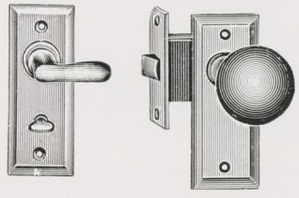


Fig. 12—Mortise screen door set.

you must first know the amount of recess from the shutter to the outside of the frame or, in case of brick, stone or stucco houses, to the outside of the wall of the house so that the shutters when open will lay flat against the wall. Here, your training gained from a previous chapter of the Intermediate Course will stand you in good stead. Incidentally, you must also know the thickness of the shutter.

Never have the shutters stand off away from the wall any more than is necessary. Fig. 2 shows a Lull & Porter shutter hinge made in several widths from 3 in. open to 6 in. open. Use the closest width that will permit the shutter to lay close against the outside wall of the house. All Lull & Porter shutter hinges come complete in sets with little cast iron catches to hook the shutters closed at the sill.

Often on colonial homes the shutters will be decorated with shutter hinge straps (see Fig. 3, an offset strap, or Fig. 4, a straight strap).

To go into all the types of shutter hinges manufactured would result in too long an article. Fig. 5 shows a hinge used a great deal, often with screw pintles or, in the case of a brick wall, with drive pintles.

Hinges of the type shown in Fig. 6 are used when shutters are recessed considerably and it is desired to throw the edge of the shutter back away from the window frame. The amount of offset can be lengthened for especially wide window frames. In ordering

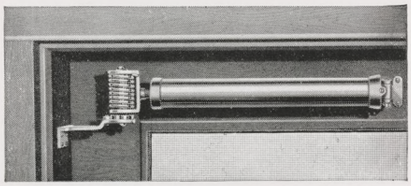


Fig. 13—Air screen door closer.

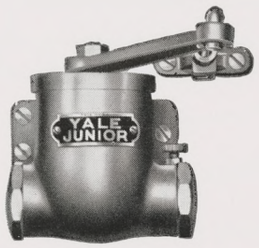


Fig. 14—Liquid screen door closer.

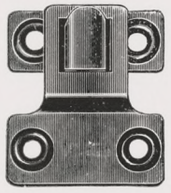


Fig. 15—Screen hanger.

hinges of this type it is always well to send the factory a full size detail showing exactly what recess and offset are required so that the window opening may be entirely cleared.

The Stanley Works, for example, make a number of shutter sets (they call them blind sets) with hinges, sill catches and back catches complete for wood and brick construction as shown in Fig. 7.

In addition to the types of catches previously shown, shutter bolts such as are shown in Fig. 8, are sometimes used. They are decorative and fasten the shutters closed rigidly.

Shutter dogs such as are shown

Fig. 16—Screen hanger.

Fig. 17—Screen fastener.

in Fig. 1, or of similar type, are used to hold the shutters open so that they will not blow shut. They are made in many patterns. Many manufacturers make them with a spring back to keep the shutters from rattling in the wind.

All the types described require the opening of the window and reaching out to close the shutters. Fig. 9 illustrates a shutter worker which is in itself a complete unit —hinge, holder and lock—which permits opening and closing the shutters from the room without opening the window at all. In ordering this type of hardware it is doubly important that proper details be furnished the factory which must furnish the shutter worker to suit the conditions shown by the details.

Next comes screen hardware. Although there is an increasing tendency for this hardware to be furnished with the screens themselves, we should give it some thought in our present course.

First, there are the screen doors. Regular butt hinges or spring hinges, such as we see in Fig. 10, either full surface, half surface or mortise, are generally used. These spring hinges are made all the way from the cheapest cast iron and wrought steel to hinges of brass and bronze metal. Screen doors usually open out and it will pay to use brass or bronze metal hardware.

Where lock sets are required either rim sets, Fig. 11, or mortise sets, Fig. 12, are quite commonly used. There are a number of other types of screen door sets as most of you know.

There are many types of screen door closers manufactured for screen doors hung on butt hinges. Fig. 13 is an air closer and Fig. 14 a liquid screen door closer. Profitable "plus" business can be secured by selling a screen door closer with the rest of the screen door hardware. Do not overlook screen door braces or screen door guards. This is all "plus" business that you want.

There are several types of hangers for the window screens that are quite popular, such as are shown in Fig. 15 and Fig. 16. They are often fastened shut with screen fasteners similar to Fig. 17 but the common hook and eye is used more frequently. If your customer uses hooks and eyes at least sell him brass ones.

The subject of storm sash hardware is closely identified with shutter and screen hardware. For storm or combination (screen and storm) doors use the same hardware suggested for screen doors, although on the storm sash you may want to use heavier hangers, such as are shown in Fig. 18. With these you will, of course, want to sell fasteners (Fig. 19) which will take care of holding the windows open for ventilation on warmer days and will also lock them shut.

As I have been impressed with the limitations of such a course as I am writing, so am I particularly impressed with the limitations of space on such an important chapter as this one.

All that I can hope to do is to outline your course of study. Take this subject of shutters, screen and storm sash hardware only as an outline. Then get your manufacturers' catalogs and find out all the other items they make for these uses.

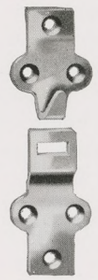


Fig. 18—Storm sash hanger.

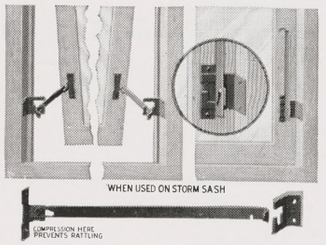


Fig. 19—Storm sash adjuster.

Chapter 30—*Intermediate Course*

MISCELLANEOUS ITEMS

WE are now approaching the end of our discussion of finish hardware for the finer home. Before closing the subject, however, there are several items frequently overlooked by a builders' hardware man, which

Fig. 1—Sliding clothes carrier.

add to the sales volume and which should be considered in our study.

Many accessories are used on closet doors in bedrooms or for dressing room wardrobes. For instance, there is the clothing carrier, shown in Fig. 1, which serves to bring the clothes on their hangers right out into the room. These carriers are made in several lengths and weights and they add dollars to your sales. Then too you may sell shoe racks such as are shown in Fig. 2. Talk to your customers about the advantage of keeping their shoes on these racks. It is better for the shoes and improves the appearance of the closet. The necktie rack (Fig. 3) is another gadget worth selling. Hat hooks, trouser hangers and garment hangers are other items which are saleable to almost any home owner.

Door holders, shown in Figs. 4 and 5, are used for keeping doors open. They are particularly useful where drafts are encountered and it should be an easy matter for you to sell them.

Door closers have not been discussed and I plan to devote an entire chapter to this subject in our advanced course. Enough to say here that door closers are used frequently in the better residences. On your next good job, check with this list and see if you cannot increase your sales of these items. Here are some of the places in which they can be used. Lavatory doors, particularly those off

Fig. 2—Shoe racks.

Fig. 3—Necktie rack.

main halls; doors leading from main and service parts of house; exterior doors; storm doors and screen doors; doors leading to the garage; doors from the basement; closet doors, particularly in the main hall; study, office or den doors. Door closers, in fact, may be used on any door the owner may want to close quietly and keep closed. Follow your manufacturers' schedule as to the size of closer required for various sized doors. Interior doors, of course, can have lighter closers than exterior doors.

Chain door fasteners were mentioned in the elementary series. Don't overlook them. Door knockers were also mentioned and then there is the guest room knocker to be applied on bedroom doors. Manufacturers have brought out some decidedly interesting guest room knockers. They run into considerable money and there is no time quite so good to sell all these accessories as when the owner is moving into the new home.

Garage doors should also be considered and the overhead doors have already been discussed. Unless you organize your department to handle and, in many cases erect, install and service this overhead door business you are going to lose out on selling garage door hardware.

It is not easy to handle this business. It isn't like sending out some straight, sliding-door track hangers and a few brackets and letting the contractor put them up. Usually, the hardware dealer has a friendly contractor who does the installing for him. In ordering this merchandise it is very, very important that the manufacturer has all the necessary information as to the size of opening, weight of doors, etc. Understand, I do

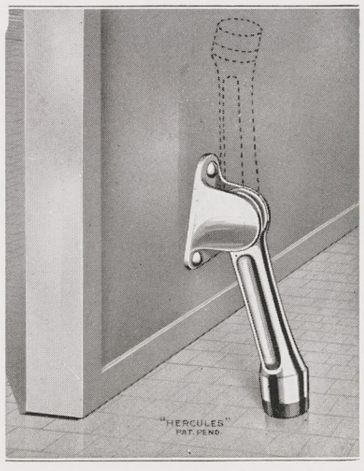
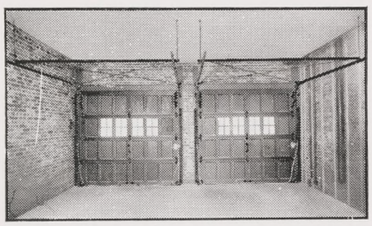


Fig. 4—Door holder, gravity type.

not suggest your passing this business up, but I do most strongly recommend that in going into it you do it in the right way. Fig. 6 shows a typical overhead door installation.

Of course, all garage openings are not of the overhead type. The sliding hinge door type is still



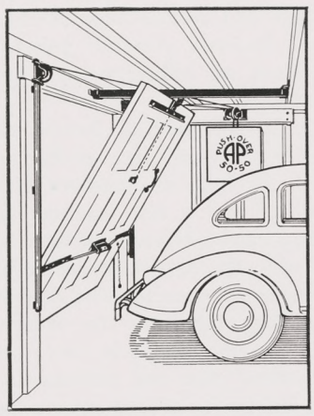


Fig. 6—Overhead doors and hardware. Exterior view above, interior center, diagram below.

used quite extensively. Fig. 7 illustrates a five-door set of this type. These sets can be secured for openings of from three to ten doors. They are made in many weights and sizes of track hangers and hardware. Consult your manufacturer's catalog for detailed information regarding them. Also remember to specify width and height of opening, amount of room overhead for the track and

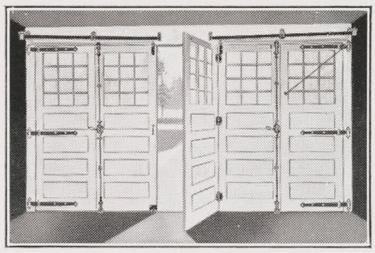


Fig. 7—Sliding folding garage door set.

brackets, whether the doors open in or out, etc. You cannot give your factory too much information in this respect. And here's another little tip. Most manufacturers price their sets complete except for the lock, so do not forget to add the cost of the lock in your quotation.

Fig. 8 shows parallel doors for garages. One door slides past the other and a double line of track is required.

Then there are several types of round-the-corner sets, such as are shown in Fig. 9. This particular illustration is of a three-door set. Sometimes there are single large doors which slide around the curved track and lay against the side wall.

Hinged door sets, as shown in the elementary series consisting of just a pair of doors on hinges, are the cheapest and are consequently the most frequently used. As pointed out in that study "plus" business on these various types of openings depends upon

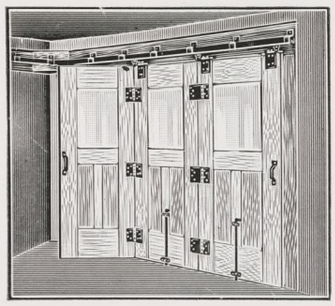


Fig. 9—Round the corner doors.

your selling the owner heavier hinges, bolts and fasteners, selling overhead door holders and better locks.

Sliding doors for residence work are not as popular as they

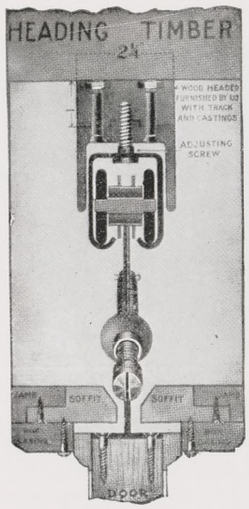
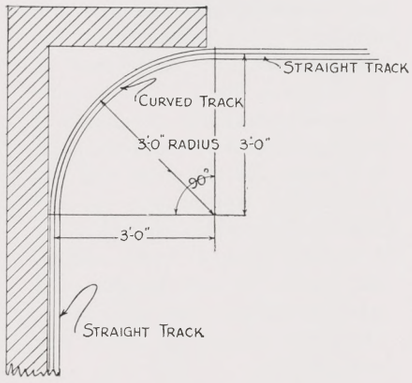


Fig. 10—Hanger and track for sliding doors.

were. Occasionally, however, they are called for both for single and pairs of doors. Fig. 10 illustrates this type of hanger and



track. In ordering the widths of the openings it must always be specified whether they are single or in pairs.

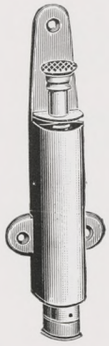


Fig. 5—Door holders, spring type.

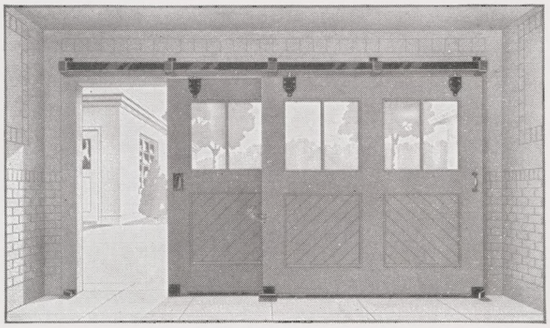


Fig. 8—Parallel sliding doors.

Chapter 31—*Intermediate Course*

BARN HARDWARE

THIS chapter is devoted to barn hardware, and the first items that come up for discussion are barn door hangers and track.

Let us start this study with the flat track type as shown in Fig. 1.

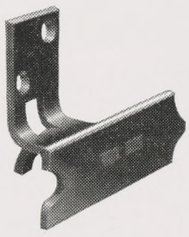


Fig. 1—Flat track with brackets attached.

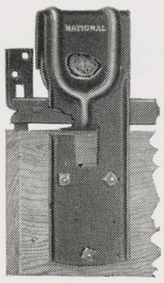


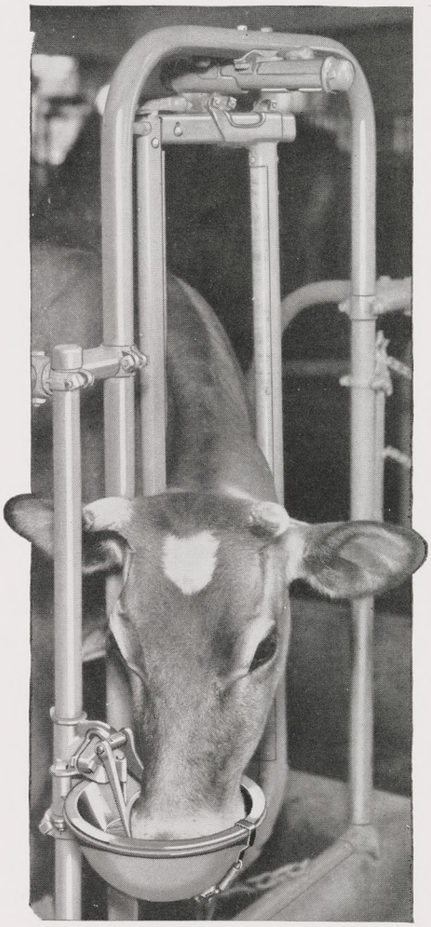
Fig. 2—Barn door hanger for use with flat track.

It comes with brackets attached as illustrated and is used with hangers as shown in Fig. 2. This type is both widely used and inexpensive and no complicated figuring is required in selling it.

Here is something worthwhile remembering. If your opening is 8 ft. wide, you must never forget that it takes twice that amount of track for an 8 ft. opening.

There are a number of other types of flat track and hangers. Some of these are made with a covering to keep out the wind and rain. Fig. 2A, for example, shows a covered track. You will readily understand, however, that by the time you reach the end of this chapter, that it is simply impossible to describe each and every type of barn door hanger manufactured. As a matter of fact, that is equally true with respect to all of the various types of hangers we will describe in this chapter. This being the case, I would accordingly suggest that you study your manufacturer's catalog carefully and consider this chapter only as a general guide.

Next, we turn to enclosed track where the hangers run inside of the track. Generally speaking, this type of hanger is used with track similar in shape to Fig. 3 which, I believe, was first manufactured by Coburn Trolley Track Mfg. Co., Fig. 4 which, as I recall, was first made by Richards Wilcox Mfg. Co., or Fig. 4-A, which I believe



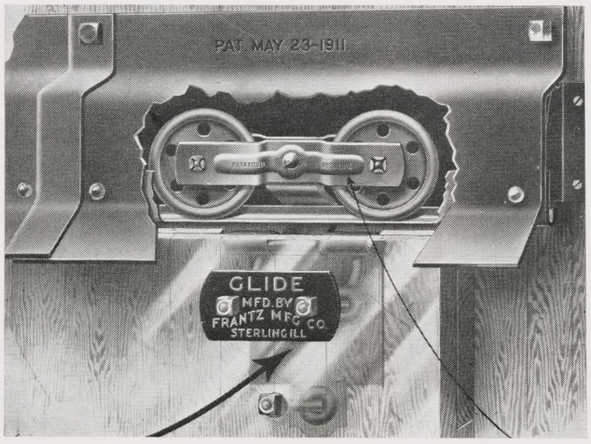


Fig. 2A — Example of a covered track. Arrows indicate the hanger attached to inside of door and reinforcement of the hanger.

was first manufactured by Hunt, Helm, Ferris, & Co., Inc., now Starline, Inc.

Bear in mind that Figs. 3, 4 and 4-A are illustrations of type only. The manufacturers mentioned, as well as many other manufacturers, make one or all of these types in many sizes to suit the weight of the door to be hung. There is also a covered track that protects the top of the door, see Fig. 4B. This

Fig. 3—Coburn type track.

type requires no brackets, as the cover forms a continuous bracket along the entire length of each section of the track.

Naturally, the first and most important thing to consider in equipping the door is its size and weight. Then refer to your manufacturer's catalog for the recommended size track for the size and weight of door you have to equip. Always remember that you will require twice as much track as the width of the door opening. The track is made in different lengths and try to use as few lengths as possible. For example, on an 8 ft. opening, I would rather send two 8-ft. lengths of track to the job than four 4-ft. lengths.

Now having figured the correct amount of track, we have to fasten that track up and in order to do this we will need brackets. Brackets for this type of track should be spaced 24 in. on centers. Fig. 5 shows an end side wall bracket and Fig. 6 a center bracket, the only difference being the end piece in the bracket used at the end. Remember to figure the right size bracket for the track size recommended.

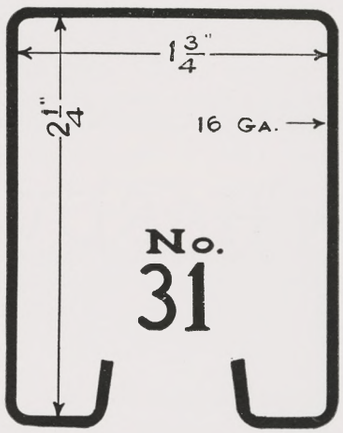


Fig. 4—Lock joint type track.

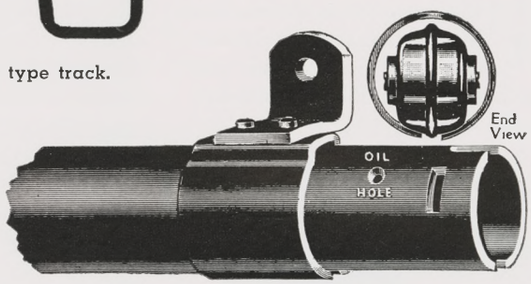


Fig. 4A—Round type track.

Our bracket problem, however, does not end here, for the proper screw or bolt must be furnished for the bracket. Where the bracket is attached to wood, you should use the regular lag screw, but if it is attached to brick you will need an expansion shield for the lag screw or a machine bolt with a washer to go clear through the wall. If it is fastened to a hollow tile construction you will need a toggle bolt.

We have not yet completed our study of the subject of brackets. Perhaps because of headroom, that is the amount of available space about the door, you cannot use a regular side wall bracket. You may have to use an overhead bracket such as is shown in Fig. 7, or if the doors are parallel doors they will require a bracket similar to Fig. 8. Fig. 8A shows a lock joint bracket; Fig. 8B a round type track hanger and bracket and Fig. 8C a flexible and rigid type hanger for use with a flat track. Study the bracket problem in your manufacturer's catalog with extreme care.

Now with your track up on proper brackets and fastened to the wall, the next problem is that of furnishing the proper hangers for the doors to run in the size track used. Do you notice how each step dovetails into the next step?

There are many sizes and types of track and hangers and there are also many styles of hangers,

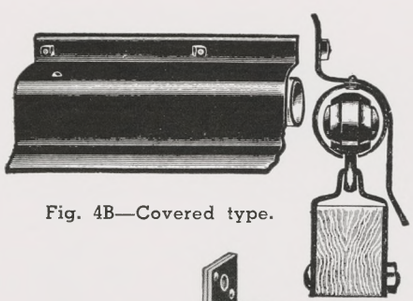


Fig. 4B—Covered type.

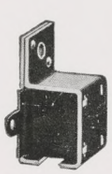


Fig. 5—Side wall end bracket.

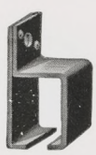


Fig. 6—Side wall center bracket.

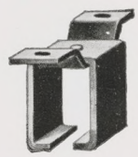


Fig. 7—Overhead bracket.

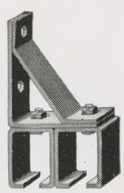


Fig. 8—Parallel side wall bracket.

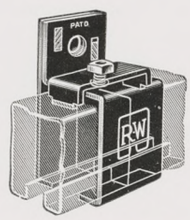


Fig. 8A — Lock joint bracket.

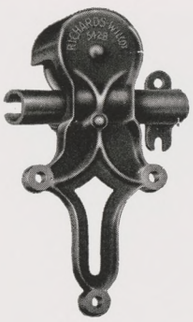


Fig. 8B—Round type track, hanger and bracket.

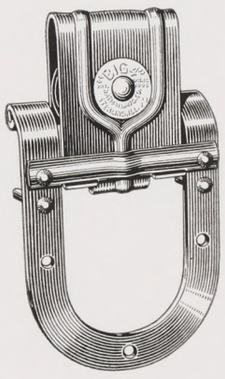


Fig. 8C — Flexible and rigid type of hanger for use with flat track.

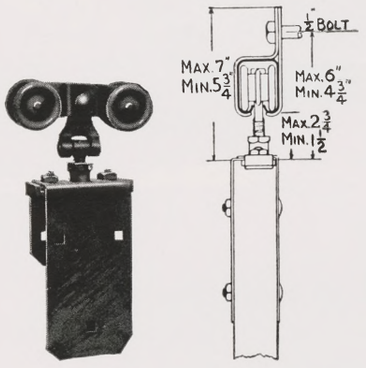


Fig. 9—Roller bearing barn door hanger.

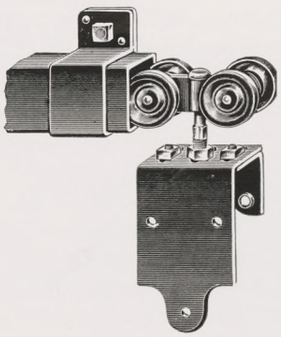


Fig. 10—Ball bearing door hanger.

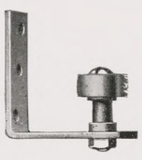


Fig. 11—Roller guide for attaching to wall.

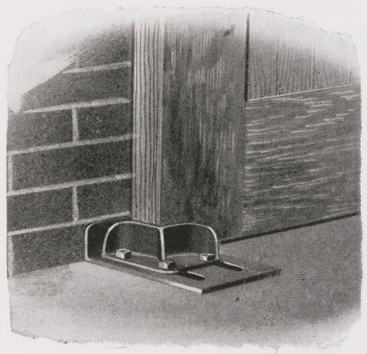


Fig. 12—Adjustable end guide and stop.

but when you selected the track you did one very definite thing. You established the size of hanger you must use because it must fit into that track.

I am not going to attempt to describe the sizes, but I do want you to keep in mind two types of bearings for those hangers. Fig. 9 shows a popular-priced roller bearing hanger. Fig. 10 shows a popular-priced ball bearing hanger, but you cannot tell the bearing by the illustration. You must refer to your manufacturer's catalog. Fig. 10A is a ball-bearing swivel hanger with roller bearing wheels.

Now your doors are sliding by means of the hangers in the track, but your job is not yet completed. To keep the doors in place you must use one of the many guides manufactured. Fig. 11 shows

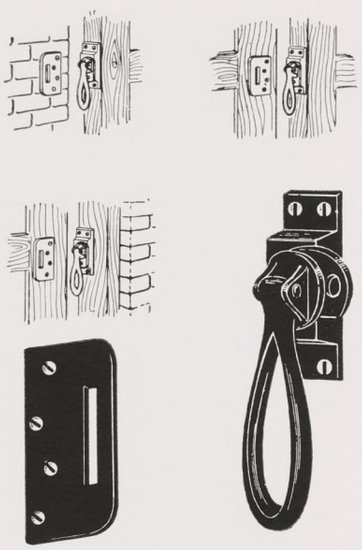


Fig. 13—Drawtite bolt can be locked with padlock. Various applications are shown.

what I mean. There are many types and styles which suit almost every need. An end stop like Fig. 12, pulls for the doors and many other accessories such as bolting, padlocking with padlock eyes or hasps, or a sliding door bolt such as is shown in Fig. 13.

I have briefly outlined the sort of practice to follow in furnishing sliding barn door hardware, always bearing in mind the size and weight of the doors, how they slide, whether they are single or in pairs and whether they are parallel or triple sliding.

There are many other things in

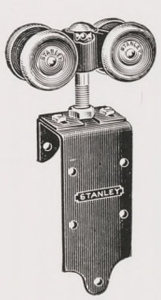


Fig. 10A—Heavy, straight, sliding door hanger.

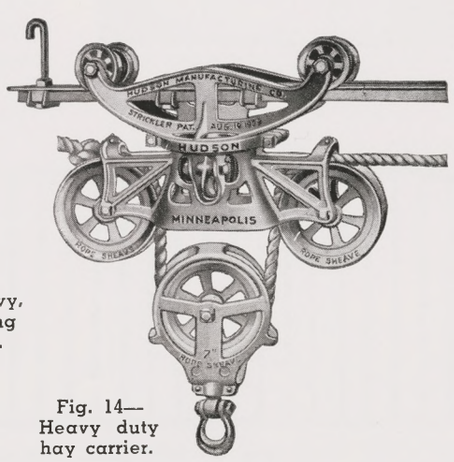


Fig. 14—Heavy duty hay carrier.

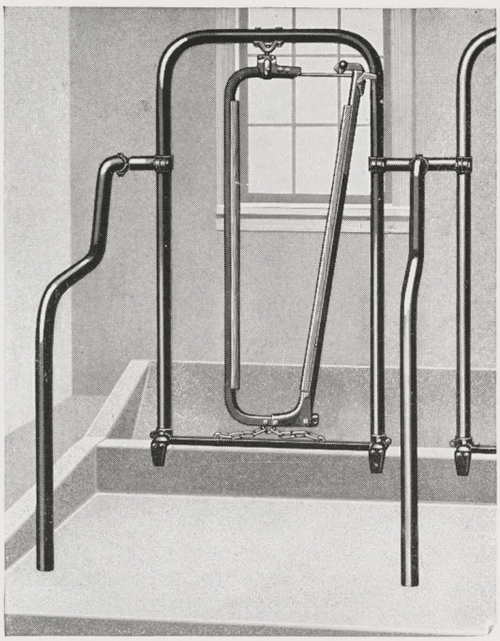


Fig. 15—
Cow stall.

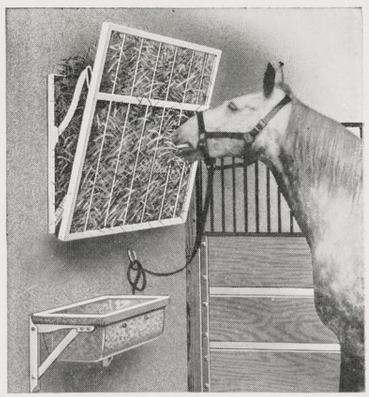


Fig. 18—Steel hayrack.

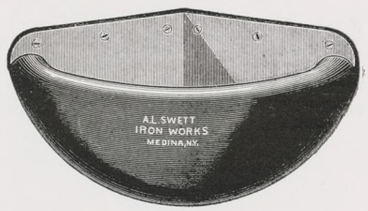


Fig. 19—Roll rim manger.

a barn that require hardware besides the doors, and, if you are on your toes, you will be able to sell many of them. I will briefly suggest a few without going into any great amount of detail.

Many barns are equipped with hay carriers such as are illustrated in Fig. 14. With the carrier will be track and rope and hay forks. The cow barn will need cow stalls such as Fig. 15, and litter carriers similar to Fig. 16. Horse barn requirements include stall guards (Fig. 17) or hay racks (Fig. 18).

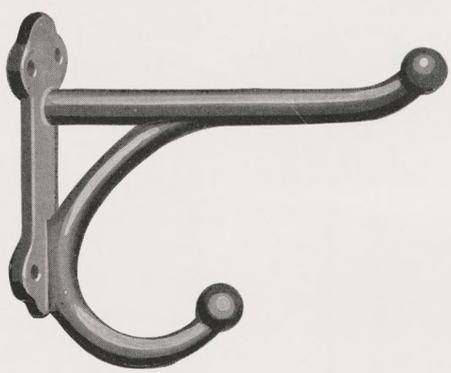


Fig. 20—Extra heavy harness hook.

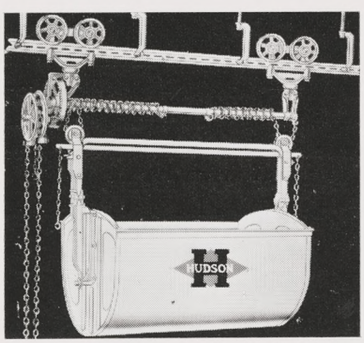


Fig. 16—Litter carrier, chain hoist type.

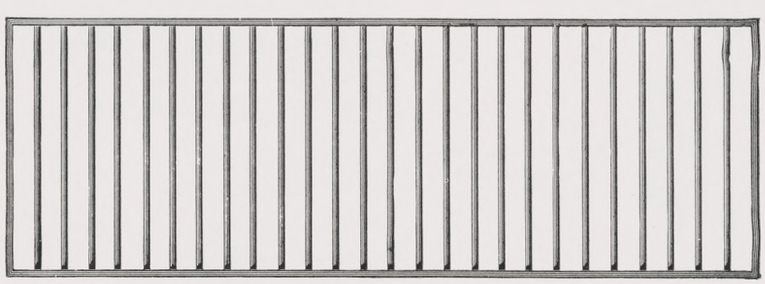


Fig. 17—Stall guard, box stall pattern.

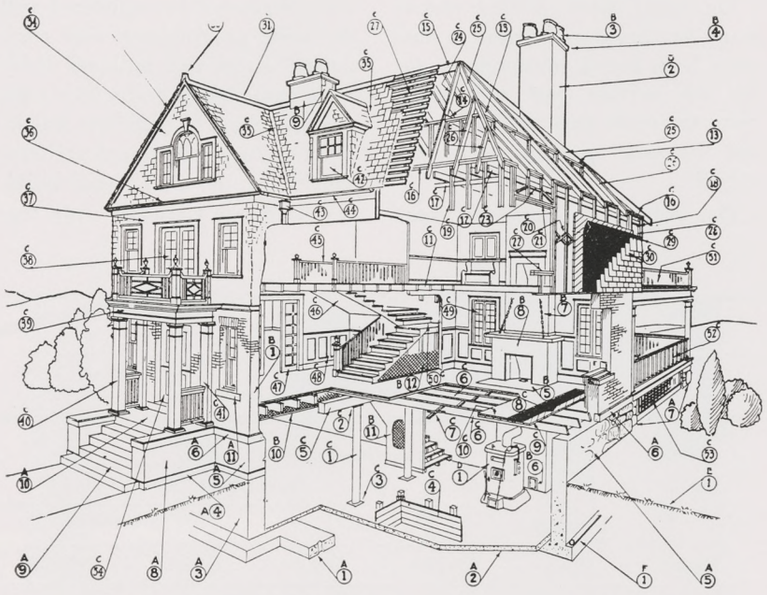
Feed boxes, called mangers (Fig. 19) are needed in each stall. And, of course, every builders' hardware man will remember the harness hooks that are illustrated in Fig. 20.

Cesspools, blanket rails, tie rings, saddle brackets, drinking fountains, stable gutters and box stall doors, are among the many "plus" items you should sell. Where chickens are raised, the field broadens for then you should consider all kinds of poultry equipment.

From the foregoing suggestions, I am confident you now realize that this subject of barn hardware is an important one.

Chapter 32—*Intermediate Course*

SUMMARY



Commonly Used Terms in Residence Construction

Stone Mason's Work

A

1—Footings
2—Cellar Floor
3—Foundation Wall
4—Ground Course
5—Underpinning
6—Water Table
7—Piers
8—Buttress
9—Steps
10—Platform
11—Outside Sill

Brick Work and Plastering

B

1—First Story Wall
2—Chimney
3—Chimney Pots
4—Chimney Cap
5—Hearth
6—Cleanout Door
8—Fireplace
9—Chimney Flashings
10—Metal Lath and Plaster Ceiling
11—Metal Lath and Plaster Partition
12—Metal Lath

Carpenter Work

C

1—Iron Columns
2—Column Cap
3—Column Base
4—Coal Bin
5—Girder
6—First Floor Beams
7—Double Row Herring Bone Cross Bridging
8—Flooring Paper
9—Under (or Rough) Floor
10—Top (or Finish) Floor
11—Second Floor Beams
12—Ceiling Beams (or Attic Floor Beams)
13—Purlin
14—Collar Beams
15—Ridge Rafter
16—Plate
17—Ledger Board
18—Corner Post
19—Studding
20—Bridging
21—Rough Head
22—Rough Sill
23—Truss over opening
24—Rafter
25—Hip Rafter
26—Jack Rafters
27—Shingle Lath
28—Diagonal Sheathing
29—Sheathing Paper
30—Shingle
31—Ridge Board
32—Finial
33—Rake Cornice
34—Gable End
35—Valley
36—Eaves Cornice
37—Second Story Wall
38—French Window
39—Porch Cornice
40—Porch Column
41—Pilaster
42—Dormer Window
43—Leader Head and Leader (or Downspout)
44—Gutter
45—Balustrade
46—Stair Soffit
47—Sliding Doors
48—Wainscoting
49—Casement Window
50—Platform
51—Deck Roof (Balcony)
52—Veranda Balustrade
53—Lattice
54—Dutch Door

D1—Boiler

E1—Grade

F1—Drain

WE now come to the closing chapter of our Intermediate Course in which it has only been possible, in many cases, to point the way for further study on your part. As I review the chapters that have been published from the opening installment on base metals to this one which summarizes the subject, I deeply appreciate the need of further study on your part.

As a student of residential hardware you have been given an outline which, I trust, is sufficiently broad to permit your handling almost any type of residence. It should have done more than that, however. The base metals, the finishes, the butts and locks described in this course as well as the lock trim, schools of design, cupboard and window hardware are often used on other types of buildings which we shall consider in our Advanced Course.

The suggestions of our Elementary Course regarding stock control, scheduling hardware, soliciting architects and getting the other business that goes with the finish hardware is just as important for the better residence as it was for the modest one, but it scarcely seems necessary to repeat it here.

Now that you have learned the base metals used in builders' hardware (Chapter 13); hardware finishes (Chapter 14); butts and hinges (Chapters 15 and 16);

locks (Chapters 17 and 18); lock trim (Chapter 19); lock sets (Chapter 20); schools of design (Chapters 21 and 22); tubular and cylindrical locks (Chapters 23 and 24); cupboard and cabinet hardware (Chapters 25 and 26), and window hardware, both rough and finish (Chapters 27 and 28); miscellaneous other rough and finish hardware items commonly used in residences (Chapters 29 and 30); barn hardware (Chapter 31), it is the hope of the author that from the study of the Intermediate Course you are in a position to select the additional stock you require.

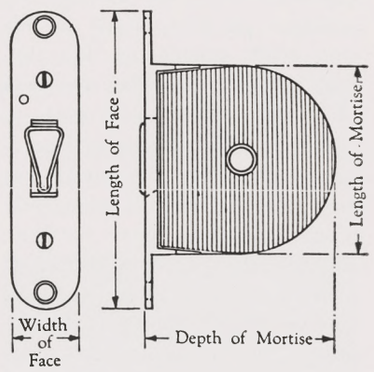
Adding to the model stock suggested at the very start of the Elementary Course, this selection is merely a matter of adding items to that same system as your experience shows these items are needed. The same system of stock records, stock control, method of keeping stock on shelves can be followed as outlined in our earlier study. The size of stock does not change the method nor does the size of the residence change the method of treating the selling, listing or servicing of the building.

On these finer homes where many finishes may be used it has often been found advantageous to list the service part separately from the main part of the house, but the same principles are involved.

Our Advanced Course (I liken it to a college course) will bring you a further and most intricate study outline on the subject of builders' hardware.

The National Contract Hardware Association, to which I referred in the introduction of the Elementary Course, have rightly as their objective "Better trained builders' hardware men" who can really be entitled to the title "Builders' Hardware Engineers."

Why shouldn't builders' hardware engineers be registered just the same as architects and engineers? Every real builders' hardware man should be for this idea. Any building of sufficient importance to use a registered architect should require a registered builders' hardware engineer. Any reg-



DIMENSIONS OF SASH BALANCES

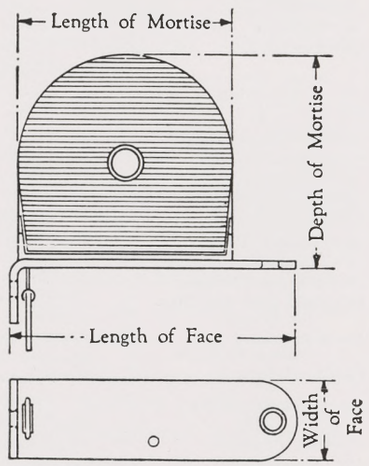
Side Balance

Group	For Sash Weighing (lbs.)	Dimensions			
		Face		Mortise	
		Length	Width	Length	Width
R A	4 to 16	4½ in.	1 in.	2½ in.	2½ in.
R B	4 to 32	5½ in.	1¼ in.	3 9/16 in.	3 9/16 in.
R C	23 to 56	6¾ in.	1 7/16 in.	4 11/16 in.	4 11/16 in.
R D	50 to 100	8¾ in.	1¾ in.	5⅞ in.	5⅞ in.

Top Balance

Group	For Sash Weighing (lbs.)	Dimensions			
		Face		Mortise	
		Length	Width	Length	Width
R A	4 to 16	3¼ in.	1 in.	2½ in.	2½ in.
R B	4 to 32	4 7/16 in.	1¼ in.	3 9/16 in.	3 9/16 in.
R C	23 to 56	5⅞ in.	1 7/16 in.	4 11/16 in.	4 11/16 in.
R D	50 to 100	7⅜ in.	1¾ in.	5⅞ in.	5⅞ in.

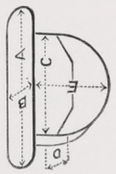
(Courtesy Rochester Sash Balance Co., Inc.)



Dimensions of Sash Balances

Side Type—Adjustable

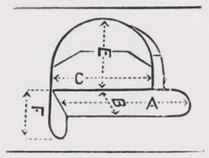
Unit A-A	Unit L-A	Unit M-A
A.....6 in.	A.....7 7/16 in.	A.....8 3/4 in.
B.....1 in.	B.....1 3/8 in.	B.....1 3/4 in.
C.....3 5/8 in.	C.....4 15/16 in.	C.....5 5/16 in.
E.....3 3/4 in.	E.....4 13/16 in.	E.....5 11/16 in.

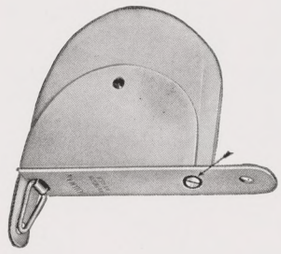


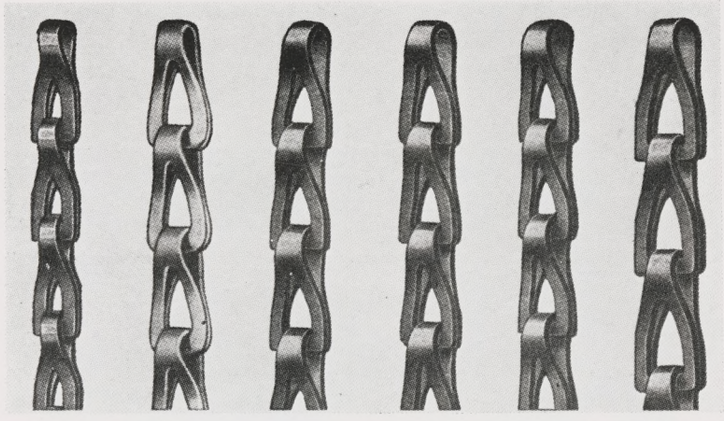
Overhead Type—Adjustable

Unit A-A	Unit L-A	Unit M-A
A.....4 13/16 in.	A.....6 1/16 in.	A.....7 3/8 in.
B.....1 in.	B.....1 3/8 in.	B.....1 3/4 in.
C.....3 5/8 in.	C.....4 5/16 in.	C.....5 5/16 in.
E.....3 3/4 in.	E.....4 13/16 in.	E.....5 11/16 in.
F.....1 3/16 in.	F.....1 1/4 in.	F.....1 1/2 in.

(Courtesy Pullman Mfg. Corp.)







No. 25 No. 30 No. 35 No. 40 No. 45 No. 50

Sash Chain

Hot Galvanized and Copper Plated

New No.	Old No.	Metal Gages	Tensile Strength Steel	Tensile Strength Bronze	For Single Sash Weighing Not Over	Weight per 500 ft. Reel
25	60	.042	425 lbs.	375 lbs.	50 lbs.	25 lbs.
30	0	.028	375 lbs.	350 lbs.	60 lbs.	24 lbs.
35	80	.035	500 lbs.	425 lbs.	100 lbs.	30 lbs.
40	100	.042	600 lbs.	550 lbs.	150 lbs.	35 lbs.
45	130	.050	750 lbs.	675 lbs.	175 lbs.	46 lbs.
50	250	.060	900 lbs.	800 lbs.	200 lbs.	57 lbs.
60	AA	.062	925 lbs.	900 lbs.	.....	74 lbs.
65	XXXX	.072	1200 lbs.	1275 lbs.	.....	96 lbs.

Nos. 60 and 65 are not illustrated. *(Courtesy American Chain Co.)*

istered builders' hardware engineer working with the registered architect would be adequately paid, which has not been true in the past. He would be responsible for the work he specified as is the heating and plumbing engineer. Here is an objective that the National Contract Hardware Association can well incorporate as an important objective for the good of the industry.

So, as you proceed into the Advanced Course and master it, you can well feel you are obtaining the knowledge you require to make you a worthy builders' hardware engineer.

The Advanced Course will not attempt to rehash the subjects previously covered, but will rather complete the outline you have already learned.

We will take up in proper order the sort of study you need to complete your objective. Hardware for metal doors of various kinds, which require different sort of treatments from the wood door hardware, we have studied in the past. Other types of butts, hinges, locks, cupboard hardware, window hardware, fire exit bolts, door closers, concealed and

REGULAR ROUND CAST IRON SASH WEIGHTS

Approximate Sizes:

Weight lbs.	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10
Diam. ins..	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½
Length ins.	7	8	9	10½	11½	12½	14	15	16	17	18	19	20½	21½	22¾

Weight lbs.	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Diam. ins..	1¾	1¾	1¾	1¾	1¾	2	2	2	2	2	2	2	2	2	2
Length ins.	18	20	21½	23	25	20½	22	23	24½	26	27	28	29½	30	32

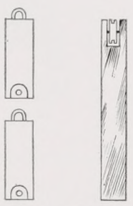
SASH WEIGHT WASHERS

Cast iron	2 sizes
½ lb.	1⅝ in. diam.
1 lb.	1⅞ in. diam.

With hole in center for cord or chain to pass through allowing washer to rest on top of weight.

Extreme left: Special iron and lead sash weights.

Right: Regular round cast iron sash weight.



Right: Sectional and compound sash weights.

SPECIAL CAST IRON WEIGHTS:—Can be furnished in any weight and size. When ordering state weight and size. As "20 lb. 2 by 2 in."—"30 lb. 2 by 2¼ in."—"100 lb. 4 by 4 in.", etc.

LEAD WEIGHTS:—Can be furnished in sizes as above. Note that lead weights cost four to five times the price of iron weights.

SECTIONAL CAST IRON WEIGHTS:—Sections weigh 5, 6, 7, 8, 9 and 10 lbs. each. Stock size is 2 by 2 in. Can be furnished in any size not less than 1¾ by 2 in.

COMPOUND WEIGHTS:—For use where sash are same size and mullion box too small for two ordinary weights. Each compound weight must be the same weight as one sash. Pulley cast in end. When ordering state weight of sash, size of weights, weight in lbs. and whether for chain or cord.

surface, floor hinges and lavatory hardware will be outlined to you. Then we will take up the special types of hardware used on various types of buildings such as churches, schools, hotels, hospitals, office buildings, institutional buildings and the like.

So let's tackle this advanced course realizing that we have come to that portion of our work that is not elementary or intermediate, but is really an advanced study of our subject.

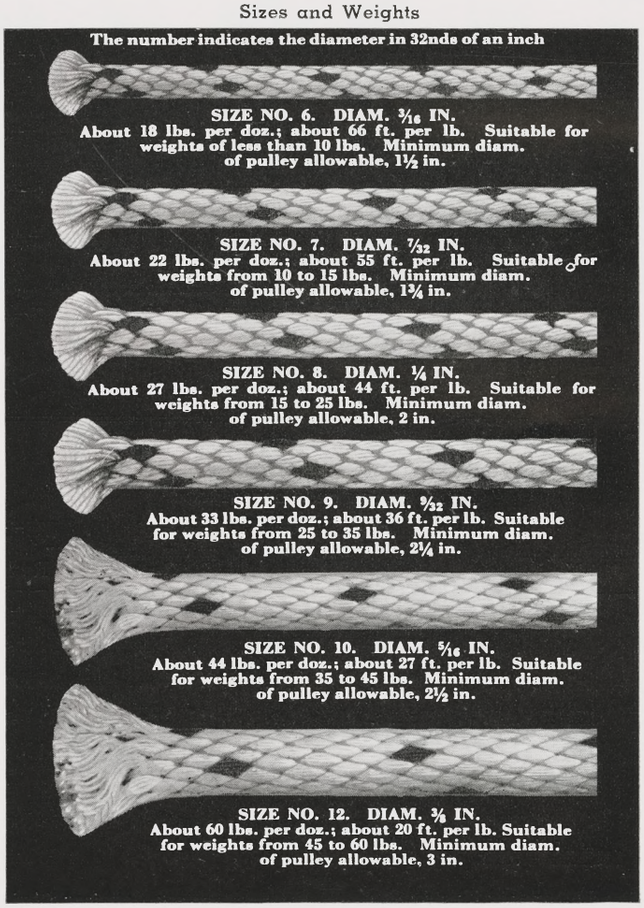
In our next chapter then you will become advanced students, your grade school and high school course completed. You are ready to enter the college course equipped to carry on.

It might be well to read over the previous chapters in review. They will all help you in this final course of study.

At the close of the Advanced Course you will find a glossary of builders' hardware terms. Continuing this idea, I have prepared these tables of weights and measures and other concise information which may be of value to you from time to time. Do not overlook

SASH CORD

Sizes and Weights



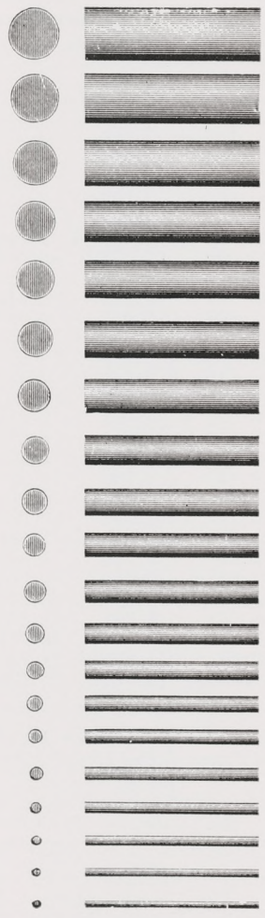
Cut Courtesy of Samson Cordage Co., Boston, Mass.

this material! It will, I am sure, come in mighty handy.

The National Contract Hardware Association adopted as their slogan the following extremely important and worth while objective:

"Two per cent of the cost of the building should, as a rule, be allowed for finishing hardware."

Steel Wire Gage



Gage	Decimals of an Inch	Feet to Pound
1	.2830	4.681
2	.2625	5.441
3	.2437	6.313
4	.2253	7.386
5	.2070	8.750
6	.1920	10.17
7	.1770	11.97
8	.1620	14.29
9	.1483	17.05
10	.1350	20.57
11	.1205	25.82
12	.1055	33.69
13	.0915	44.78
14	.0800	58.88
15	.0720	72.32
16	.0625	95.98
17	.0540	128.6
18	.0475	166.2
19	.0410	223.0
20	.0348	309.6

Common Wire Nails and Spikes

In 100 lb. kegs

Size	Length Inches	Gage	Approx. Number in 1 lb.
2d.	1	15	876
3d.	1¼	14	568
4d.	1½	12½	316
5d.	1¾	12½	271
6d.	2	11½	181
7d.	2¼	11½	161
8d.	2½	10¼	106
9d.	2¾	10¼	96
10d.	3	9	69
16d.	3½	8	49
20d.	4	6	31
30d.	4½	5	24
40d.	5	4	18
50d.	5½	3	14
60d.	6	2	11
Spikes	7	5/16 in.	7
Spikes	8	3/8 in.	4
Spikes	9	3/8 in.	3½
Spikes	10	3/8 in.	3

Wire Finishing Nails

Size	Length Inches	Gage	Approx. Number in 1 lb.
2d.	1	16½	1351
3d.	1¼	15½	807
4d.	1½	15	584
5d.	1¾	15	500
6d.	2	13	309
7d.	2¼	13	238
8d.	2½	12½	189
9d.	2¾	12½	172
10d.	3	11½	121
16d.	3½	11	90
20d.	4	10	62

Table for Estimating (per square foot) the Weights of Garage Doors

Kind of Wood	*Thickness of Doors* 1¾ in.	2 in.	2¼ in.	2½ in.	2¾ in.	3 in.
	Weight (lbs.) Per Square Foot					
White Pine	3	3¼	3½	3¾	4	4¼
Yellow Pine	3¾	4¼	4½	4⅞	5¼	5⅝
Cypress	3⅜	3¾	4	4⅜	4⅝	5
Spruce	3	3¼	3½	3¾	4	4¼
Fir	3⅝	4⅛	4⅜	4¾	5⅛	5½

The above weights are based on panel doors with glass in the upper part and measuring 4 by 8 feet. Narrower doors will run slightly heavier per square foot.

Materials per Square Cubic Foot

Approximate Weights in Pounds

Aluminum	162
Brass, cast	504
Brass, rolled	524
Copper, cast	542
Copper, rolled	548
Iron, cast	450
Iron, wrought	485
Steel	490
Lead	711
Zinc	437
Anthracite, loose	54
Coal, bituminous, solid	84
Coal, bituminous, broken	49
Coke, loose	26.3
Brick, common, hard	125
Brick, fire	120
Cement, natural	60–75
Cement, Portland, loose	100
Concrete, average	125–140
Mortar	103
Clay, lump, loose	63
Earth, loam, dry loose	76
Sand, loose, dry	75–105
Gravel	105–120
Shale	162
Asphaltum	87
Granite	170
Sandstone	151
Limestone, solid	168
Water	62⅓
Snow, fresh fallen	5.2
Ice	58.7
Chestnut, dry	41
Hemlock, dry	25
Oak, white, dry	50
Pine, white, dry	25
Pine, yellow, dry, South	45
Green timber, ⅛ to ½ more than dry	

Approximate Weights of Flat Rolled Iron per Lineal Foot

Thickness, Inches

Width In.	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/4
1/2	.422	.528	.634	.738	.845	.....	.....	.....	.....	.....
5/8	.528	.660	.792	.923	1.056	1.320	.....	.....	.....	.....
3/4	.633	.792	.950	1.108	1.265	1.584	1.901	.....	.....	.....
7/8	.738	.923	1.108	1.294	1.477	1.846	2.217	2.588	.....	.....
1	.845	1.056	1.267	1.478	1.690	2.112	2.534	2.956	3.380	.....
1 1/8	.950	1.187	1.425	1.663	1.901	2.375	2.850	3.326	3.802	4.752
1 1/4	1.056	1.320	1.584	1.848	2.112	2.640	3.168	3.696	4.224	5.280
1 3/8	1.161	1.452	1.742	2.032	2.325	2.904	3.484	4.065	4.646	5.808
1 1/2	1.266	1.584	1.900	2.217	2.535	3.168	3.802	4.435	5.069	6.337
1 5/8	1.372	1.716	2.059	2.402	2.746	3.432	4.119	4.805	5.492	6.864
1 3/4	1.479	1.848	2.218	2.589	2.957	3.696	4.435	5.178	5.914	7.393
1 7/8	1.584	1.980	2.376	2.772	3.168	3.960	4.752	5.544	6.336	7.921
2	1.689	2.112	2.534	2.957	3.379	4.224	5.069	5.914	6.758	8.448
2 1/8	1.795	2.244	2.693	3.141	3.591	4.488	5.386	6.283	7.181	8.977
2 1/4	1.900	2.376	2.851	3.326	3.802	4.752	5.703	6.653	7.604	9.505
2 3/8	2.006	2.508	3.009	3.511	4.013	5.016	6.019	7.022	8.025	10.032
2 1/2	2.112	2.640	3.168	3.696	4.224	5.280	6.336	7.392	8.448	10.560
2 3/4	2.323	2.904	3.485	4.066	4.647	5.808	6.970	8.132	9.294	11.617
3	2.535	3.168	3.802	4.435	5.069	6.337	7.604	8.871	10.138	12.673
3 1/4	2.746	3.432	4.119	4.805	5.492	6.865	8.237	9.610	10.983	13.730
3 1/2	2.957	3.696	4.436	5.175	5.914	7.393	8.871	10.350	11.828	14.785
3 3/4	3.168	3.960	4.752	5.544	6.336	7.921	9.505	11.089	12.673	15.841
4	3.380	4.224	5.069	5.914	6.759	8.448	10.138	11.828	13.518	16.897
4 1/2	3.802	4.752	5.703	6.653	7.604	9.504	11.406	13.306	15.208	19.010
5	4.224	5.280	6.336	7.392	8.449	10.560	12.673	14.784	16.897	21.122
5 1/2	4.647	5.808	6.970	8.132	9.294	11.616	13.940	16.264	18.587	23.234
6	5.070	6.337	7.604	8.871	10.138	12.674	15.208	17.742	20.276	25.346
7	5.914	7.392	8.872	10.350	11.828	14.786	17.742	20.700	23.656	29.570
8	6.760	8.448	10.138	11.828	13.518	16.896	20.276	23.656	27.036	33.794

Approximate Weights of Bar Iron

Round and Square Rolled Iron, Per Lineal Foot

Size In.	Round Weight (lbs.)	Square Weight (lbs.)	Size In.	Round Weight (lbs.)	Square Weight (lbs.)	Size In.	Round Weight (lbs.)	Square Weight (lbs.)	Size In.	Round Weight (lbs.)	Square Weight (lbs.)	Size In.	Round Weight (lbs.)	Square Weight (lbs.)
1/16	.010	.013	13/16	1.752	2.231	1 5/8	7.010	8.926	3 1/8	25.926	33.010	4 5/8	56.788	72.305
1/8	.041	.053	7/8	2.032	2.588	1 3/4	8.128	10.352	3 1/4	28.040	35.704	4 3/4	59.900	76.264
3/16	.095	.119	15/16	2.333	2.971	1 7/8	9.333	11.883	3 3/8	30.240	38.503	4 7/8	63.094	80.333
1/4	.165	.211	1	2.654	3.380	2	10.616	13.520	3 1/2	32.512	41.408	5	66.752	84.480
5/16	.261	.330	1 1/16	2.997	3.816	2 1/8	11.988	15.264	3 5/8	34.886	44.418	5 1/8	69.731	88.784
3/8	.373	.475	1 1/8	3.360	4.278	2 1/4	13.440	17.112	3 3/4	37.332	47.534	5 1/4	73.172	93.168
7/16	.508	.647	1 3/16	3.744	.....	2 3/8	14.975	19.066	3 7/8	39.864	50.756	5 3/8	76.700	97.657
1/2	.663	.845	1 1/4	4.172	5.280	2 1/2	16.688	21.120	4	42.464	54.084	5 1/2	80.304	102.240
9/16	.840	1.069	1 5/16	4.573	.....	2 5/8	18.293	23.292	4 1/8	45.174	57.517	5 5/8	84.001	106.953
5/8	1.043	1.320	1 3/8	5.019	6.390	2 3/4	20.076	25.560	4 1/4	47.952	61.055	5 3/4	87.776	111.756
11/16	1.255	1.597	1 7/16	5.486	.....	2 7/8	21.944	27.939	4 3/8	50.815	64.700	5 7/8	91.634	116.671
3/4	1.493	1.901	1 1/2	5.972	7.604	3	23.888	30.416	4 1/2	53.760	68.448	6	95.552	121.664

Note—For cast iron deduct 1/16 part, for steel add 1/48, for copper add 1/7, for cast brass add 1/12, for lead add 1/2, for zinc deduct 1/12.

Avoirdupois Weight

16 drams ..... 1 ounce
16 oz. ..... 1 pound
25 lbs. ..... 1 quarter
4 quarters ..... 1 hundredweight
2,000 lbs. ..... 1 ton
2,240 lbs. ..... 1 long ton

Square Measure

144 sq. in. ..... 1 sq. ft.
9 sq. ft. ..... 1 sq. yd.
30 1/2 sq. yds. ..... 1 sq. rod
40 sq. rods ..... 1 rood
4 roods ..... 1 acre
640 acres ..... 1 sq. mile
36 sq. miles ..... 1 township

An acre is approximately 209 by 209 feet.

Liquid Measure

4 gills ..... 1 pint
2 pints ..... 1 quart
4 quarts ..... 1 gallon
31 1/2 gals. ..... 1 barrel
2 bbls. ..... 1 hogshead

Circular Measure

60 seconds ..... 1 minute
60 minutes ..... 1 degree
30 degrees ..... 1 sign
90 degrees ..... 1 quadrant
360 degrees ..... 1 circle

Dry Measure

2 pints ..... 1 quart
8 quarts ..... 1 peck
4 pecks ..... 1 bushel
36 bushels ..... 1 chaldron

Long Measure

12 inches ..... 1 foot
3 feet ..... 1 yard
5 1/2 yards ..... 1 rod
40 rods ..... 1 furlong
8 furlongs ..... 1 stat. mile
3 miles ..... 1 league

Miscellaneous

3 in. ..... 1 palm
4 in. ..... 1 hand
6 in. ..... 1 span
18 in. ..... 1 cubit
21.8 in. ..... 1 Bible cubit
1728 cubic in. 1 cubic foot
27 cubic ft. 1 cubic yard
128 cubic ft. 1 cord
2150 cubic in. 1 bushel
268.8 cubic in. 1 gal. dry meas'e
231 cubic in. 1 gal. liquid
1 cubic ft. water weighs 62 1/3 lbs. and contains 7 1/2 gallons.

Chapter 33—*Advanced Course*

INTRODUCTORY CHAPTER and DISCOUNT FIGURING

As we approach the Advanced Course we will find that many old items of the Intermediate Course carry right on through our Advanced Course as well. Certainly the base metals are the same and so are the finishes, hands of doors and hardware terms such as "back set," "throw of hinges," "schools of design," etc. All of these things have been mastered, or should have been, so that in our advanced study little or no further explanation will be given to them.

It is also true that in this Advanced Course you will learn many things that will help you further on residential work.

For example, the next chapter deals with hardware practice on metal and metal-covered doors. Occasionally you will find doors of this type in residences, particularly where there are doors leading from the house to an attached garage. The increased use of metal and metal-covered doors on all types of public buildings makes this chapter of the Advanced Course particularly important for you to know.

Then we shall devote a chapter to butts and hinges used for metal and metal-covered doors as well as various butts used in public buildings but seldom found in residences.

Next will come a chapter on the important builders' hardware item "door closers." Some suggestion as to their importance was briefly made in the Intermediate Course but in this chapter the subject will be covered in detail. Following that a chapter naturally follows on floor hinges of larger and heavier construction than those used in residences.

To me, "keying" is a most fascinating study. In the chapter after floor hinges this study will challenge your interest I am sure. All types of public buildings require the expert advice of contract builders' hardware engineers. Every building of major importance offers a new problem in this subject of keying.

Fire exit bolts have a special appeal to the hardware engineer who specifies them. He is guarding human life when he equips a building with them. Anyone who understands the horrible loss of life that brought fire exit bolts into use will recognize his responsibility to society in doing this job well.

Door stops and door holders are also a matter of great importance in almost any type of public building so a chapter will be devoted to that subject.

In most public buildings cupboard hardware of a more rugged and varied use is required than in residences, so after fire exit bolts, a chapter will be devoted to this subject.

The last chapter on generally used hardware in all types of public buildings will be that very important one on lavatory hardware. It is seldom, in these days that you will find lavatory partitions of wood. Slate, marble, steel and glass are the word today. In this chapter you will learn how to equip them all with the proper lavatory hardware.

All of the types of hardware already mentioned are apt to be used on all types of public buildings—now we shall begin to specialize. You will find two new features in the Advanced Course that I am sure will be helpful. The first consists of a number of detail sheets illustrating conditions you will find on most any job. On each of these I will indicate and note the points of particular interest to you. The chapters generally describing items used in all types of public buildings will, in most cases, have comparative charts.

Here is the second new feature. When we come to individual types of buildings you will find not a comparative but a suggestion list for three-priced buildings as to lock suggestions by individual manufacturers but not as comparatives with other manufacturers. It is important to make this distinction.

First, special hardware for office buildings and apartments, then school hardware. For schools you will find manufacturers have developed locks with special functions and different kinds of window hardware.

As we consider each type of public building, we shall take up only those items particularly devoted for that type of building. You have already learned the standard items used in all these buildings. There will be a chap-

Nets of Combination Discounts

	25	30	35	40	42½	45	47½	50	52½	55	57½	60	
5	.7125	.665	.6175	.57	.54625	.5225	.49875	.475	.45125	.4275	.40375	.38	5
5-2½	.69469	.64838	.60206	.55575	.53259	.50944	.48628	.46313	.43997	.41681	.39366	.3705	5-2½
5-5	.67688	.63175	.58663	.5415	.51894	.49638	.47381	.45125	.42869	.40613	.38356	.361	5-5
5-5-2½	.65995	.61596	.57196	.52796	.50596	.48397	.46197	.43997	.41797	.39597	.37397	.35198	5-5-2½
7½	.69375	.6475	.60125	.555	.53188	.50875	.48563	.4625	.43938	.41625	.39313	.37	7½
7½-2½	.67641	.63131	.58622	.54113	.51858	.49603	.47348	.45094	.42839	.40584	.3833	.36075	7½-2½
7½-5	.65906	.61513	.57119	.52725	.50528	.48331	.46134	.43938	.41741	.39544	.37347	.3515	7½-5
7½-5-2½	.64259	.59975	.55961	.51407	.49265	.47123	.44981	.42839	.40697	.38555	.36413	.34271	7½-5-2½
10	.675	.63	.585	.54	.5175	.495	.4725	.45	.4275	.405	.3825	.36	10
10-2½	.65813	.61425	.57038	.5265	.50456	.48263	.46069	.43875	.41681	.39488	.37294	.351	10-2½
10-5	.64125	.5985	.55575	.513	.49163	.47025	.44888	.4275	.40613	.38475	.36338	.342	10-5
10-5-2½	.62522	.58354	.54186	.50018	.47933	.45849	.43765	.41681	.39597	.37513	.35429	.33345	10-5-2½
10-7½	.62438	.58275	.54113	.4995	.47869	.45788	.43706	.41625	.39544	.37463	.35381	.333	10-7½
10-7½-2½	.60877	.56818	.5276	.48701	.46672	.44643	.42614	.40584	.38555	.36526	.34497	.32468	10-7½-2½
10-7½-5	.59316	.55361	.51407	.47453	.45475	.43498	.41521	.39544	.37567	.35589	.33612	.31635	10-7½-5
10-7½-5-2½	.57833	.53977	.50122	.46266	.44338	.42411	.40483	.38555	.36627	.347	.32772	.30844	10-7½-5-2½
10-10	.6075	.567	.5265	.486	.46575	.4455	.42525	.405	.38475	.3645	.34425	.324	10-10
10-10-2½	.59231	.55283	.51334	.47385	.45411	.43436	.41462	.39488	.37513	.35539	.33564	.3159	10-10-2½
10-10-5	.57713	.53865	.50018	.4617	.44246	.42323	.40399	.38475	.36551	.34628	.32704	.3078	10-10-5
10-10-5-2½	.5627	.52518	.48768	.45016	.4314	.41264	.39389	.37513	.35637	.33762	.31886	.30011	10-10-5-2½
10-10-7½	.56194	.52448	.48701	.44955	.43082	.41209	.39336	.37463	.35589	.33716	.31843	.2997	10-10-7½
10-10-7½-2½	.54789	.51136	.47484	.43831	.42005	.40179	.38352	.36526	.347	.32873	.31047	.29221	10-10-7½-2½
10-10-7½-5	.53384	.49825	.46266	.42707	.40928	.39149	.37369	.35589	.3381	.3203	.30251	.28472	10-10-7½-5
10-10-7½-5-2½	.52049	.4858	.45109	.4164	.39905	.3817	.36435	.347	.32965	.3123	.29495	.2776	10-10-7½-5-2½
10-10-10	.54675	.5103	.47385	.4374	.41918	.40095	.38273	.3645	.34628	.32805	.30983	.2916	10-10-10
10-10-10-10	.4921	.4593	.4265	.3937	.37725	.3609	.34445	.328	.31164	.2952	.27884	.2624	10-10-10-10

	62½	65	67½	70	72½	75	77½	80	82½	85	87½	90	
5	.35625	.3325	.30875	.285	.26125	.2375	.21375	.19	.16625	.1425	.11875	.095	5
5-2½	.34734	.32419	.30103	.27788	.25472	.23156	.20841	.18525	.16209	.13894	.11578	.09263	5-2½
5-5	.33844	.31588	.29331	.27075	.24819	.22563	.20306	.1805	.15794	.13538	.11281	.09025	5-5
5-5-2½	.32998	.30798	.28598	.26398	.24198	.21998	.19799	.17599	.15399	.13199	.10999	.08799	5-5-2½
7½	.34688	.32375	.30063	.2775	.25438	.23125	.20813	.185	.16188	.13875	.11563	.0925	7½
7½-2½	.3382	.31566	.29311	.27056	.24802	.22547	.20292	.18038	.15783	.13528	.11273	.09019	7½-2½
7½-5	.32953	.30756	.28559	.26363	.24166	.21969	.19772	.17575	.15378	.13181	.10984	.08788	7½-5
7½-5-2½	.32129	.29987	.27845	.25703	.23561	.2142	.19278	.17136	.14994	.12852	.1071	.08568	7½-5-2½
10	.3375	.315	.2925	.27	.2475	.225	.2025	.18	.1575	.135	.1125	.09	10
10-2½	.32906	.30713	.28519	.26325	.24131	.21938	.19774	.1755	.15356	.13163	.10969	.08775	10-2½
10-5	.32063	.29925	.27788	.2565	.23513	.21375	.19238	.171	.14963	.12825	.10688	.0855	10-5
10-5-2½	.31261	.29177	.27093	.25009	.22925	.20841	.18757	.16673	.14588	.12504	.1042	.08336	10-5-2½
10-7½	.31219	.29138	.27056	.24975	.22894	.20813	.18731	.1665	.14569	.12488	.10406	.08325	10-7½
10-7½-2½	.30438	.28409	.2638	.24351	.22321	.20292	.18263	.16234	.14205	.12175	.10146	.08117	10-7½-2½
10-7½-5	.29658	.27681	.25703	.23726	.21749	.19772	.17795	.15818	.1384	.11863	.09886	.07909	10-7½-5
10-7½-5-2½	.28916	.26989	.25061	.23133	.21205	.19278	.1735	.15422	.13494	.11567	.09639	.07711	10-7½-5-2½
10-10	.30375	.2835	.26325	.243	.22275	.2025	.18225	.162	.14175	.1215	.10125	.081	10-10
10-10-2½	.29616	.27641	.25667	.23693	.21718	.19744	.17769	.15795	.13821	.11846	.09872	.07898	10-10-2½
10-10-5	.28856	.26933	.25009	.23085	.21161	.19238	.17314	.1539	.13466	.11543	.09619	.07695	10-10-5
10-10-5-2½	.28135	.26259	.24384	.22508	.20632	.18757	.16881	.15005	.1313	.11254	.09378	.07503	10-10-5-2½
10-10-7½	.28097	.26224	.24351	.22478	.20604	.18731	.16858	.14985	.13112	.11239	.09366	.07493	10-10-7½
10-10-7½-2½	.27394	.25568	.23742	.21916	.20089	.18263	.16437	.1461	.12784	.10958	.09131	.07305	10-10-7½-2½
10-10-7½-5	.26692	.24913	.23133	.21354	.19574	.17795	.16015	.14236	.12456	.10677	.08897	.07118	10-10-7½-5
10-10-7½-5-2½	.26025	.2429	.22555	.2082	.19085	.1735	.15615	.1388	.12145	.1041	.08675	.0694	10-10-7½-5-2½
10-10-10	.27338	.25515	.23693	.2187	.20048	.18225	.16403	.1458	.12758	.10935	.09113	.0729	10-10-10
10-10-10-2½	.26654	.24877	.231	.21323	.19546	.17769	.15592	.14216	.12439	.10662	.08885	.07108	10-10-10-2½
10-10-10-5	.25971	.24239	.22508	.20777	.19045	.17314	.15582	.13851	.1212	.10388	.08657	.06926	10-10-10-5
10-10-10-5-2½	.25321	.23633	.21945	.20257	.18569	.16881	.15193	.13505	.11817	.10129	.08441	.06752	10-10-10-5-2½
10-10-10-10	.24604	.22964	.21323	.19683	.18043	.16403	.14762	.13122	.11482	.09842	.08201	.06561	10-10-10-10
10-10-10-10-5	.23374	.21815	.20257	.18699	.17141	.15582	.14024	.12466	.10908	.09349	.07791	.06233	10-10-10-10-5

ter on hotel hardware, one on hospitals, another on churches and then factory buildings and other special items for various public buildings will have a chapter.

In the Elementary Course we hinted at sample display. Now that you have had an outline of all kinds of hardware, it seems to me that we can well take a chapter to consider sample rooms and the proper scheduling of hardware.

After that I invited all members of the National Contract Hardware Association to describe the most interesting hardware problem encountered in their experience and their solution of that problem. From these requests I have obtained several chapters of unusual interest to every one in the business.

We then approach the close of the series with a chapter entitled "Did You Know" — devoted to items perhaps made by only one manufacturer and closing with a review and a glimpse into the future.

Figuring Discounts

Up until now I have said nothing about figuring builders' hardware other than the mention in Chapter 20 of the fact that it was cheaper to buy complete lock sets rather than locks only and parts. My reason for this is the fact that residential work is generally figured without referring to the factory by all legitimate builders' hardware engineers.

These same people are capable of figuring public buildings the same way until the factories discontinue the practice (I think they should discontinue) of making special lump sum bids. Until then, I say, it is best to prepare your list of requirements, lump them together and send for lump sum figures. If you don't and your competitor does, you are apt to be out of line in quoting.

So many men, I find, have forgotten how to figure. They do it the long and hard way. Learn the short cuts. Some short cuts have been given you on the accompanying chart.

Here's the quick way and you arrive at the same answer without nearly the same opportunity to make mistakes (See Problem B):

Problem B

$9.78 list
.4275 multiplier—see chart

4890
6846
1956
3912

4.179950 or $4.18 a set net

Problem A

9.78 (list)	9.78 list less
x .50 (first discount)	4.89 first discount
4.8900	4.89 first balance
4.89 (first balance)	4.89 first balance less
x .10 (second discount)	.49 second discount
.4890	4.40 second balance
4.40 (second balance)	4.40 second balance less
x .05 (third discount)	.22 third discount
.2200	4.18 third and final balance
or Net Cost, $4.18	

For example, if you had a lock set listed at $9.78 a set and your factory extended you a discount of 50-10-5 per cent, do not do it as shown in Problem A.

You may think I have been very extreme in my example of the long way. I really haven't. I've seen college graduates do it just this way when they first went to work for me.

Now here's the easy way—find on the chart inclosed with this chapter the multiplier for discount 50-10-5 per cent. It is .4275.

Now suppose for example 50-10-5 per cent had not been shown on this sheet.

How would you have arrived at the multiplier? That's easy. Problem C tells you.

Then make a record for the discount and the multiplier for your records for the future.

Do not forget to add your freight if prices quoted are f.o.b. factory. Many jobs are secured at the expense of the bidder because he forgot to add the freight or the master keying or other items that should have been figured and which are part of the cost.

Problem C

100 deduct	.50 first balance	.45 second balance
x .50 first discount	x .10 second discount	x .05 third balance
.50 first balance	.05 deduct from first bal.	2.25 deduct from second bal.
	.45 second balance	.4275 multiplier

Chapter 34—*Advanced Course*

METAL DOORS

THIS, the opening chapter of our Advanced Course, marks a sharp division in our subject matter. In both the Elementary and Intermediate Courses we considered only residential hardware.

The first sharp division from hardware for various types of public buildings from that for residences which we shall consider is that of hardware for metal doors. While it is true that a few metal doors, mostly kalamein, are used on some residences, you will find an ever-increasing use of all types of metal doors on all types of public buildings.

Fireproof buildings necessarily must use metal doors and windows to make them fireproof, and this changes materially the builders' hardware man's problem.

Doors made of wood and covered with metal are called "kalamein doors." The metal cover usually is steel but is not necessarily so. It might, for example, be metal covered with bronze metal.

Let's first consider the kalamein door. If hardware is to be installed on these doors and screwed on, the hardware would be furnished with wood screws because the screws go right through the metal cover into the wood. However, the wood core is generally soft wood and where these doors and hardware get constant use screws prove unsatisfactory usually because they come loose in the soft wood core. Therefore, it has become good practice to furnish the hardware for these types of doors with sex bolts, as Fig. 1. Half or full surface butts such as will be described in our next chapter are being more and more specified in place of the full mortise butt on kalamein doors.

Kalamein doors also frequently have the door closers and even escutcheon plates of the lock set applied with sex bolts. Then comes the hollow metal door. This door differs from the kalamein door in that it has no wood core. It is as the name implies, hollow center, the stiles and panels being of sheet metal. These doors are reinforced where the hardware is applied to strengthen the doors for the more

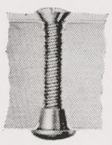


Fig. 1—Sex bolt.

severe strain and use at these places. Hollow metal door hardware, unlike wood or kalamein doors, is furnished with machine screws to use in applying the hardware. Never overlook this important point.

There are other types of metal doors such as sheet metal doors, but these types are usually furnished complete with hardware by the manufacturer of the doors.

So for this study we will consider only the kalamein and hollow metal. It matters little whether they be of steel, bronze, or aluminum, the hardware practices are the same.

We cannot stop with the doors, however, we must also consider the door frames. These frames may be kalamein or hollow metal as are the doors, or they may be channel steel frames or even cast iron. In all these cases, except kalamein, the hardware attached to the frames must be furnished with machine screws, not wood.

In later years the use of hollow metal frames, even where wood doors are used, has increased greatly. In such cases the builders' hardware man must be especially careful. All hardware attached to the frames must be furnished with machine screws, whereas the hardware applied to the wood door must be furnished with wood screws.

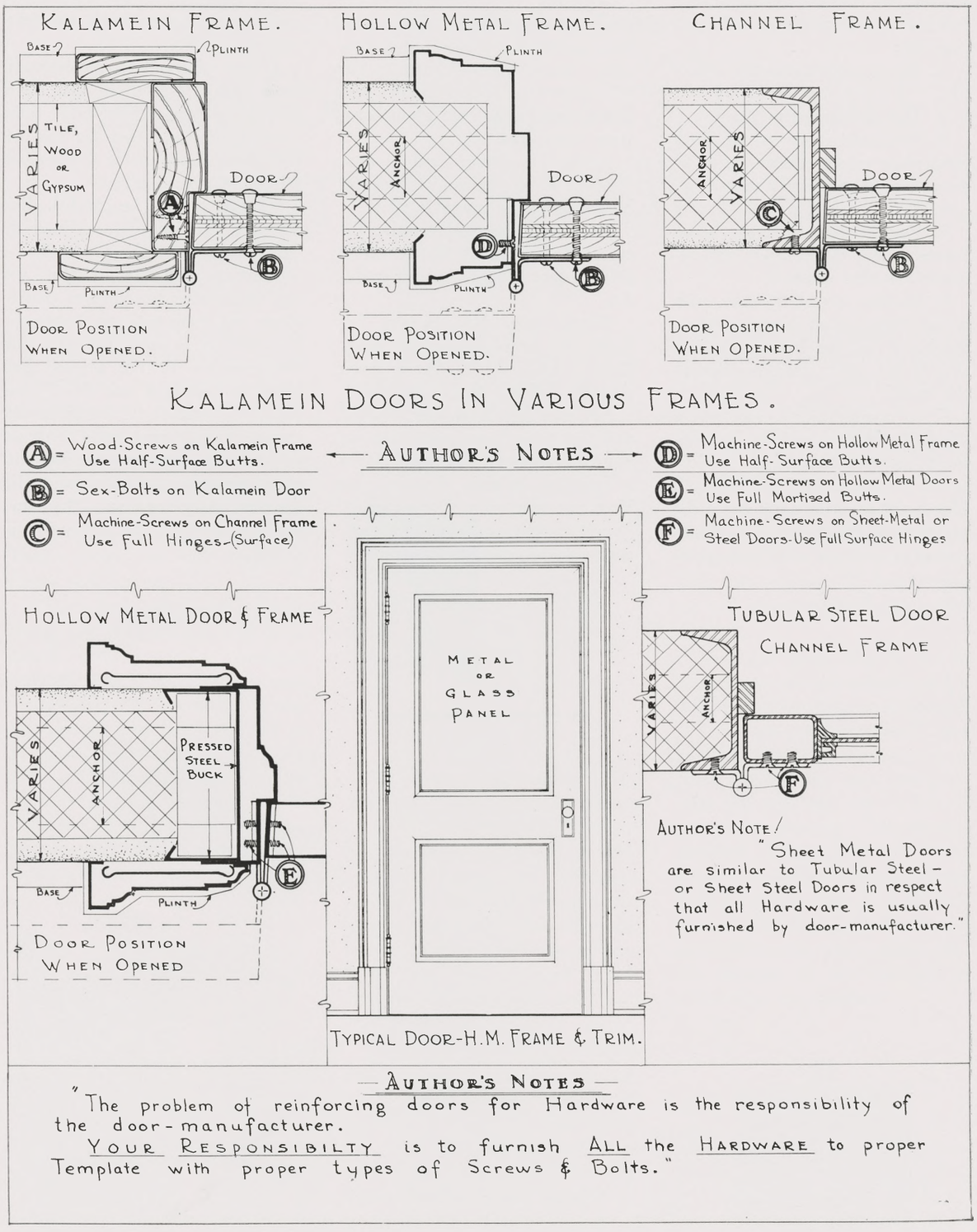
For example, the butts would be furnished one-half wood screws, one-half machine screws. The lock set would have machine screws for the lock strike, but wood screws for the rest of the lock set. Watch your step on this item!

That, however, is not all that you must watch out for. Hardware for all types of metal doors should be to template.

Hardware to template means that a pattern called template with exact measurements is furnished. Every screw hole is at the exact same spot so that after the metal doors or frames have been reinforced, tapped and threaded to this template or pattern, the hardware, which has also been made to the same pattern, will fit exactly into the metal doors and frames prepared for it.

Care and proper scheduling for the hardware for these types of openings are essential. You cannot be *too* careful! It is comparatively easy to patch a wrong hole in a wood door, but a metal door that has been cut, reinforced, tapped and threaded incorrectly is quite a different problem. I have emphasized this so much because it is so important. Carelessness is mighty costly when metal doors and frames are not properly and respectfully considered.

Arthur H. Fisher, of the Richmond Fireproof Door Co., in re-



Detail drawing showing kalamein, hollow metal and tubular steel doors and frames.

plying to my invitation to offer suggestions in connection with this chapter, gives the following suggestions which I am sure every builders' hardware man will appreciate:

1. The correct hardware schedule.
2. The proper templates.
3. Kalamein doors which have steel plate reinforcements must be packed with machine screws.
4. Check your details.
5. Flush bolts which are being furnished for metal doors will require machine screws.
6. Hollow metal frames with wood doors must have template hardware on the butts and lock sets or any other items applied to the metal.
7. In practically all cases where labelled doors, especially in kalamein construction and hollow metal frames, are being furnished, blue print templates will serve the purpose. (*Author's note.*—Manufacturers will furnish blue print templates without charge, but many manufacturers charge for physical templates.)
8. Metal door manufacturers prefer physical, that is actual (not blue print) templates for hollow metal doors which insures better fit, eliminates lock binding and labor costs in the field when hardware is applied.
9. On aluminum and bronze doors it is best to send the actual hardware to the manufacturer.
10. Give proper information for cutting for cylinders, that is, which side of door is to be cut for cylinder.

Thank you, Mr. Fisher, for those 10 very important rules. Good builders' hardware men should follow them carefully.

And now here's another I would add for your own protection in figuring hardware for metal doors to template, be sure of your costs. Most manufacturers, for example, do not charge extra for door closers made to template by machine screws, but most manufacturers do list additional charges for the rest of the hardware, such as butts, bolts, lock sets, etc., when made to template with machine screws.

Before you put in an estimate stop and find out if you have added the proper extras for template hardware. Also the cost of the physical templates if physical templates are required.

Finally, always be careful. Remember the 10 rules outlined in this chapter. Do the job well.

Starting with this chapter, we are illustrating the various conditions one runs into on hardware by means of a page of details and notations as to the things that must be watched out for. This additional feature of the advanced course will, I trust, meet with as enthusiastic response as did the stock records and blue prints in the elementary course and the comparison charts in the intermediate course.

Chapter 35—*Advanced Course*

METAL DOOR BUTTS, HINGES and OTHER HARDWARE

IN this chapter I want to discuss butts and hinges which have not been previously considered in either the Elementary or Intermediate Course.

Inasmuch as our last chapter was devoted to metal doors and frames, it might be well to consider first those types of butts and hinges which are used on metal doors and frames.

Fig. 1 is a half surface butt. These can be secured in both extra heavy and regular standard weights. This type of butt is used particularly on kalamein doors, the surface part being applied to the door and fastened with sex bolts as illustrated. The frame or mortise part of the butt is furnished with wood screws if the frame is kalamein, or with machine screws if the frame is hollow metal, and of course it must be to template as you learned in the last chapter. These are furnished with ball bearing if desired.

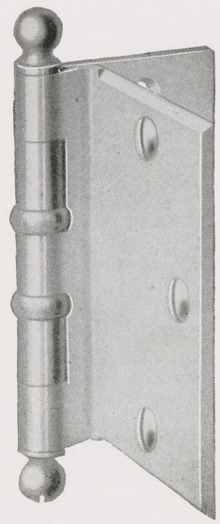


Fig. 1—Half surface template butt.

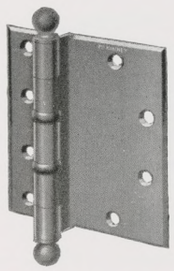


Fig. 2—Full surface template butt for channel frames.

Fig. 2 is a full surface hinge used with kalamein doors having a channel iron frame. Like the half surface it comes in two weights and is fastened in the same manner on the door side as is the half surface type. The other half always to template being screwed to the face of the channel. These also are furnished with ball bearings if desired.

Fig. 3 is a full mortise template butt for hollow metal doors with hollow metal frames. Both leaves are furnished with machine screws and they also can be secured in both weight butts. They are furnished ball bearing if desired.

All three of these types can be secured in wrought brass or bronze, extra heavy and regular weights, as well as in steel.

A brief outline of the use of cast iron and cast bronze butts was given in the Intermediate Course. In the sort of work we are considering in our Advanced Course, I am sure I am correct in stating that far more cast iron and cast bronze butts are used than in residential work.

Cast bronze butts, shown in Fig. 4, can be obtained in three weights —regular, heavy and extra heavy. They can be had with ball bearing as well as regular and also in half surface.

Cast iron butts, Fig. 5, can be obtained in various weights and in half surface, but my search through the various manufacturers' catalogs does not show that any of them are making cast iron butts with ball bearings, nor do I think it is at all necessary. The wearing qualities of cast iron are, I am sure, well enough known to the reader by this time to have him realize that cast iron butts will show little wear at the joints over the lifetime of the building in which they are installed.

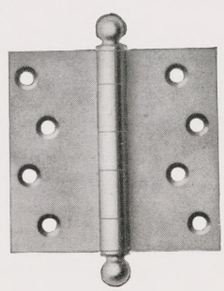


Fig. 3—Template butts for hollow metal doors and frame.

Both cast bronze and cast iron butts can be ordered to template as in the case of wrought bronze or wrought steel.

Let me warn the beginner of the importance of specifying the exact thickness of doors where any of the above butts are orderd for kala-

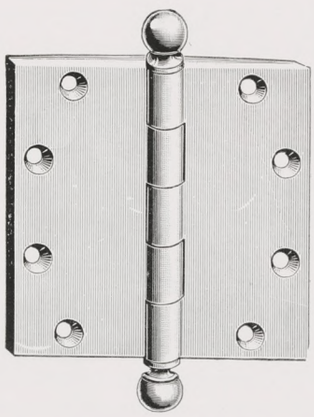


Fig. 4—Cast bronze butt

mein doors so that the proper length sex bolt may be furnished by the factory.

In my chapter on butts in the Intermediate Course, I unintentionally did an injustice to the invisible ball bearing type of butts manufactured by Lawrence Bros. They manufacture the invisible type for all wrought bronze and wrought steel mentioned before, such as full mortise, half surface, and full surface.

McKinney Mfg. Co. do the same with their Oilite bearings. Others use fibre washers, though, as I have previously stated, the visible ball-bearing type is widely popular.

While two bearings are the common practice on most butts, some of the heavier ones are furnished with four bearings as shown in Fig. 6.

Loose joint butts are often used on the cast types and, of course, on the olive knuckle types. In such cases the hand of the doors must always be given the manufacturer when ordering the goods.

Double or single-acting jamb hinges. for use with metal doors and frames must be to template and can be so ordered.

While we shall discuss various locks and other hardware manufactured for particular types of buildings in the chapters which follow, it does seem proper at this point, when we are dealing so largely with hardware for metal doors and frames, to point out some general rules about locks for metal doors.

In recent years most manufacturers have developed standard fronts and strikes for all types of locks to fit in metal doors. It mav be only a latch or a bit key lock or a cylinder lock, but the same standard front and strike is made for them all. Many metal door manufacturers have adopted this standardization program which eliminates a great many of the problems for the manufacturer of the doors, though, of course, with the great variety of locks it prohibits any standardization of the spacing between the keyhole and the knob.

So when ordering templates of hardware, if they are to be all standardized fronts and strikes it will be necessary for you to specify accordingly.

As was the case with butts, so it is with locks. Watch out carefully that you furnish the proper screws —wood or machine—for the lock and strike as required. It should not be necessary to repeat those instructions again in this chapter.

On double doors where bolts are used, the same care must be exercised. From the rules mentioned by Mr. Fisher in the preceding chapter, it would seem that many builders' hardware men overlook this important detail in the ordering of hardware.

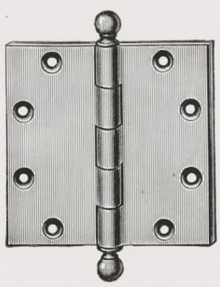


Fig. 5—Cast iron butt.

On all metal doors and frames, order your bolts to template with the proper kind of screws.

While most all metal windows come furnished with hardware, if you are called upon to furnish any such hardware, remember that it, too, must be to template with screws. If you have any metal cupboards, access or other doors on which you have to furnish hardware, again I repeat, always figure and specify to template by proper screws.

By this time you may feel that I have repeated the words "to template by proper screws" too often, but I assure you it is so very important and has caused so much trouble for everyone concerned that the matter cannot be over emphasized. Never think of hardware for metal doors and frames without thinking of template by proper screws.

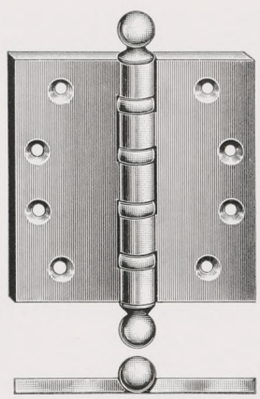
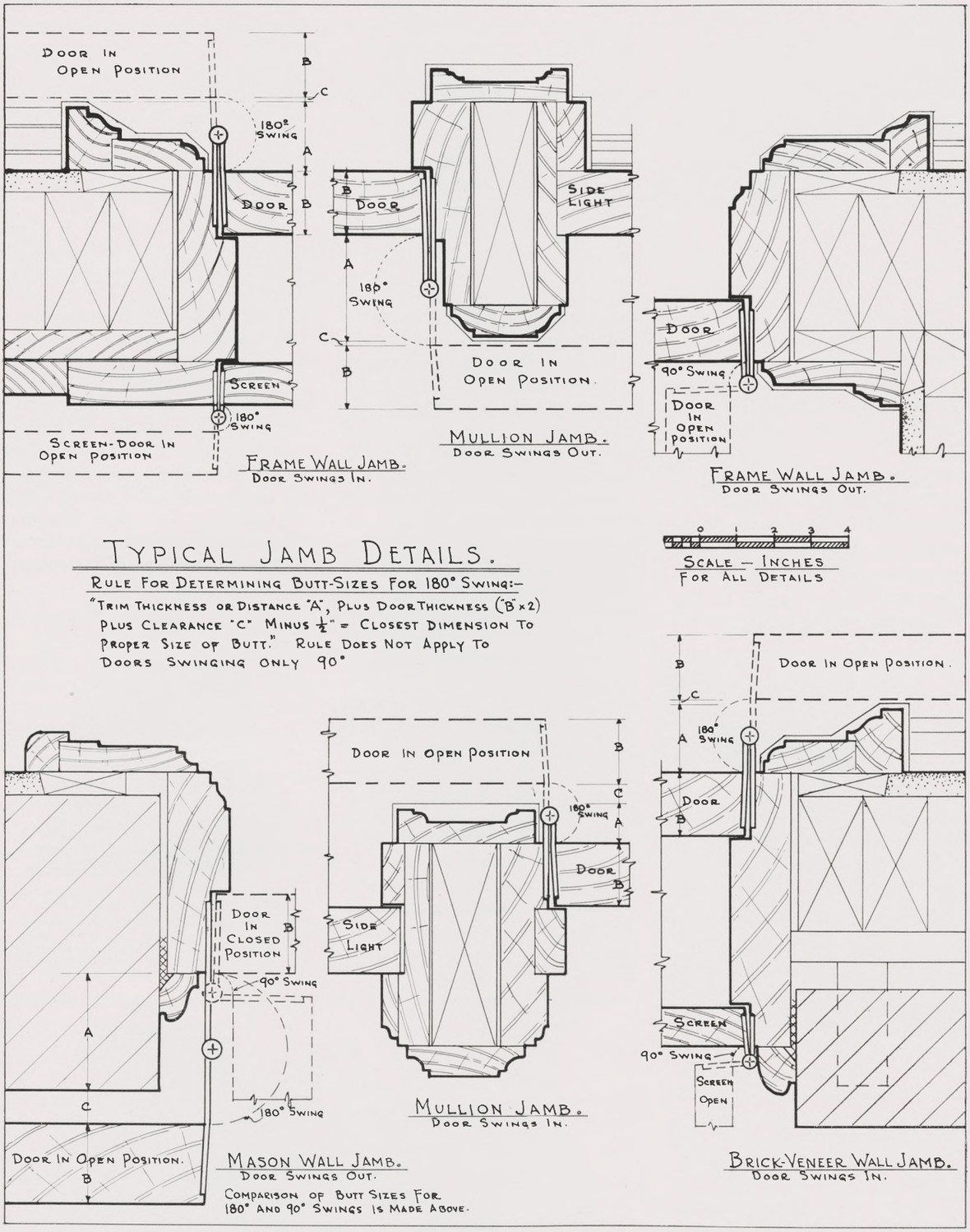


Fig. 6—Four bearing cast bronze butt.

Remember what I told you in the preceding chapter. Check with your source of supply for the proper additional charge for making hardware to template on every single piece that is to template.



Typical problems—throw of hinges

Chapter 36—*Advanced Course*

SURFACE DOOR CLOSERS

DOOR closers represent a very sizeable amount of the money used in all types of public buildings. Specifying the proper size and type of closer is therefore extremely important.

First let me give you a bit of the history of door closers, as a background for our study.

The idea was originated by a mechanic who was employed as carpenter-foreman on the famous Trinity Church of Boston at the time of its erection 60 years ago. This mechanic's name was L. C. Norton.

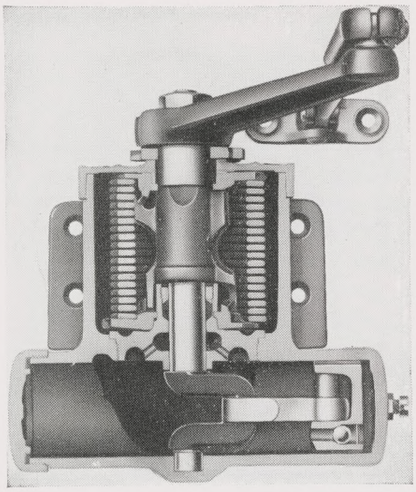


Fig. 1—Cut open model crankshaft type closer

The rector of Trinity Church, who later became the famous Bishop Brooks, was much annoyed at the continuous slamming of the vestibule doors during the services. He took Mr. Norton to task about it. Mr. Norton, in a huff, threw his tool kit in a closet and slammed the door. Quite to his surprise, there was no "bang" of the door, and, in fact, it did not really close completely.

He immediately began to reason out why the door did not bang, keeping in mind his problem with the vestibule doors. He decided that the compression of air in the closet prevented the "bang" and reasoned that, if he could bottle up some air and harness it to the door, he could control its movement and prevent its banging. He began to work out this idea in his own basement and, with his heating furnace for a forge, evolved the first successful door closer—an air closer.

In 1893 a Mr. Blount brought out the first liquid closer. This principle involved the use of liquid instead of air as the cushion or checking feature to stop the bang. So to Mr. Norton and Mr. Blount goes the credit for the early principles of surface door control.

The Blount closer, named after the inventor, used the crank shaft piston principle which is still successfully used by some leading manufacturers today.

Essentially, a closer consists of a powerful coil spring in an upper (vertical) cylinder, connected with a piston which moves back and forth in a lower (horizontal) cylinder filled with liquid. Opening the door "winds up" the spring and the energy thus built up operates to close the door when the latter is released by the person passing through. In order that the door shall close smoothly, without slamming, the force of the spring is offset somewhat, and controlled, by the checking action, which is provided by the regulated passage

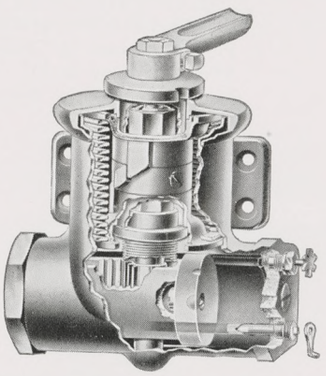


Fig. 3—Cut open model semi-rack and pinion type closer

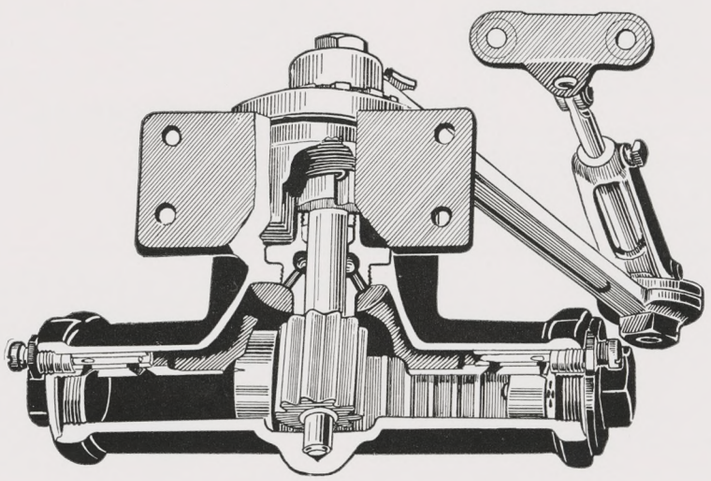


Fig. 2—Cut open model full rack and pinion type closer

of the liquid from one side of the piston to another through small apertures or "ports."

The crank shaft principle has its piston operated by a crank which transmits the spring power to the checking device in much the same way as the pistons in an automobile are moved. See Fig. 1.

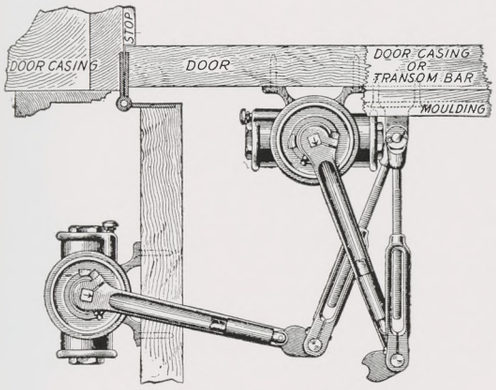


Fig. 4—Holder arm closer friction arm type

This principle did not permit full checking action for the entire swing of the door. In the earlier closers the door was controlled about 45 degrees. Since that time, by means of dual valves, much better door control is possible in the crank shaft type closer.

In the earlier closers all springs were, in general, of the flat ribbon type of spring, tightly wound up and banded around the outer circumference. With this type of spring the checks were handed. In later years a spring was developed which is rolled out from round rod stock that makes it a very flexible spring, universal in its action. This type of closer has become quite popular because it reduces the necessary stock to be carried, and, particularly for over the counter sales, eliminates the necessity of knowing the hand of the door when selling the closer.

Particularly on schools, there came a demand for a closer that would control the door all the way and from the demand developed the closer known as full rack and pinion type now made by many leading manufacturers.

This principle employs a single, double-headed piston with its center section geared directly to the spring shaft. See Fig. 2. In this type action the piston travels in one direction only for each swing of the door and continuous checking effect is secured.

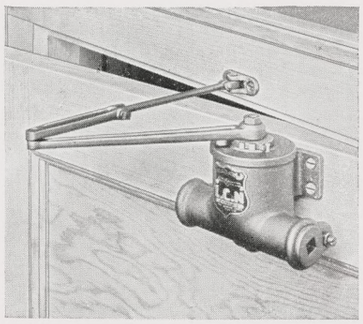


Fig. 6—Telephone booth closer

This full rack and pinion type closer is handed, and it is necessary to know the hand of the door or reverse the spring on the job if the other hand is required.

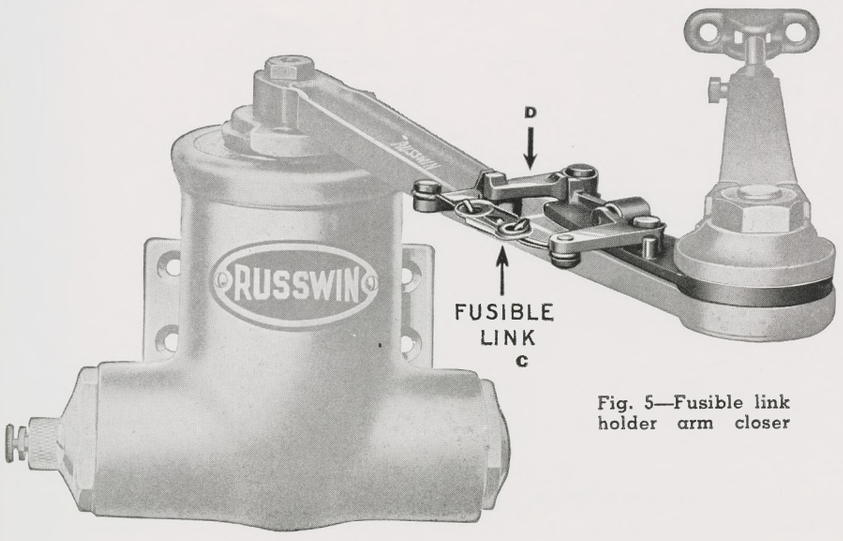
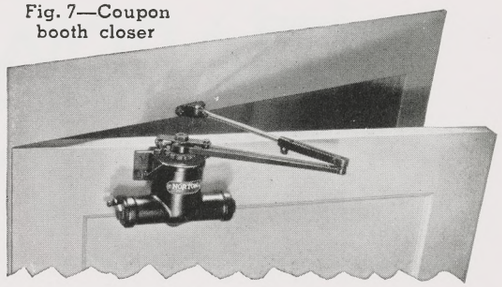


Fig. 5—Fusible link holder arm closer

Fig. 7—Coupon booth closer



Still another type between these two has been developed and adopted by other leading manufacturers which I would call the semi-rack and pinion principle. This type also controls the door all the way. See Fig. 3. This type uses an action in which a geared pinion on the spring shaft travels in a slotted member, geared on both sides of the slot, which moves the piston forward and back for the opening swing of the door and forward and back for the closing swing.

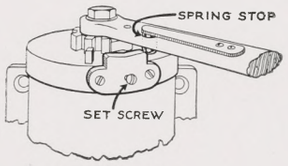


Fig. 8—Hospital type closer

In the last two types where desired a back checking action can be secured to prevent the door from slamming into furniture or wall.

Each one of these three types offers advantages and certain disadvantages. It is not my intention by the slightest inference to draw any conclusions as to which is the best. I only want you to know about all these types and decide for yourself which you prefer.

If space permitted it would be interesting to study the various types of liquid used by various manufacturers but I am going to refer you to your sources of supply for that information.

As I said at the start of the chapter, the problem of using the

HARDWARE AGE COMPARATIVE CHART

	P & F. Corbin Mfg. Co.	Independent Lock Co. and Lockwood Mfg. Co. make two lines both same numbers	Norton Door Closer Co.
LIQUID DOOR CLOSERS			
* = Crank Shaft Type			
‡ = Rack and Pinion Type			
Sizes A	1 ‡	31 *	A ‡
" B	2 ‡	32 * B ‡	B ‡
" C	3 ‡	33 * C ‡	C ‡
" D	4 ‡	34 * D ‡	D ‡
" E	5 ‡	35 * E ‡	E ‡
" F	6 ‡		F ‡
CLOSERS AS ABOVE—HOLDER ARM			
● = Friction Type			
■ = Plunger Type			
Sizes A	101 ■		AHA ●
" B	102 ■	HB32 ● BX Holder Arm	BHA ●
" C	103 ■	HB33 ● CX " "	CHA ●
" D	104 ■	HB34 ● DX " "	DHA ●
" E	105 ■	HB35 ● EX " "	EHA ●
" F	106 ■		FHA ●
CLOSERS AS ABOVE—FUSIBLE LINK			
○ = Underwriters Approved			
§ = Not Approved			
Sizes B		HB32FL §	
" C	523 ○	HB33FL §	CFL Style
" D	524 ○		DFL 5○ and
" E	Note—Can furnish	Note—Sizes B and C only	EFL style
" F	§ type to order		FFL 3§
HOSPITAL ARM CLOSERS			
3 point Sizes B	2 point—3 point	HR32	
" C	423—723	HR33	C—Hospital
" D	424—724		D—Hospital
COUPON BOOTH CLOSERS			
Sizes A	101¾		
" B	102¾		B—Coupon
" C			C—Coupon
TELEPHONE BOOTH CLOSERS			
Sizes A			
" B			B—Telephone
" C			
BRACKETS FOR DOOR CLOSERS			
Soffit Type	25	Soffit Soffit	Soffit
Corner Type	26	Corner Corner	Corner
Flush Type	27	Flush Flush	Flush

On all brackets be sure and specify size closer to be used with these numbers.

OF LIQUID DOOR CLOSERS

L-C-N Norton-Lasier Corp.	Reading Hardware Corp.	Richards-Wilcox Mfg. Co.	Oscar C. Rixson Co. Cam Action	and Crankshaft Action 2 Types	Russell & Erwin Mfg. Co.	Sargent & Co.	Yale & Towne Mfg. Co. YR Model	and Y Model 2 Types
A-110 ‡	1 *	643-1A *	1		A *	41-A ‡ 21	71 *	11 *
B-110 ‡	2 *	643-2B *	2	A	B *	42-B ‡ 22	72 *	12 *
C-110 ‡	3 *	643-3C *	3	B	C *	43-C ‡ 23	73 *	13 *
D-110 ‡	4 *	643-4D *	4	C	D *	44-D ‡ 24	74 *	14 *
E-110 ‡	5 *	643-5E *	5	D	E *	45-E ‡ 25	75 *	15 *
F-110 ‡	6 *	643-6F *	6	E	F *	46-F ‡	76 *	16 *
			Leaf Spring and Roller Type					
A-115 ●	51 ●	643-1A-HA ●			A-1 ●	41-AH ●	171 ●-1171 ■	111 ●-1111 ■
B-115 ●	52 ●	643-2B-HA ●	2HA	A-HA	B-1 ●	42-BH ●	172 ●-1172 ■	112 ●-1112 ■
C-115 ●	53 ●	643-3C-HA ●	3HA	B-HA	C-1 ●	43-CH ●	173 ●-1173 ■	113 ●-1113 ■
D-115 ●	54 ●	643-4D-HA ●	4HA	C-HA	D-1 ●	44-DH ●	174 ●-1174 ■	114 ●-1114 ■
E-115 ●	55 ●	643-5E-HA ●	5HA	D-HA	E-1 ●	45-EH ●	175 ●-1175 ■	115 ●-1115 ■
F-115 ●	56 ●	643-6F-HA ●	6HA	E-HA	F-1 ●	46-FH ●		
C-114 ○	53FL §		3FLHA §	B-FLHA §	C-1F ○	44CL ○	173F ○	1173F §
D-114 ○	54FL §		4FLHA §	C-FLHA §	D-1F ○	45CL ○	174F ○	1174F §
E-114 ○	55FL §		5FLHA §	D-FLHA §	E-1F ○	46CL ○	175F ○	1175F §
			Also 6 size	Also E size				
						42Dg	2 point	3 point
D-113	053					43Dg	H113	H1113
3 point	054				HC	44Dg	H114	H1114
					HD			
	1B				11	41AM		
B-112	2B				12	42AM	CB172	
						43AM		
B-111						42BT	TB72	
10	84	Soffit	13	3	127	51—51	201	201
11	083	Corner	10	1 or 2	128	52—52	251	251
12	85	Flush	14	4	129	53—53	241	241

EDITOR'S NOTE:—While every care has been taken we assume no responsibility for correctness of these comparisons furnished by the manufacturers. The comparative data has been furnished, in each case, by the individual manufacturer, and as published here has been approved by them.

proper size closer is of major importance. Every manufacturer has his own recommendation along that line. I would only say that it is better to use a size larger rather than a size smaller than factory recommendation.

Door closers should be of ample capacity to handle draft and other conditions. To use an old expression, "Never send out a boy to do a man's work."

After these developments of door closers came other new features. The holder arm closer, for example. Fig. 4 shows the type. Some are made with friction, and some with plunger typeholder arms.

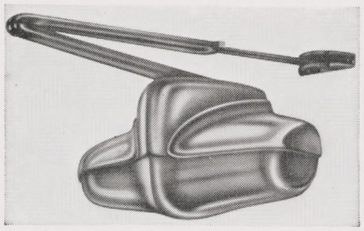


Fig. 9—Streamlined door closer

Then came the fusible link release holder arm closer, Fig. 5, particularly for fire doors and exits to fire tower stairways and the like—a holder arm closer with a fusible link release that would automatically close the door in case of fire. Some have the approval of the fire underwriters. These types are generally more expensive.

Telephone booth, Fig. 6, and coupon booth closers, Fig. 7, have a limited play to hold the door open for ventilation when the booths are not in use.

Hospital door closers, Fig. 8. too, are often required when the door may be held open at the desired position to give ventilation yet have the door act as a screen from the corridor.

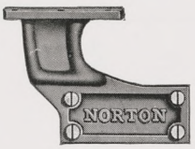


Fig. 10—Soffit type bracket

Fig. 11—Corner type bracket

In the accompanying comparison chart you will get a good idea of the various makes and the features discussed before.

Surface door closers, with all their advantages, are not exactly ornaments. One manufacturer has encased his regular surface closer to make it more attractive. They call it "streamlined" (Fig. 9). It is so furnished to order at a slightly higher price.

One manufacturer has just introduced a new idea in door construction, using ball bearings to reduce the friction. Fig. 9A illustrates this closer which is of the full rack and pinion type.

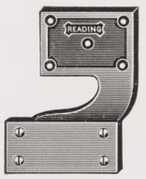


Fig. 12—Flush type bracket

Time marches on and who knows what the future will hold. It is probably safe to predict further progress will be made, but the modern surface closer of today does do a very efficient and satisfactory job.

Before we leave this subject we must consider the various types of brackets used with these door closers we have been studying.

In the comparative chart I have mentioned the three most popularly known ones, though all the manufacturers make special brackets for special conditions such as segment head doors. We will only consider three.

First let me say I believe every manufacturer will agree with me that it is more satisfactory, wherever possible, to apply the closer to the door and the arm to the frame.

This, however, cannot always be done and brackets often are used.

Fig. 10 shows a soffit bracket recommended by many because it can be placed well out on the head jamb giving greater leverage.

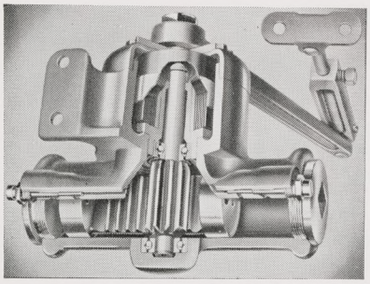
Fig. 11 shows a corner bracket recommended by many because it anchors the bracket not only to the head but to the side jamb as well.

Fig. 12 shows a flush bracket used where conditions do not give sufficient room for either the soffit or corner bracket.

At times, other conditions necessitate the use of a parallel arm closer as Fig. 13, though there is not the same power in a closer placed in this position.

Become an expert on this subject by knowing all the merits of the particular closer or closers you sell. Consult your factory representative on the subject.

Fig. 9A—Full rack and pinion type ball-bearing door closer.



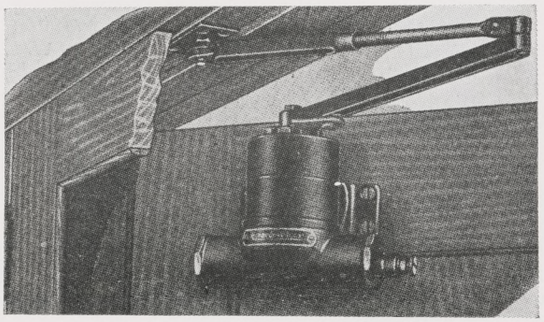


Fig. 13—Parallel type closer

Chapter 37—*Advanced Course*

FLOOR HINGES, CONCEALED CLOSERS and THRESHOLDS

NOW that the subject of door closers of the surface application type has been rather fully covered in the preceding chapter, we will in this chapter consider other door closing devices. There are really five types to be studied in this chapter.

Checking floor hinges are the first types that we will take up. In

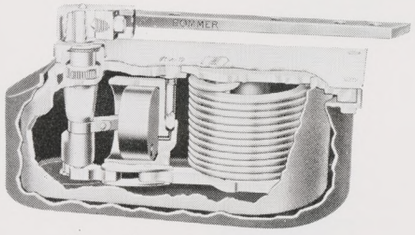


Fig. 1—Torsion Spring type, single-acting floor hinge.

both the Elementary and Intermediate Courses we mentioned those single torsion spring types, both single and double-acting that are used in residence work, as shown in Fig. 1.

The Advanced Course, however, has to do with all types of public buildings. While many of these same floor hinges are used on interior doors in many places for all types of public buildings, I do not think it will be necessary to discuss them further in this chapter.

Rather, we shall turn our discussion to the heavier types of floor hinges. For many years the Oscar C. Rixson Co. held patents and manufactured exclusively the double-acting floor hinges for entrance doors, illustrated in Fig. 2. Incorporated in this hinge are two

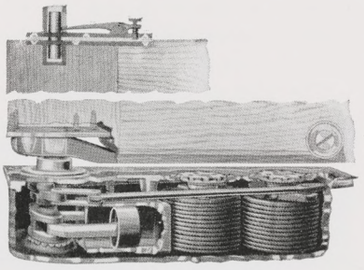


Fig. 2—Torsion type, double-acting floor hinge.

springs and two checks which can be adjusted independently. Where the wind pressure is much stronger on one side than the other, this is an important feature.

Within comparatively recent years Rixson patents ran out and other manufacturers have entered this field, notably such firms as Bommer Spring Hinge Co. and Shelby Spring Hinge Co. Manufacturers recommend various sizes for various conditions. Refer to your manufacturer's catalog for proper sizes to suit various conditions. These type hinges are always furnished with cement boxes to be embedded in the floor so that the hinge itself can be removed when necessary.

These same manufacturers make these same type compression spring hinges for single-acting doors as shown in Fig. 3. They are the same quality, heavy duty type as Fig. 2, save that they are made for single-acting doors. No other hinges are required with either of these types. However, on extremely high, single-acting doors an intermediate pivot, such as Fig. 4, is used.

Norton-Lasier Co., I believe, are the originators of the second type of concealed floor closers. In this type, shown in Fig. 5, the door is first hung on butts, center or offset pivots as the situation may require so that the mounting of the door itself is independent of the

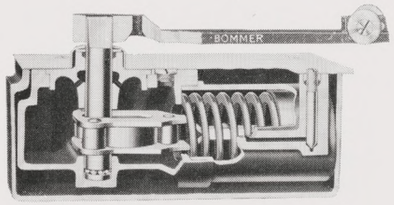


Fig. 3—Compression type, single-acting floor hinge.

closer mechanism. This closer mechanism is connected with the door, and exerts its power through a lever arm having one end at-

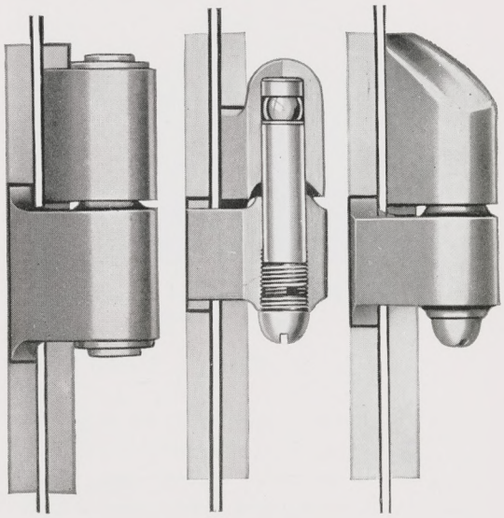


Fig. 4—Intermediate pivot for use with floor hinge.

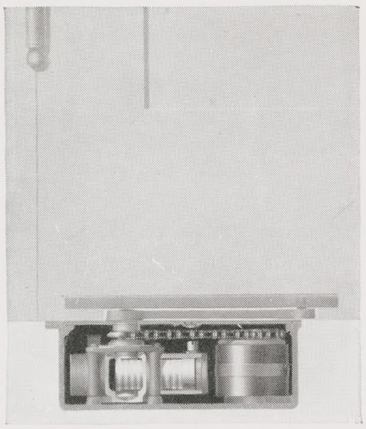


Fig. 5—Concealed floor closer for single-acting doors hung on butts.

tached to the closer spindle and the other engaged in a track concealed in the under edge of the door. The closing power is applied at some distance out from the hinge side for greater efficiency. This type is available for either single or double action doors.

The third type of door control that we shall consider is the overhead concealed closer, Fig. 6. The closer is installed in the head jamb or transom bar at a proper distance out from the hinge in

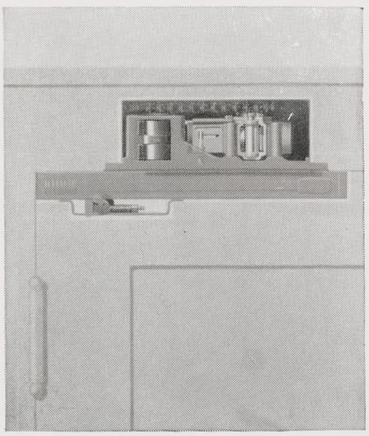


Fig. 6—Overhead concealed door closer.

order to afford the desired leverage. The spindle, projecting slightly downward through the casing, is connected with the door by means of a lever arm, which in some cases is concealed and in others visible.

The door may be hung on butts or on center or offset pivots, and is available in single or double-acting action. It is extremely important with the use of this type closer to be sure that the architect details his head jamb or transom bar to receive the device.

The fourth type of door control, shown in Fig. 7, is a concealed side jamb closer. This device is installed in the side jamb of the door frame with connecting parts attached to the hinge side of the door. This device was formerly manufactured by C. H. Newton Co., but the patents were later purchased by the American Hardware Corporation who have developed a similar device for use with lavatory doors which we shall discuss in a later chapter.

The fifth of the five devices we shall study in this chapter, as shown by Fig. 8, is a door control concealed in the door. There are several varieties of this device made for installation in the door

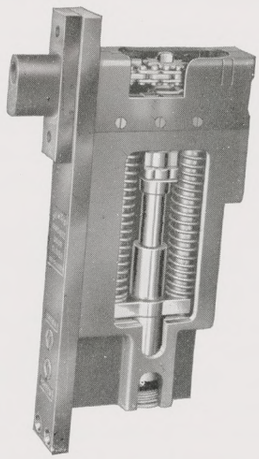


Fig. 7—Side jamb concealed door closer.

itself either in the top rail at a distance from the hinge side or in the stile at the hinge side.

These closers employ lever arms for connection with the door casing. Some of the arms are concealed when the door is closed,

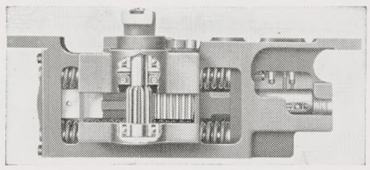


Fig. 9—Cut open illustration of semi-concealed closer.

others are jointed like those on surface closers and remain exposed. In some cases the checking arms are concealed, in others they are only partly concealed in the top rail of the door.

Recently the American Hardware Corporation has developed a new type of semi-concealed closer such as is shown in Fig. 9. It is made in one size, but fits various sized doors by changing the size of the springs. For further information on this I would refer you either to P. & F. Corbin or Russell & Erwin, the two divisions of the American Hardware Corporation which distribute this new product.

As far as I know, both the fourth and fifth types are recommended by the manufacturers as

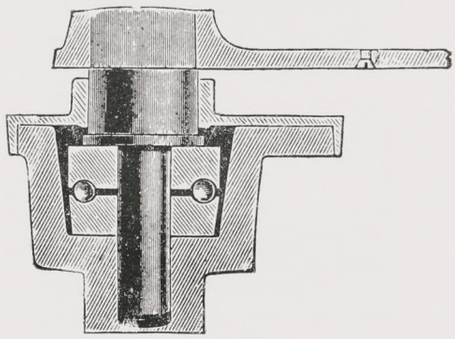


Fig. 10—Pivot hinges for doors up to 2500 lb. and 2 to 4 in. thick.

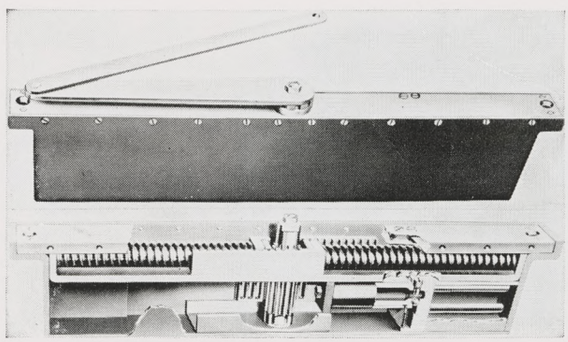


Fig. 8—Concealed door closer — installed in door.

a general rule for use on interior doors only.

Occasionally the builders' hardware engineer will be faced with the problem of hanging large doors of extreme weight that any regular butt hinge or floor hinge cannot handle, such as large doors on an armory. Then a floor pivot, such as is seen in Fig. 10 should be used. These are made in various sizes to swing doors weighing up to 2500 lbs.

One manufacturer of door control devices, in response to my letter of inquiry, outlined six very important rules that every builders' hardware engineer should follow in specifying or furnishing

Fig. 11 — Cast threshold especially made for use with floor hinges.

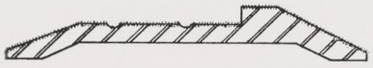


Fig. 12—Cast bronze threshold for special condition.

these devices. I give you these six rules as follows:

1. Of all door closing devices a floor hinge requires greater care in selecting the correct type and size, due to the fact that it is usually built in or becomes a permanent part of the door opening or frame. It is not easy to replace with a different hinge in case the first selection is incorrect and, therefore, it is most important that the original specification be right.

2. With a thorough understanding of floor closers the builders' hardware engineer can assist the architect in writing specifications for floor hinges so that they will be correctly described as to type, size and number. This will insure all bids being based on the same material with no question as to what is required.

3. A careful examination of the blueprints by the builders' hardware engineer should be made before attempting to specify types or sizes with particular reference to the opening as it is affected by drafts and other possible factors which would change the operation of the closer. Carefully check door size, weights, materials that the doors are made of and whether they are interior or exterior doors. Do not take the manufacturer's specifications on his particular hinge too literally. Conditions surrounding the opening, construction of the doors and operating conditions must be taken into consideration when determining the proper size and type of floor hinge to be specified. (For example, suppose the manufacturer recommended a No. 2 closer for an inswinging entrance door not over 2 ft. 6 in. wide. If the builders' hardware man after examining the blueprints found that this door was located on a corner of the building, which was subjected to heavy drafts occasioned by an elevator well, large lobby, etc., he should disregard the manufacturer's recommendation and specify a size No. 3.)

4. It is most important that this correct size as described above be established and specified as when you under-size the closer, it is handicapped in its work, does not give good operation and it is practically impossible to remove and install one size larger due to the construction detail involved. This same condition would apply to over-sizing the closer, which would make for difficult door operation.

5. It is well to keep in mind that in batteries of doors with no mullions, the maximum amount of available opening can be secured by the use of the center-hung type hinge and that in single openings the maximum amount of available opening can be secured by the use of off-set type pivots or hinge which will permit the door to open back to 180 deg.

Fig. 14—Flat drawn brass threshold.

6. Keep in mind when specifying the various types and sizes of hinges that every floor hinge at some time is going to require service and it should be made readily accessible and not buried under entire thresholds which have to be removed or buried in stone sills or concrete floors in such a way that they cannot be removed easily.

Thresholds

Threshold conditions are of tremendous importance in connection with the use of floor hinges. Therefore, it would seem a logical time to discuss this subject.

Fig. 11 shows a threshold manufactured by one of the floor hinge manufacturers. It is made to conform exactly to that manufacturer's floor hinge and eliminates the necessity of cutting the threshold on the job to receive the hinge.

Builders' hardware engineers should always try to get thresholds specified with the builders' hardware. These can be secured in many grades, shapes, sizes and tops.

Fig. 12, for example, shows a cast bronze threshold of unequal sides designed to take care of certain conditions. Fig. 13 is a popular drawn brass threshold with corrugated top to prevent slipping.

Fig. 14 shows a flat drawn brass threshold with beveled edges. Occasionally, particularly on inexpensive school jobs, a cast iron threshold may be used.

Details must be checked with

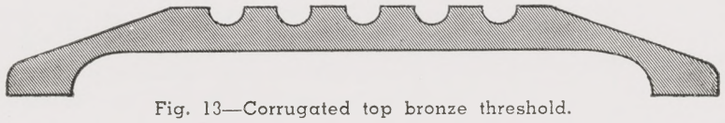


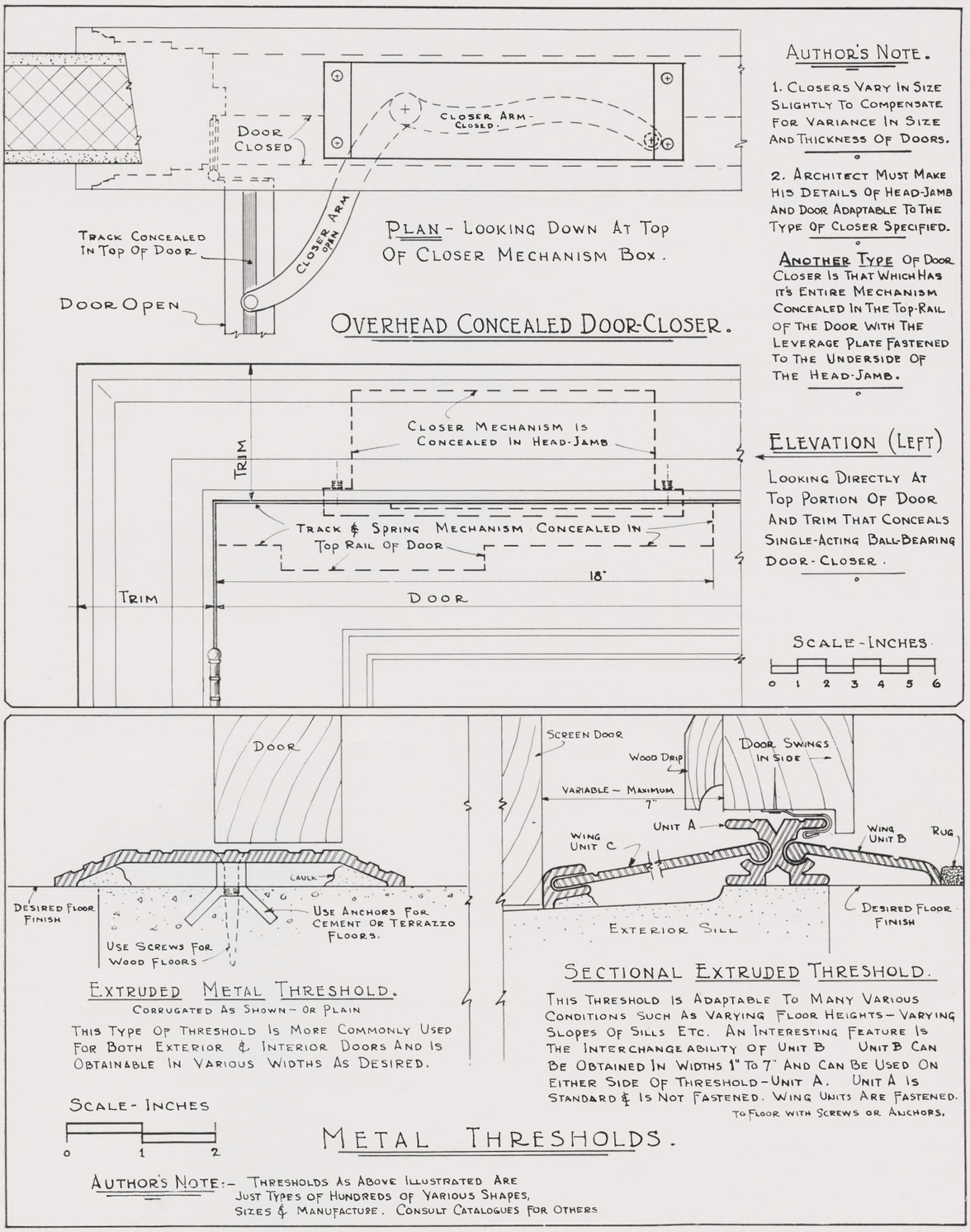
Fig. 13—Corrugated top bronze threshold.

HARDWARE AGE

Comparative Chart of Floor Hinges— Concealed and Semi-Concealed Door Closers

		Bommer Spring Hinge Co.	P. & F. Corbin Company	Norton Door Closer Co.	L-C-N Norton Lasier Company	Oscar C. Rixson Company	Russell & Erwin Mfg. Co.	Shelby Spring Hinge Company	Yale & Towne Mfg. Co.
1	Single-Acting Checking Floor Hinges, Offset Type—Light	88			12	18		8	
2	Single-Acting Checking Floor Hinges, Offset Type—Medium	88½			14	20 and 120		18	
3	Single-Acting Checking Floor Hinges, Offset Type, Heavy	89			16	25 and 125		19	
4	Single-Acting Checking Floor Hinges, Center Hung Type—Light	C88			02	18½		C 8	
5	Single-Acting Checking Floor Hinges, Center Hung Type—Medium	C88½			04	21		C18	
6	Single-Acting Checking Floor Hinges, Center Hung Type—Heavy	C89			06	26		C19	
7	Single-Acting Checking Floor Hinges, for Use with Butts—Light				2	318½			
8	Single-Acting Checking Floor Hinges, for use with Butts—Medium				4	321			
9	Single-Acting Checking Floor Hinges, for use with Butts—Heavy				6	326			
10	Double-Acting Checking Floor Hinges—Medium	86	623		44	30		22	
11	Double-Acting Checking Floor Hinges—Heavy	87			66	40		23	
12	Single-Acting Overhead Door Check, Concealed within the Transom Bar—Medium				204	220			
13	Single-Acting Overhead Door Check, Concealed within the Transom Bar—Heavy				206	225			
14	Single-Acting Check—Type to Conceal in Door Either Side or Top Rail for Interior Doors Only			C-33-S for metal doors C-33-W for wood doors	303	100			03W for wood doors 03 for metal doors
15	Checking Pivot for use with ¾″ to 1¼″ thick doors		Corbin-Newton 100 SF			350	Russwin-Newton 100 SF		
16	Checking Pivot for use with 1⅜″ to 1¾″ thick doors		Corbin-Newton 101 SF			350	Russwin-Newton 101 SF		
17	Semi Concealed-Partially Mortised into Rail-Heavy Duty Door Closer		400				400		

NOTE—While every care has been taken, we assume no responsibility for correctness of these comparisons furnished by the manufacturer.



Overhead door closer and threshold details.

due care in furnishing any threshold. The type of floor, proper screws or expansion bolts or other devices to hold the threshold in place must be furnished with the order.

In sending in threshold measurements the length given should be exact, allowing metal to come long enough in order to go under the stops at the frame to the full length of the opening. The width must be sufficiently wide to cover the joint of the two types of floors that the threshold covers.

In the limited space of this part of the chapter it is quite out of the question to illustrate all types of thresholds. Further study should be made from your sources of supply.

Chapter 38—*Advanced Course*

MASTER-KEYING PROBLEMS

WE now take up a most fascinating subject — master-keying. To me the keying problem on every public building is one of delight and interest. Working out the most advantageous keying arrangement for the owner is one of the most distinctive services rendered by a hardware engineer. Making the system as simple as possible in order to give the owner the proper control should, I think, be first emphasized in our chapter on this subject.

Contrary to the understanding of many, master-keying a lock does not give it additional security. It works out just to the contrary. The individual security of each lock is not as secure against possible key interchange or unauthorized entry by picking as a lock that is not set to a master key.

Keep the above statement of fact in mind. The impaired security is an inherent weakness in any master-keyed lock regardless of the manufacturer. Therefore, as I suggested earlier in this chapter, make your master key requirements as simplified as possible, even to the extent of dividing a complicated system in two where owner will permit it, controlled by two different master or grand-master key systems.

We shall consider first the master keying of cylinder locks. In the Elementary Course you may remember I went to some detail to suggest keying locks alike for exterior doors of the modest home.

Keying alike does not add to the cost. It means that there is only one chance in about 100,000 locks of the same manufacturer and keyway of having duplication. So manufacturers usually say, "changes practically unlimited." Then the third reason is that the security is greater as explained above.

In a six-tumbler cylinder the last tumbler acts as a guard and rest on the end of the key. There are five cuttings on the key to engage the tumblers or bearings of the cylinder itself.

Perhaps you can more quickly grasp what I am driving at by stating if a cylinder had only one bitting in the key, there would be only seven different changes possible, this being made by the depth of the cut in the key.

Key Change Possibilities

Watch how this key change possibility grows with five bittings.

With 1 bitting key you would have 7 changes.
With 2 bitting key you would have 49 changes.
With 3 bitting key you would have 343 changes.
With 4 bitting key you would have 2401 changes.
With 5 bitting key you would have 16,807 changes.

You can readily see how the changes are practically unlimited.

In the accompanying chart you will notice that 100,000 changes are possible for one complete system.

Master-keying, grand-master-keying, and great-grand-master-keying are accomplished by what is commonly known as splitting the pins. This is the reason for the inherent weakness of any master keyed lock, regardless of manufacturer.

The more intricate the system the more the splitting of pins is necessary. A master keyed lock is less secure than a lock set to a change key only. A grand master-keyed lock is less secure than a master-keyed lock, and a great-grand-master-keyed lock is less secure than a grand-master-keyed lock. Have I made that plain?

These keying systems are necessary though and are desirable in most every kind of public building.

Where there is a single building, a comparatively simple master key system may be worked out.

Take an apartment building, for example. Here the Maison system is used whereby every apartment entrance door is keyed differently, but all apartment entrance doors operate the main entrance door to the building. The manufacturer leaves out the last two or three tumblers of the cylinder on the main entrance door to the building and thereby does not lose the security of the locks to the individual apartments. However, most managers of apartments insist on master-keyed locks even though the Maison system is in use, so they can enter the individual apartment in case of trouble, such as to the plumbing or fire or to show the apartment.

There may be 100 apartments and certainly he does not want to carry 100 different keys. Always remember to add for the cost of master-keying for every single cylinder that is master-keyed costs extra. If there are two cylinders in one lock, you must add the cost of master keying both cylinders.

Then there is perhaps a big plant. One of the most interesting grand-master-keyed jobs I ever worked out was a number of years

ago for the Kelly-Springfield Tire Co. plant at Cumberland, Md.

The office building had to be master-keyed separately from the factory. The factory had separate divisions which had to have separate master keys, as one group of sub-officials were not allowed keys to any other part of the plant than the one in which they had control.

Each of these different groups had different master-key systems, but the high officials who wanted to go into any part of the office or factory required a grand-master-key which permitted them to enter any lock in any building at any time. This was a grand-master-key system.

Grand-master-keyed cylinders take a higher extra cost than a master-keyed cylinder. Don't forget to figure that cost when you figure the job.

There is nothing more different or strange about the Kelly-Springfield plant than will be found in thousands of plants throughout the country. I use these personal experiences merely to illustrate the problem.

The Cleveland Terminal Tower Buildings at Cleveland, on which I had the privilege to have some small part, also illustrates the great-grand-master keying system. It was the most intricate key arrangement I have ever been permitted to know about.

The Terminal itself is 52 stories high. The Medical Arts Building. The Midland Bank Building, The Builders' Exchange Building, the Higbee Store, etc. All of these buildings with thousands of locks installed are tied together with their individual keys for each lock. There are master keys for the various floors of each building. Each building is grand-master-keyed, and finally there is a great-grand-master key system for the entire group of buildings permitting the owners to enter any door of any building of the entire group.

Few students of this course will have any opportunity to serve such an installation for such groups of buildings, but it is interesting to know as our chart pictures it, that it is possible to have 100,000 locks with 50 different master-key systems, 20 grand-master-key systems, all tied up to one little great-grand-master key that will open all 100,000 locks.

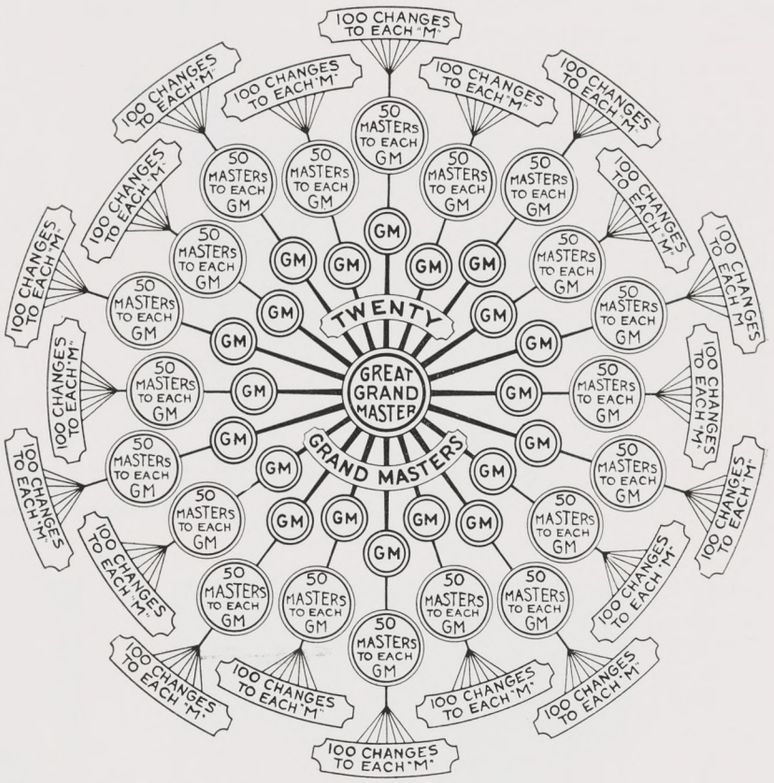
Keying for hotels is a story in itself and will be discussed in our chapter on hotel hardware.

Bit key locks, too, can be master and grand-master-keyed. This is done by means of the lock tumblers and the wards guarding the key way on the case of the lock.

It is not possible in the case of bit key locks to get anywhere near the key changes you can get on cylinder locks, nor is it often necessary, except on hotel locks, to grand-master-key bit key locks, though it can be done.

When ordering master-keyed locks explain to your factory with fullest detail the requirements of the system if there is any likelihood of additional buildings being added to a present system at some later date. Advise your factory so that they may make adequate provisions when the system is first being laid out.

This subject is indeed too big to cover in any single chapter of this course, but if from reading this it has challenged your imagination to a point that you will carefully consider the advantages and possibilities, that is all I can expect.



Courtesy The Yale & Towne Mfg. Co.

This chart shows how 100,000 doors could be controlled with a single key, the maximum practical number of changes in a master key system.

Chapter 39—*Advanced Course*

FIRE and PANIC EXIT DEVICES

AMONG the many problems facing the builders' hardware engineer is that of proper protection of human lives. All types of public buildings should be equipped with proper fire and panic exit devices. There is often more danger from panic than there is from fire itself. The building may be called fireproof, but it is surprising how many so called fireproof buildings have been entirely gutted by fire.

As long as I live I shall never forget one in a building directly back of our store in Pittsburgh. A film building called fireproof was gutted by fire and more than 20 girls lost their lives.

Such catastrophes as the Iroquois Theater fire in Chicago where 596 lives were lost, and the Collingwood School fire in which 174 children died will bear out the definite responsibility that is every builders' hardware engineer's who specifies or equips fire and panic bolts for the exit doors of any public building.

In so doing, you are rendering a real contribution to humanity. It becomes your duty to do it right. Carelessness or ignorance on your part would be a sad alibi if you failed to specify or equip such doors with suitable devices, thereby causing the loss of human lives.

Leading manufacturers in this field are:

Hugh Elmer Clark, P. & F. Corbin, Monarch, Reading Hardware Co., Russell & Erwin, Sargent & Co., Sargent & Greenleaf, Steffens-Amberg Co. and Vonnegut Hardware Co. with its Von Duprin fire and panic exit devices. Many manufacturers make a limited line of devices, but those mentioned above are among the most widely known.

It is not the purpose of these articles to pass judgment on any of them. Sargent & Co. use a patented, roll back, latch feature.

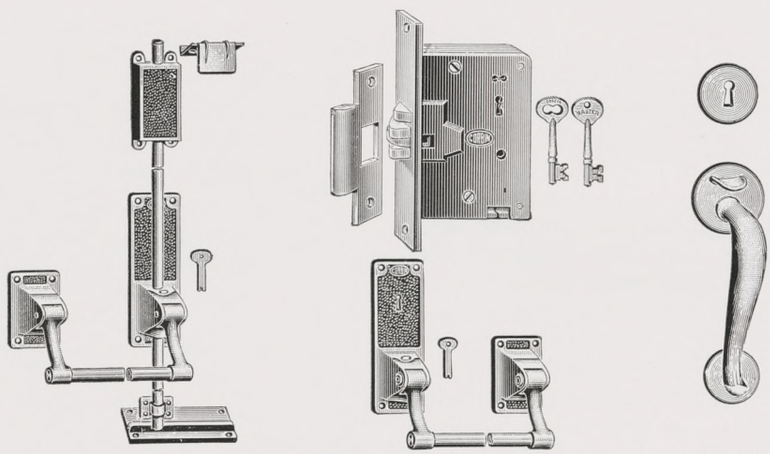


Fig. 2—Exit device for pair of doors—handle outside.

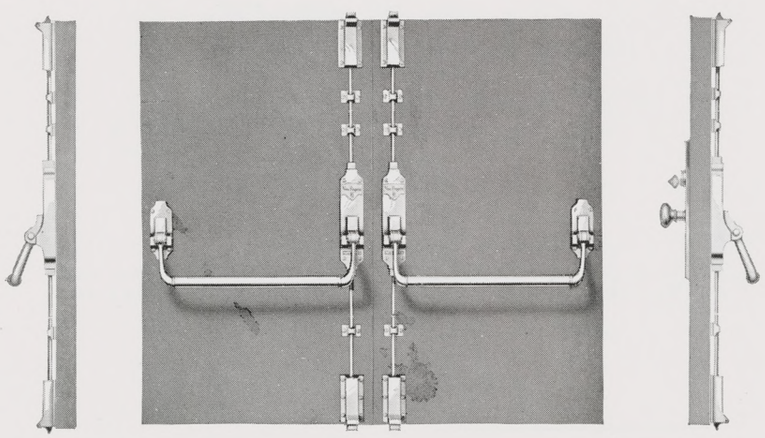


Fig. 1—Exit device for pair of doors—knob outside.

Russell & Erwin operate the bar to a hub in the lock instead of the straight lift latch idea. Von Duprin uses drop forgings. Many of the companies noted above use double-acting bars so that a pull up as well as a push down will release the doors. Others use a single acting bar and so on.

We will leave it to the individual manufacturers to explain their own particular individual features. We do not endorse or condemn any of these special features in these articles. We merely are pointing out various differences.

There is nothing particularly complicated about fire and panic exit devices. Many of the lock actions are the same as you find in mortise locks. The bolt actions used in exit devices are the same as common bolts, the difference being that they are so unified that the simple pressing of the cross bar releases instantly the bolts and lock in one operation. Do not become scared about this subject. Just view it in the light of this paragraph and the subject will not seem so difficult.

In the illustrations which accompany this chapter are shown the more popularly used types of devices. It would be impractical to attempt a description of all types so we will discuss only the more commonly used ones.

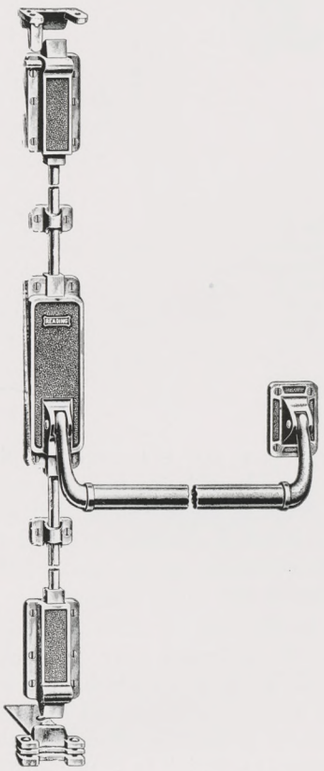


Fig. 3—Exit device for single exit door. No hardware outside.

Fig. 1 shows an exit device for a pair of doors where it is desired to fasten both doors top and bottom. One of the devices has an outside locking feature with knob operation from the outside.

Fig. 2 is an exit device for a pair of doors where it is desired to fasten one door top and bottom, the active door with a mortise lock operated by the cross bar inside and a store door handle outside. This can also be secured with a cylinder lock.

Fig. 3 shows an exit device for a single exit door for exit only, no hardware on the outside to permit entrance.

Fig. 4 is an exit device for a single exit door using a mortise lock with a cross bar release inside and knob and cylinder operations outside to permit entrance. This type can also be secured with handle operation as shown for the active door of Fig. 2.

Fig. 5 shows an exit device for single doors using the rim type eliminating the mortise lock such as used in Fig. 4.

Fig. 6 is what we commonly call a paddle device. You will notice that there is no cross bar extending across the door. Naturally, it is less expensive but it also lessens the degree of safety because a paddle instead of a bar clear across the door acts as the releasing feature.

Fig. 7 is the most inexpensive top and bottom exit device. It is made in malleable iron as well as brass and will do where exit only is required and where no large number of people would ever use the exit. This type of bolt should never be used where it is possible to sell the better grade of bolt but they do very well *if* conditions are as described in this paragraph.

For a pair of doors, two of

Fig. 5—Rim type exit device.

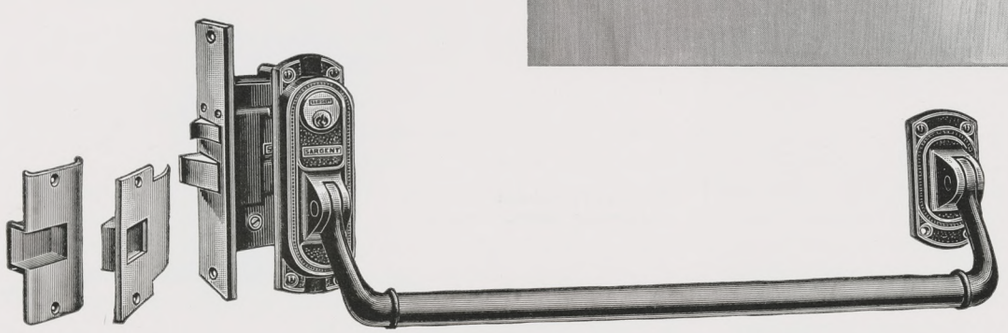


Fig. 4—Exit device for single door. Knob or handle outside.

Fig. 6—Paddle bolt for exit only. No outside hardware.

these devices may be used or a double arm device can be furnished with a cross bar only operating the other bolt.

Study your manufacturer's catalog. Some use hinged latch bolts top and bottom of the vertical rods. Some of the locks have a night latch feature with retracted latch bolts and auxiliary latches when the doors are unlocked. Some have the top and bottom bolts retracted until the door is closed when a trigger releases the bolts into the strikes. Some lock through inside cylinder control and others only from the outside.

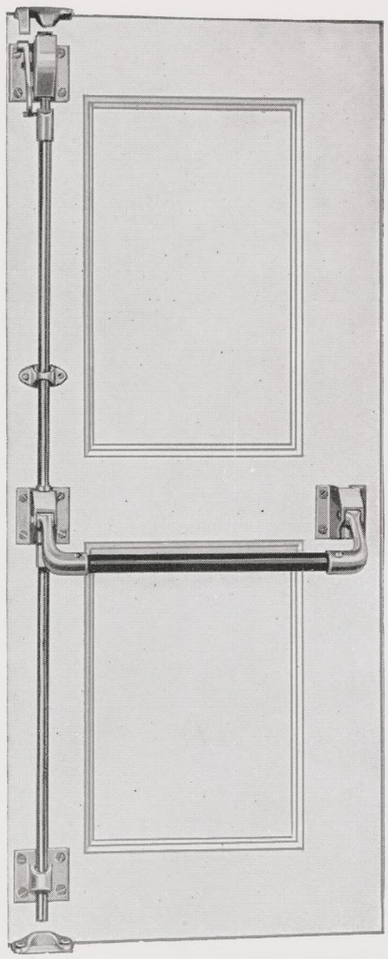


Fig. 7—Gravity bolt for exit only. No outside hardware.

Some cross bars are equipped with dogging devices in the end of the bar. Separate dogging devices, such as shown in Fig. 8, can also be furnished. In this case always try to sell *one at each end of the bar or two instead of one.* It will be much more satisfactory.

In the city of Pittsburgh, several years ago, devices for all city schools were specified to have the cross bars with a 3½ in. clearance when depressed so that it would be impossible for anyone's arm to wedge between the bar and the door, preventing release of the device.

Extreme care must be taken in ordering all devices. Always give the following information:

Width of each door.
Height of each door.
Width of Stile.
Thickness of door.
Hand of door from outside—in case of pairs of doors specify which is to have lock.
Detail of astragal in pairs of doors.
Thickness of stops.
Type of threshold.
Catalog number of devices required.
Finish.
If for hollow metal doors specify machine screws.

In case you are using another manufacturer's cylinder than the one making the device, order without cylinders *but be sure and advise exit device manufacturers whose cylinders will be used with the devices.*

Many manufacturers of exit devices also make thresholds like Fig. 9, but it is always wise, in

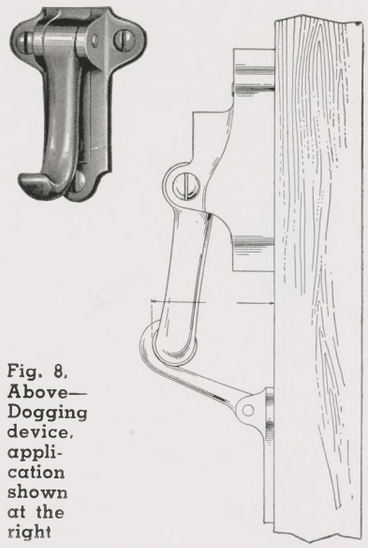


Fig. 8, Above—Dogging device, application shown at the right

case you are not ordering the thresholds with the bolts, to send a detail of the threshold that will be installed. Sending a detail of the condition at the head of the door is also good practice.

In the case of pairs of doors, double astragals are generally used, a detail of which showing the amount of bevel will help the factory greatly in furnishing the devices to the job in proper shape.

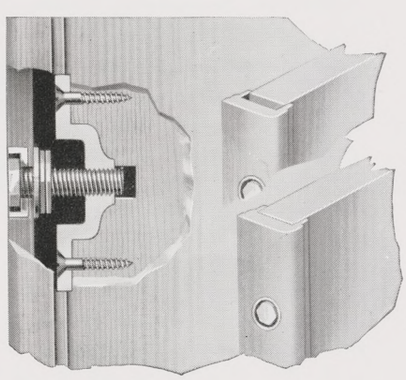


Fig. 10—Compensating astragal fixture.

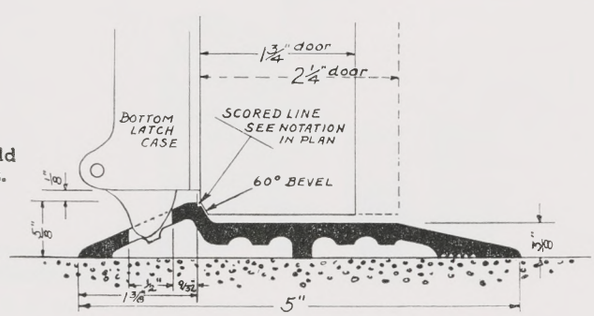
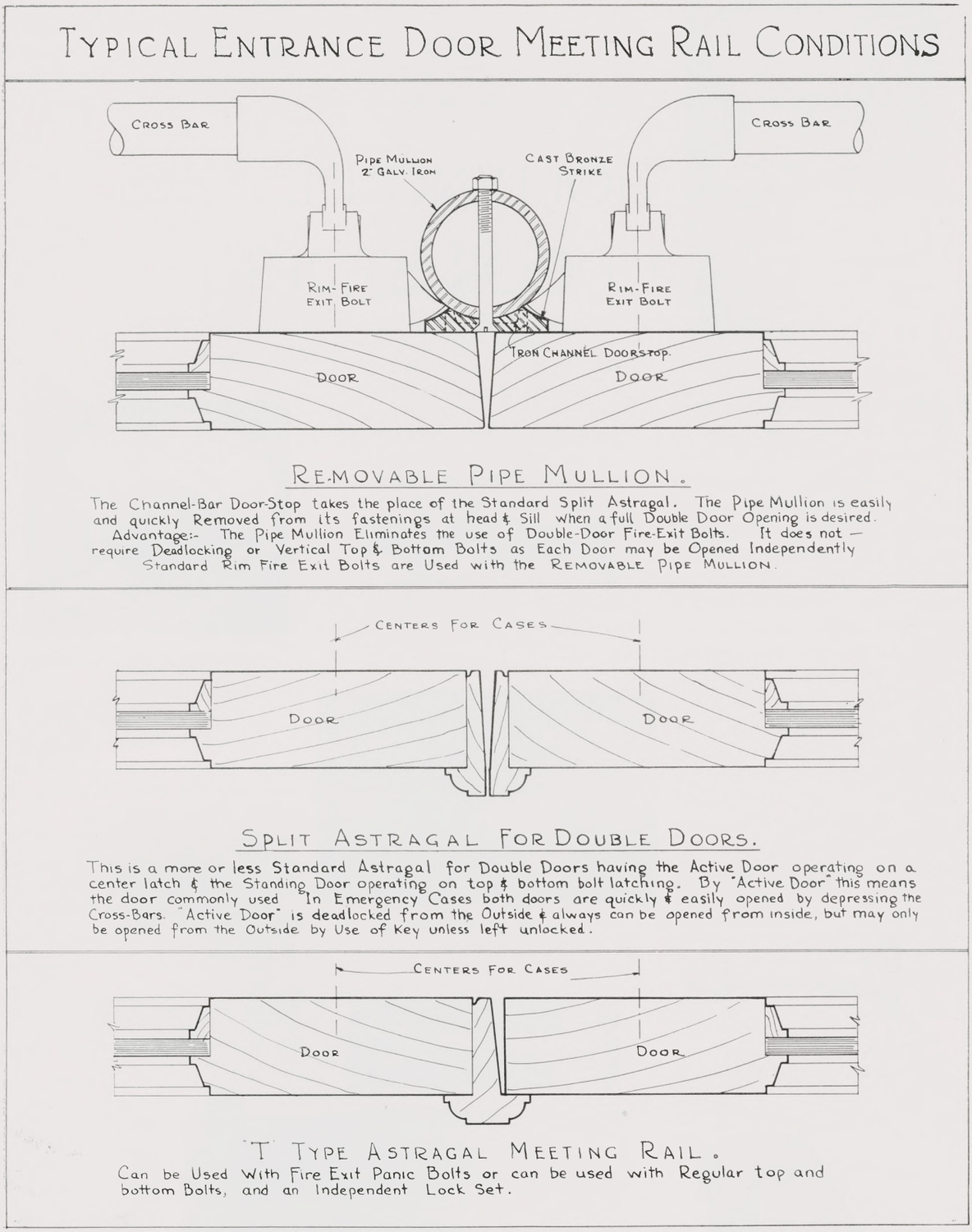


Fig. 9 — Threshold for panic bolts.



Typical details—meeting rails for exterior doors.

Some manufacturers have developed a special compensating type astragal such as is shown in Fig. 10. Some manufacturers are making metal mullions to use in connection with exit devices.

In a general way this will give you an outline of the more commonly used types of fire and panic exit devices, the conditions to watch for, how to order, etc. Again I suggest further study of the subject from your manufacturer's catalog, or with their representative personally. Keep in mind as I have tried to emphasize the seriousness of the work you are doing protecting human lives.

Chapter 40—*Advanced Course*

DOOR HOLDING DEVICES and DOOR STOPS

THERE just does not seem to be any type of public building that I can think of which does not require door stops and door-holding devices.

In the Elementary Course some attention was given the subject of door stops. However, when we consider this subject in connection with public buildings in the Advanced Course, we find that we must use heavier stops and holders.

For example—Fig. 1 shows a heavier door stop, but of the same type we studied in the Elementary Course, while Fig. 2 shows a heavier floor stop. This is anchored in the floor with three screws.

Then we have the dome type bumper — Fig. 3. This type bumper will not twist out of alignment as it has a lug cast on the bottom and requires but one screw and expansion shell. The round top and heavy rubber face makes it very practical.

It is extremely important, particularly in public buildings, to know to what kind of floor or base the stop is to be attached. On wood floors or base, of course, the regular wood screws are all that is necessary, but most floors and bases in public buildings are of some other composition than wood and require lead shields or expansion bolts and, in some cases, a toggle head and machine screws to fasten in the wall or floor.

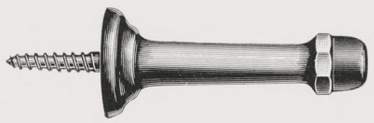


Fig. 1—Cast door stop, 3⅛ in. projection.

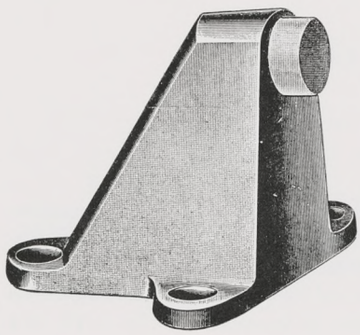


Fig. 2—Extra heavy door stop.

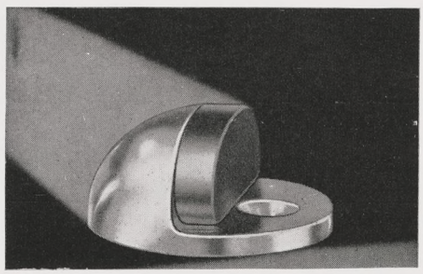


Fig. 3—Dome type bumper.

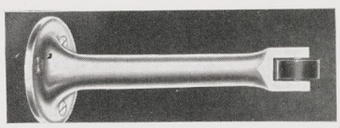


Fig. 4—Two door roller bumper.

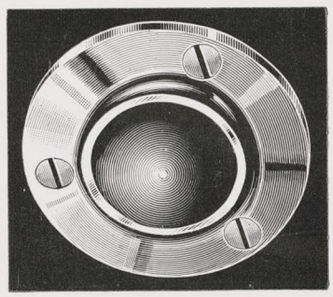


Fig. 5—Flush type bumper.

Another type bumper is needed where two doors contact each other and the knobs interlock or strike. The two door roller bumper (see Fig. 4) should be applied to the top rail of one door so that the rubber roller contacts the other door and does not mar the door and pushes it out of the way.

The flush type bumper, Fig. 5, has its place where you desire to

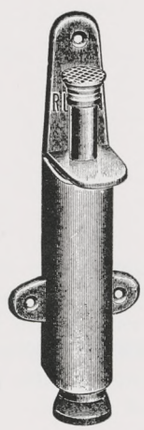


Fig. 6—Plunger type door holder.

do away with a bumper projecting too far from the wall. They are made in all sizes to suit various conditions.

Our problem is not only that of stopping the door, but of holding it open and stopping it at the proper point of opening especially on entrance and vestibule doors. The builders' hardware engineer is confronted with many complicated problems such as ramps,

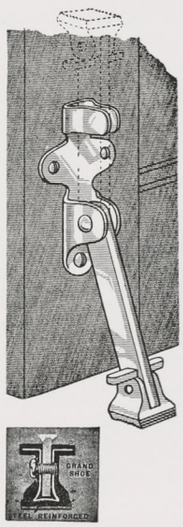
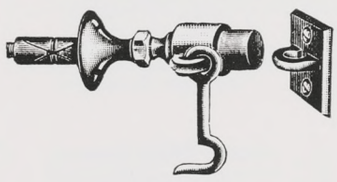


Fig. 7—Silent lever type door holder.

steps or raisers, doors set in reveals and batteries of doors opening back to back. Much study has been given to this in recent years and devices can now be had to meet all types of construction.

You are all familiar with the standard plunger type door holder (Fig. 6). It has long been an old standby. It is made in steel and wrought brass or bronze as well as cast iron, brass or bronze. This type, however, is not nearly so much used since the introduction of the lever type door holder shown in Fig. 7. This is made in various designs and lever lengths by a large number of manufacturers, each of whom claims certain features which you will have to get from a study of the manufacturer's catalog.

Next, let us consider the combined stop and holder. As we have studied door stops and door holders we will now combine the stop and holder as shown in Figs. 8-9. We take the standard door



Right Hand

Fig. 8—Wall door stop and holder

stop and apply a hook so as to engage the door and hold it open.

Still another type is the automatic push-pull, which combines the door stop and holder in one, for wall installation, as shown in Fig. 10. A firm push engages it and a pull releases it. This type is used on classroom doors in schools and institutions.

Fig. 11 has an advantage over the plain type in that it engages

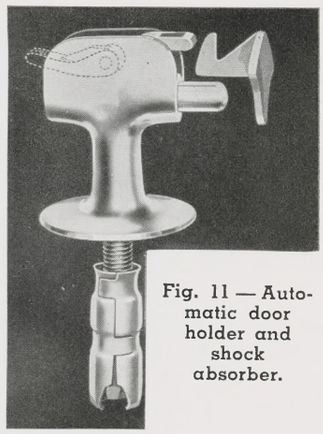


Fig. 11 — Automatic door holder and shock absorber.

and holds the door automatically. It has a bronze plunger instead of rubber as a shock absorber. To hold the door open, one flips the tongue forward and the door in striking the floor member automatically engages. When the door is released, the tongue falls back to a neutral position.

There are a number of other types of door holders, of course. Fig. 12 shows a type cabin door hook.

Then there is the friction-type door holder which is made for wall or floor and has been on the market for years. It is shown in Fig. 13. The most recent development in friction door holders is the concealed or surface-friction type, which is shown in Fig. 14. The friction shoe is adjustable to wind or draft conditions and prevents the door from slamming shut. It stops the door at the desired point of opening and holds

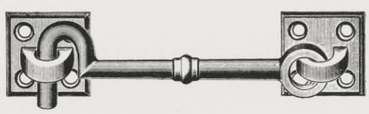


Fig. 12—Cabin door hook.

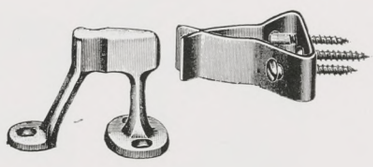
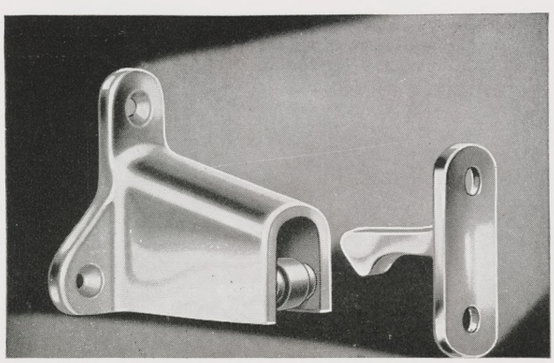


Fig. 13—Friction door holder, floor type.



Figs. 9 and 10—Semi-automatic action door stop and holder.

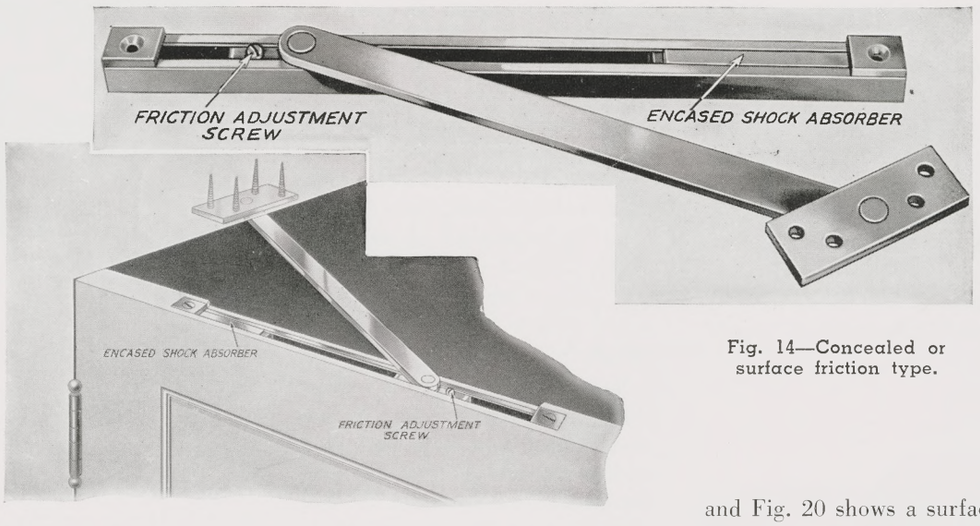


Fig. 14—Concealed or surface friction type.

it in any open position. The channel is of extruded bronze and there is a shock absorber in the end of the channel to relieve the strain on the hinges.

A ball-type door holder, shown in Fig. 15, is a type which is inserted in the floor, usually in a cement box. It is adjustable to any angle. We frequently have cases, particularly on entrance doors, where doors come together when opened in batteries and Fig 16 shows a stop and holder for use between such doors.

In cases where the door swings over a step, the holder should be high enough to reach above the height of the stop and engage the door, Fig. 17 or Fig. 18, either of which will accomplish the purpose.

Now there is one other type of door holder that I am going to present in this chapter. That is the overhead type of holders and stops.

There are certain advantages in overhead door holders such as the appearance and safety standpoint, the stumbling hazard for example is eliminated.

Fig. 19 shows a concealed type for single or double-acting doors

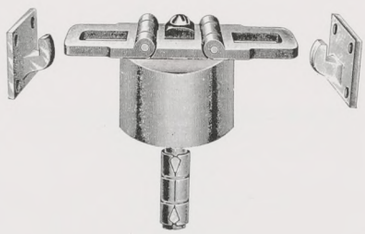


Fig. 16—Double door holder for two doors.

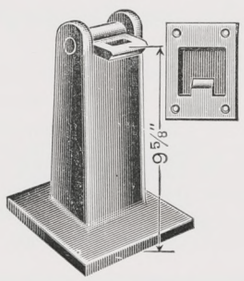


Fig. 17—Automatic door holder with 9 in. reach.

and Fig. 20 shows a surface type. The concealed holder is fast becoming the better type holder for entrance and vestibule doors. It serves to stop the door at the proper point of opening and when one turns the small control knob, which is all that is visible on the door, the holding member automatically engages and holds the door open. It is also automatic in its release. The channel requires a small mortise in the top rail. Fig. 20 shows a holder with the same automatic features of engaging and releasing the door, the neutral position being for surface application. This is desirable on certain types of doors.

Another very popular type is that as shown in Fig. 21. This has the combination of stop and shock absorber as well as the hold-open feature. These are made in malleable iron as well as cast bronze. Consult your manufacturer's catalog for further information regarding them.

A few years ago the dealer's selection of door holders and door stops was very limited, but today,

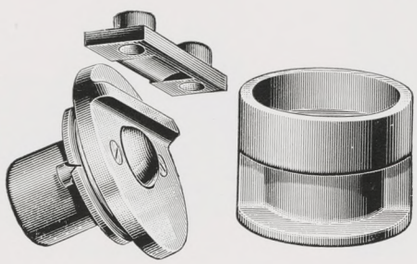


Fig. 15—Ball type door holder.

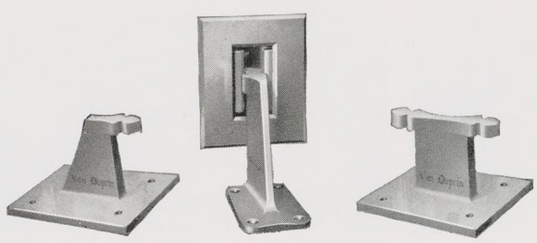


Fig. 18—Bronze door holder.

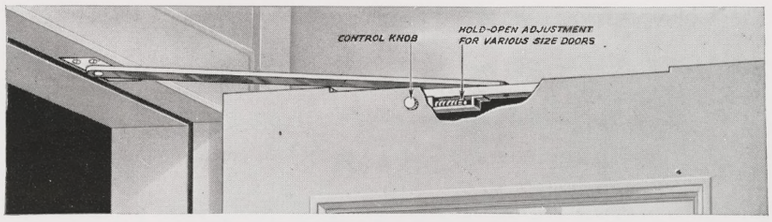


Fig. 19 — Concealed overhead door holder.

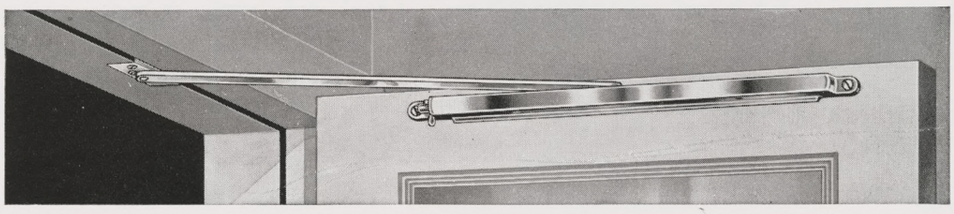


Fig. 20—Surface type overhead door holder.

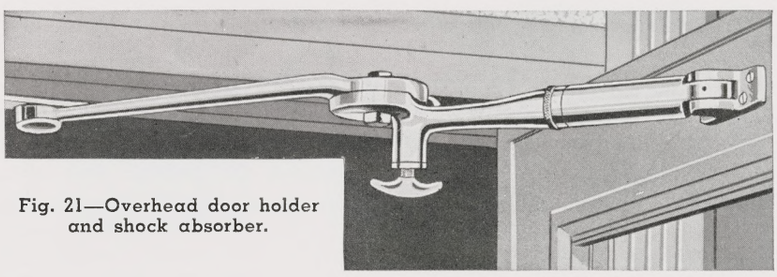


Fig. 21—Overhead door holder and shock absorber.

as you can see from the illustrations in this chapter alone, there are items available with individuality and quality that answer every problem in door control.

My final word of warning on this subject would be to again repeat my earlier words of instructions in this chapter. Be sure and furnish the proper size screws or anchorage.

A chain is only as strong as its weakest link and the same axiom applies to any door holder or door stop.

Chapter 41—*Advanced Course*

CUPBOARD HARDWARE for PUBLIC BUILDINGS

ON almost every type of public building, you will find cupboards and drawers which must be equipped with hardware. The information on this subject gained from the Elementary and Intermediate Courses will, of course, help you, but additional information is necessary that you may be properly trained to handle this part of the job.

In the first place, these openings are subjected to much more severe usage than they usually encounter in private residences and, therefore, hardware that is suitable for residence work is not necessarily suitable for public buildings. Be very sure that all your cupboard hardware is strong and substantial.

For example, where a light weight butt would serve indefinitely on a 1⅛-in. book case door in the library of a home, it would be inadequate for a 1⅛-in. book case door in a school. The regular weight butts (not light) should be used. Attention to detail in using the proper size is, of course, very important, but the use of the proper weight butt is also important.

Here is another example: you might satisfy the owner of a private residence by using an elbow-catch on the inactive door of a pair of book case doors in his library, but it would not be satisfactory or suitable to use the same type of elbow catch on the book case of a doctor's office in a hospital. The bolts applied on the inside of the inactive door are sturdier and make for much more secure locking of the cupboard which is a very desirable feature. (See Fig. 1.)

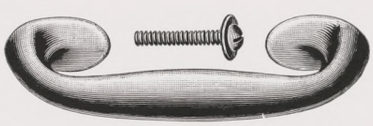


Fig. 2—Heavy drawer pull bolted through drawer.

Notice that the detail sheet of cupboard details which accompanies this chapter shows how necessary it is that the correct strike be used when the bolts are placed inside the door. They must be placed inside in order to lock the doors securely.

Certainly we would never be satisfied to put a light drawer pull on the drawers in any kind of a cupboard in any public building. Sturdy pulls, which are usually bolted through the drawer for additional strength as well as better appearance, are essential. (See Fig. 2.)

Shelves in cupboards of public buildings usually should be adjustable, requiring adjustable shelf supports which add to the sales possibilities of the builders' hardware man. (See Fig. 3.)

On many sliding doors used in cupboards for these types of

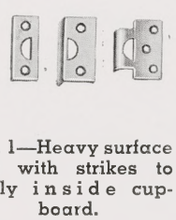


Fig. 1—Heavy surface bolt with strikes to apply inside cupboard.

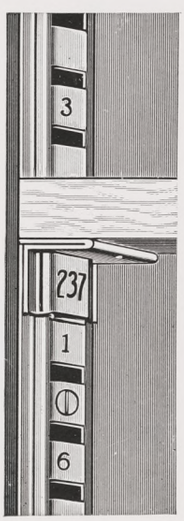


Fig. 3—Adjustable shelf standard and support.

Fig. 4—Track for sliding door.

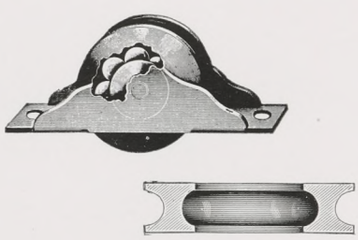


Fig. 5—Sheave for sliding door used with track.

buildings where you must furnish track, such as is shown in Fig. 4, sheaves like those in Fig. 5, and pulls, as shown in Fig. 6.

Access doors in plumbing spaces, trap doors to the roof and many small doors are continuously popping up on plans and they have to be taken care of. Let me repeat a sentence I put in italics in the Intermediate Course —"*Every mark on a plan means something.*" You must know when any of those marks mean that hardware is to be furnished.

Of all the problems encountered with respect to the hardware for cases, cupboards and drawers that of locks is the most important.

While there are many sizes and shapes of drawer locks, we really have to think first whether we can sell pin tumbler locks, shown in Fig. 7, or secure lever flat key

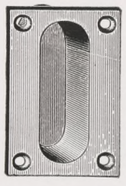


Fig. 6—Heavy flush pull for sliding door.

locks, seen in Fig. 8, and whether we want a spring lock similar to Fig. 7, or a dead lock such as is shown in Fig. 8, for both locks, that is, pin tumbler and flat key which can be furnished either way.

Here's another case of checking details for the thickness of the wood as well as the depth of the drawer stile. Where hinged doors are in pairs, of course, only one lock is required for the pair of doors, but now comes a bit more complicated problem. First we have the same two problems we had on the drawer locks, namely —pin tumbler or flat key locks and spring latch or dead bolt types.

After that is settled we note that a cupboard lock (Fig. 9), a wardrobe lock (Fig. 10), or a locker lock (Fig. 11), might be satisfactory. The question is which shall we use? What really is the difference?

In many cases any one of the three types would be used satis-

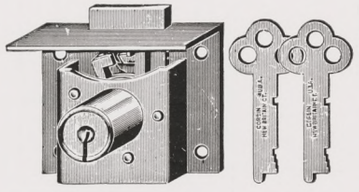


Fig. 8—Secure lever drawer lock - dead bolt type.

factorily. The cupboard lock mortising into the wood gives the best appearance, but is more expensive to apply. The wardrobe lock and the locker lock, each being of the surface application type, would be less expensive to apply, and that really is the chief difference. Remember, all three types can be furnished in pin tumbler or flat key operation, spring or dead bolt type.

Either type can be master-keyed and grand-master-keyed, although a grand-master-keyed, flat key lock is not recommended by the manufacturers themselves. It is a better practice to make the keying arrangement on these smaller locks as simple as possible. For example, on schools the book-

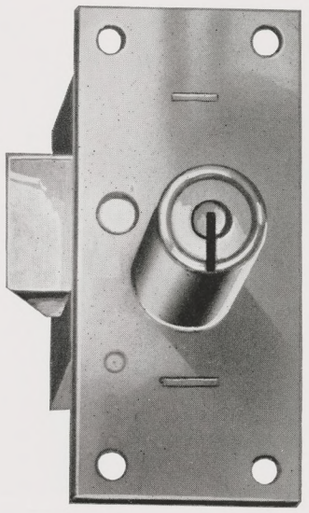


Fig. 10—Secure lever wardrobe lock—spring latch type

cases in all the rooms of schools will often be keyed alike instead of being master-keyed.

Cabinet lock manufacturers use charge schedules for special work which differ from those of the regular lock manufacturers, so before you estimate very much of this sort of work it would be wise for you to read carefully the schedule of extras for this class of hardware. For example, in many cases keyed alike takes an extra charge which isn't true in regular door lock practice.

Even differences in price occur for different thicknesses of wood. At times you will be called upon to furnish small locks for metal doors, such as the sub-treasury lock shown in Fig. 12, or a sliding gate lock like that illustrated by Fig. 13 or a show case lock such as is shown in Fig. 14, so study this subject with diligence from your own manufacturer's catalog.

While we are on the subject of

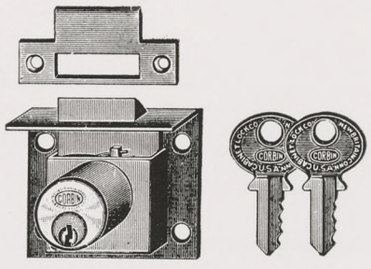


Fig. 7—Pin tumbler drawer lock-spring latch type.

Fig. 9—Pin tumbler cupboard lock-spring latch type.

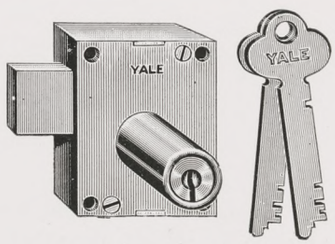
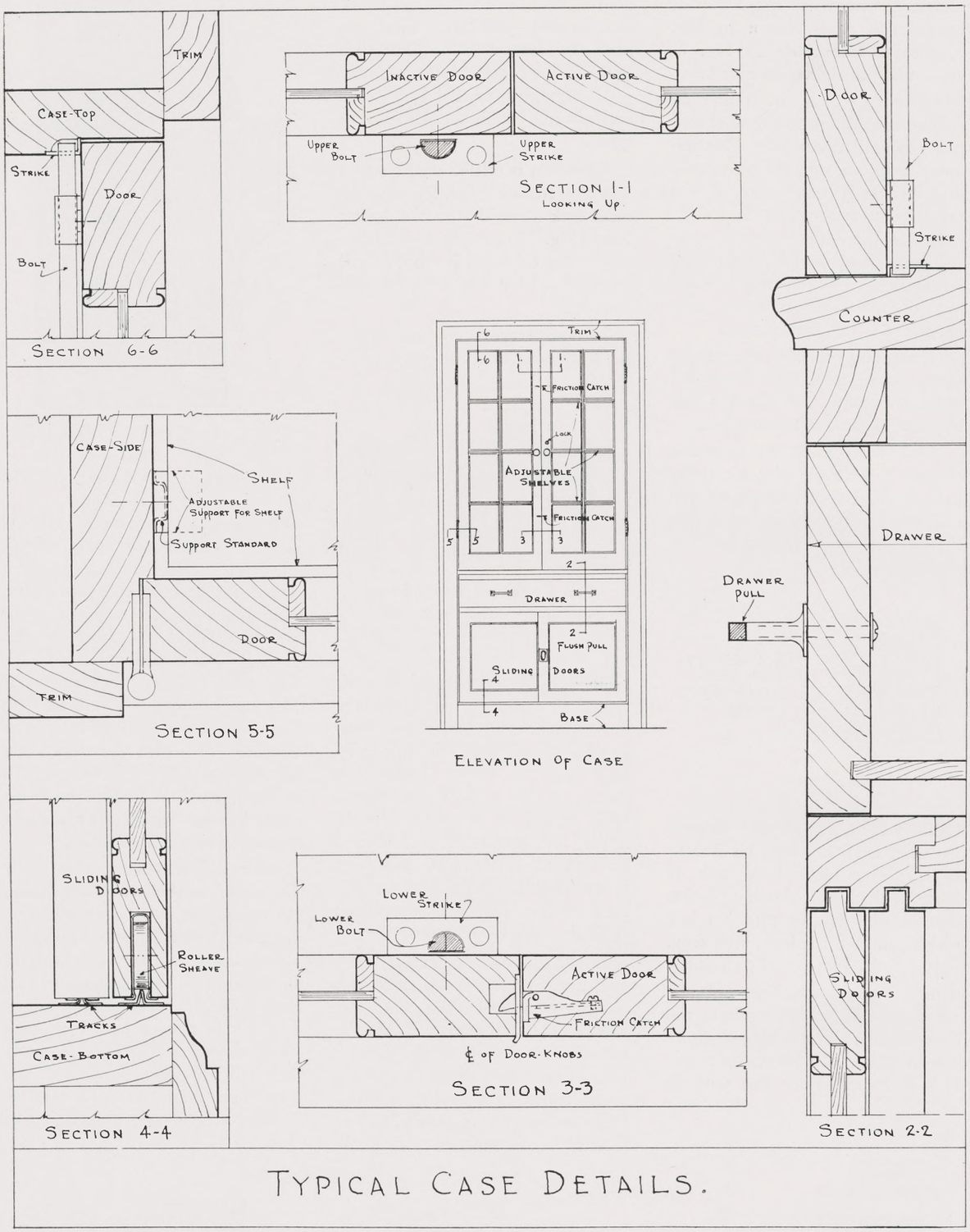


Fig. 11—Secure lever locker lock — dead bolt type.



Typical case details.

locks it might be well right here to discuss the subject of padlocks. The making of padlocks, like the writing of books, seems to have no end and I shall not attempt here to give any outline of the general subject of padlocks that retail from 10 cents to $5.00 in so many shapes and fashions that it is not practical to include them here. Rather, our thinking should be turned to the one type of pad-

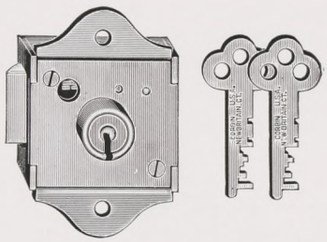


Fig. 12—Sub-treasury lock.

lock that is used in various places in public buildings, and master or grand-master-keyed to the building system.

Fig. 15 shows the type I mean. It is made with or without chain with hardened steel or bronze shackle and in several sizes by practically every lock manufacturer in pin tumbler to match his own keyway and keying system. Several of the cabinet hardware manufacturers make really an astounding number of locks. I have only tried to give a comparison of a few typical examples.

Fig. 15—Pin tumbler padlock.

Again, let me remind the student, particularly in the case of flat key locks, that care must be taken where a wardrobe and drawer lock are desired keyed alike that, unless they are of the same type of manufacture and key class of that manufacturer, it cannot be done.

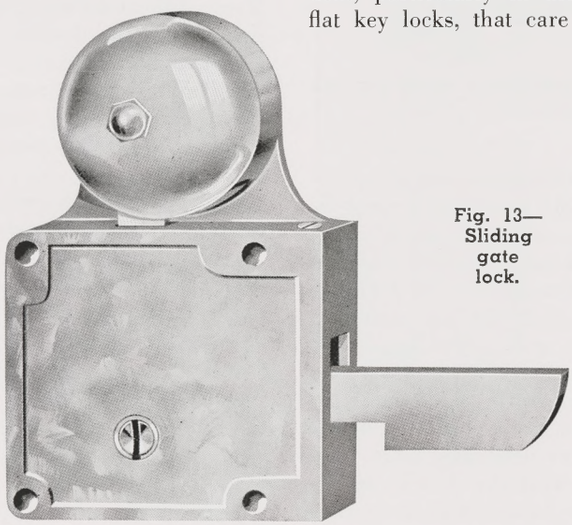


Fig. 13—Sliding gate lock.

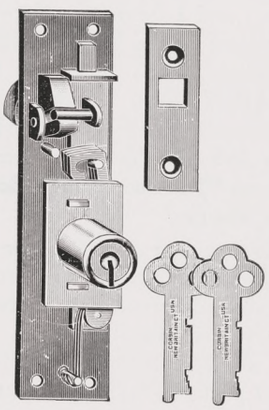


Fig. 14—Sliding showcase lock.

Chapter 42—*Advanced Course*

LAVATORY HARDWARE

DURING the last few chapters we have studied articles which are more or less common to every type of public building. In this chapter, however, we will discuss another type of hardware used generally in all types of public buildings, namely, lavatory hardware.

As long as I live I will never forget the first public building I ever figured with lavatory hardware. The job was in Worcester, Mass., and I figured it while first employed by the J. Russell Co., of Holyoke, Mass., and was fresh from the factory. There was a lot of lavatory hardware specified and I got the job. You have seen the cartoon "The Successful Bidder?" That was me.

No one had ever told me that marble, slate, or glass partitions required different and more expensive hardware than was used on wood partitions. I figured wood partition lavatory hardware. Naturally I got the contract. My price was so low that the contractor, who was very friendly with the J. Russell Co., told them a mistake must have been made. This probably saved me my job because he permitted us to find our error and revise our price.

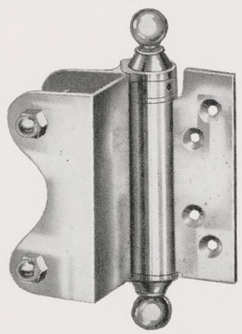


Fig. 1—Box flange lavatory hinge.

Perhaps you will remember I strongly urged the use of brass and bronze hardware in bathrooms. This recommendation applies equally well for lavoratory hardware even on wood partitions. I would always recommend brass or bronze. And, incidentally, you will find that the architects are more and more demanding chromium finish. White bronze is also specified to a considerable extent. On wood partitions, which are seldom used any more, you will find that the doors are occasionally hung on jamb spring hinges of the type you have already studied.

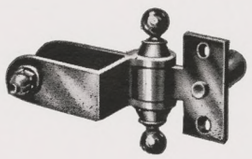


Fig. 2—Box flange blank for use with hinge Fig. 1.

On marble, slate and glass partitions the doors are often hung on box flange spring hinges (Fig. 1) and, where it is necessary to keep the price down, the hinge, similar to Fig. 1, with a blank (no spring) hinge (Fig. 2) is ordered. This spring hinge serves to keep the door closed at all times. If "reverse spring" is ordered the door is always open against the partition save when the stall is in use.

Next, in point of general use for lavatory door hinges, come the spring pivot hinge surface type (Fig. 3) and the mortise type (Fig. 4). This type of hinge prevents the door from sagging. In recent years various types of gravity hinges, similar to that shown in Fig. 5, have increased in popularity. Fig. 6 shows a checking lavatory pivot hinge, manufactured by P. & F. Corbin, which controls the speed with which the door closes. All of these types are adapted for use under various conditions by special construction or attachment. Many of them are made double or single-acting as desired. Should you desire more detailed information I would suggest your study of the catalog of the manufacturer from whom you buy your lavatory hardware.

Having hung the doors by one of these various methods, it next becomes necessary that you use a suitable type of latch or bolt. One of the many types of throw latches is shown in Fig. 7. Fig. 8 shows

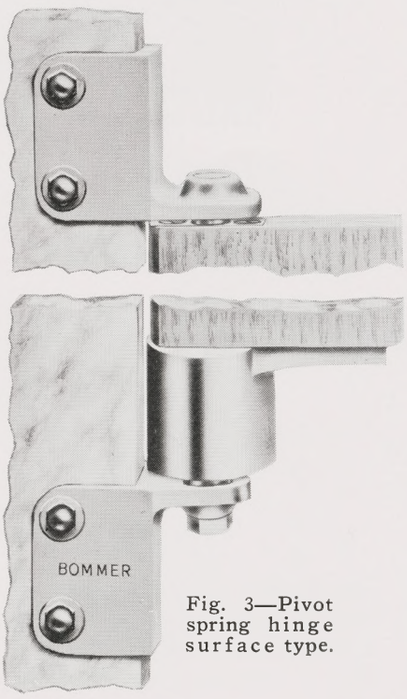


Fig. 3—Pivot spring hinge surface type.

a slide bolt with rubber bumper in the handle to protect the hardware and stall partition. Fig. 9 shows one of the commonly used

Fig. 4—Pivot spring hinge surface type.

indicator bolts showing whether the stall is occupied or not. There are so many types that I again think it best to refer you to your manufacturer's catalog.

The next important item is the strike which acts as a stop for the door and the keeper for the bolt. You must be extremely careful at this point. Order the proper strike for the bolt you are using but be sure to specify whether the door opens in or out. When specifying hinges and strike it is important to know the exact thickness of door and particularly whether the door has different thicknesses and is flush with the partition both inside or out. In fact, I would suggest that you always send your factory a detail. While certain adjustments can be made in both hinge and strike, the adjustment is limited and a wise builders' hardware engineer will give all the essential information when ordering. Fig. 10 shows one of several types of strikes for wood doors. A stop similar to that shown in Fig. 11 may be all that is needed.

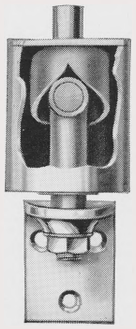


Fig. 5—Pivot gravity hinge.

Every men's toilet stall should be equipped with a coat hook. Often these are in the form of a combined hook and bumper (Fig. 12) which fastens to the door or one similar to Fig. 13 which fastens to the partition.

Certain types which open out

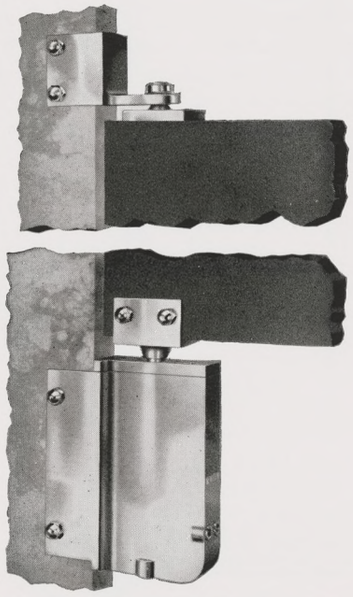


Fig. 6—Checking pivot for lavatory door.

require a door pull. Study the types of bolts, nuts and washers used with this lavatory hardware as they are shown in your manufacturer's catalog.

Steel lavatory stalls usually come equipped with hardware and in referring to your specifications on this item in the general architect's specifications you will find this to be true.

On marble, slate and glass partitions it is generally found that the lavatory hardware is furnished by the builders' hardware man but that the lavatory partition standards and stall partition fittings are part of the marble, slate or glass partition contractor's obligation to figure and furnish. Always check the architect's specifications on this point. Don't figure what another sub-contractor is to furnish or you won't get the job. Don't fail to figure what the specifications say you are to figure or you will get the job and wish you hadn't.

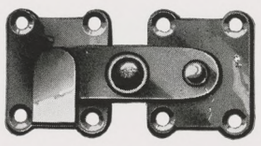


Fig. 7—Throw latch for lavatory door.

On wood partitions it is quite the common practice to have the builders' hardware man figure and furnish the stall partition fittings. Legs, such as are shown in Fig. 14, and angles similar to the one shown in Fig. 15 are among the articles which may be required.

Armed with the information obtained from studying this chapter and your manufacturer's catalog and backed by a careful study of the architect's plans and specifications you should be well prepared. I trust that none of my readers will ever get a job as a result of ignorance of the subject.

One manufacturer has been kind enough to send me an outline which covers a number of instructive points and I have decided to list them in much the same way as he sent them. They are as follows:

Clamp Flange Spring Hinges:

A. Single action with one adjustable clamp flange made of wrought metal. Hanging stile type.

1. Clamp flanges are adjustable ⅛ inch over and under: 1 in., 1¼ in., 1½ in., 1¾ in., 2 in.

2. Regularly made to close the

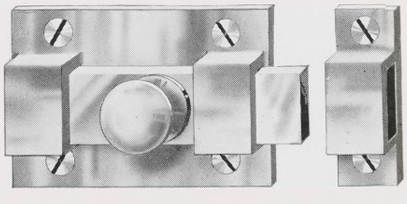
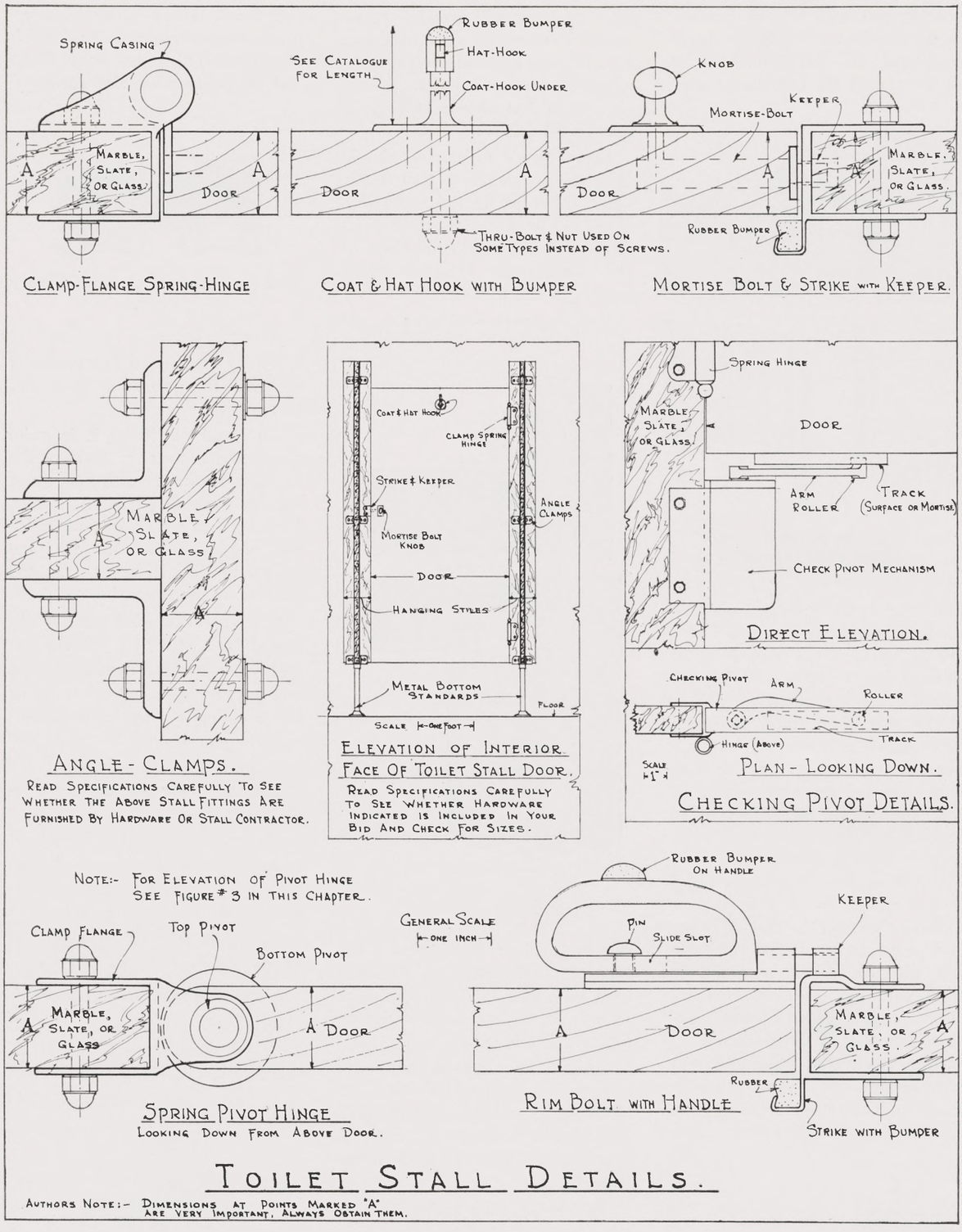


Fig. 8—Slide bolt for lavatory door.



Toilet stall details

door, can be made to hold doors open when reverse acting springs are specified.

3. Used on either right or left-handed doors opening out or in.

4. For light doors furnished in sets, one spring hinge and one springless hinge with adjustable clamp flanges.

a. The springless hinge is placed at bottom of door.

5. The thickness of both hanging stile and door must be stated.

6. Single action with two adjustable clamp flanges.

a. With reverse springs is approved Gov. Type 2360.

b. Furnished with springless

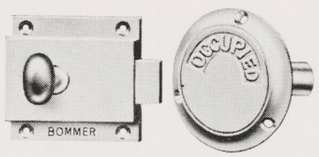


Fig. 9—Rim indicator bolt for lavatory door.

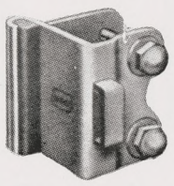


Fig. 10—Strike and keeper for lavatory door.

hinge, with two adjustable clamp flanges.

7. Cast type, clamp flange is adjustable 1/16 in. over and under the specified thickness of hanging stile.

a. Also furnished with springless hinge.

B. Single Action, Without Hanging Stile.

1. Clamp flange for the partition is not adjustable.

2. Hinges for doors opening in are constructed differently than those opening out, same must be stated.

3. Doors opening in can be supplied with reverse springs to hold doors open, but are regularly furnished to hold doors in a closed position.

4. Doors opening out, in this type are only made to hold doors closed.

5. Hinges made for two doors, one type for doors opening in, and another type for two doors opening out.

6. All the above types are furnished with springless hinges.

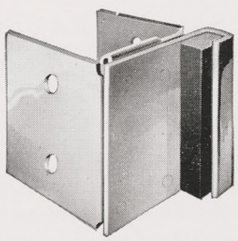


Fig. 11—Strike only for lavatory door.

7. Exact thickness of partition and door must be stated.

8. With reverse springs approved Government Types 2362, 2363 and 2364.

C. Surface Spring Hinges, Cast Single Action.

1. Made to hold door closed, can be furnished with reverse acting springs so door will stand in open position.

2. Springless hinge also furnished with this type.

3. For light and narrow lavatory doors only, a combination hinge with a springless hinge at the bottom may be used, one type called the checking blank has a bumper, holds the door partly open while toilet is not in use, dispensing with the use of an indicator bolt.

D. Double Action Spring Hinges with One Clamp Flange.

1. Clamp flange not adjustable, thickness of hanging stile must be stated.

2. Not furnished with springless hinge.

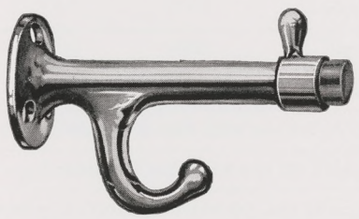


Fig. 12—Hook and bumper for lavatory door.

E. Double Action Spring Hinges with Two Clamp Flanges.

1. Both hanging stile and door thicknesses must be stated.

2. Regular type without hanging stile used where hinges are hung from a partition or from a wall.

F. Single-action Hinges Made to Use on Pipe Partitions.

1. Exact outside diameter of pipe and thickness of door and partition must be stated.

2. Doors opening in can be furnished to hold door open or closed.

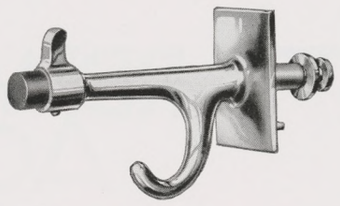


Fig. 13—Hook and bumper for lavatory partition.

G. Double-action Hinges Made to Use on Pipe Partitions.

1. Exact outside diameter of the pipe must be stated and thickness of the door.

H. Single-action Hinge with Angle Flange.

Lavatory Spring Pivot Hinges. (Ball Bearing.)

1. Made in mortise hinge type.

2. Made in surface hinge type.

a. These two types are made up either adjustable or non-adjustable (spring tension easy adjustment).

b. Adjustable to permit aligning and setting door to close or hold open in any desired position after the door is hung.

c. The clamp flanges are adjustable 1/8 in. over or under the following sizes: 1 in., 1¼ in., 1½ in., 1¾ in., 2 in.

d. Used for right and left-hand doors single and double acting.

e. Doors hung at the center of the edge of the partition; special offset brackets can be furnished so that the door when closed will line up with the partition surface.

Hand of door, whether they open in or out, and thickness of

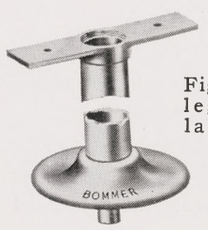


Fig. 14—Bottom leg for wood lavatory partition.

Fig. 15—Angle for wood lavatory partition.

HARDWARE AGE COMPARATIVE CHART

		Bommer Spring Hinge Co.	Chicago Spring Hinge Co.
1	Spring Hinge and Blank Single Acting with Hanging Stile	1000 x 01000	2242 x 2244
2	Spring Hinge Single Acting with Hanging Stile	1000	2242
3	Spring Hinge Double Acting with Hanging Stile	1005	2241
4	Spring Hinge and Blank Single Acting No Hanging Stile, Opening in	1002 x 01002	2842 x 2844
5	Spring Hinge Single Acting No Hanging Stile, Opening in	1002	2842
6	Spring Hinge and Blank Single Acting Surface Type	1011 x 01011	2442 x 2444
7	Spring Hinge Single Acting Surface Type	1011	2442
8	Spring Pivot Hinge, Single or Double Acting Surface Type	1030	C7227S
9	Spring Pivot Hinge, Single or Double Acting Mortise Type	1032	CI7227M
10	Gravity Pivot Hinges, Single or Double Acting Surface Type	1330	C47227S
11	Gravity Pivot Hinges, Single or Double Acting Surface Type	1331	CI47227S
12	Lavatory Bolt, Rim Indicator Type	5009K x 5015	1250K x 1258
13	Lavatory Bolt, Mortise Indicator Type	5010K x 5015	1254K x 1258
14	Lavatory Bolt, Swing Latch Rim Type	5000K	1242K
15	Lavatory Bolt, Slide Bolt Rim Type	5003K	1240K
16	Lavatory Stop and Keeper, opening in, for use with Rim Indicator Type Bolt	1055	1247F
17	Lavatory Stop and Keeper, opening out, for use with Rim Indicator Type Bolt	1057	1247G
18	Lavatory Stop and Keeper, opening in or out, for use with Mortise Indicator Type Bolt	1051	1247D
19	Lavatory Stop and Keeper, opening in, for use with Swing Latch Rim Type Bolt	1053	1247C
20	Lavatory Stop and Keeper, opening in, for use with Slide Bolt Rim Type Bolt	1055	1247F
21	Lavatory Stop and Keeper, opening out, for use with Slide Bolt Rim Type Bolt	1057	1247G
22	Hook and Bumper for Lavatory Door	5030	1233

EDITOR'S NOTE:—While every care has been taken we assume no responsibility for correctness of these comparisons fur- as published here has been approved by them.

door and partition must be stated for this special requirement.

f. Pipe and flat brackets can be furnished, width of flat brackets and outside diameter of pipe must be stated.

Gravity Pivot-Hinges

1. Can be used either single or double action. Right or left hand.

2. Adjustable, permitting alignment and setting the door to close or hold open in any desired position after the door is hung.

3. Furnished with adjustable clamp brackets as per other types. Also for pipe partitions, and flat brackets, same precautions in exact outside diameter of pipe, and width of flat bracket must be stated.

4. Single-action offset type.

a. Always state if wanted for right or left hand doors and whether opening in or out.

b. These hinges are supplied with a special bracket that will permit the door to open and hold open at 180 degrees, providing partition and trim do not project beyond the surface of the door on

OF LAVATORY HARDWARE

P. & F. Corbin	Lockwood Hdwe. Mfg. Co.	Milwaukee Stamping Co.	Norwalk Lock Co.	Penn Hardware Co.	Russell & Erwin Mfg. Co.	Sargent & Co.	Yale & Towne Mfg. Co.
596 x 0596		1900 x 1910	4000 x 4000¼		446 x 446B	1108	
596		1900	4000		446	208	
		1904				1208	
		1907 x 1917					
586		1907			486		
		1920 x 1930					
		1920					
		2834					
		2234					
		2834G			501		
		2834G					
156	8316	1990K x 1985	8590	5065	0156	238	1217
157¼	8317	1988K x 1985	8591	5075	0165	239	1208
599½—3″	8318	1964K	8727	5055	0171	120	1224
		1965K					
673		1848	8599¼		21	255	891
673½		1849	8599½		23	257	
675		1842	8591¼		24	251	890
671 and 672		1844	8726¼		22½	252	892
673		1848			21	255	891
673½		1849			23	257	
2420	8502	1982	4784		206	338	437

nished by the manufacturers. The comparative data has been furnished in each case, by the individual manufacturer, and

the hinge side more than ⅜ in. When closed the surface of the door will be flush with the partition on the hinge side.

Lavatory Door Strikes and Keepers

1. Thickness of door and hanging stile, and where partition is used instead of hanging stile must be stated.

2. Particular attention should be paid to whether doors open in or out in selecting this item of lavatory hardware.

3. Latch slots and mortises have to agree with the type of latch or bolt selected.

4. Latch bolts are also applied on surface, half mortise and mortise. This also governs the position of the latch slots and mortise holes.

5. Clamp flange is adjustable for regulation thicknesses wrought type.

6. Cast type not adjustable.

7. Flat strikes and keepers.

8. Pipe type strikes and keepers.

a. State exact outside diameter.

b. State whether doors open in or out.

Chapter 43—*Advanced Course*

OFFICE BUILDING and APARTMENT HARDWARE

WE now begin a study of various types of public buildings which use hardware particularly adapted for that particular type of building. The first of these studies will be devoted to office buildings.

The first step from general to specific types is undoubtedly a shorter step than any of those that will follow. In all of the others will be found examples with hardware treatment very similar to that which we will study in this chapter.

First let us review the steps we have already taken, all of which will be put to use in an office building of any size. Let us imagine a typical sort of office building say of 10 stories with stores on the first floor.

Modern office buildings are usually fireproof and, therefore, Chapters 34 and 35 which discuss metal doors are certain to be required. The stairways will probably have metal doors of some kind and at least the exits from these fire stairways will be equipped with the fire and panic exit bolts we studied in Chapter 39. It's certain the building will have lavatories so we will also make use of what we learned in Chapter 42.

The doors will probably be master-keyed or grand-master-keyed so we will have to apply the lesson of Chapter 38. Doors to stairways, lavatories and, more often than not, to the offices themselves are equipped with door closers either surface or concealed so Chapters 36 and 37 are important to consider in equipping an office building. Offices frequently have built-in cupboards of one kind or another so that Chapter 41 will probably stand us in good stead. Door stops and door holders will be required in many places and you remember that we discussed them in Chapter 40.

In short, what I am trying to point out is that every single chapter of the Advanced Course from Chapter 34 to 42 inclusive is definitely a part of the study of office building hardware treatment and unless you have first mastered these chapters you cannot hope to learn what you need to know by simply reading this chapter.

Let us approach the building and we first come to the entrance doors. Most modern office buildings use batteries of doors with

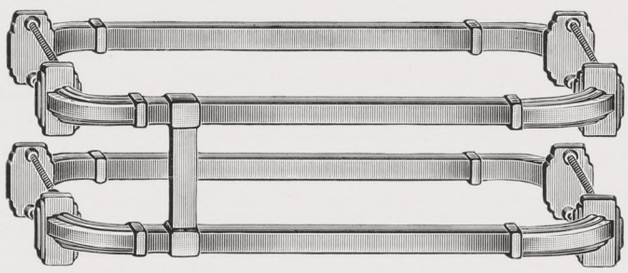


Fig. 1—Combined door pulls and push bars.

Fig. 2—Wrought brass kick plate—bevelled three sides.

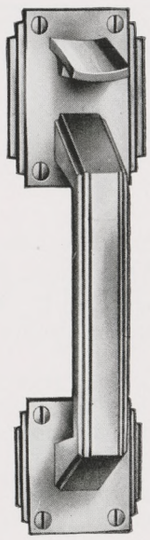


Fig. 3—Modernistic store door handle.

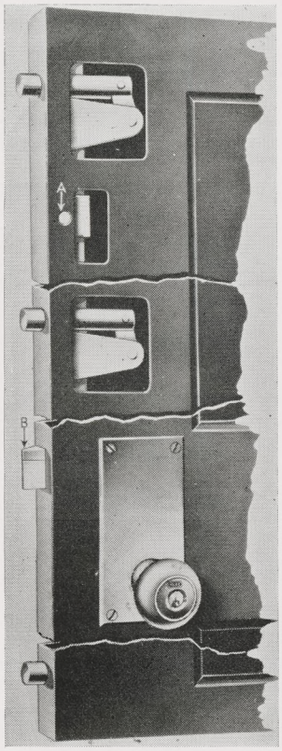


Fig. 4—Fire door lock.

some type of door control such as we studied in Chapters 36 and 37, but, in addition to being hung and controlled by some type of device, they also have some method of pulling or pushing them open. This may be a store door handle set or it may be a very simple pull and push plate proposition. Let us go a step further, however, and equip these entrance doors with push bars and pulls such as are shown in Fig. 1. This sort of treatment is coming more and more into use and many manufacturers have done exceptionally well in developing proper and interesting designs.

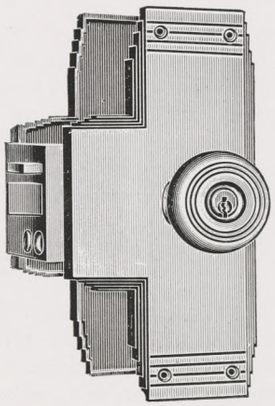


Fig. 5—Office door unit lockset—vertical type.

These same doors may require kick plates—something we have not studied before. Kick plates are particularly desirable on wood doors which are used a great deal. Fig. 2 shows a standard 14-gage, bronze kick plate. The general practice on kick plates is to furnish them about two-thirds the height of the bottom rail, bevelled three sides and to within a half-inch of the edge of the door to allow for the necessary fitting of door or stops.

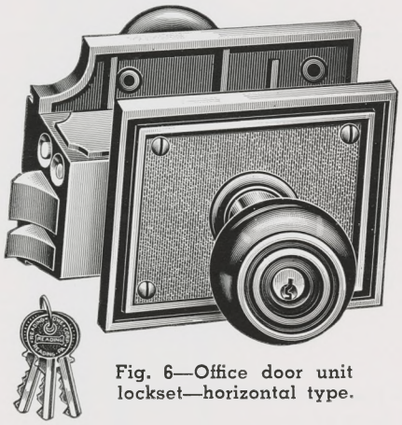


Fig. 6—Office door unit lockset—horizontal type.

Many buildings have their entrance doors continually open so that locks are only required to lock the entrance doors at night. Now in many cases all the doors are bolted from the inside except one door which may be locked with a cylinder dead lock or mortise cylinder latch or both.

Then there come the entrance doors to the ground floor stores. Here we find it quite common practice to use store door handle sets similar to Fig. 3 in design and finish as selected with door-closing devices, door holders and probably kick plates and thresholds completing the necessary trim. Occasionally these doors will have fire exit devices and more often the pull and push bar treatment similar to the entrance doors shown in Fig. 1.

Doors to stairways and lavatories are frequently not locked and are equipped only with pull and push plates and door closers. Fig. 4, however, shows a three-point underwriters lock for certain types of stair doors to fire stairways.

Doors to lavatories often have locks so that the general public cannot have access to the rooms, in which case it is quite in good practice to have all office door keys operate the lavatory door lock.

It is the usual practice to furnish some type of cylinder lock on doors to the offices themselves. It may be a simple vestibule latch set such as we studied way back in the Elementary Course, one with auxiliary latch to eliminate picking the lock or a high-grade cast bronze unit lock set such as is shown in Fig. 5.

Here is a type of lock set we haven't studied before. Corbin and Russell & Erwin call them "unit locks." Sargent call them "union locks." Yale & Towne call them "mono locks" and the Reading Hardware Co. terms them "unilocks." All these various names mean the same in general in that they are factory assembled, easily applied and have knobs which cannot bind in addition to

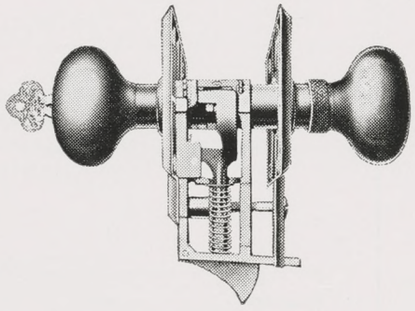


Fig. 7—Interior view of a unit lock.

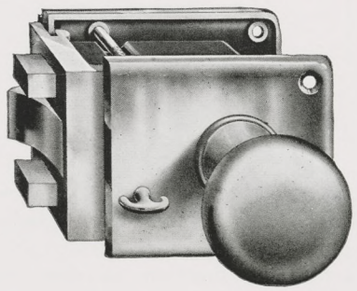
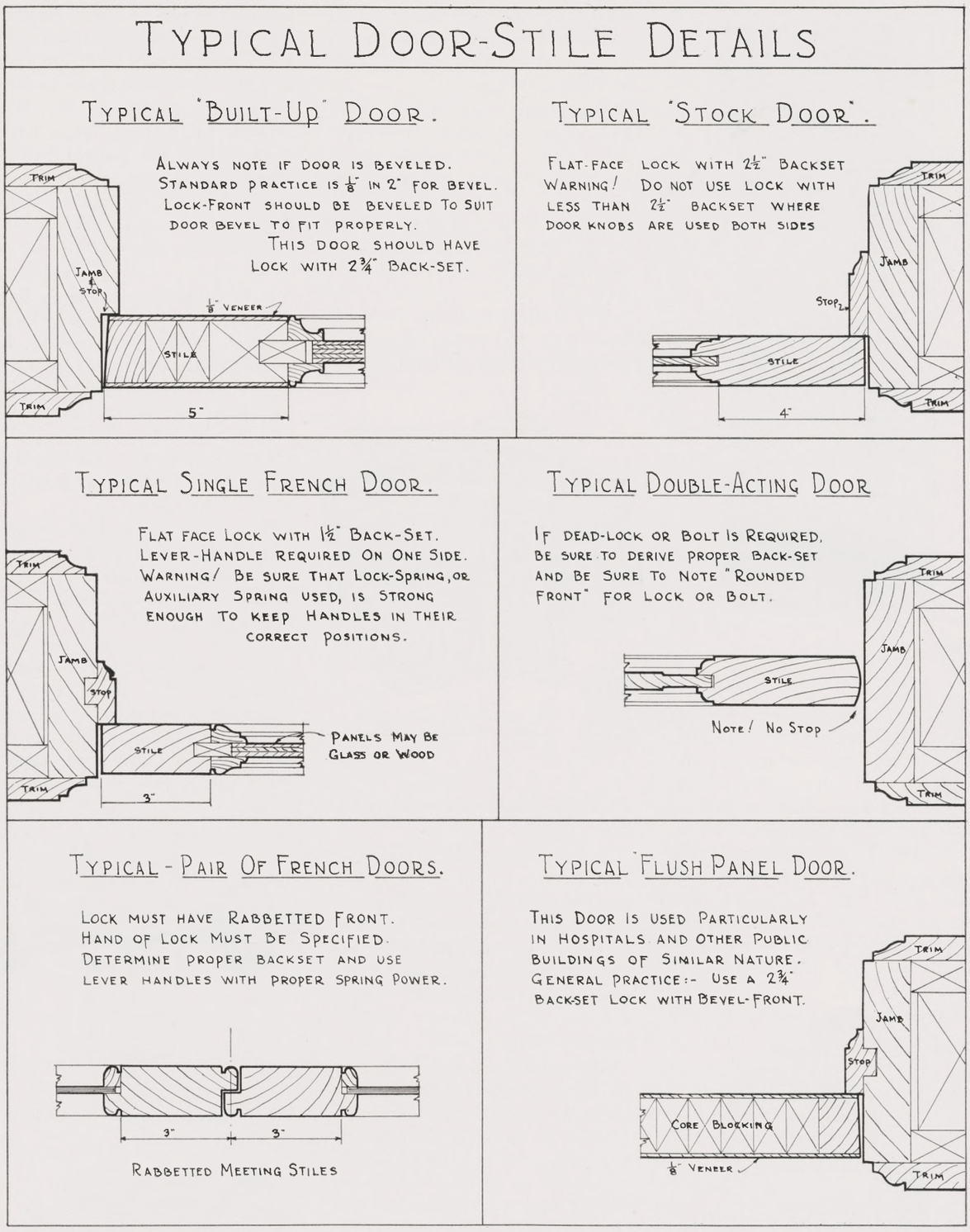


Fig. 8—Communicating door unit lock—horizontal type.



Typical door-stile details.

other features which each of these five manufacturers will gladly point out. They are used for every type and function of door in office buildings as well as for many other buildings we will eventually study and you should know about them.

Many of the finest and largest office buildings in the world are equipped with unit locks which have given universally good service throughout the country. They come in horizontal and vertical types and in many designs.

Inner office doors from office reception rooms usually have cylinder locks, as for example Fig. 6.

Communicating locks, similar to Fig. 8 with a turn piece on both sides and no key or closet door locksets which are just latch sets are sometimes used in unit locks.

These last three illustrations are all of the unit type but I trust you understand that the usual mortise locksets with all these functions of operation are available. A review of locks, schools of design and lock trim from the Intermediate Course will refresh your memory on them.

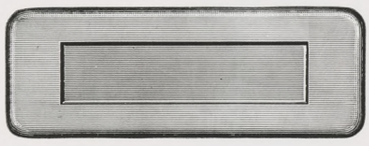
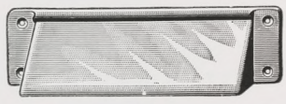


Fig. 9—Letter box plate.

Inside plate.



Hood.

Letter boxes with an inside hood for the entrance doors to offices should also be considered. Figs. 9 or 10 show them.

Apartments are much like office buildings in hardware treatment as far as entrance doors or store doors are concerned. Many apartment houses, however, have vestibule doors which are always locked but are operated by tennants' keys as we studied Maison System in Chapter 38 or by an electric door opener, like Fig. 11 which is operated from each apartment by means of an electric push button. Of course these vestibule doors have to have door closers.

Substantial locks are frequently furnished on the entrance doors to each individual apartment as would be the case were it a private home, a double bolt lockset being used for security. On these particular doors it is also well to specify chain door fasteners.

For the interior of the apartment the regular practice of hardware trim you learned in both the Elementary and Intermediate Course will stand you in good stead. You would use the same procedure for a bedroom, bathroom or closet door in an apartment that you would use in a private home.

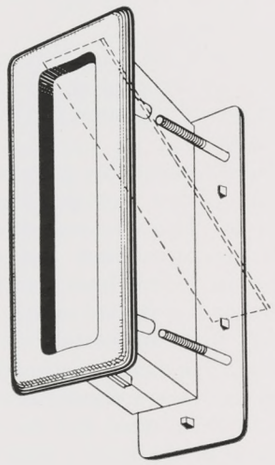


Fig. 10—Vertical top hinged letter box chute.

Various types of apartment house letter boxes in an apartment vestibule are often a part of the builders' hardware contract but these vary to such an extent that I will merely mention them in passing.

In this chapter I have introduced another distinctive feature of the study—one that has taken a great deal of work but one that I believe you will find extremely valuable.

It is a suggestion chart of various manufacturers' items which are used particularly in office buildings and apartments—in that feature it is no different than the comparative charts you have studied.

Here, however, you will find a forward step for I give you suggested specifications for three priced jobs: A—B—C type or price range groups of these particular buildings so that you may select the type of hardware to fit three types of pocketbook.

In many cases I would recommend items of the same number for B and C type as for A because it is either made in only one quality or I feel the importance of the item warrants that expenditure even in a type C building. After a study of your own manufacturer's catalog you may want to substitute another number for the one I suggest but at least it will be a guide to you in writing specifications.

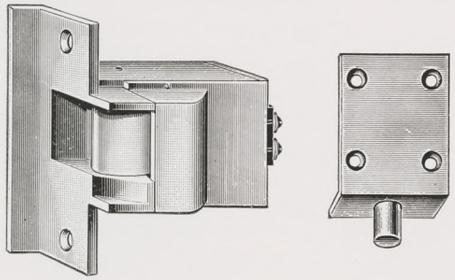


Fig. 11—Electric door opener.

Chapter 44—*Advanced Course*

SCHOOL HOUSE HARDWARE

ALL that I said in the preceding chapter about butts, door closers, fire exit bolts, lavatory and cabinet hardware and door holding devices which were discussed in the earlier chapters of the Advanced Course being applicable to that chapter holds equally true in this one.

As a matter of fact many of these items are used more in schools than they are in office or apartment buildings. Fire and panic exit devices for example play a much greater part in equipping schools. This is also true of cabinet hardware and door holder equipment. In fact every chapter you have studied to date has a place, a very definite place, in the subject of school hardware. Even the preceeding chapter will help you because every school has some office doors.

However, the things that we will discuss in this chapter have to do with special hardware particularly for schools.

So with our doors to be locked we face a new problem. Particularly on classroom doors it is vitally important that the doors never be locked from the inside but often it is desired to have them locked from the outside.

Now that sounds very simple. Why not take a regular vestibule lock without dead bolt but with buttons in the face? Well there is only one good reason. If you are not too old to remember when you were a kid you will remember you probably would have loved to lock the next fellow out by pushing the buttons in the face of the lock so he couldn't enter. Boys are still boys so the vestibule lock with buttons in the face is out.

Fig. 1 shows a special classroom dead lock. Years ago in Pittsburgh this lock was developed to meet the needs of the Pittsburgh School Board and I believe is still used there.

All classroom doors are trimmed with pulls and push plates and the dead lock shown in Fig. 1. This lock can be locked from the outside with a key so that no one can enter, but if some student were accidently locked in he could unlock the door by means of the inside thumb turn.

Now comes the point that makes the lock advantageous to classroom doors. Although the student can unlock the door by means of the thumb piece, he cannot lock the door with the same thumb piece. A student cannot lock the door from the inside by means of the thumb piece. The lock was first manufactured by the Sager Lock Co. but now, I believe, is made by many manufacturers in cylinder

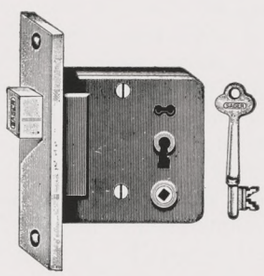


Fig. 1—Classroom dead lock

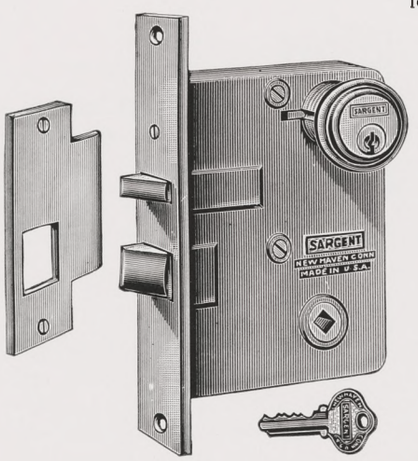


Fig. 2—Classroom cylinder door lock.

Fig. 3—Classroom bit key door lock.

Fig. 4—Classroom recessed face door lock.

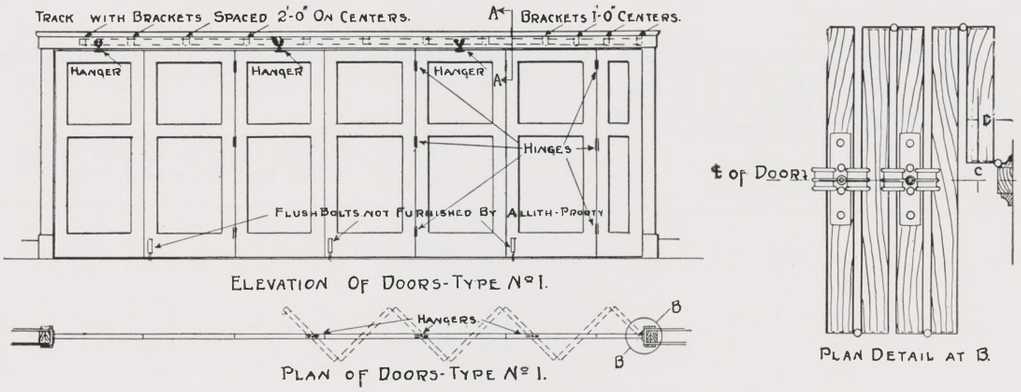


Fig. 5—Typical accordion door installation

as well as the bit key type illustrated.

Fig. 2 shows a cylinder lock used with knobs and escutcheons for classroom doors. The outside knob can be locked by means of a key but the inside knob is always operative. The auxiliary latch safeguards the lock from being picked with a knife.

Fig. 3 shows the same type of classroom lock with a bit key which is a very popular lock on doors of this type.

The lock illustrated in Fig 4 has the same lock operation except for the auxiliary latch depending on the recessed face to protect against picking. This is less expensive than the one shown in Fig. 3.

These four types illustrate the generally used types of classroom locks.

In many states the law requires that all classroom doors open out, while in other states they may open in. In my opinion a classroom door should open out. The closet doors, communicating doors, etc., take the same kind of hardware recommended for these types of openings in the preceding chapter.

So much for the door locks. Now we come to the question of accordion doors frequently used between rooms so that two rooms may be thrown into one to accommodate larger audiences.

There are a number of types of these doors. The accordion type, shown in Fig. 5, with the half door is usually equipped with overhead hangers and track as well as with guides at the floor. Here the lesson you learned on barn hardware in the Intermediate Course will be of decided help to you.

Then there is the folding door type, shown in Fig. 6, where the half door is not used but where the doors fold in pairs and slide into the end of the opening.

On each of these types it is necessary for you to figure butts, bolts and lock or pulls. To go into all these details would take too much space to consider here so I am going to my oft-repeated recommendation. Get out your manufacturer's catalog and master how to properly equip the opening with h a n g e r s, track, brackets, guides and finish hardware.

Here's one little detail you must never overlook with respect to bolts. If you use mortise bolts (Fig. 3) will they interfere with either the track or the guides? Check your detail to find out.

Fig. 7 shows a large opening equipped with large high doors such as are found between two sections of a gymnasium. Doors, hardware, and all equipment are frequently installed by the door manufacturer but, if you do figure it, let me give you one bit of warning. Never try to do it without expert help and instruction from the manufacturer for it takes special hardware and expensive hardware and you can easily lose a lot of money if you do not figure the proper material.

In the case of school windows you often use different hardware from that used on other buildings. The signal sash lock shown in

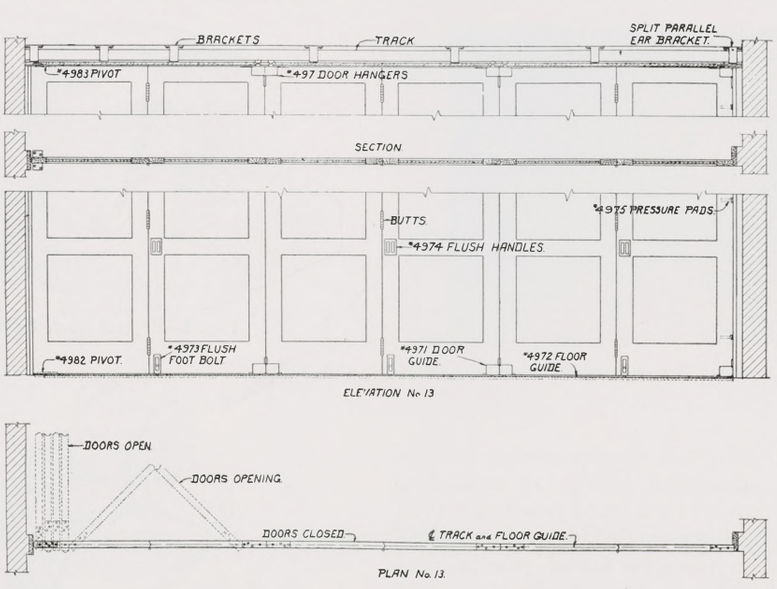


Fig. 6—Typical folding door installation.

HARDWARE AGE

KEY TO CHART

A Type—Best Lock Regardless of Price.
B Type—Medium-Priced Lock for Medium-Priced Bldgs.
C Type—Least Expensive Lock for Low-Priced Bldgs.

SUGGESTION LIST

	Barrows Lock Co.	Clinton Lock Co.	P. & F. Corbin	Lockwood Hardware & Mfg. Co.	Norwalk Lock Co.
Classroom Doors					
A	1103 or 860	7030	01339½ x Knobs 1519½ TS x Roses	5156¾	3766 or 2766
B	953	7030	1272⅞ x Knobs 1419 x Roses x Escts. 2660	L5374¾	8390 Push & Pull or 8189½ Push & Pull
C	963	1270¾	1270⅞ x Knobs 1419½ PW x Roses x Escts. 2660	5385½	8339½
Office Doors					
A	990	7030	8551 x Knobs 1519½ TS x Roses	5100½	3761
B	378	7000	0563 x Knobs 1419 x Roses	5556	2761
C	873	1270¾	1365½ x Knobs 1419 x Roses x Escts. 2660	3602	8531½
Teachers' Rooms					
A	378	7030	8551 x Knobs 1519½ TS x Roses	5100½	3761
B	873	V7000	0563 x Knobs 1419 x Roses	5556	2761
C	923	1270¾	1365½ x Knobs 1419 x Roses x Escts. 2660	3602	8531½
Teachers' Lavatories					
A	996	7030	580¼ x Knobs 1519½ TS x Roses	5100¼	3765
B	574	V7000	233½ x Knobs 1419 x Roses x Escts. 2660	5556	2765
C	877	1270¾	285⅞ x Knobs 1419½ PW x Roses x Escts. 2660	3602	8531½
Closets					
A	378	7030	0563 x Knobs 1519½ TS x Roses	5100½	3761
B	873	3010	1365½ x Knobs 1419 x Roses x Escts. 2660	5556	8531½
C	230	3030	795⅞ x Knobs 1419½ PW x Roses x Escts. 2660	3602	8064

EDITORS' NOTE: This suggestion chart is not to be confused with the comparison charts published elsewhere in this book. This chart includes the ideas of individual manufacturers as to the proper locks to specify from their own catalogs.

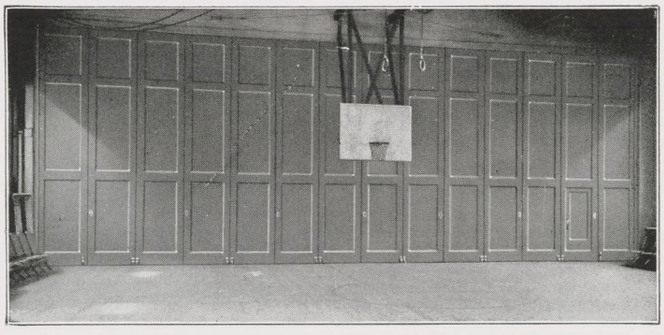


Fig. 7—Example of large opening folding door installation.

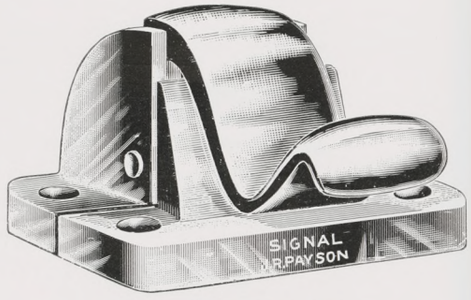


Fig. 8—Signal sash lock.

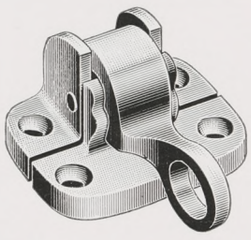


Fig. 9—Ring type signal sash lock.

Figs. 8 and 9 is frequently used instead of the crescent type we have previously studied. Heavier sash sockets shown in Fig. 10 are suitable for most school house windows.

In the coat rooms you will often find coat hangers similar to those illustrated in Fig. 11 applied to pipe or wardrobe pole hooks (Fig. 12) or applied to wood poles held in place by use of pole brackets shown in Fig. 13. Here's a lot of extra business you can get.

NOTE—While every care has been taken, we assume no responsibility for correctness of these suggestions furnished by the manufacturer.

SCHOOL BUILDINGS

Penn Hardware Co.	Reading Hardware Corp.	Russell & Erwin Mfg. Co.	Sager Lock Works	Sargent & Co.	Schlage Lock Co.	Skillman Hardware Mfg. Co.	Yale & Towne Mfg. Co.
7351xDM576L—16x3½xDM575L—16x3½ or 7262—1 Cyl.x52¼xDM508	1624 or 1509	0783 or 11458⅝ MP	902¾ or 800	4843 or 6736	C70PD	7780	7646
DM547	1308	444¾	810¾	4736	A10S + B263P	7780	7792
DB648	1208	00125	841¾	4737	A70WD	7780	772
DM573—7243	01711	11456	790	7805½	C51PD	7772¼	7646
DM573	01708	1239¾	781	6805½	D51PD	4442½	7660
DB626—2478	1422	382¾	370¾	5639	A51WD	441½	1500
DM573	01708	1239¾	781	6805½	C51PD	7772½	7646
DM525—2478	1422	382¾	370¾	5639	D51PD	5246	7660
DB626—2398	01257	380¾	311¾	5269	A51WD	5230	1500
DM595—7262—1 Cyl.	01817	11458½	796	6816	C80PS	7772½	7646¼
DM531—3170	1188	0019¾	501	6113	D80PS	441½	7660
DB632—3130	01180	234	450	4663¾	A80WS	6012¾	7790
DM573	01714¾	1239¾	781	6805½	C71PD	7780	7656
DM525—2478	1422	382¾	370¾	5639	A20S + B260P	5246	772
DB616—1667	01025¾	025	140	4645	A71WS	5230	1820

No attempt is made in this suggestion chart to make comparisons of the items of one company with the quality of lines made by other manufacturers.

Fig. 10—Heavy sash socket.

In many cases complete wardrobes may be specified to have each unit open in one operation as is illustrated in Fig. 14. Sell them complete doors, hardware and all. Room numbers and card holders are often required on classroom doors and this means more builders' hardware business for you.

Cabinet hardware may be a big item on this type of building. Check your specifications carefully for cabinet hardware is frequently specified with the finishing hardware and in many other cases it is made an item for separate esti-

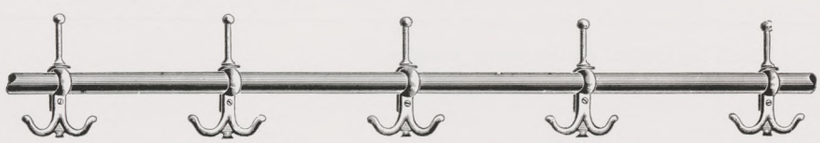


Fig. 11—Coat and hat hooks applied to pipe.

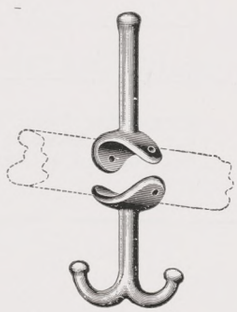
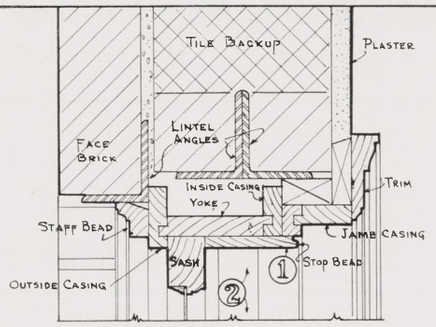
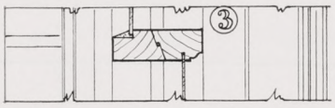


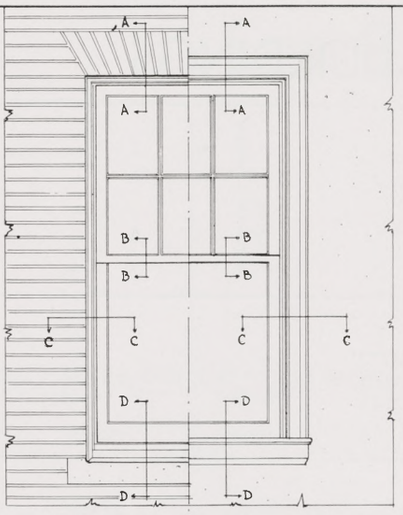
Fig. 12—Coat and hat hooks applied to wood rail.



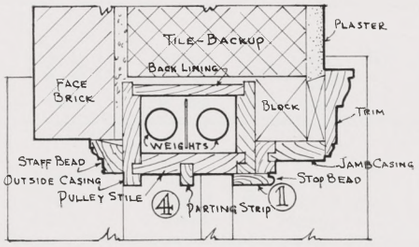
HEAD SECTION A-A.



MEETING-RAIL SECTION B-B.



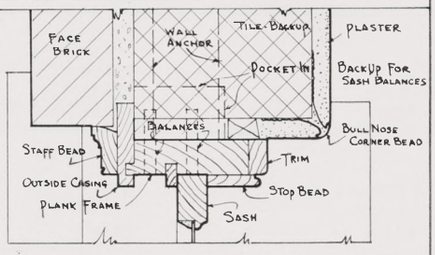
EXTERIOR — INTERIOR
ELEVATIONS OF WINDOW.



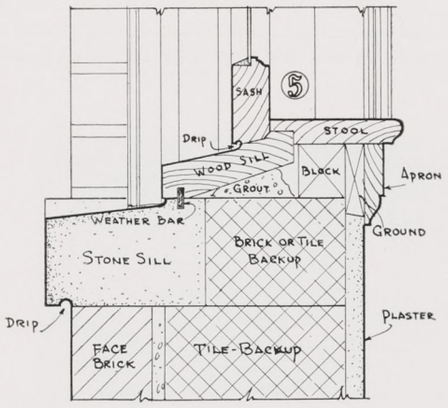
SIDE JAMB SECTION C-C.

PLANK-FRAME WINDOW, USING SPRING-BALANCES IN PLACE OF SASH WEIGHTS.

ALWAYS NOTE IF SPECIFICATION CALLS FOR SASH-WEIGHTS OR SASH-SPRING-BALANCE SEE NOTE→ (6) BELOW.



SIDE JAMB SECTION C-C
HEAD SECTION SIMILAR
MEETING RAIL & SILL SECTIONS SIMILAR TO B&D.



SILL SECTION D-D.

NOTE:- SEE SMALL SCALE ELEVATION ABOVE AT RIGHT FOR POSITION OF SECTION-CUTS.

- AUTHOR'S NOTES -

(1) ALWAYS CHECK DETAILS FOR PROPER BEAD SCREWS @ HEAD AND JAMB. NONE REQUIRED @ STOOL.

(2) ASCERTAIN FROM DETAILS AND SPECIFICATIONS IF SASH PLATES ARE REQUIRED. BE SURE TO GET PROPER SIZE TO FIT SASH.

(3) ALWAYS CHECK DETAILS FOR PROPER SIZE STRIKE AND SASH-LOCK.

(4) IF YOU ARE FURNISHING ROUGH HARDWARE:-
*1. CHECK SIZE OF WEIGHT POCKET.
2. CHECK THICKNESS OF PULLEY STILE.
3. CHECK LENGTH OF POCKET-OPENING FOR ADMITTING WEIGHTS.
4. OBTAIN THE ACTUAL WEIGHT OF EACH SASH COMPLETELY GLAZED.

(5) CHECK DETAIL TO OBTAIN HEIGHT OF LOWER SASH-RAIL ABOVE TOP OF STOOL FOR PROPER SIZE SASH-LIFTS. THIS DIMENSION IS OF PARTICULAR IMPORTANCE IF WINDOW-VENTILATORS (THAT MORTISE INTO SASH-RAIL) ARE USED.

(6) CHECK SPECIFICATIONS TO ASCERTAIN IF SASH-BALANCES ARE TO BE TOP-HUNG OR SIDE-HUNG. OBTAIN THE ACTUAL WEIGHT OF EACH SASH COMPLETELY GLAZED. OBTAIN ACTUAL MILL-LENGTH OF SASH-OPENING FOR PROPER TAPE-LENGTH.

TYPICAL DOUBLE-HUNG WINDOW

IN REGARD TO HARDWARE - FRAME AND SASH
DETAILS FOR MASONRY & FRAME WALLS ARE SIMILAR.

Detail for typical double-hung window.

mate with the cabinets themselves. You would surely lose the job if

Fig. 13—Double bracket for wood rail.

you included this hardware when not specified with the finish hardware, and leaving it out when it should be included would get the job to your sorrow. Standards and brackets are often specified but as these have been illustrated twice before in the course it should not be necessary to illustrate them again.

Stair rail brackets, of which there are many, many types, must be furnished with the finish hardware on many occasions. Fig. 15 illustrates one of the popular types. Be sure to check the specifications, for you may find that even this

Fig. 14—Wardrobe doors operating in unison.

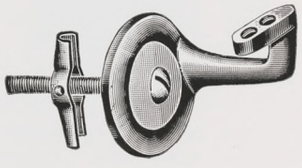


Fig. 15—Stair rail bracket.

responsibility is divided. That is, the brackets for the metal rails may be included in another contract while the brackets for the wood rails are in your contract.

Read carefully the specifications as to the distance each bracket should be placed and especially check the type of screw bolt or toggle bolt that may be required to fasten the bracket to the wall.

Chapter 45—*Advanced Course*

HOTEL HARDWARE

PROPERLY equipping a hotel with hardware is a most fascinating problem. Of course, hotels, like all the other types of public buildings we have considered, require butts, door closers, lavatory hardware, etc., as we have previously studied. However, in hotels we find a distinct difference when it comes to the matter of locks. First to me in point of interest is the keying system, and it seems to me that studying that will be a good introduction to the subject of the locks themselves.

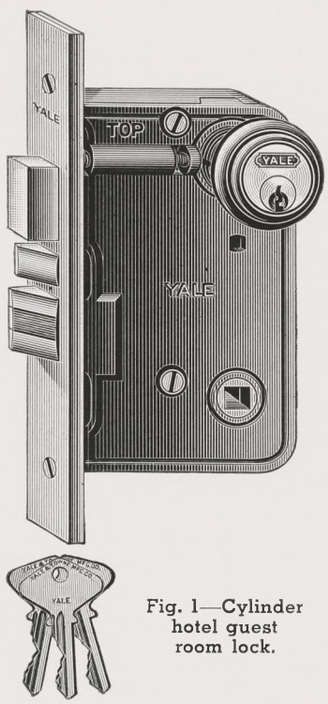


Fig. 1—Cylinder hotel guest room lock.

Let us take a hotel to be equipped with hardware. In this hotel there are 1000 guest rooms, so we will have 1000 guest keys to furnish 1000 guests with a key, but not one of the guests should

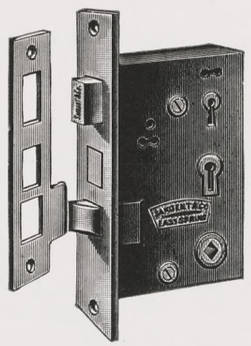


Fig. 2—Bit key hotel guest room lock.

be able to enter any room but his own, so all the 1000 keys must be different.

Then let us suppose that a maid takes care of 20 rooms, so that she may get into each room when the guest is not occupying it, and not wishing to make her carry 20 keys, we will have to provide 50 maids' keys or 50 master key systems in the hotel. Naturally the maid should only be permitted to enter the 20 rooms in her charge so one

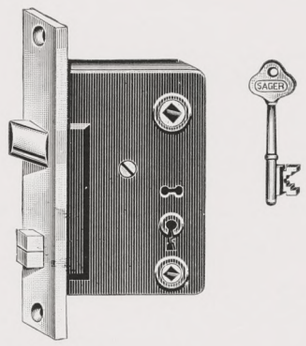


Fig. 3—Bit key communicating hotel lock.

maid with her key cannot enter any of the other 980 rooms in the hotel.

There are 10 floors to this hotel with a matron in charge who checks the work of the five maids working on her floor. Certainly she does not want to carry 100 keys to get into the 100 rooms, nor does she even want to carry five maids' keys, so we must provide her with a matron's or grand master key that will give her entrance to the 100 rooms under her charge.

At the same time we do not want her to have entrance to the other 900 rooms in which she has no business to be, so the locks are thus set up and no matron can enter any room except the 100 on her own floor.

Next comes the housekeeper who checks the work of all the matrons and maids in all of the 1000 rooms. It would be an impossibility for her to carry 1000 keys.

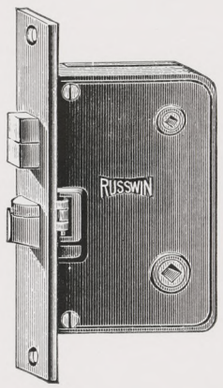


Fig. 4—Communicating bathroom hotel lock.

She would not want to carry 50 maids' keys or even 10 matrons' keys, so we must provide her with a housekeeper's key or great-grand master key that will permit her to enter any one of the 1000 rooms.

Up to this point, that is, guest,

maid, matron, or housekeeper, entrance to the room can only be gained when the room is not occupied or locked on the inside, but only when it is locked from the outside.

There are times, however, when even these keys should not permit entrance when the room is locked on the outside. All modern hotels have display rooms. A jewelry salesman might have a very expensive display of jewelry laid out. Locks are so made that on these display rooms a salesman can be provided with a guard key and when he locks the door on the outside with this guard key neither the guest, maid, matron, or housekeeper's keys will open the door.

Now we come to the final and very important matter from the standpoint of the management. A guest is in the room and the door is locked. He may perhaps become suddenly ill, cannot leave his bed and calls for help on the 'phone at the side of his bed. Or, as may happen in hotels, a guest may have committed suicide. The management must get into that room. Bear in mind no guest, maid, matron or housekeeper's key will let the manager enter. Shall he break in the door? No, that would be too expensive.

The lock is arranged so that it may be controlled by an emergency key. What a tricky little

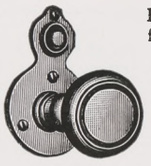


Fig. 5—Indicator for hotel locks.

"devil" that emergency key is, as you shall see. It will unlock from the outside any one of those 1000 locks, even though the guest is inside with the door locked.

That isn't all that the emergency key will do, however, for there is another problem the manager has that this key solves for him. When the guest's door is locked from the outside by the emergency key no other key but the emergency key will unlock it.

Suppose there had been a murder in the room and the management does not want anyone to enter until the police arrive. That's easy. Just lock the door from the outside with the emergency key.

A guest may not have paid his bill for some time and may have left his clothes in the room. He hasn't answered polite requests to see the manager. How is the manager going to be sure of seeing him? It's simple. Just lock the door from the outside with the emergency key. The guest goes to his room. His key won't open the door. That's funny! So he goes to the maid or the matron or the housekeeper. Their keys won't open it either, even though the room is not locked from the inside. If the guest wants his clothes he will have to contact the manager, because the emergency key is in the manager's hands and he is the only one who can unlock the door. Simple, isn't it?

Not all locks for hotels have all these key operations, but many of them have, and a careful check of your manufacturer's catalog will clarify these points.

I have taken a lot of space to tell you about hotel keying systems, but that's the crux of the entire problem. Besides, I think it is the most fascinating story of the whole builders' hardware business. Don't you?

Now as to the locks themselves. Some managements prefer a spring lock so the door is always locked from outside (Figs. 1 or 2). Others prefer a lock that requires the guest to lock the door after him when he leaves. Each system has its advantages and each has its disadvantages. Some managements prefer to have the lock bolted from the inside by means of a guest key. Others prefer a thumb bolt on the inside. Again, each system has its advantages and disadvantages. Study them out yourself.

On many closet doors the closet lock is made for the same key change as the room door so that the guest needs only one key. Frequently these locks will not open to the maid, matron's or housekeeper's key and only the emergency key will operate them. This is done so the guest can lock valuables in the closet so that they will be safe from any employee of the hotel.

In many states it is compulsory that the communicating doors between rooms be locked with a key in addition to the usual thumb turn on each side. See Fig. 3.

Many hotels use double doors between rooms in order to deaden the sound travelling from one room to the other. In such cases flush cups are usually necessary between the doors instead of knobs because of the limited room.

Another little gadget that is

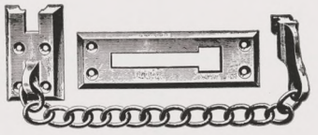


Fig. 6—Chain door fastener.

usually specified for guest rooms is the indicator which operates when the door is locked on the inside so that the maid can know the room is occupied without trying the door and disturbing the guest. Fig. 5 shows one of several types made.

Bathroom doors (Fig. 4) the private baths in guest rooms, are often equipped with just latches and no lock. Many managements feel that they are totally unnecessary when the room door is bolted.

A study of the suggestion chart and the illustrations in this chapter will give you most of the fine points of this story I have tried to present to you.

Many hotels equip their guest room doors with chain door fasteners. I know one large hotel, one of the most prominent in the country, that at one time had trouble

HARDWARE AGE

SUGGESTION

KEY TO CHART A Type—Best Lock Regardless of Price. B Type—Medium - Priced Lock for Medium-Priced Bldgs. C Type—Least Expensive Lock for Low-Priced Bldgs.	Barrows Lock Co.	Clinton Lock Co.	P. & F. Corbin	Lockwood Hardware & Mfg. Co.	Norwalk Lock Co.
Guest Room Doors					
A	544	7040MK	547	5170	3711B
B	855EK	400MK	517	T5070	2711B
C	955EK	4080MK	507	5588	8615½
Clothes & Linen Closet Door					
A	990	7000CS	580¼	5100½	3761
B	893	8000CS	0563	T5000½	2761
C	853	V7000CS	1366½	3602	8531½
Twin Communicating Door (Check space between doors to ascertain if knobs or flush handles are required.)					
A	9987	510CS	444½	5120 x 1 Cyl.	3715
B	987	500CS	159¾	T5120 x 1 Cyl.	2715
C	977	580CS	159¼	3604	6570
Single Communicating Door					
A	934	7040-2 Cyl.	444¾	5538	3722
B	934	530	159½	5538	2722
C	977	520	159	3605	6587
Bedroom to Private Bath Door					
A	973	510	0233½	5535	6570
B	210	500	049	1048	8064
C	220	580	045	1034	011
Communicating Passage to Bedroom Door					
A	973	7040	0233½	5535	8649½
B	877	7630	285⅞	5549	6570
C	977	V7000	0159½	3604	8340
Communicating Passage to Bath Door					
A	877	590	0233½	5549	6570
B	877	590	285⅞	5549	6570
C	937	580	0159½	3604	8372
Communicating Bath Door					
A	934	530	444½	5538	8694
B	987	520	159¾	5538	6587
C	977	520	159¼	3605	8572
Closet Door in Room					
A	378	7000CS	090 no keys	T5000½	2761
B	873	8000CS	049 no keys	1034 x 5910	8531½
C	220	3030	045 no keys	1034	011
Wire Shafts—Pipe Chases, etc.					
A	1141	8050½ Cyl.	0547¾	2217	8392¼
B	1163	960¾	0548	2217	8171½
C	1221	960¾	6011	2217	8180½

EDITOR'S NOTE: This suggestion chart is not to be confused with the comparison charts published elsewhere in this book. This chart includes the ideas of individual manufacturers as to the proper locks to specify from their own catalogs.

with a thief who, in some unknown manner, secured an emergency key and prowled into guest rooms while the occupants were asleep.

The hotel, however, put a stop to that by equipping every guest room with a chain door fastener (Fig. 6) and a sign in each room for the guest to chain his door before retiring. The stealing stopped, and incidentally I sold the hotel a large number of cast bronze chain

Note—While every care has been taken, we assume no responsibility for correctness of these suggestions furnished by the manufacturer.

LIST—HOTELS

Penn Hardware Co.	Reading Hardware Corp.	Russell & Erwin Mfg. Co.	Sager Lock Works	Sargent & Co.	Schlage Lock Co.	Yale & Towne Mfg. Co.
DM595 x 9461HM	01674¼D	1449EM	542	6852	C85PD	1674
DM525 x 3879HM	1276D	608¼EM	513	6120	D83PD	1642
DB626 x 3818M	1192	619¼EM	518	6119	A80WS	1687
DM573	01708	11456	790	7805½	C51PD	7656
DM525 x 2428	1412	1384¾	380¾	5639	D81PD	1570
DB626	01297	0375¾	320¾	5259	A81WD	1820
DM595 x 7551	01714¾	11224	9452	6825	D51PD	7660
DM525 x 3558	1197	0022¾	452	6113	D51PD	1449
DB626 x 3169	01180	229	482	4663½	A51WS	1519
DM525x 3369	1182 x 1622	1121¾	557	6873	D62PD	7526¼
DM525 x 3408M	1182 x 3092	1121¾	557	6143	D41D	1545
DB638	1184	229½	482	4671	A42D	1524
DM525 x 3558HM	01714¾	0022¾	455¾	6215	F73WS	1449
DM525 x 1667	1282	026	130	4645	A10S	1819
DB626 x 1597	01180	029	120	4634	A10S	1016
DM525 x 3558HM	01714¾	0022¾	455¾	6215	F73WS	1449
DM525 x 3189	1282	236	450	4665	A30D	1535
DB626 x 3169	01180	229	482	4663¾	A30S	1819
DM525 x 3189	1282	236	450	4665	F40S	1535
DM525 x 3189	1282	236	450	4665	A40S	1535
DB626 x 3169	01180	229	491	4663¾	A40S	1819
DM525 x 3408M	1182 x 1622	1121¾	557	6143	F30S + B280	1545
DM537 x 3369	1182 x 3092	236½	452	4675	A30S + B280	1525
DB638	01180 x 1184 x 1029	229½	482	4671	A30S + B280	1524
DM573	01714¾	11456	781NS	7805½	F20S — B250PD	7656
DM525 x 2478	1412	382¾	370¾	5639	A71WD	1500
DB626 x 1597	01297	029	120	4634	A10S	1022
7340 x Pull 531	1620	1203	966	4861	B250PD	325
3958 x Pull 531 x 2 Esc. DN501⅝	3092	0786	963¾	4949	B260P	297
3938 x Pull 531 x 2 Esc. DT601⅝	1092	078¾	961¾	4949	A81WS	275

No attempt is made in this suggestion chart to make comparisons of the items of one company with the quality of lines made by other manufacturers.

door fasts within a short time.

Razor strop hooks in the bathroom, coat and hat hooks in the bathroom and closets, room numbers and guest room knockers are among the many other things which add to sales of a hotel job.

There has not been a chapter of the entire course I have enjoyed writing more than this one. I hope you catch the fascination that there is in hotel hardware.

Chapter 46—*Advanced Course*

HOSPITAL HARDWARE

WE will consider hardware for hospitals in this chapter and I want to point out the fact that a great deal of special hardware has been developed for this type of building. Let me again remind you of all the general items used in all types of public buildings which we have already studied in this course, including door closers, floor hinges, lavatory hardware and the like.

There are two distinct types of hospitals to consider in the group we are now about to study. The first, with which we are most familiar, is the building to serve the sick who are sane. The second is the building to serve the sick who are insane. Many of their problems are identical but the locking problem for buildings designed for the insane is much more complicated.

First let us consider the matter of butts. All of the things we have previously learned regarding throw, bearings, metals, etc., apply here, the only difference being that in the better hospitals it has become a matter of good practice to furnish butts similar to that shown in Fig. 1. Note the fact that the ends of the barrel are rounded so that it is impossible to attach ropes or wearing apparel. No one could possibly hang himself from the barrel of a butt of this type.

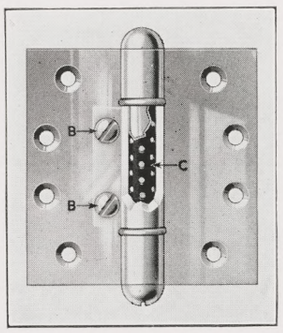


Fig. 2—Friction hinge loose pin type.

This type of butt is easily kept free from dust and dirt and is suitable for both kinds of hospital buildings. They come in extra heavy and heavy weight and in full mortise, half surface and full surface. They are made in wrought bronze and steel, cast bronze and iron.

Many hospitals, where the rooms are not controlled by door closer devices, use friction hinges to prevent the doors from slamming. Fig. 2 shows one of many types of friction hinges manufactured. In using any type of friction hinge it is very important that the jambs of the door frame be securely anchored.

Another method when neither door closers nor friction hinges are used that will prevent doors from slamming, is to equip each door with a roller door holder such as is shown in Fig. 3.

At the door jamb, especially when friction hinges are used, a roller catch is often furnished. This is shown in Fig. 4. It is noiseless in operation and is positive enough so that it will eliminate all chattering of the door against the stop.

If the roller latch is not used, three rubber door bumpers, shown in Fig. 5, on each door will cushion the door as it comes to a closed position against the stop.

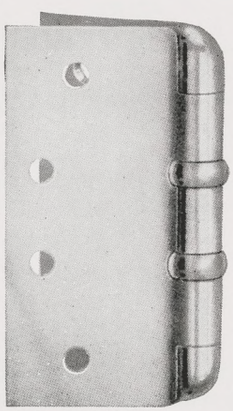


Fig. 1—Regular weight ball bearing hospital butt.

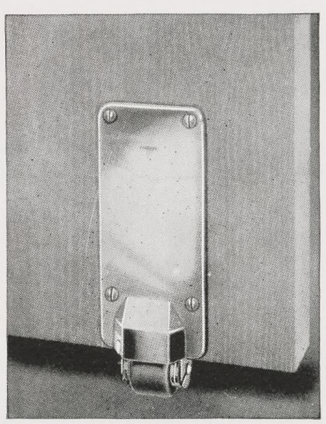


Fig. 3—Roller door holder.

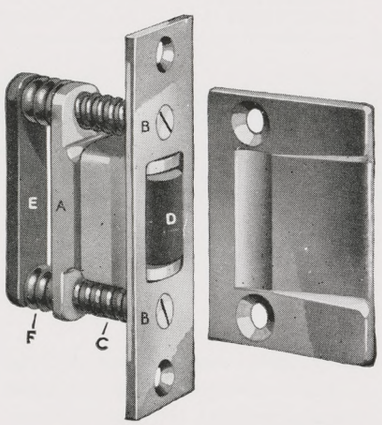


Fig. 4—Roller catch for door jamb.

On these types of installation it is customary to use a dead lock for locking the door and a push plate with a hospital arm pull similar to Fig. 6 for opening. A nurse may have her hands occupied with a tray of food. With this hospital arm pull on the door she may hook her arm under the pull and open the door without setting down the tray.

In the interest of quiet, so necessary in a hospital, even the locks can be manufactured with a pneumatic device in the lock by means of which the bolt goes into the deadlock position slowly and quietly. Fig. 7 shows a typical lock for a private patient's room.

When friction hinges are used, the friction of the hinge will hold the door in a slightly open position where desired, for ventilation, but many hospitals prefer door closers on the room doors, so manufacturers have developed a door closer, like Fig. 8, which holds the door slightly open when desired.

The various locks for hospital doors of the sane sick are not so different. In fact, many times they operate in the same manner as those suggested for office buildings. However, when we come to the locks for hospitals for the insane we have a different problem. Here all room doors must be securely locked. Fig. 9 shows a heavy, no-click hospital lock with a spring box strike that allows the dead bolt to enter with a no-click noiseless operation.

Fig. 10 shows a hospital latch with auxiliary latch bolt. This latch is so constructed that the hub holds the knobs rigid. The door is always locked when closed. This type is particularly adapted for asylums so that the attendant can enter a room for violent patients and kick the door shut as he steps in so that no one can slip by him and escape. He must unlock the door to leave or enter the room.

Fig. 11 shows another peculiar condition which has been successfully met. This is a unit lock of unusual construction. Unlocking the door from the outside uncovers the inside keyhole, which then remains visible, since the keyhole protection, or cover, is automatically locked by the stop lever in face of lock when the door is closed. This prevents the covering of the keyhole by an inmate while an attendant is within the room. Opening of the door with a key by the attendant on the inside, releases the stop lever and allows the protector to be thrown over the keyhole, in which position it is automatically locked until released by the key from the outside. The auxiliary latch automatically safeguards and deadlocks the latch bolt, preventing it from being retracted by any instrument inserted between face of lock and strike.

I hope that you will never have the unpleasant duty of having to visit any institutions for the insane, especially those who are violently insane, but if it does become your duty, as it has been mine in the past, you will fully realize the importance of proper locking devices.

To me it is far more depressing to visit such places than it is to visit a morgue. You cannot go through such an experience without realizing the danger which doctors, nurses and attendants constantly face.

For an inmate, especially a violent patient, to escape, even to another room, is often extremely dangerous. These patients may be insane, but they are often tricky and cunning, so if you have to equip an insane asylum hospital, it is your duty to safeguard the doors with the very best lock protection possible.

Even the windows have to be locked. Fig. 12 shows a mortise sash lock for double-hung windows. It can be locked open as well as closed and is made with a spring bolt that is always locked.

Inmates are always trying to escape or to commit suicide. They will fill the keyhole with bread or other food on occasion. It is one of the tragedies of our modern life that there are so many insane, and it is your obligation to safeguard the sane when equipping one of these buildings by seeing to it that

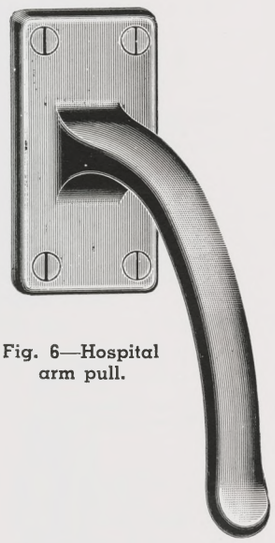


Fig. 6—Hospital arm pull.

Fig. 7—Hospital room lock with pneumatic feature.

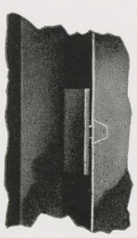


Fig. 5—Rubber door bumper.

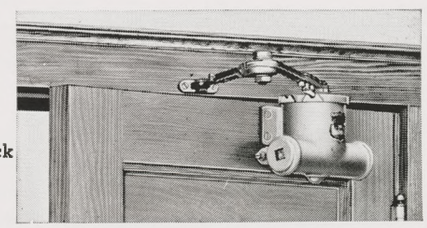
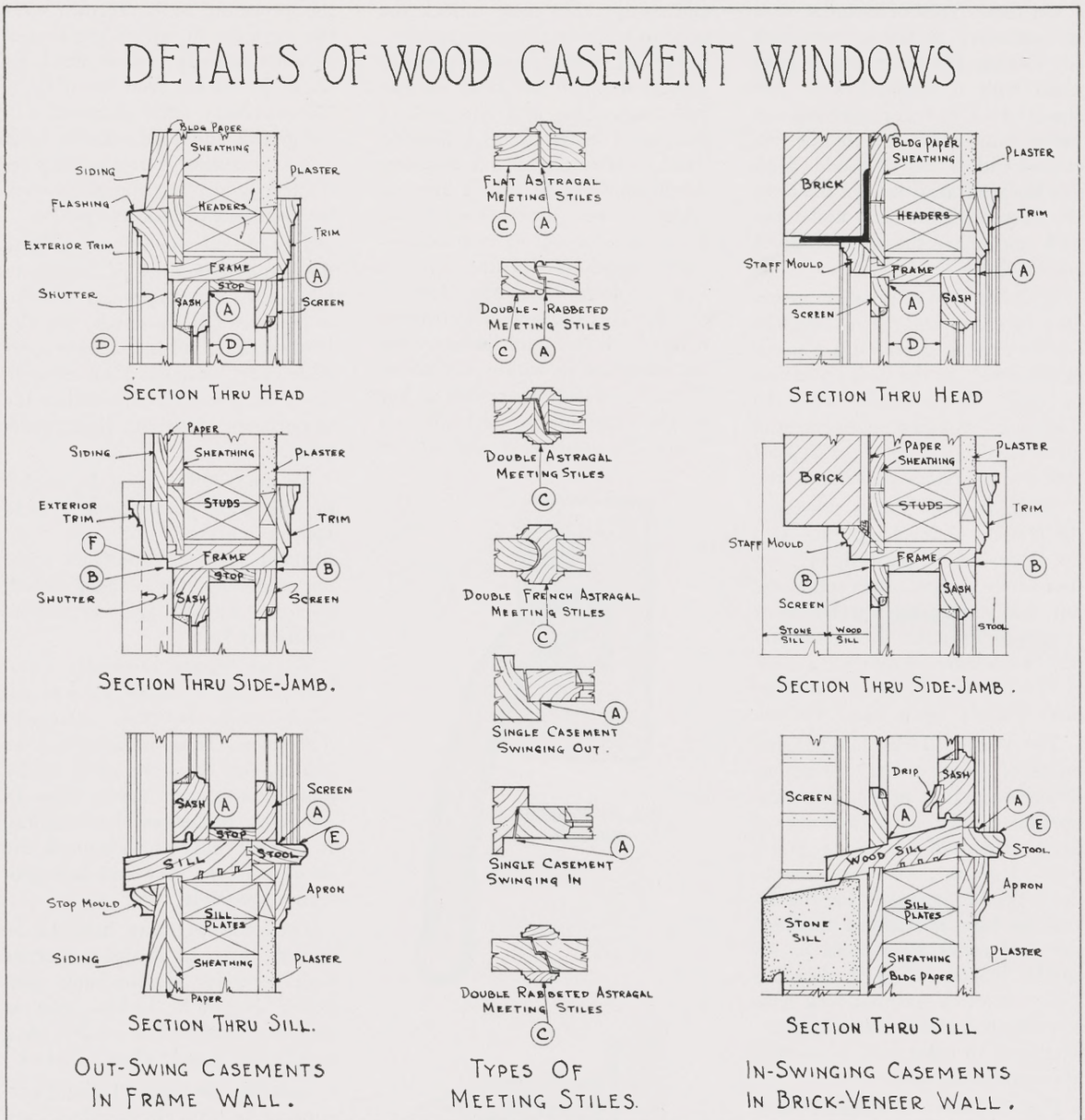


Fig. 8—Hospital door closer with hold open feature.



Details for wood casement windows.

all openings are properly and securely locked.

Throughout this course I have at times taken the liberty of giving personal experiences and in closing this chapter I am going to describe an experience I once had in equipping a building to house insane patients. It was the outstanding experience of my many years of hardware service for quick delivery.

At Woodville, Pa., just outside of Pittsburgh, is a large group of buildings used by the county. One group houses the old folks who are sane. The other group houses the county insane. A new building

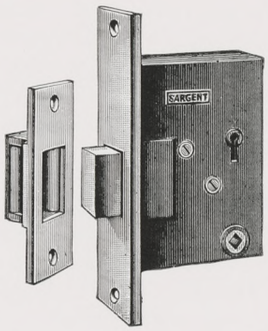


Fig. 9—Hospital Noiseless lock.

had just been completed for the old folks and they were being moved into it. Their old quarters were being taken over to house some of the county insane.

One Saturday morning I was called down there with a most urgent message to "make it snappy." When I arrived I found that someone had just discovered that the entire old building had been equipped with regular hardware. Every room lock gave an easy, quick outlet to any occupant in case of fire, which was the proper thing for an old folks' home, but not for a home for the insane. All plans had been made to move the insane in on Monday morning and there was not enough hardware of the right kind in the whole city of Pittsburgh to properly equip this rather large building.

At 11 a. m., with a complete list of requirements at my hand, I called the Russell & Erwin Mfg. Co., whose line we carried, got Isaac Black, then sales manager, on the 'phone, described the situation, told him I must have the

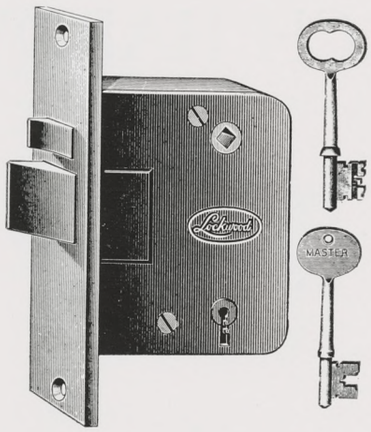


Fig. 10—Hospital latch, knobs rigid, always locked.

goods in Pittsburgh on Monday morning, and asked him to send them in any finish and keep the cylinders alike.

This was no small order. I have

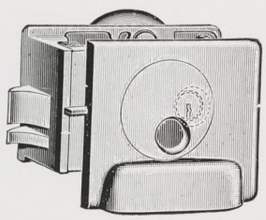


Fig. 11—Asylum unit lock.

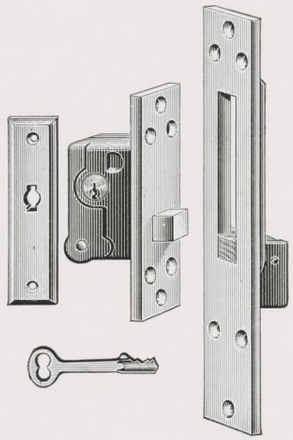


Fig. 12—Mortise ventilating sash lock.

forgotten the exact number but there were dozens of flush bolts and a great many locks. Mind you, this was Saturday and nearly noon. Mr. Black kept the factory working, and late Saturday night the entire shipment left New Britain, Conn., by express and was received in Pittsburgh Monday morning. I took it to Woodville. A large force of carpenters was waiting to apply the hardware and by Monday evening the inmates were in their quarters, properly locked in.

In all my 30 years of hardware experience I have many times been greatly exercised by factory delays, but this was certainly one time in which a firm came through in a big way.

Chapter 47—*Advanced Course*

CHURCH HARDWARE

As we take up the study of hardware for churches it might be well to refresh our memories on the subject of Schools of Design outlined in Chapters 21 and 22 of the Intermediate Course.

In all the previous chapters dealing with various types of buildings I have kept away from the subject of design, feeling that the outline given you in the Intermediate Course, not only for design but also for lock trim, would be firmly established in your minds. Nor is it my intention in this chapter to particularly emphasize the subject again other than to say that churches usually

Fig. 1—Ornamental door pull.

follow some particular school of design and the design of the hardware should match that of the building.

Gothic design undoubtedly gets

Fig. 2—Escutcheon with drop ring.

attention in church hardware, but this is not always the case. Many churches follow the Romanesque or even the Colonial school, etc. As we approach the study of church hardware it is well to first bear in mind the question of the architectural design of the church in connection with our lock trim.

Churches require all those hard-

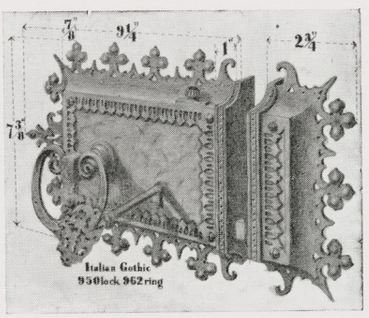


Fig. 3—Escutcheon with drop ring with rim lock on the inside.

ware items which have been outlined in the earlier chapters of the Advanced Course such as butts, door closers, floor hinges, lavatory hardware and the like, and careful consideration must be given to the matter of trimming the church with proper hardware. An interesting additional touch can be given the butts on churches of Gothic design by furnishing them with Gothic tips.

Aside from these ever-present items in all public buildings we have a number of new things to consider as we take up the subject of church hardware.

As we come to the entrance doors we find these are often equipped with a design pull such as Fig 1, using a suitable design push plate inside. You might, however, use a drop ring on an ornamental escutcheon similar to Fig. 2. This sort of trim is often

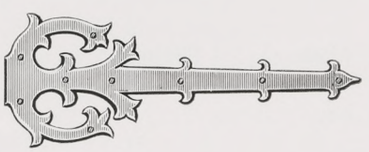


Fig. 4—Ornamental hinge plate.

used with a rim lock on the inside as shown in Fig. 3.

Not much has been said about rim locks in our course but they do have a very definite place in the builders' hardware picture. They are often made with cylinder locks but more frequently with large and fancy bit keys which are usually left in the lock at all times. Rim locks are used a great deal with French architecture as well as with the Colonial. Look through your manufacturer's catalog for these interesting items.

But to return to our entrance doors, we have another item now that has had little attention in our study to date. That is the matter

of hinge plates. Fig. 4 is simply an illustration of the type. They are made in many, many designs and patterns. It will be extremely important that you give particular attention to the door details for width of door and stile when furnishing them. Architects frequently design special patterns which have to be made to order.

Hinge plates, like rim locks, are used on many other doors than church entrance doors, so investigate this subject further in your research. Door bosses, as shown in Fig. 5, are also specified at times.

While our thoughts are turned to these items, which are used so much on churches and on many other types of buildings, we can discuss a mortise lock, shown in Fig. 6, sometimes called the English type. You will notice that the lock has an extremely deep backset. This varies with different manufacturers, but averages about 5 in. or about twice the depth of a standard lock.

Many architects want the knob to come farther away from the edge of the door. Church doors will frequently be detailed with a box-like stile, wider than the regular stile, where the lock is inserted. It might be a 10 in. stile at this point. The lock shown in Fig. 6 would be just the one for such a condition. The knob would be centered on the center of the box stile although the keyhole would be much nearer the edge of the door on the same line as the knob. The architect might desire this effect and have the lock fit into the cross rail of the door and, as the height of the case is much less than it is on a standard mortise lock, it could be done. You must always check details and be sure that the cross rail is long enough to receive it.

Fig. 5—Ornamental door bosses.

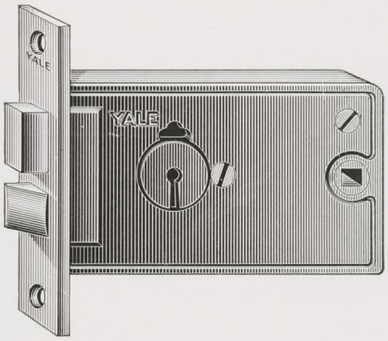


Fig. 6—English type deep backset mortise lock.

Generally speaking, the other types of locks used on churches are the same old friends you studied way back in Chapters 17 and 18 of the Intermediate Course.

Office doors on churches generally follow the same practice followed in office building hardware. A church school section, usually found in churches, would follow along the same lines described in the chapter on school hardware. By this time I am sure that you are getting the idea that all of these steps we have been discussing are leading you to the position we started to attain—that of making you a builders' hardware engineer capable of furnishing hardware for any type of public building or private residence.

In Catholic churches particularly, you will find many small doors leading to confessionals, baptismal founts or receptacles for holy water and all of these must be equipped with hardware. If there are such doors they will be noted in the plans. And at this point let me repeat the warning which has been emphasized throughout the course that "every mark on a plan means something." Don't overlook any of them!

These small doors are not particular hardware problems. They just have to be taken care of and the former lessons should show you how to take care of them.

Hat holders, as shown in Fig. 7,

Fig. 7—Hat holder for church pews.

are often furnished in hotel guest rooms but you will more frequently find them used in church pews.

Doors leading from church altars or rostrums are often required to have no hardware showing on the altar or rostrum side so that they will seem to be merely a part of the panel work. This is a matter that is easily solved. Just use a door closer on the back of the door with a door pull and with no hardware on the altar or rostrum side and a push on the door itself without a push plate.

Doors from the narthex (vestibule) to the nave (auditorium) frequently need pulls, push plates and door closers with holding devices and are not locked at all. This has all been studied in Chapter 40. In case it is necessary or desirable, flush bolts, similar to the one shown in Fig. 8, with cylinder or bit keys are used.

Altar rails across the front of the church cut off the chancel and have gates which must be equipped with hardware. Inasmuch as we have not discussed gate hardware, the present would be an excellent time in which to take up the subject.

Gates, of course, are not only used at altar rails but also in many offices. Sometimes they are hung

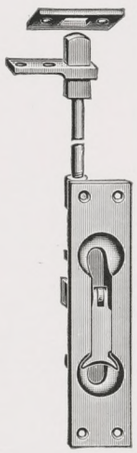
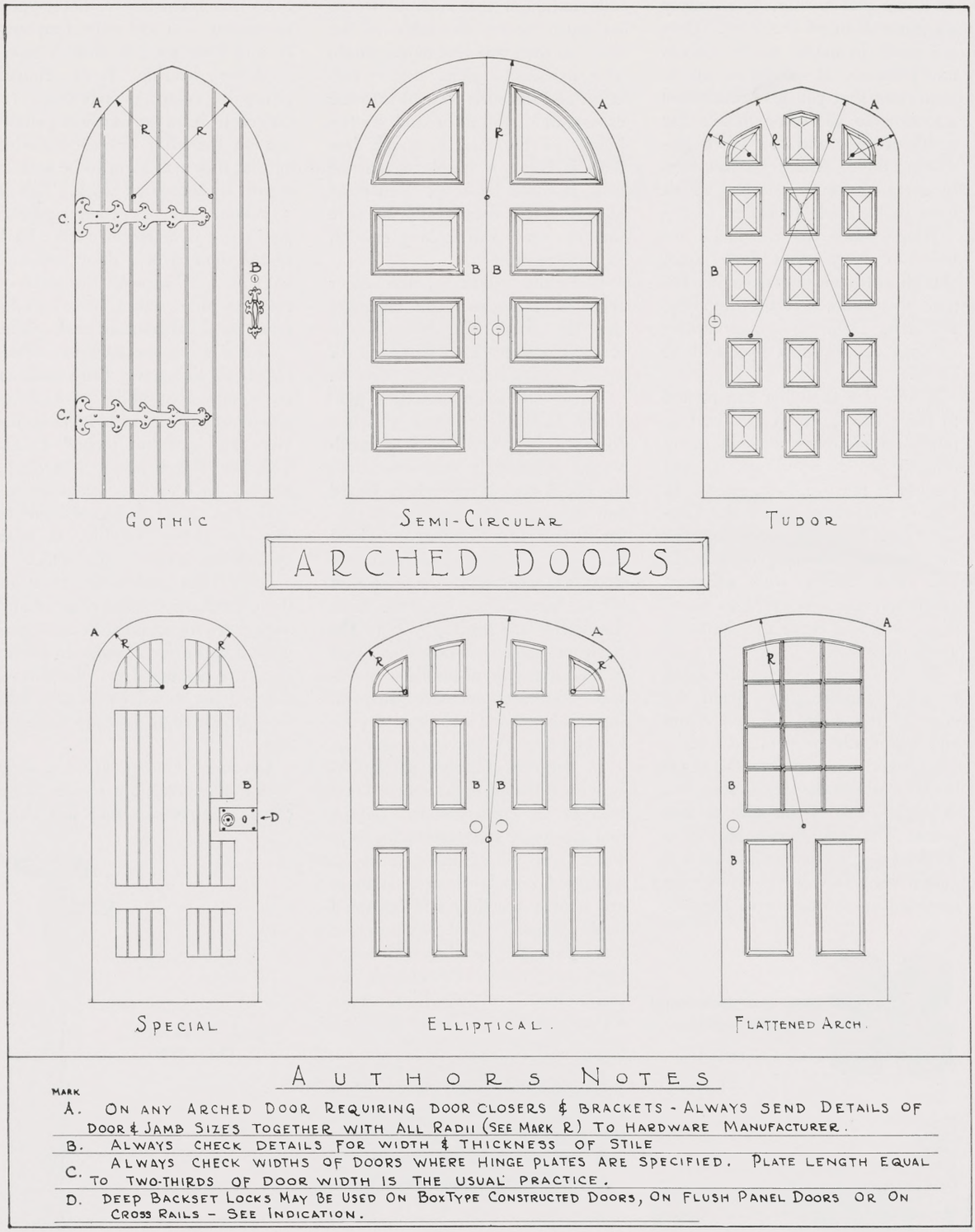


Fig. 8—Flush bolt for edge door.

on jamb hinges but I believe that the pivot hinge will usually be found to be the most satisfactory type to use in order to prevent sagging. Fig. 9 shows the type I mean. This is similar to the type discussed in Chapter 42 under lavatory hardware and can be ob-



Detail drawing of arched doors.

tained in the checking type if desired.

Secret gate latches are shown in Fig. 10, although there is little that is secret about them any more. Almost everyone knows that the secret consists in the pressure of a finger on the under side of the latch case which will open the gate. The knob is stationary and does not operate the latch bolt.

While a church does not need the extreme quiet so essential to a hospital, it does add to the sense of reverence and worship if all doors are equipped with closing devices which eliminate all possibility of slamming.

Church locks are usually the same type locks used on buildings already studied and, such being the case, it does not seem at all necessary to compile a comparative chart such as have accompanied previous chapters. It would, however, be excellent practice for you to compile one for your own use and from previous charts make your own suggestions for locks used on A, B and C type churches. Why not try it for your own edification?

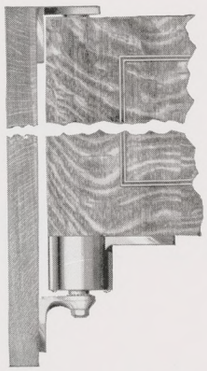


Fig. 9—Pivot spring hinge for gates.

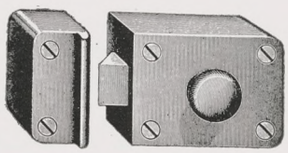


Fig. 10—Secret gate latch.

Chapter 48—*Advanced Course*

FACTORY HARDWARE

THE first rule of procedure for factory hardware is to use heavy, strong and simple operating material. It must be rugged in order to stand the strain.

Of course, there probably will be office doors and lavatories in factory buildings and on these places you must follow the lessons you have earlier learned as to proper hardware trim for these types of openings. Hardware for factories, except for office and lavatories, is usually of galvanized, japanned or plain steel. Regular hardware finishes, such as we have discussed before, would not be suitable for this kind of building.

There are frequently many sliding doors in a factory and, whenever this is the case, all the knowledge you gained in Chapter 31 of the Intermediate Course will stand you in good stead. However, you may find that you will need even heavier hangers than the ones previously described. Fig. 1 shows a hanger of a larger size than any we discussed in Chapter 31. It is used with a 13-gage track and is capable of handling doors up to 2000 lb.

Naturally, the same instructions called for in Chapter 31 regarding brackets, guides, pulls, etc., will also apply on this type.

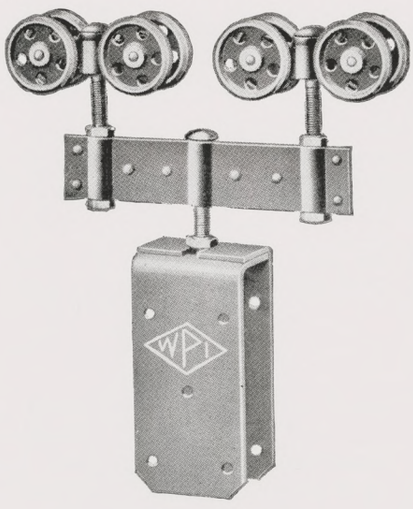


Fig. 1—Hanger for sliding door — 2000 lb. capacity.

Track and carriers of various loads, used as labor-saving equipment, may be also required in the same factory. Fig. 2 shows a carrier of this type with a capacity up to 3000 lb. These can be used in both straight and curved track. Carrying systems are frequently quite complicated and if you have any specified I would suggest taking the matter up with your source of supply before figuring jobs.

In factory work you will also find many large hinged doors. Regular butts would never hold them up against the heavy use to which they are subjected. Here again it is important to know the weight of the door and to follow factory suggestions.

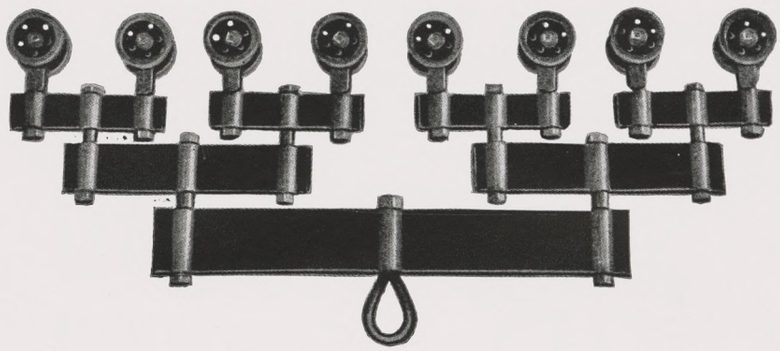


Fig. 2—Carrier equipment—3000 lb. capacity.

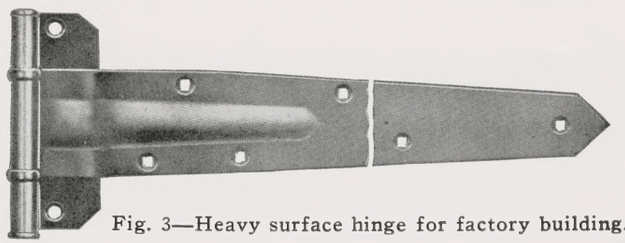


Fig. 3—Heavy surface hinge for factory building.

A hinge, generally called a garage hinge and shown in Fig. 3, may be just what you need. It is made in several lengths from 12 to 36 in. You may need even more substantial hinges, particularly when methods of fastening them to the wall, such as are shown in

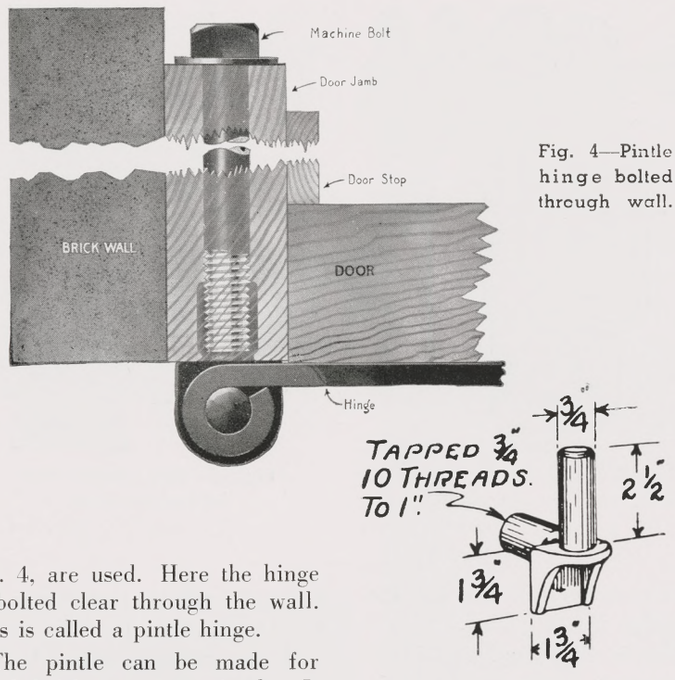


Fig. 4—Pintle hinge bolted through wall.

Fig. 4, are used. Here the hinge is bolted clear through the wall. This is called a pintle hinge.

The pintle can be made for wood, brick or concrete jambs. It can be made for doors that are flush with the wall, as is the case illustrated by Fig. 4, or it can be furnished for overlap doors as required. Better send a detail to the factory showing exact conditions when ordering.

The strap part of the hinge applied to the door itself may be of any desired length and this strap should also be bolted through the door. You cannot be too careful in making it a strong, sturdy job.

Fig. 5 shows another extra heavy type of warehouse hinge and is made in sizes from 24 to 48 in. Fig. 6 is still another strap hinge. This time you will note from the illustration that it is ball-bearing.

Frequently you will find that these large factory doors are in pairs and this means that bolts must be used on one leaf to fasten the door. It may be wise to furnish a heavy spring bolt such as is shown in Fig. 7. These are made in lengths from 6 to 36 in., so if the door is a high one be sure and furnish the proper length.

Another popular bolt is shown in Fig. 8. This comes in lengths up to 10 in. and a foot bolt of similar design is made to match it. However, I prefer to use a heavy cane bolt for the bottom. Fig. 9 illustrates this type of bolt.

In many cases it is necessary to lock these big doors and Fig. 10 shows a rugged store door cylinder handle set made especially for this sort of work. At other times a separate cylinder latch on the order of Fig. 11 is specified.

Doors that do not need to be locked, and for that matter many doors that are locked (usually with padlocks), will take a very heavy thumb latch trim such as is shown in Fig. 12. Sometimes a plate is required on one side or on both sides as is illustrated in Fig. 12.

Factory doors are not always large, but even on smaller doors I would follow the same general practice used for the large ones. In other words, just use lighter and smaller hardware of the same type that is used on the large doors.

Frequently a mortise latch, shown in Fig. 13, will be used on these smaller doors or perhaps a rim latch like Fig. 14. Note on this illustration how the handle is bolted clear through the door.

Probably there will be not so many door closers required on these types of buildings but certainly the entrance doors used by the employees, the office and lavatory doors should be so equipped.

There are many fire doors and fire shutters in factories. In almost every case tin-clad fire doors and shutters are furnished complete with all necessary hardware, so I am not going to take you into any extended study of that subject in this course.

Certainly in all the larger cities there are many concerns specializing in fire door equipment which includes the doors, shutters and complete hardware. If the student of this course happens to be in a

Fig. 7—Extra heavy spring bolt.

Fig. 5—Extra heavy warehouse hinge.

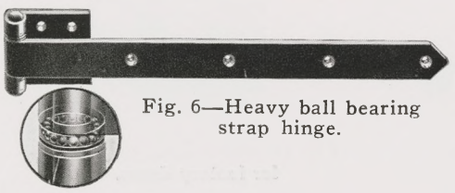


Fig. 6—Heavy ball bearing strap hinge.

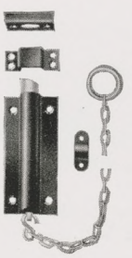
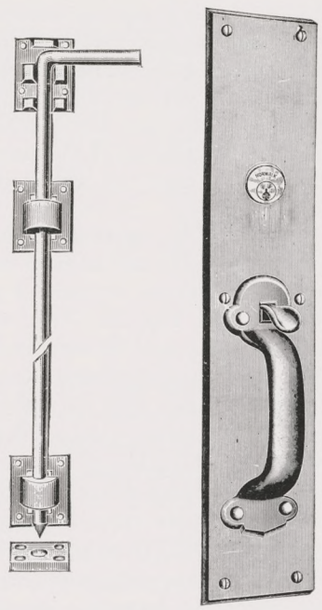


Fig. 8 Extra heavy chain bolt.



Left, Fig. 9—Heavy cane bolt. Right, Fig. 10—Heavy japanned mill door handle set.

smaller town where the hardware store may be an agent for one of the fire door manufacturers he can undoubtedly get all the necessary information from that manufacturer.

Just this about fire door hardware—if you do have to figure any, be very cautious and know exactly what is required. Fig. 15 shows a sliding door and Fig. 16 a pair of hinged doors. Just from these illustrations of only two of dozens of kinds of fire doors you can get the idea that this type of hardware is something else again and would require a chapter or two to cover it in only sketchy fashion. This being the case, we will omit it. Follow it through for yourself in a study of your manufacturer's catalog. Most of us,

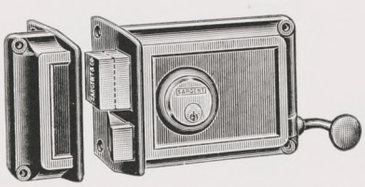


Fig. 11—Heavy double throw lock bolt.

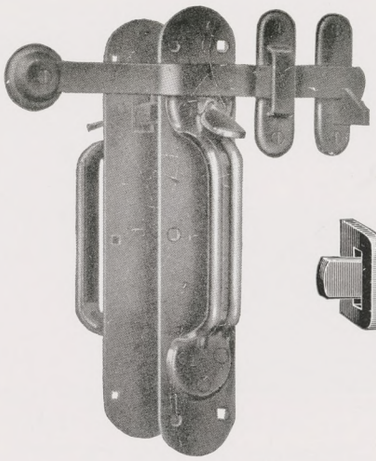


Fig. 12—Extra heavy thumb latch for factory doors.

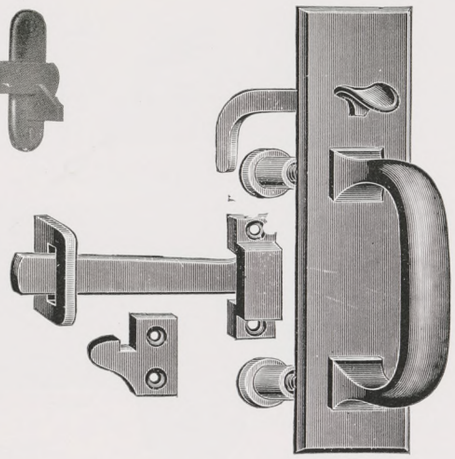


Fig. 14—Rim handle latch for factory doors.

however, have little use for the knowledge if it is gained.

There is little cupboard hardware in most factories and usually no window hardware. The windows are of steel and come equipped with hardware.

Somewhere I have read that if you would have people think you are young don't reminisce. I have, perhaps on too many occasions, referred to personal experiences of the past and therefore may be accused of being old. Let me assure, however, I mention my personal experiences only in order to illustrate actual experiences in order to bear out a point.

Here's another experience I want to use for the purpose of pointing out the changes in building practice. I well remember how it used to be necessary to climb around factory roofs to measure the skylight operating devices on the wood sash which was used at that time. Let me tell you you have to be young to do that without breaking your neck.

Sash-operating devices for wood sash are not nearly as important in our industry as they used to be 20 or 30 years ago, but they are apt to bob up on some occasion, so I will briefly call them to your attention. You see I would not want it said by one of the students of this course, "Never heard of them." Fig. 17 shows a comparatively simple type of sash oper-

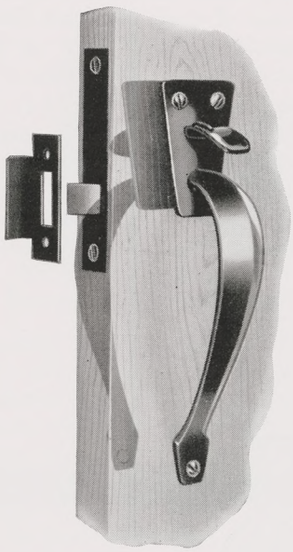


Fig. 13—Mortise handle latch for factory doors.

Fig. 15—Single incline sliding fire door.

ator. They operate one or more high up sash. Operators are made to work them with crank or chain. The one illustrated is made by Payson Mfg. Co. of Chicago and it would be well to get a catalog on operating devices if you run into such a problem. Occasionally you will run into the need of a skylight operator, as is illustrated in Fig. 18. This particular one is also manufactured by Payson.

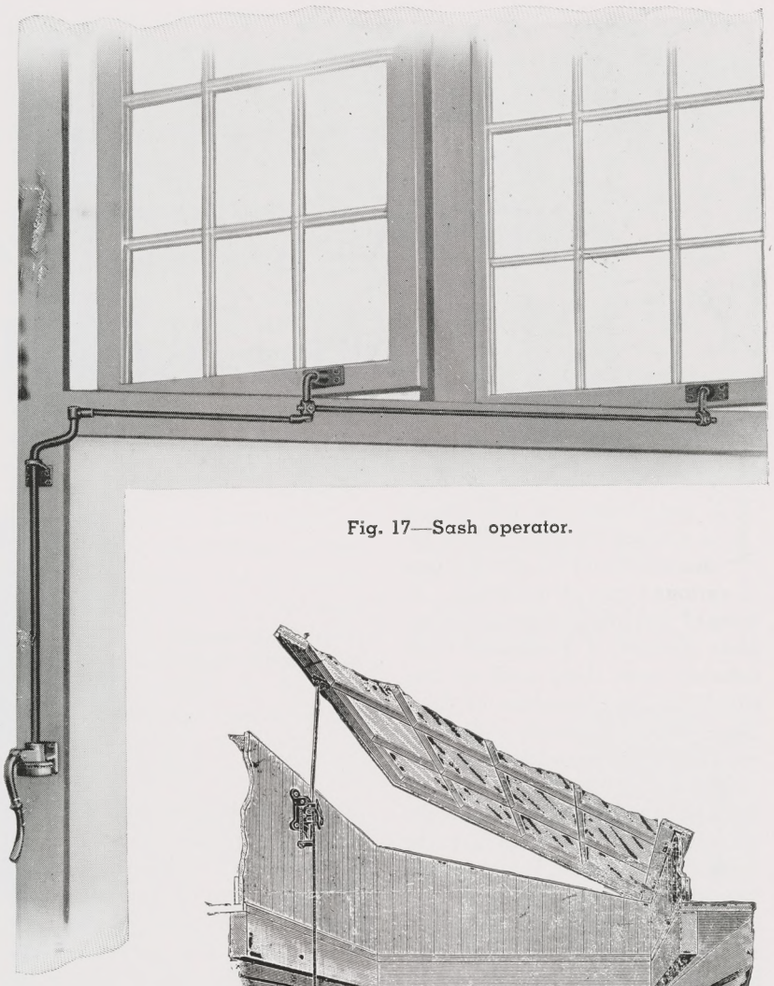


Fig. 17—Sash operator.

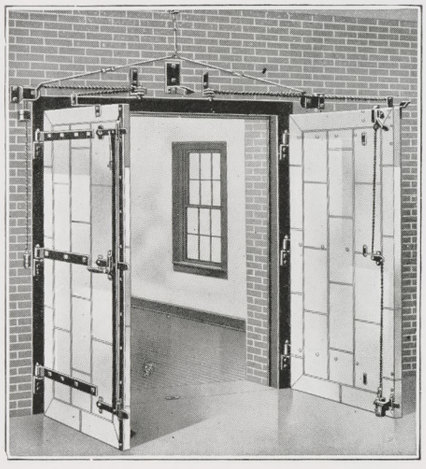


Fig. 16—Pair hinged fire doors.

Fig. 18—Skylight operator.

Chapter 49—*Advanced Course*

SPECIAL HARDWARE for PUBLIC BUILDINGS

IN this chapter we will discuss a number of items which are manufactured for specific uses in various types of buildings. As none of these items requires a complete chapter, I postponed commenting upon them until we had concluded our discussion of those items which required a detailed description in separate chapters.

I have accordingly looked through my library of hardware manufacturers and here are the items I found which, I think, might be well worth your study:

Starting at "A," I came across a catalog devoted to airport door hardware. Most builders' hardware engineers have very little opportunity to furnish the hardware for airport doors. These doors have to be high enough and wide enough to permit the entrance of an airplane. I have never had the privilege of furnishing the hardware for this purpose, but, when I read this particular catalog, I decided that if such a job ever came my way that I would know what to do.

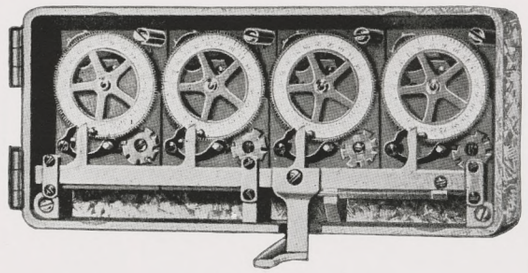


Fig. 2—Bank time lock.

In the first place, I would call for help. The factory engineer would guide me before I would put in a bid and I imagine you would want to follow the same procedure. Several of the large manufacturers, such as Richards-Wilcox, Coburn and Allith-Prouty make this line of equipment as may many others I do not know about. Fig. 1 shows one elevation of airport doors.

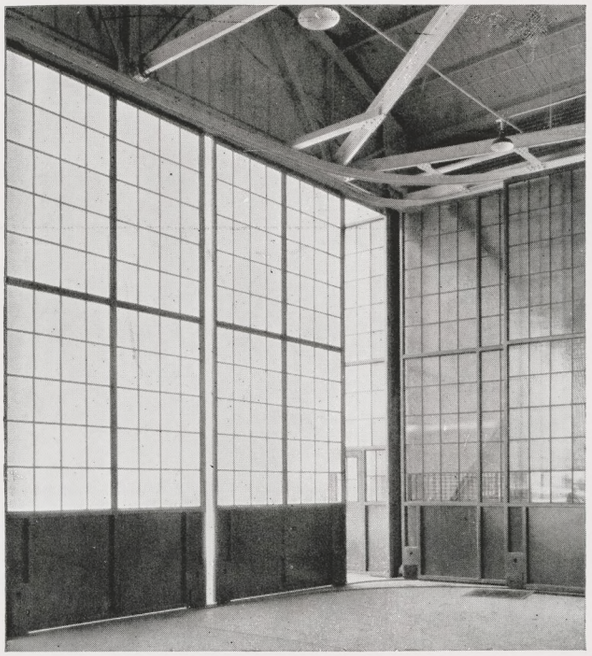


Fig. 1—Airport doors on Municipal Airport, Columbus, Ohio.

Then I came across two catalogs from Sargent and from Greenleaf. One was on bank locks and another on prison locks. Yale & Towne, I believe, also make a similar line, but I did not happen to have their catalog on these items.

If you really want to see some intricate locks just take up the study of bank locks or prison locks. It is a line though, I believe, with little play in the ex-

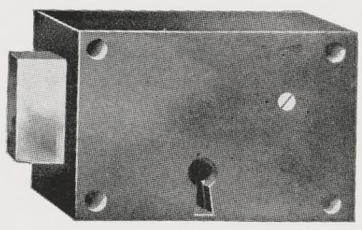


Fig. 3—Dead locking spring bolt prison lock.

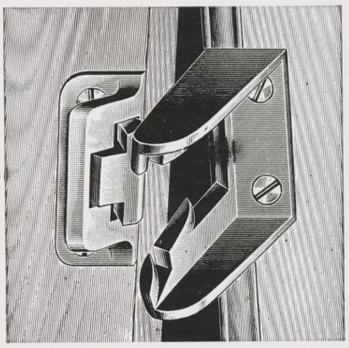


Fig. 4—Coupon booth door holder.

perience of a builders' hardware engineer. However, Fig. 2 will at least illustrate what I mean on a bank lock, while Fig. 3 shows a prison lock.

Then I ran across a device for coupon booth doors in a bank building. This particular one, shown in Fig. 4, is from the catalog of P. & F. Corbin. Similar ones are made by other manufacturers. This device holds the door open to the degree shown in the cut, indicating that the booth is ready for use as well as giving ventilation while it is unoccupied.

In among my Corbin catalogs I also found a folder for special hardware for metal cabinets. This folder was full of special items for this purpose. Fig. 5, for an example, showed a tee handle and lock with a three-point catch. It is only one of many items manufactured for metal cabinets.

From the Norton Door Closer Co. I have taken Fig. 6 which shows a coupon booth closer with holder device. This type of closer is also made by several manufacturers.

The proper lock for coupon booth doors is shown in Fig. 7 taken from Russell & Erwin Mfg. Co. catalog. They also make a unit lock for coupon booth doors. This lock contains an indicator so that when the client leaves the booth the attendant can examine the booth to be sure no valuable papers have accidentally been left behind. After such an examination the attendant throws the indicator back and the booth is ready for the next client. Other manufacturers make similar locks as well.

Next, I came across the Knape & Vogt catalog with a most complete line of showcase hardware. We have given some attention in previous chapters to some items of showcase hardware, but a more complete study of this subject from one of the catalogs of manufacturers of this type of hardware will stand you in good stead.

Among the many items in that particular catalog was a drawer slide, shown in Fig. 8. On large drawers which are apt to be heavily loaded, a drawer slide, or at least drawer rolls, are essential for providing easy operation and add many dollars to the sale of hardware. Always try to get them specified.

Many lodge buildings, state capitol buildings and some office buildings require special emblematic designs, such as is illustrated in Fig. 9. This one is taken from many such designs in the catalog of Yale & Towne.

Fig. 10 is a monogram knob from the catalog of the Norwalk

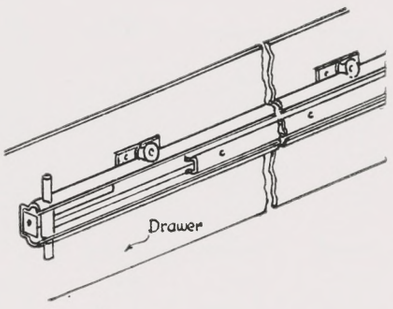


Fig. 8—Drawer slide.

Lock Co. Nearly all lock manufacturers make a wide variety of monogram door knobs. Frequently in residence work the owner will want his initials on the knobs or at least on the front door knob. This means more "plus" business for you.

Fig. 11, showing various types of lock strikes from the Sager Lock

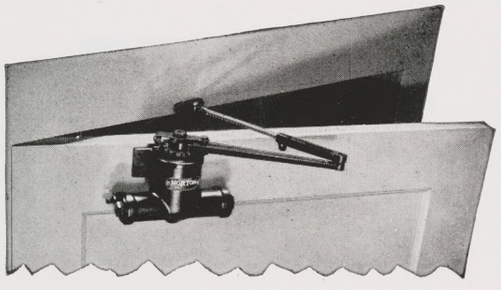


Fig. 6—Coupon booth door closer.

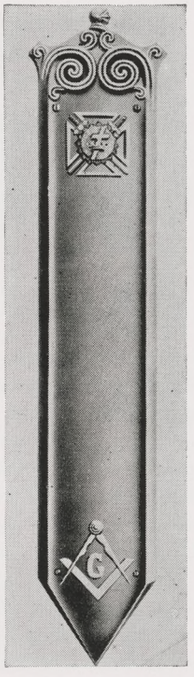
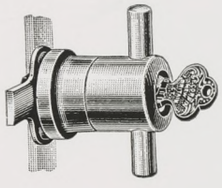


Fig. 9—Emblematic push plate.



No. 5—Tee handle and lock with three-point catch.

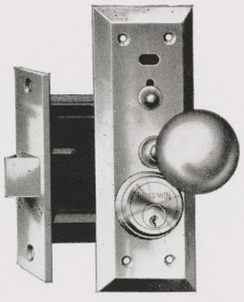


Fig. 7—Coupon booth door lock with indicator.

Fig. 10—Monogram door knob.

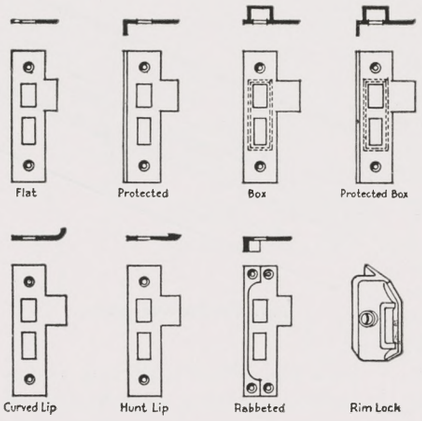


Fig. 11—Various kinds of strikes for locks.

Works catalog, is worth your study. Sager, in the front of its new catalog, has done a most creditable job of giving general builders' hardware information and this particular illustration clearly pictures the different types of lock strikes manufactured by nearly every lock manufacturer.

In this connection, let me remind you of what I said in a much

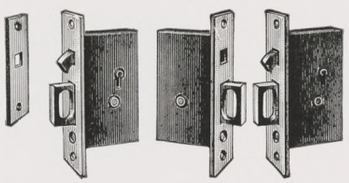


Fig. 12—Locks for single and double sliding doors.

earlier chapter regarding lock sets. One of the best indications of a qualified builders' hardware engineer is his ability to furnish the proper length lip on the strike to fit the details of the job. The lip should extend only 1/8 in. beyond the jamb in most cases.

Practically nothing has been said throughout the entire three courses about sliding door locks, so perhaps it will be well to close this chapter with some discussion on that subject.

You will remember that I did mention sliding door hangers and track for sliding doors in residences, and at that time stated that the use of this type of door had passed largely from the picture. This, however, is not entirely the case. Fig. 12 shows a standard sliding door lock set from the catalog of Sargent & Co. which is the type made by most of the manufacturers.

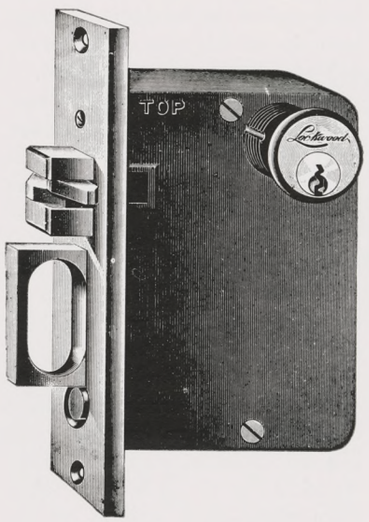


Fig. 13—Cylinder sliding door lock.

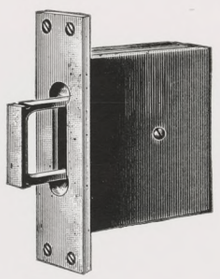


Fig. 14—Sliding door handle.

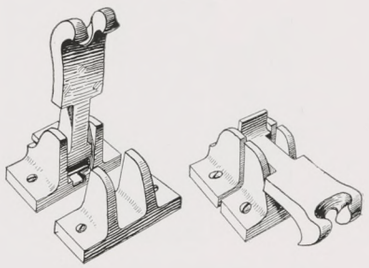


Fig. 15—Interlocking sash device.

In banks and other public buildings you will often find much heavier doors requiring cylinder sliding door locks. Fig. 13, from the catalog of the Lockwood Hardware Mfg. Co., shows the type I mean. Sliding door details must be checked with extreme care. Usually these doors have chafing strips or stiles of unusual construction. Not only must the lock fit, but the flush pull cups as well. In other cases a plain sliding door pull, such as is shown in Fig. 14, in the edge of the door and a flush cup on the face without keyhole, does the trick.

Fig. 15 shows an unusual interlocking sash lock. This is manufactured by the Detroit Hardware Mfg. Co. which makes a complete line of this interlocking hardware with sockets, hangers and pulls to match. This company also has an unusual lock for the so-called store door lock which operates with a drop ring whereby you lift the ring to retract the latch bolt instead of turning it. This eliminates the breakage of spindles. For rooms which are air-conditioned there has been a demand for a sash lock which could be locked tight with a key. Fig. 16 shows such a sash lock which is made by the Payson Manufacturing Company.

When we come to Chapter 59 I shall continue the presentation of interesting unusual items.

This brings us to the close of our study of hardware for public buildings and I hope it has been as interesting to you in reading as it has been to me in writing about these different types of buildings.

Fig. 16—Key-operated sash lock

Chapter 50—*Advanced Course*

FEDERAL SPECIFICATIONS

THE use of Federal Specification numbers has increased to a decided degree during the past few years and the modern builders' hardware engineer should be thoroughly familiar with them in every possible way. With this thought in mind, we have considered it advisable to include this chapter on the subject in the Advanced Course.

The following Federal Specifications are now available on builders' hardware and we have listed them by number, date and price at which they may be obtained:

F.F-H.—106, June 6, 1933, 5 cents.

F.F-H.—111, Sept. 5, 1933, 10 cents.

F.F-H.—116A, Feb. 10, 1937, 10 cents.

F.F-H.—121A, April 12, 1937, 5 cents.

F.F-H.—136, Oct. 29, 1936, 5 cents.

F.F-P.—101A, June 6, 1933, 5 cents.

C.S. 22-40 July 1, 1940.

No builders' hardware engineer can possibly figure any job using Federal Specification numbers without a copy of these specifications. They may be obtained from the Superintendent of Documents, Washington, D. C., by listing the numbers and dates and enclosing the necessary money as indicated.

As revisions occur from time to time, it would be well even if you have copies at present to check the dates against those given above. These are the latest issued and I am advised by I. J. Fairchild, chief of the Division of Trade Standards, that it seems doubtful if any new hardware specifications or any revisions of existing ones will be completed during the current year.

Specification FF-H-106, dated June 6, 1933, has one amendment shown as Amendment 1, dated November, 1934. This is included in the price of the original. It covers the specifications of: Finishes, mortise locks, night latches, tubular locks, cylindrical locks, unit locks, knobs, lever handles, escutcheons, roses, key plates, entrance door handles, cupboard locks, and fire exit devices.

The Specifications

Specification FF-H-111, dated Sept. 5, 1933, has one amendment shown as Amendment 1, dated January, 1935. This is also included in the price of the original. It covers the specifications of shelf and miscellaneous builders' hardware such as: Casement adjusters, push bars, clothes bars, bolts of all kinds, except fire exit bolts, brackets, catches and turns, pivots, chains, casement and sash fasteners, door molders, hooks, latches, lifters (transom), sash lifts, letter box plates, pulleys, sash poles—hooks—hangers, door pulls, drawer pulls, door stops, window stop adjusters, hasps, sash and scuttle operators, hooks and eyes, shutter (blind) hardware and screen hardware.

Specification FF-H-116A, dated Feb. 10, 1937 has no amendment and covers hinges of all kinds (except lavatory). They include the following: Full mortise butt hinges, full surface hinges, half surface hinges, garage hinges, scuttle hinges, spring hinges and strap and tee hinges.

Specification FF-H-121A, dated April 12, 1937 (no amendments) covers door closers of all types including surface door closers, screen door closers and floor hinges (checking).

Specification FF-H-136, dated October 29, 1936 (no amendments) covers lavatory partitions and inclosures hardware as follows: Partition fittings, lavatory hinges, lavatory bolts, lavatory strikes, lavatory hooks and fastenings for lavatory hardware.

Specification FF-P-101A, dated June 6, 1933, has one amendment shown as Amendment 2, dated August, 1936, superseding Amendment 1, dated January 1934, and covers in general the specification of padlocks.

A number of the manufacturers have compiled a list showing their own comparative number to that number given in the Federal Specifications which they may furnish you if you are figuring such work.

I strongly recommend that having obtained your copies of Federal Specifications that you endeavor to get your main sources of supply to give you their comparative number. Write it right in your Federal Specifications opposite the Federal number.

While this will entail considerable work, in the long run, it will save you many hours of time if you are figuring this type of business.

In concluding this brief discussion of Federal Specifications, I know of no better ending than to quote from the article on "The Government Specification for Builders' Hardware" which was prepared for the National Association of Purchasing Agents by I. J. Fairchild, secretary of the Builders' Hardware Committee of

the Federal Specifications Board.* The foreword, scope and purpose according to Mr. Fairchild are as follows:

Foreword

"The Federal Specification for Builders' Hardware FF-H-101 may be considered somewhat apart from the usual run of Government specifications: first, because it covers a multitude of articles and devices of a widely different character; second, for a given purpose, there is an astonishing variety of constructions and metals used; and third, because there was comparatively little background or experience in the specification method of procurement of builders' hardware prior to the promulgation of this specification in its original form.

"It is believed that many purchasers of builders' hardware will be interested, not so much in the history of the development of this specification as in the underlying principles governing its preparation, the more important criteria by which the leading items may be judged and the essential points to be checked by inspectors.

"The subject of builders' hardware presents a tangled maze of detail which is likely to baffle or discourage most novices. However, in spite of the dearth of books on the subject, it is possible, by steering clear of many non-essentials, for one to grasp the more indispensable elements in a brief study of the subject. It is a field in which a little real knowledge is richly rewarded in terms of superior service which normally accompanies a suitable selection of materials and devices for the duties required of them.

I. Purpose

"The chief purpose of the Federal Specification for builders' hardware is to unify and standardize the purchase requirements for such items of builders' hardware as are in regular demand by two or more departments or establishments of the Federal Government, and, as far as practicable, to confine such purchases to items regularly available in open competition on the hardware market.

II. Scope

"The term, 'builders' hardware,' may be said to cover mechanical devices for supporting, guarding, operating, controlling or securing the various movable parts of a building, such as doors, windows, transoms, gates and scuttles; and for the convenience, protection and safety of the occupant.

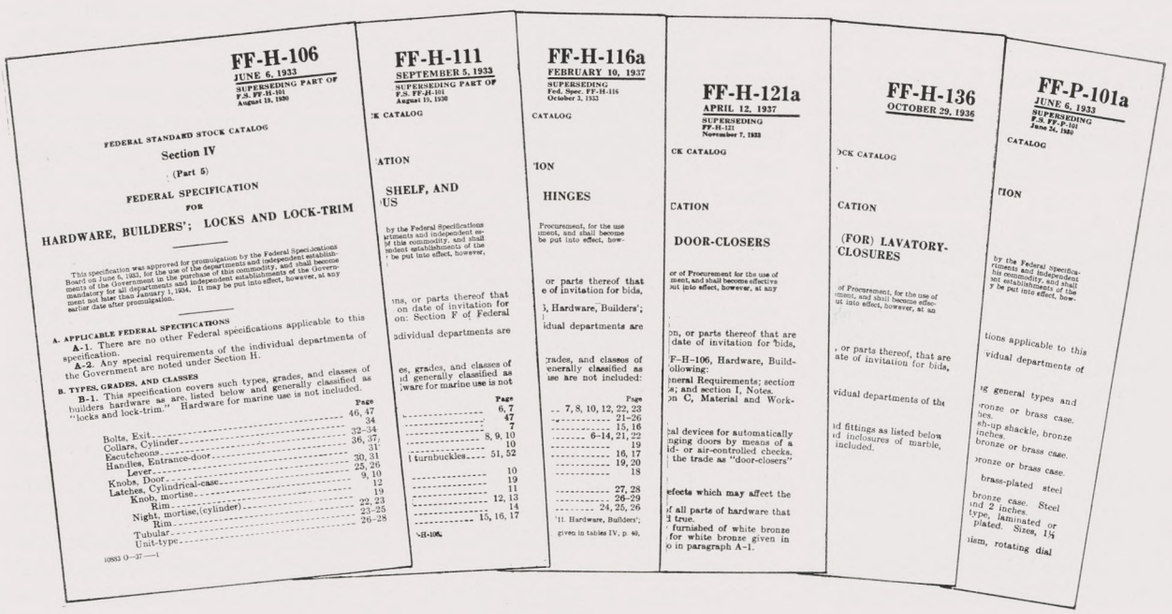
"According to Henry R. Towne, American usage has adopted the term 'builders' hardware' to designate that large group of metal products, used in buildings, which relates to *protection, convenience,* and *decoration,* as distinguished from the heavier and simpler materials of construction such as columns and beams, or nails and screws. It is usually interpreted to include such items as locks, latches, catches, hinges, bolts, door closers, door holders, sash and transom operators, hooks, sash pulleys, strikes, push plates and kick plates."

It is to be regretted from the standpoint of the legitimate builders' hardware distributor that manufacturers have seen fit in many cases to quote direct prices to contractors on government work. All too often these prices have been lower than the cost to the distributor, making it impossible to compete for this business. Hasten the day when manufacturers will manufacture and distributors will distribute, all for the good of the industry.

---

* Publication approved by the Director of the Bureau of Standards of the U. S. Department of Commerce.

** Also Secretary of Manufacturers Advisory Committee on Standardization of Builders' Hardware.



The **Federal Specifications booklets now available on builders' hardware.**

Chapter 51—*Advanced Course*

SAMPLE ROOMS

THROUGHOUT this chapter you will find a number of illustrations of builders' hardware display rooms. All of these, I think, are decidedly interesting. They offer excellent suggestions to the hardware firm that is desirous of installing such a room.

The display room of the Farrey Hardware Co. at Miami Beach, Fla., is shown in one of these illustrations. I had the pleasure of visiting this room a couple of years ago and it is decidedly attractive.

My particular personal pride is the sample room of the Geo. Worthington Co. in Cleveland. I think it is a natural pride for I laid it out and put through the sample arrangement when I was in charge of this firm's builders' hardware department.

Doors Are Closed

The doors are all opened in the illustration, but this was not the case when clients came in to select hardware. At such times all doors were closed until I knew the type of hardware which was to be selected and until I had seen the plans, knew the design of the building in question and knew approximately how much was to be allowed for hardware.

This is an important point in your presentation of samples. It may seem wrong to you, and many may disagree with me, but I will tell you frankly that I never believe in showing any more samples than are absolutely necessary in order to sell the job. The salesman knows so much more about the type and design of hardware that each particular building requires. Time will be saved and confusion will be avoided in the mind of the client if he only sees and can be satisfied with the samples from one opened case in the sample room.

The ornamental school of design hardware is by itself in this room. Commercial wrought designs (the most used hardware samples) are also by themselves. Brass colonial designs, forged iron samples and white metal period hardware are all shown by themselves, while cylindrical and tubular locks are in still another cabinet. Every case and every row of samples is numbered and there is also a number on the sample board itself. There is a place for everything and everything is in its place.

The samples should be kept clean and dusted at all times and the sample room itself should be kept in the same condition. It is also a good idea to have a place where plans may be stored when not in use.

Salesmen showing samples should be required to wear their coats or light smocks when waiting on customers. Architects, contractors and owners who are selecting hardware are entitled to this courtesy and it is always important to be presentable when selling builders' hardware. First appearances are always important.

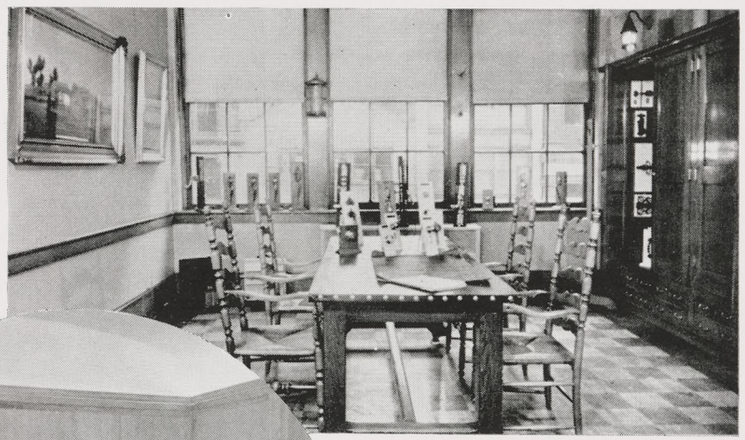
Suggest "Plus" Items

While your client is making the selection you have an excellent opportunity to build up your sales

Builders' hardware sample room of the Geo. Worthington Co., Cleveland, Ohio, which was designed by the author. Clients entering this room to inspect samples find all doors closed.

Builders' Sample

Above — The sample room of the Warner Hardware Co., Minneapolis, Minn., is approximately 18 ft. by 21 ft. with an 8-ft. ceiling. Its paneled ceiling and cupboard doors, enameled in ivory make an effective background for the hardware and provide a restful but cheerful atmosphere. Stained glass windows for privacy and comfortable chairs complete the furnishings. Samples are numbered so they can quickly be returned to their proper places and as quickly located when needed again. As a point of prestige, the outside walls of the room display photographs of the important buildings in which the company has furnished the hardware.



Below—This sample room of the Joseph Woodwell Co., Pittsburgh, Pa., uses the closed type of display. The various lines are segregated so that only those that are required to show a particular client can be displayed.

Left — Extreme simplicity and modernity is the motif of the builders' hardware display rooms of H. M. Sanders Co., Boston, Mass. Walls are light walnut flexwood with glass brick. Other modern touches are a barrel ceiling of smooth stucco; cove lighting using reflectors lights the inside of the wall cases; a green linoleum floor; maroon leather furniture, rubber tile table top, and a black and gold marble false fireplace.

Samples are concealed behind flush doors and mounted on racks or in drawers—residence hardware on white enamel blocks; schoolhouse and commercial trim, on walnut blocks, and chrome and modern pieces on dull black panels.

Behind the flush concealed panel in the main room is a complete Colonial entrance doorway in which in cut-out sections, entrance handles, door knockers, etc., can be quickly inserted. Sections of casement windows show actual operation of casement hardware. Other units are door closers, panic bolts, etc.

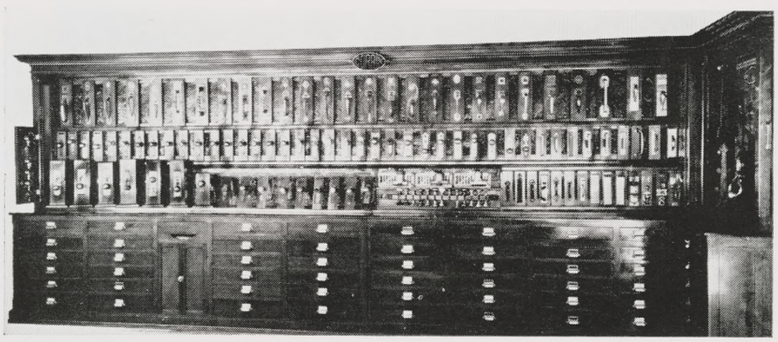
Left—The Vonnegut Hardware Co., Indianapolis, Ind., uses pivoted panels in its builders' hardware sample rooms. These panels can be entirely reversed and the samples concealed. The display case at the far end of the room contains removable panels showing sash and window hardware and mounted blocks of lock sets, casement operators, etc.

Hardware Rooms

Right—Open-type wall cabinets provide a builders' hardware sample display center for Ernst Hardware Co., Seattle, Wash., where architects bring customers to make comparisons and selections.

Left—Lock sets of all kinds from the lowest prices to the finest gold plated as well as a complete stock of builders' hardware is found in the display room of the Belknap Hardware & Mfg. Co., Louisville, Ky. The room is kept constantly up-to-date by frequent changes of display.

Right—Omer DeSerres Limitee, 1406 St. Denis St., Montreal, Canada, provides this compact and complete builders' hardware sample room for its prospects. Also, just off its spacious salesroom the company provides a little office for the use of architects and special customers. This somewhat private room has proven very useful in closing sales.



Left—Accent on color is the decorative scheme of J. Jacob Shannon & Co., 1744 Sedgley Ave., Philadelphia. Display cases are painted in jet black trimmed with silver. Walls are midnight blue with pure white ceilings for contrast. Floors are covered with deep blue linoleum with a yellow border. In the center is a large red keystone, the company's trade mark.

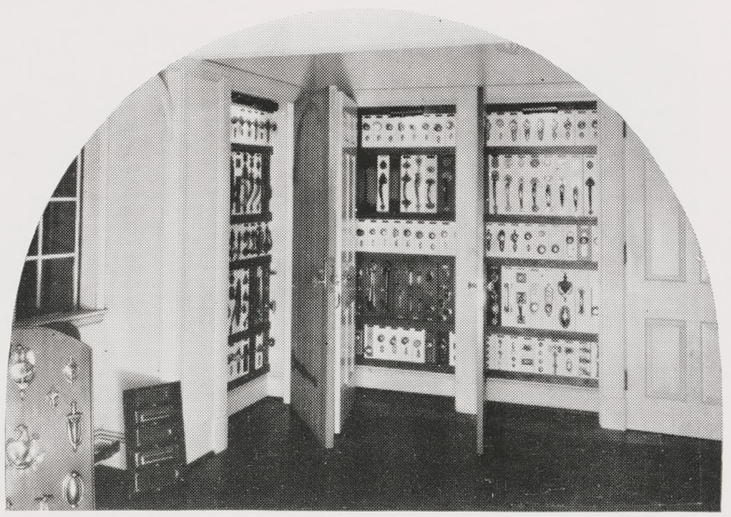
The display arrangement provides a jewel-like setting for the builders' hardware samples. The cases are floodlighted with the samples set on pure white against a black background, the lighting bringing out the sparkling finish of the hardware. Chrome tubular furniture completes the furnishings.

Builders' Sample

Troxel Brothers, of Denver, Colo., finds the open type of sample display room most effective for the Schlage line of builders' hardware it sells exclusively.

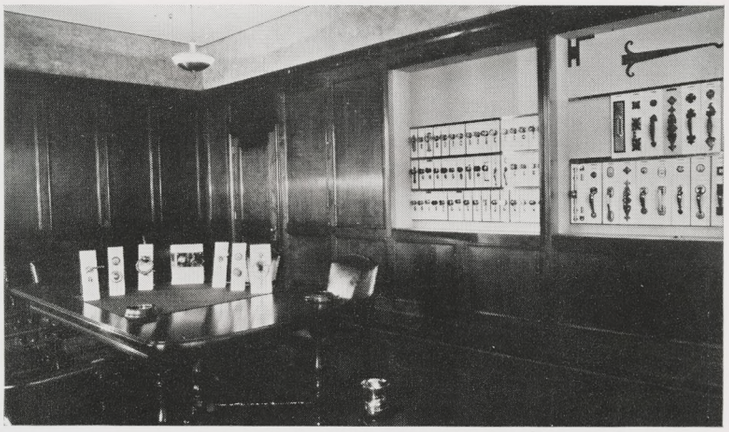
The sample room of the Bidwell Hardware Co., Hartford, Conn., is finished in knotty pine with colonial forged iron hardware on the cases. Display space is approximately 12 by 18 feet.

Left—The display room of the Smith Bros. Hardware Co., Columbus, Ohio, now uses wood panels which enable the salesman to show only the hardware best suited to his customer's type of home. Display panels are easel-backed and can be removed from their cases and displayed on a table for closer inspection. Lower cabinets are equipped with shelves which contain working models of various types of locks. Twenty-five drawers in the lower part contain butts, etc. All samples, both of lock sets and butts and miscellaneous trims, are mounted on individual panels or boards so that any particular item may be placed before customers.

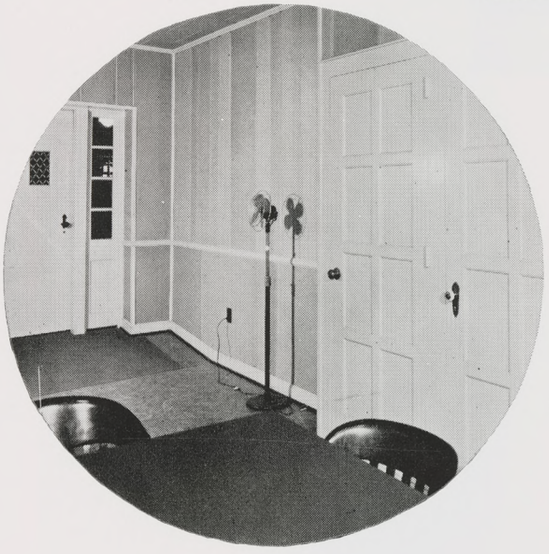


Right—From the nation's capital comes an illustration of a most interesting sample room in the store of Fries, Beall & Sharp Co., Washington, D. C. All samples are concealed. The room, in addition to the entrance door, has five doors behind which are racks containing individual samples. By using the two sides, the firm can display two types of hardware on each door. Behind each door, hardware of the same type or design of architecture of the door is used. The samples light up automatically whenever doors are opened. In order to increase display space, there are two doors at the entrance to the room. One opens in, the other out. This makes it possible to display four types of entrance door hardware at one place.

Hardware Rooms



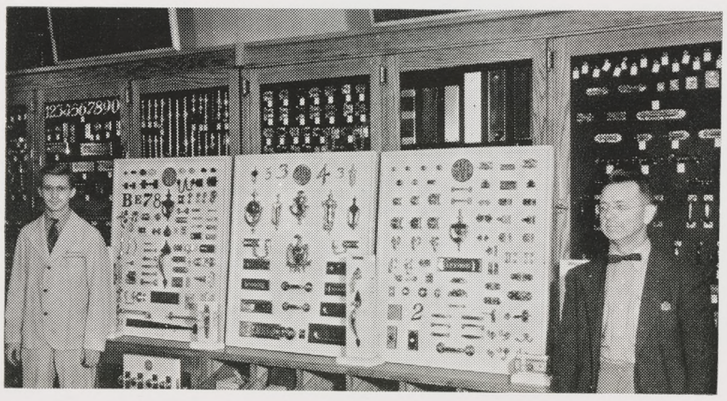
This interesting sample room was recently completed at a cost of more than $10,000 by the J. M. Tull Metal & Supply Co., Atlanta, Ga. All of the panels are secret panels. The two open panels illustrate how attractively the samples are arranged. Floor is rubber tile and woodwork is of birch and walnut finish. Across the front of the room is large plate glass window with Venetian blinds. Floor space is approximately 19 sq. ft.



In this beautiful sample room, the O'Dea Hardware & Paint Co., Des Moines, Iowa, carries out the idea of concealed hardware. E. F. Sperry, manager of the firm's builders' hardware department, advises that this arrangement helps materially. It does not result in confusing the customer with a profusion of samples and it also cuts down the time needed to show samples to customers. The shelving on one side has four doors and behind them are medicine cabinets, mail boxes, coal chutes, and other bulky goods. Locks, cabinet hardware, etc., are in drawers. The room is finished in Nu-Wood and the woodwork in enamel with mahogany finished panels in the small doors.

W. A. Rankin Ltd., Ottawa, displays and segregates its builders' hardware samples according to type to expedite showing the merchandise to customers. On the inside of each cupboard door are two pieces of molding so that individual sets may be removed and displayed separately against any background. Each cupboard door back is in a different color.

The floor is of asphalt tile, mottled brown and white, with a black border. Woodwork is in ivory with moldings in sea green. Fireplace front and table top are in black and white marble finish. Fireplace fittings are changed frequently affording a greater opportunity to sell this type of merchandise.



Left—On the letterhead of the Safe Padlock and Hardware Co., Lancaster, Pa., is a picture of this sample room of the Steinman Hardware Co. at Lancaster. This store, established in 1744, is said to be the oldest hardware store in the United States. The Safe Padlock and Hardware Co., which was established in 1849, is one of the oldest builders' hardware manufacturers.

Builders' Sample

By means of a photographic stunt, using a mirror, we are able to show a four-sided view of the sample room used by the Clark Witbeck Co., Schenectady, N. Y. The mirror on the table reflects the cabinets against the wall. C. P. McRae believes, as many other builders' hardware men rightfully believe, that the customer should not be faced with numerous samples and should be permitted to concentrate only on those best suited to the particular job.

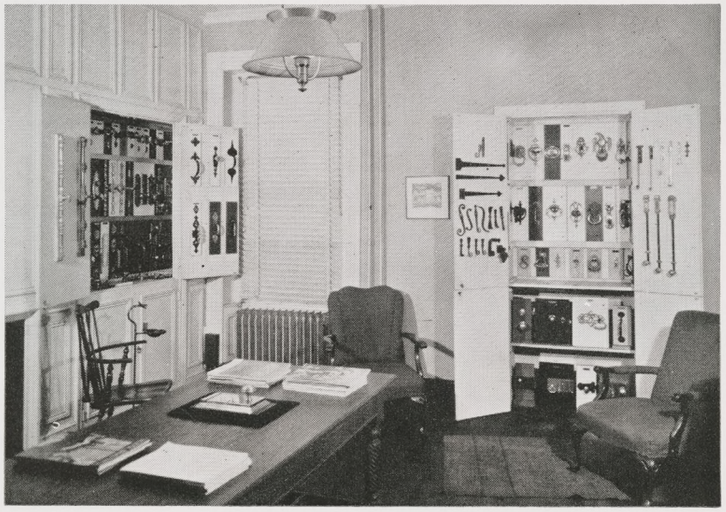
Paul Patrick, manager of the builders' hardware sample room for the H. A. Pleasants hardware store, Richmond, Va., makes some interesting comments regarding segregated displays of builders' hardware lines. Sample rooms, he feels, definitely increase sales and are indispensable to a fruitful builders' hardware business. Clerks, who may be inexperienced, receive a keener appreciation of their job and are inspired to greater sales efforts by this type of display. Sample rooms also enable a dealer or his clerk to discuss the customer's requirements in a room, where both will be free of interruptions and where the interest of the customer can be concentrated on builders' hardware alone.

In this view of the display room of the Townley Metal and Hardware Co., Kansas City, Mo., may be seen on the left, R. F. Townley and on the right, John Meyer, who is in charge of the company's builders' hardware department. This sample room is used by the company's dealers, who bring their customers in to make their builders' hardware selections. The company assists in selling the customer's dealers. Many of the wholesalers throughout the country are providing this service for the small dealer who is not equipped to furnish and display builders' hardware from their own stocks.

Hardware Rooms

This sample room is one of the many sample rooms used by the Lockwood Hardware & Mfg. Co. of Fitchburg, Mass. This room is in the company's Chicago office.

Unique in design is the sample room of the Keith-Simmons Co., Inc., Nashville, Tenn. Instead of one display room there are two, each 12 ft. square. The first room is furnished with a table and chairs and several samples on display. The second room is entirely lined with cabinets designed to look like panels. These display all the various builders' hardware samples. Walter Keith states this arrangement permits him to call to his customer's attention as few or as many samples as he desires. It also avoids confusing the customer with a profusion of sample displays, since the customer views the samples only in the first room. This arrangement also enables the company to keep its samples in a clean and orderly fashion.



The MacCarthy Hardware, Baltimore, Md., is a business devoted exclusively to the sale of contract hardware. The cupboards in the sample room have upper and lower doors. Against the adjoining wall are three chests of drawers, which contain most of the knob samples, mounted on 3 by 5 in. boards. Also in these drawers are hinge samples and other small items such as casement features. The paneled wall, cornice molding, doors, window and trim are in ivory. The other walls are done in a plain, old rose-colored paper with black baseboards. Floors are natural finish.

volume by suggesting the "plus" business builders which we have so frequently emphasized throughout this course. You also have an opportunity of "stepping up" the quality of the merchandise under discussion.

Intelligence and Tact

An intelligent display and a tactfully done selling job serve to build up the client's confidence in you. This is particularly the case in residence work when an owner can be sold better goods for longer service in the home. Price is not the chief consideration unless a lack of tact on your part makes it so.

What I told you in the Elementary Course about the architect and contractor's position in the picture is equally true for the largest office building as well as for the modest residence.

These illustrations of sample rooms should give you some good ideas and I shall not dwell longer on the subject. The illustrations should give you a better idea than words can give.

The display room of the Farrey Hardware Co., Miami Beach, Fla., is furnished in modernistic fashion. There is plenty of light and the samples are concealed by means of drapes hung on rods.

The sample room of the McCrudy-Rogers Lumber Co., Pittsburgh, Pa., is spacious and contains a wide range of samples. Doors are shown opened to display the items carried by the firm.

◈ ◈ ◈

Chapter 52—*Advanced Course*

SELLING HINTS

OF the writing of books on salesmanship there is no end. Far be it from me to attempt to cover such a subject in any single chapter. However, it has occurred to me that a chapter, even a single one, on this subject, would not be inappropriate in such a course as this. There will perhaps be nothing new in this chapter for you, but at least it may cause you to check up on yourselves and see how you rate.

Certainly, neatness of self, clean sample rooms and attractive fresh appearing samples are three very elementary but none the less important selling hints, as are keeping appointments on time, close attention to detail and fulfilling promises made.

However, the things I would stress in this article, granting your own good judgment prevails to see to it that these elementary things are done, reaches deeper into the subject of selling.

In our own business we have a decided advantage to start with. Everyone who builds must use some grade of builders' hardware. We do not have to create a desire for a person to buy builders' hardware. It is a necessity wherever there is any building.

Our problem is to get the prospect to buy from us. That's the first step and the six elementary hints mentioned before will help materially in that respect, particularly if we know our business and take a sincere interest in our prospect's problems.

The next step is not so easy. That is to get the prospect to buy the proper quality the job should have to serve adequately for years to come.

So, I am going to try and give you a few suggestions along that line. Take them for what they may be worth.

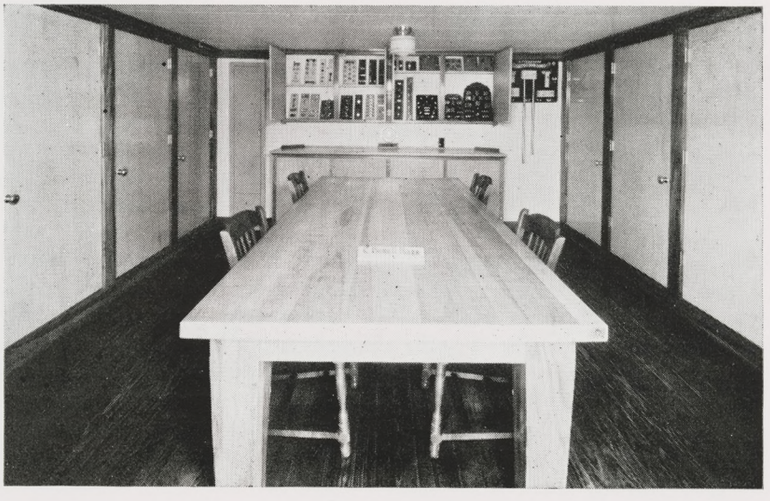
First, there is the selling in our sample rooms. Of the physical set-up of the sample rooms, some discussion and many illustrations were given in our last chapter. The finest sample room, the most attractive display of samples are merely sales helps. They in themselves cannot sell the goods. That's your job.

As we study this first phase of selling, we have so much on our side to start. Here in our own sample room, surrounded by all kinds of sales help, we have an unusual opportunity to clinch the sale. The method of selling procedure in my estimation to show all necessary samples would be exactly as outlined in the various chapters of the Elementary Course.

Start with the selection of the front door set, then the other outside doors, follow that with a presentation of the hardware for all special inside doors, such as French doors, double-acting doors, bathroom doors, and all other interior doors. Then take all types of cupboard hardware, and after that the hardware for all windows, shutters, etc.

Settle the lock question first then the design and finish. After that has been decided, close the presentation with the many miscellaneous items that enter into every sale of builders' hardware.

It is my firm opinion that it is better to build up rather than down. It is extremely important that you have a good idea at the start of the amount to be spent for hardware. I realize that it is not always easy to get this from your prospect, but a few minutes of tactful explanation of its im-



Kilpatrick Brothers, Oklahoma City, Okla., in its sample room uses five full-size doors, on each side. Their backs are equipped with samples on easel-backed panels. Samples are separated according to types and pieces. By this method the right-priced hardware can be shown to a customer whereas when all samples were exposed the customer was liable to see and select the cheaper hardware.

portance to you in saving his time and permitting you to more intelligently serve his needs should establish confidence with your client and bring forth this necessary information.

As an example of what I mean by building up; suppose your prospect figures steel-plated hardware is good enough and that it looks just as good in the sample room as the brass. What would you do about it?

Well, here is what I would suggest. Have a sample of a bronze-plated steel escutcheon in your sample kit that has rusted. Show it to him. The eye will catch and hold the benefits longer than anything you can say. Picture to him the rust marks on highly finished wood work as well as the appearance steel hardware makes as demonstrated by your sample. So I might go on, but I think I have said enough to give you the idea I am trying to convey.

This sample room is in the store of J. J. Moreau & Son, Manchester, N. H. On the right is an open display of builders' hardware grouped with related items such as storm doors, kitchen tables, chairs, etc.

When the use of higher priced merchandise shows greater economy, better appearance, more comfort, a pride of ownership and less upkeep cost, even a price minded buyer can be sold a better grade of builders' hardware.

This thought can be so well carried on for many build ups that it is worthy of much study and practice on your part and these examples can be used over and over again.

One of the things, though, that you must guard against is the fact that what becomes an old story to you is never old to your customer. Do not let yourself get into a rut in your sales presentation. Be as interested and enthusiastic in helping your prospect solve his hardware problem as if it were your own problem and new to you.

We are too apt to become automatic in our selling, whereas we should be individually interested in each sale for that sale itself. Pause and consider. Don't rush a buyer just to get it over with.

It is so easy to write "don'ts," but I cannot resist giving you one more among my selling hints. It's this—don't knock your competitor or his product. It never gets you anywhere.

Of course, at times you must make comparisons. We all must do that, but do it thoughtfully by generalities. It is far better to say "other goods," "ordinary hardware," "some manufacturers," and so forth, than it is to stick your chin out by venturing a direct slam at an individual company, manufacturer, or product. If you devote your available time to presenting the value, convenience and safety your products offer, your client, instead of knocking a competitor's products, you will get much farther on your way to a sale.

Be sure your customer understands the values you present. For example:

We may tell a customer the locks are master keyed and that may not mean a thing. If, however, we tell the customer we have figured on having a key for his use that will eliminate the necessity of carrying a lot of keys, that one key will let him quickly into all his locks and that it will save him time or money—those are the points to which he will quickly react favorably.

So much for the first type of selling. The second that I would consider is the solicitation type, where you do not have the advantage of your sample room and its selling helps. It's harder selling, true, but if we always waited for the customer to come to us, many of us would not be in business. So we subscribe to various building report services, or our factory provides them for us and we start out digging up our prospects.

Just a word at this point on building reports. We must learn to use them intelligently. A building report that merely says "work contemplated" does not offer us much of an immediate prospect and much time has been lost by many builders' hardware engineers chasing "work contemplated" that never materializes.

However, when the building report states that an architect has been selected then there is an active prospect. The architect should be contacted. Help write his specifications or make his hardware allowance for him if you can.

When calling on architects, remember they are professional men and if busy do not want their time wasted with needless chatter. Be brief on such occasions and to the point. Be helpful and ready to serve him. Let him know you are ready to help. Impress him tactfully with your knowledge of your business so he will respect your position.

The next step is the building report that the contract is let and you are given the name of the general contractor. Perhaps he is to place the order, but even if he is not, he certainly is a "hot" prospect for all the rough hardware and should be contacted regularly from the start to the

finish of the job for all his requirements that you are prepared to furnish.

Especially on large contracts, too much emphasis cannot be made as to the importance of contacting all interested persons. Whenever it is possible to contact owner, architect and contractor, do so. Do not overlook using every avenue that will help you get the order. The contractor may be the one who will place the order, but if you have the architect and owner in your corner, too, it will help materially.

The service you have rendered on previous contracts for either the architect or the contractor always has a decided effect on future business.

The third and last phase of selling that I would like to elaborate on is selling builders' hardware to a committee. Here, indeed, is your sales ability challenged. It may be a school board, a building committee, or the board of a bank.

In times past I have gone so far as to call on every member of a school committee before the board meeting to win a large contract. I well remember one large contract for a school building. I not only went myself, but I got the president of my company to go with me. We landed a $15,000 contract that we would never have gotten without those calls. That was a bit drastic, I will admit, but every job presents certain competitive situations that your good judgment will chart your course if you take time to let it.

On every large job of whatever nature, I have found that it pays to face frankly the facts surrounding the job and without "kidding" myself call a spade a spade to myself.

Contacts are so very important on many big jobs and they must not be overlooked. Who do you know who can help you reach the owner, the architect, the contractor, or influential members of a building committee for favorable consideration of your proposal? If you haven't any, make some! So much desirable business is placed not strictly on a basis of price or quality that any builders' hardware engineer that overlooks the importance of contacts is often overlooked himself when the order is placed.

Personally, I'm glad it is that way. Friends are so important in modern American business life that we are the better for it. Because we secure business through friendship does not mean we take advantage of those contacts to secure a greater profit. The very fact that we have secured a contract through friendship challenges us to render better service and greater value which benefits all concerned.

Chapter 53—*Advanced Course*

SCHEDULING HARDWARE

AFTER the order has been received, your next step should be a very careful listing or scheduling of the hardware. Some time ago James J. McEvoy, secretary of the J. G. Rogerson Co., Inc., Hudson, N. Y., wrote in a very interesting story of how he considered this subject one of decided importance. Mr. McEvoy was kind enough to include a thoughtful paper on the subject for which we are indeed grateful.

While I will not attempt to reproduce his article word for word, I will take the liberty of pointing out many of the well made points he expressed on the subject, as well as my own thoughts on the matter.

After the sale, the proper scheduling of the hardware is of utmost importance. Starting the schedule with the correct name of the job, architect and contractor's name, I like first to list the keying information in full detail.

Get a Receipt!

Let me mention right here a very important matter. Always deliver the master keys themselves to the owner or his representative, the architect, *and get a receipt for their delivery.*

The builders' hardware engineer is indeed a trusted man. In all my years of experience I have never heard of a single case where that trust has been betrayed. If master keys got into dishonest hands it would be a serious matter to the building owner. Keep your master keys locked up and only deliver them to responsible persons. Be sure to get their receipt and then put this receipt away as a permanent record.

Methods of Procedure

Now we come to matters of question of procedure that different builders' hardware engineers disagree on, so I am going to give you two ideas.

Mr. McEvoy, for example, suggests numbering each opening on the plan in the following manner. No. 1—1 Store Door Front East Left Hand 1¾ in.

1½ Pr. Butts
1 Set Store Door Handles
1 Door Closer
1 Pr. Butts Transom
1 Transom Lifter.

Then he says when they call for hardware for Door No. 1 take these items, tie them together and tag them, listing the door number and the goods furnished. He suggests using prefix B (B-1) for basement and for each upper floor add the prefix of that floor. (No. 301 for the third floor, for example.)

A great many builders' hardware men do follow such a procedure, but I honestly believe the suggestion I gave you in the Elementary Course is better, and so I am going to show you how I would list the same opening explained by Mr. McEvoy, as follows:

1 Sgle. Ent. Door, No. 1 Front East Store 3° x 7° x 5 in. x 1¾ in. L.H.

Item 1—1½ Pr. Butts
" 2—1 Set S. D. Hdles.
" 3—1 Closer
" 4—1 Pr. Trans. Butts
" 5—1 Trans. Lift

and then I want to tell you why I prefer my system. I always abbreviate wherever possible, but I believe in giving all necessary information. Note that my list gives the width and height of door, the width and thickness of stile, as well as the hand of the door.

It Pays to Be Exact

It does take a bit longer to put all this information in and it pays to do so. Supposing the owner decides later he wants a kick plate. The width of the door is shown, or a threshold may be required. The proper back set to use is known because the width of stile is given, etc.

I list the item number for each piece of hardware, instead of one number for the entire opening. First, you will note I do give the opening number in the heading, but every piece of hardware on the entire schedule carried a number, too.

Suppose the contractor only wants the butts sent out first to hang the door. Either by means of a label, as previously suggested, or simply by marking with a pencil Item No. 1 and No. 4, you send the butts out, checking them off the schedule as delivered. Then he may want the lock set to mortise the locks. Another shipment goes out, Item No. 2. If these were the first two shipments, I would have the item checked and double-checked, the first item showing "A" shipment, the second "B" shipment, etc. All my delivery slip would show would be the item numbers for that particular shipment which the contractor would receipt for and check against his own schedule.

In a previous paragraph I spoke about "the front of the contract." Here's what I mean by

that. Every builders' hardware order is a contract to furnish the hardware for that particular job.

When I secure a contract I have a heavy cover of strong paper (many manufacturers furnish these on request). Each job carries a contract number. Let us say, for example, that it is contract number X347.

On that cover there is a sheet which carries all necessary information—name and address of job—name of contractor—to whom and where charged—to whom and where shipped—architect and contractor's name—schedule for shipping dates A-B-C, etc., as explained—terms—credit approval and the like, as illustrated.

In between the cover I would put copies of all orders to factory, copies of all letters referring to that contract, original estimate sheets and copies of quotations and order of acceptance of quotation. In other words, every single bit of information about Contract X347 would be under that cover. On large contracts, of course, special heavy binders would be used. Then I would have a fireproof place to keep these contracts when not in use and I would keep them there.

Of course, the copy of schedule for architect and contractor would contain only the schedule. If I were writing anyone about any item on that schedule, I would refer only to the item number and force them to go to the schedule where all information is available.

Many times you buy everything but the butts from your lock manufacturer and perhaps a few other small items. In such a case provide the factory with an order. My order number, no matter how many factories, would always be the same, X347 on this particular contract, and the factory would be instructed to put this order number on each shipment.

When it comes in you immediately know what contract the goods are for. I would send in the schedule to the lock manufacturer, calling for all items on that schedule except those marked out, which would in this supposed case be the butts and a few other small stock items.

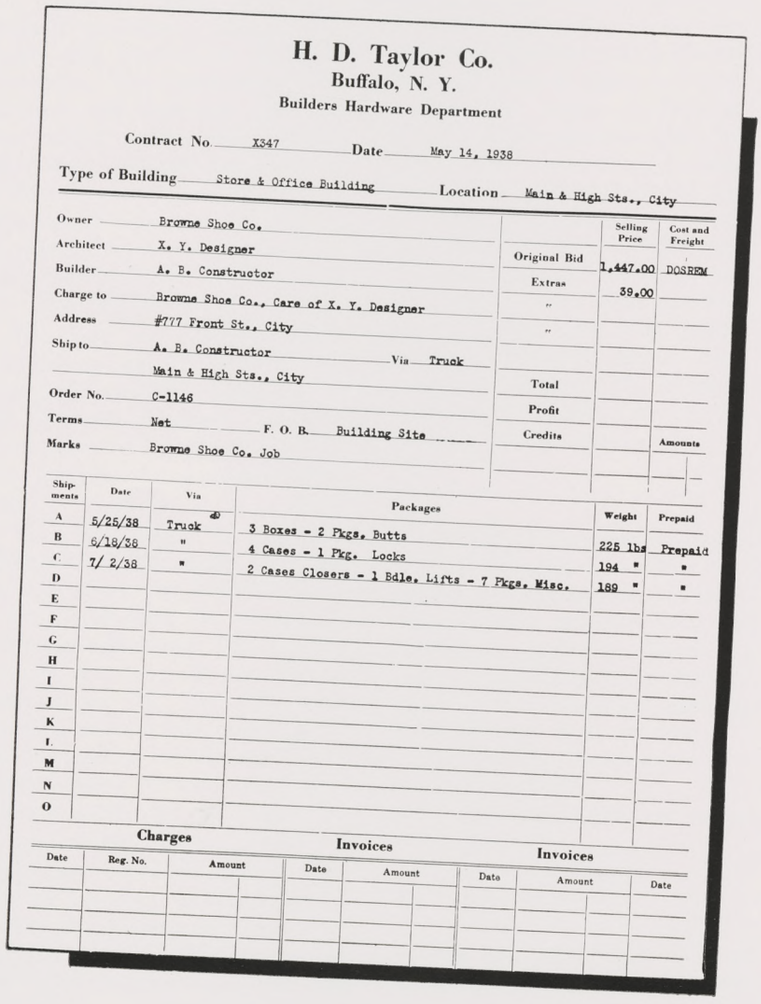
See how this works out on the case I used. For example, the factory does not need to write back and ask you the hand or thickness of door for the lock, etc., because all the information is contained in the schedule you have attached as your order.

If it becomes necessary to send a second order to the same factory on the same job, my order number would be X347-A, the third X347-B, etc. I trust that I have been able to make this clear.

In the back of the contract I use a yellow and a blue sheet, the regular schedule paper being white. If it is necessary, due to oversight in taking off the plans or because openings are added to send out hardware not on the schedule, it is put on the yellow sheet.

If goods are returned they are listed on the blue sheet before the job is finally filed away completed. The record must show every bit of hardware shipped to the job and any returned.

A record of the charging of the job and the extras and a record of any credits issued should also be kept. I believe that returned goods from contract orders should only be credited at cost when they are regular stock items. If they are special goods for this contract which are returned through no fault of yours in ordering them, no credit should be given the customer for such merchandise.



H. D. Taylor Co.
Buffalo, N. Y.
Builders Hardware Department

Contract No. X347 Date May 14, 1938

Type of Building Store & Office Building Location Main & High Sts., City

Owner Browne Shoe Co.
Architect X. Y. Designer
Builder A. B. Constructor
Charge to Browne Shoe Co., Care of X. Y. Designer
Address #777 Front St., City
Ship to A. B. Constructor Via Truck
Main & High Sts., City
Order No. C-1146
Terms Net F. O. B. Building Site
Marks Browne Shoe Co. Job

	Selling Price	Cost and Freight
Original Bid	1,447.00	DOSHEM
Extras	39.00	
"		
"		
Total		
Profit		
Credits		Amounts

Shipments	Date	Via	Packages	Weight	Prepaid
A	5/25/38	Truck	3 Boxes - 2 Pkgs. Butts	225 lbs	Prepaid
B	6/18/38	"	4 Cases - 1 Pkg. Locks	194 "	"
C	7/ 2/38	"	2 Cases Closers - 1 Bdle. Lifts - 7 Pkgs. Misc.	189 "	"
D					
E					
F					
G					
H					
I					
J					
K					
L					
M					
N					
O					

Charges			Invoices		Invoices		
Date	Reg. No.	Amount	Date	Amount	Date	Amount	Date

Front cover for builders' hardware contracts

Profit

As long as the good old U. S. A. continues on the capitalistic sys-

tem, just so long should you endeavor to sell at a profit. Taking jobs for the honor of furnishing them or the advertising value expected doesn't buy shoes for the baby, as the old saying goes.

Let me leave this thought with you in closing this chapter. Builders' hardware should be 2 per cent of the value of the building. You have not received your full share until you reach that percentage.

A builders' hardware contract costs more to handle than selling the same items over the counter at retail. Have you obtained a profit adequate for your work when you put in your figure? Ask yourself that question every time you quote on a job.

Competition will not let you? Remember it costs your competitor as much to do business as it does you. Let's put a stop to this doing builders' hardware business without proper compensation. It can be done if we all decide to live and let live.

Let's sell builders' hardware for profit! Forget the glory, advertising value, or taking it at no profit because of a competitor. It can be done!

Chapter 54—*Advanced Course*

INTERESTING HARDWARE PROBLEMS SOLVED

THIS is the first of several chapters which, I think, should be of unusual interest, not only to new students learning the builders' hardware business but also to the oldest man in the game who still loves the business.

Builders' hardware engineers are constantly being faced with unusual problems. That's what makes this business so intensely interesting. You never know what problem will come up next and you cannot usually find the answer from previous problems.

For the next three chapters I have asked a number of builders' hardware engineers to give me some problems they have met and how they solved them.

The first one I am going to give is one sent in by J. Harold Dumbell, executive secretary of the National Contract Hardware Association. I am selecting this as the first for three separate reasons.

The first reason is that Mr. Dumbell, who for many years was in charge of the builders' hardware department of Samuel F. McKnight Hardware Co. in Pittsburgh, was one of my keenest competitors in the Pittsburgh market when I was growing up in the business myself, and I have always had a great deal of respect for his knowledge and ability.

My second reason is, that despite this increased responsibility, he still has a love for the builders' hardware business and has contributed to its development as probably no other one man has through the formation and development of the National Contract Hardware Association. This he has done without salary and at great personal sacrifice of time and talent during the formative years of the association when he served as its president.

He resigned from the Samuel F. McKnight Hardware Co. and now devotes his full time and talents to the work on a salary basis. The industry will always owe J. Harold Dumbell a debt it can never repay.

The third reason is that, as might well be expected of him, he chose as his interesting problem one that is easily understood, but not so easily solved until you see how he did it. Then it looks easy, as most problems do when you have the answer. This problem also gives an interesting keying solution. Without further comment, therefore, let Mr. Dumbell speak for himself. Here's his problem and its solution.

* * *

"Recently I furnished the hardware for an office building consisting of three stories and basement in which approximately 200 people are employed. There are two pair of double-acting entrance doors and the hardware specified for each pair is as follows:

2 sets Checking floor hinges
2 " Flush bolts
1 " Dead lock with two cylinders
4 " Special push bars
4 " Kick plates
1 " Threshold

"The building is set on a large piece of ground, has two stairways to basement, four from the first to second floor and two from the second to third floor.

"There is a watchman in the building at night. It is customary for some of the employees to work at night and they do not all have keys to the building. There is a bell at the main entrance to bring the watchman to that point to permit entry.

"The employees do not all leave at the same time and, due to the door being locked from both sides by key, it would be necessary for anyone leaving to hunt up the watchman who might be in any part of the building and hard to find.

"We could not use a dead lock with turn piece on the inside as that would permit exit but no means of locking the door after going out. A regular night latch could not be used as doors are double acting and latch bolt would interfere. Now the answer.

"A jamb bolt Payson No. 750 (Figure 1) was placed in the head or frame over the doors to pull

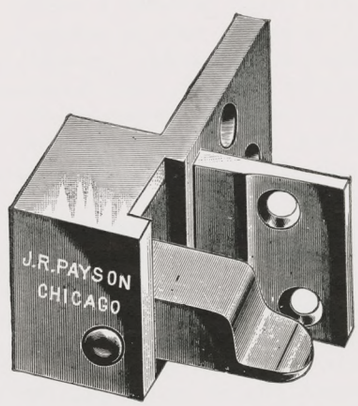


Fig. 1—Payson jamb bolt.

down and cause the one door to be single-acting opening out after regular closing time.

"A mortise night latch with auxiliary latch bolt (Figure 2) two cylinders and turn knob was installed on the active door.

"The watchman could by operating his key in the inside cylinder hold the latch bolts in a retracted position, close the jamb bolt and thereby permit the doors to be double acting during the day. The regular pass key does not operate the inside cylinder, thereby placing retracting feature under control of the watchman. The watchman's key operates both inside and outside cylinder.

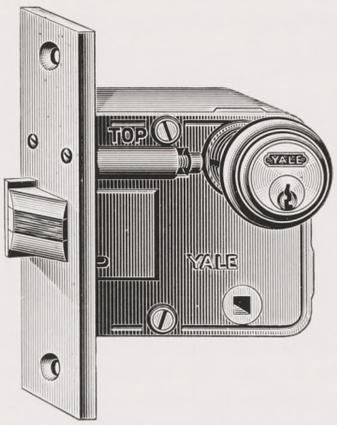


Fig. 2—Mortise night latch with auxiliary latch bolt.

"Anyone there at night, upon completing his work, can walk out by use of turn knob, door closing by means of checking floor hinge and returning to a locked position. A double-acting door during the day. A single-acting door at night with an exit latch."

The second problem I would like to present with its solution comes from another builders' hardware engineer, Ray S. DeRonde, who is manager of the builders' hardware department of the H. D. Taylor Co., Buffalo, N. Y.

The chief reasons I have for selecting this as second of my interesting problems is not only the fact that Mr. DeRonde and I were raised together as boys in Oneonta, N. Y., and that I first interested him in going into the business, but above all he has been the greatest single contributing factor in suggestions, criticisms, and corrections to this entire series, having checked me back on all the work which I have tried to do for you. Here's his story.

* * *

"We were called in to handle some in and out doors from a restaurant dining room to the kitchen. These doors were 2 ft. 8 in. by 5 ft. 6 in. by 1¾ in., and quite heavy. The doors were off the floor about 12 in. and had a circle head at the top.

"As this is a very large restaurant, it was estimated each door operated nearly 1000 times a day. In fact, we checked them later and found this to be about right. We believed these doors to be too heavy for a checking gate hinge; the owner would not stand for jamb hinges as they would be too noisy, and, of course, it was impossible to use a floor or overhead closer.

"Our answer was to use 1½ pairs ball-bearing butts to handle the door. We then used an L.C.N. closer, size C, fastened to the jamb under the door. Fig. 3 pictures the actual installation. We did not use the regular closer fork arm and fork arm rod. In their place we used the bottom slide of a floor closer with a rectangular brass piece, ¾ in. thick, drilled to hold the knob on the main arm of the closer. The rectangular brass piece was put in the slide arm and the slide arm mortised into the bottom of the door. The knob of the main arm was then inserted into the hole in the rectangular piece, giving us a checking hinge controlled by a door closer.

"This gave us positive action with quiet closing and no slamming."

* * *

The third and final problem I shall present in this particular chapter is one that I was required to solve on one of my own contracts while in Pittsburgh and which frankly had me stumped. A. A. Hutchison was then president of the Fort Pitt Hardware Co., of Pittsburgh, while I was manager of the builders' hardware department—a position he had formerly held.

While it has been my privilege to work with some unusually keen builders' hardware men in my hardware experience, Mr. Hutchison was, in my estimation, without an equal. All of you have heard the expression—"So and so is the best builders' hardware man in the country." To me Mr. Hutchison was just that. Certainly he taught me more than any man I have ever been associated with and I have been associated with some of the best. Here was my problem that I could not solve and then I will give you Mr. Hutchison's solution.

* * *

The contract was for a Chinese restaurant. The architect had designed a series of booths along each wall. The walls were panelled and the booths were formed by partitions standing into the room about 6 ft. deep forming bays to accommodate four chairs and a table.

Here was the difficulty. At times the partitions must swing back

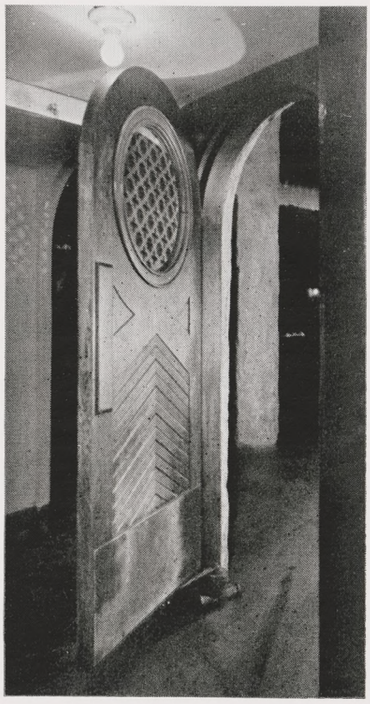


Fig. 3—Installation for in-and-out restaurant door.

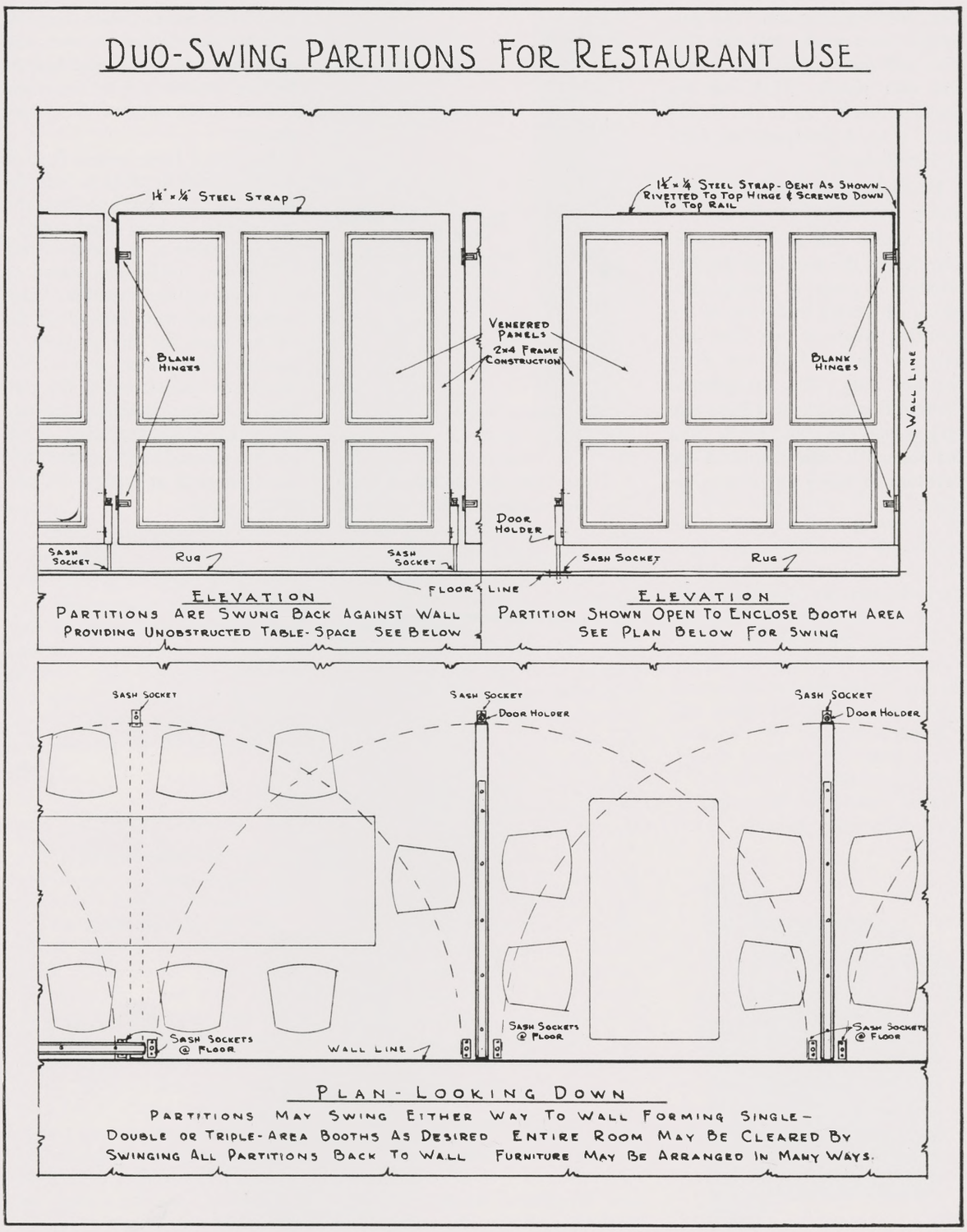


Fig. 4.—Duo-swing partitions for restaurant use.

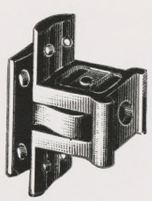


Fig. 5 — Type of hinge used for Chinese restaurant door.

against the walls so that when a party was being held the room could be turned into one large room without these partitions interfering. The owner and architect would permit nothing like an arm to show above the partitions. The partitions were off the floor so that pivots were out of the question.

These partitions had to swing in either direction yet had to be held open or closed as desired and no spring-hinge double-acting de-

vices were permissible. The partitions were made just like the side wall panels with heavy rails and thin panels. That was the problem that I took to Hr. Hutchison. (Fig. 4 illustrates the actual installation.)

Here's how he solved it for me, and it was a perfect solution.

He used a pair of Niles hinges, Fig. 5. To the top hinge he had rivetted a piece of heavy steel which he carried to the top of the partition where it was bent and extended nearly 5 ft. out along the top rail. This strengthened the partition and kept it from sagging yet no one could see it from the room. It also permitted the partition to swing either way desired.

Fig. 6 — Door holder used for holding restaurant door.

Then came the matter of holding the partition either open or closed. He accomplished that with a long Caldwell door holder, such as is shown in Fig. 6, and had the factory furnish it with the round brass rod but without the rubber plunger.

He placed three sockets flush in the floor, one in place to hold the partitions in an open position and the others to hold them against the wall either to the right or left.

The door holder was placed on the edge of the partition. Sash sockets were used instead of the rubber cups for the purpose of making them more secure. Mr. Hutchison feared that if the rubber cup alone was used to hold the partition that the holder might easily be forced to give if someone leaned against or pushed the partition.

Chapter 55—*Advanced Course*

INTERESTING HARDWARE PROBLEMS SOLVED

CONTINUING our study of interesting hardware problems and how they were solved, I next want to present one sent in by C. G. Lindquist, of the Lindquist Hardware Co., Bridgeport, Conn.

In these days since Uncle Sam went off the water wagon, and it is even hinted before, many private homes are equipped with interesting bars. Mr. Lindquist had such a problem on a bar in a home he was furnishing. I am going to let him tell you now what it was and how he solved it.

Problem No. 1

"Problems in hardware specials must be solved. Here is one with which we bothered for some time:

"One door, sliding up into a pocket, formed a continuance of panel in the room when closed. No hardware could show in the panel on the room side, and there could be no mark of connection of the door in the panel when closed. Back of the panel was the bar. Here is the hardware. We made a pattern for a brass casting approximately 5 in. long, ¾ in. wide, with reinforcing angles on the sides and put a steel pin through. The angle slotted top was ¼ in. wide and approximately 2 in. long. This was mortised in the panel. On the door we mortised a special flat hook with a 5/16-in. square hole fitting tight on the steel spindle. This operated two lever handles with rose. The hook made a graduating degree to draw tight.

"This operated perfectly and everybody was happy. There are other problems popping up from time to time."

* * *

The industry as a whole, I feel sure, well knows the reputation of that very famous distributor of fine builders' hardware, Ostrander and Eshelman, of New York City. They are undoubtedly deserving of the position they have earned of being to the builders' hardware business what Tiffany is to the jewelry business. Their work on fine residences throughout the country is outstanding, so I wrote to "Doc" I. S. Eshelman and asked him to give me a problem or two that he had met and solved. "Doc" is a past-president of the National Contract Hardware Association and rendered distinctive service to the industry in that position. He replied that two of the most interesting problems he had were printed in *Profit Bound*, the association publication, and, with their permission and "Doc" Eshelman's, I am reprinting them here.

Problem No. 2

"I have pulled out at random from 'our library' two drawings showing special conditions and will try to relate the circumstances concerning each as fairly as I can recollect them, hoping that what must necessarily be a brief description of the facts may so visualize the problem that the reader can understand it as clearly as if he were looking at the blueprint before me.

"Because the intricacies of master keying are always interesting and, in the case of a pin tumbler cylinder, difficult to understand by many, this problem was unusual. A new bank and office building was being erected, in which the bank, in addition to the several basement levels, would occupy the first five floors. As usual the locks were to be sub-master keyed by floors—all the bank space above and below ground being set up to one of these sub-master keys, and the entire building grand master keyed in one set—all of which is simple enough we'll agree.

"As usual also, there were doors to stairs and fire towers on every floor requiring locks with ¾-in.

Fig. 2—Lock used with extra cylinder plug.

throw latch bolts and cylinder control of the stop works—a standard lock of any manufacturer. From now on, however, it begins to get complicated. Note the operation.

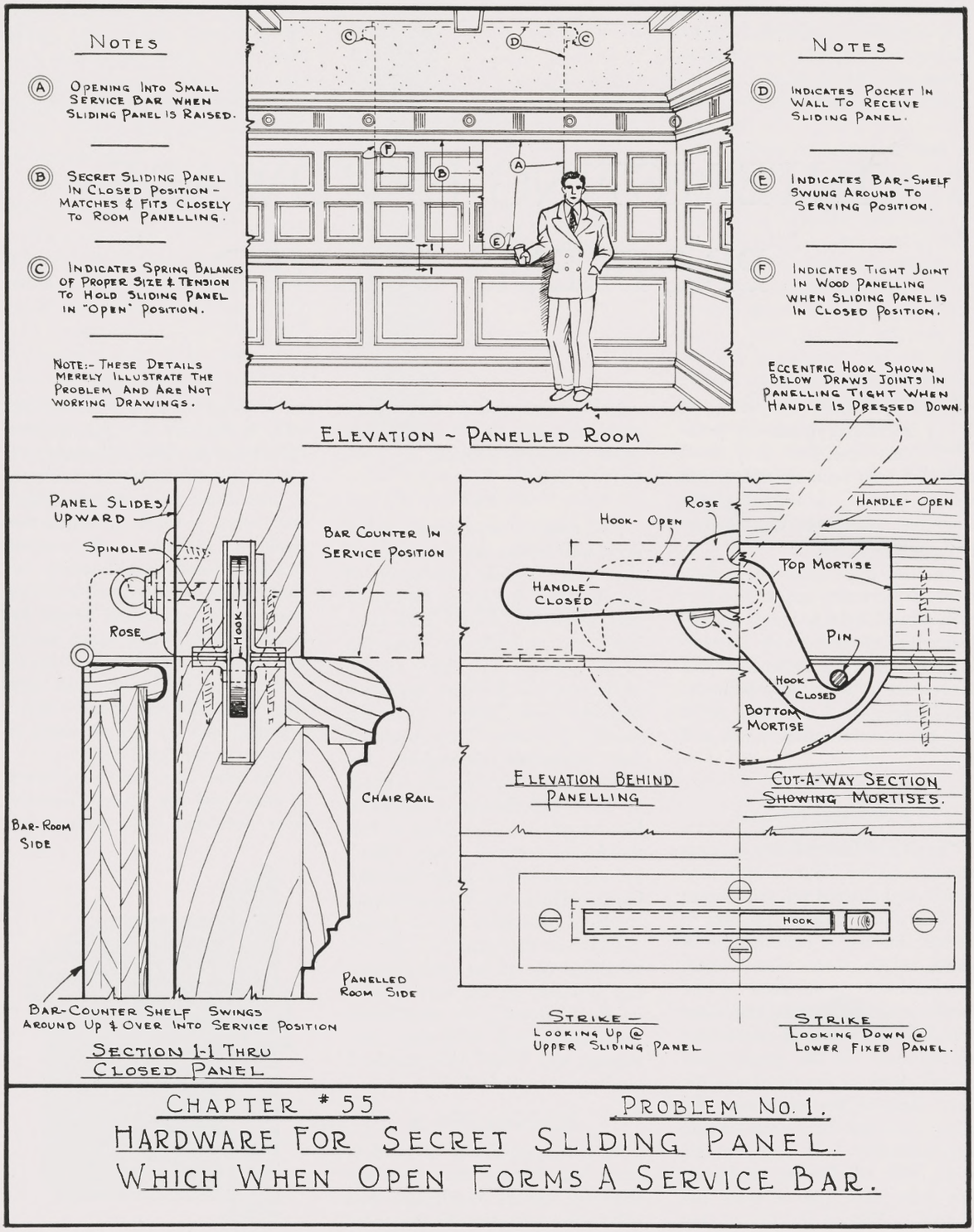


Fig. 1—Detail drawing of the bar.

The bank requested that the locks on the stair doors entering into their quarters be operated as follows: Knob from bank side at all times, knob from stair side when stop work was released by key; except when stop work was released by change key, sub-master key and grand master key from stair side; but when required, the grand master key could render inoperative the change and sub-master keys.

"This shut out feature, though primarily a keying problem, was in reality one of lock construction and it took us many hours of concentrated scheming to work it out. It was successfully solved at last by constructing a lock (Fig. 2) of standard proportions meeting

underwriters' qualifications with the usual inside and outside cylinders, but with a third cylinder plug in the face of the lock. This key way and the cylinder on the bank space side were operated by the grand master key only, which placed the control of these locks in the hands of one who at will could lock out from the bank every individual except himself.

Problem No. 3

"In the days not so long ago when a solid ivory knob and rose would bring $45.00 into the cash drawer and locks costing $300.00 wouldn't make the buyer blink, we did a big residential job involving thousands of dollars for repairing and completing innumerable pieces of antique hinges, locks, handles and escutcheons; accumulated by the owner through many years of patient collecting; and all examples of early American hardware which museums would gladly accept and highly prize. No ordinary repair work this, for each restored or new part had to be made by the same primitive methods in use at the period of the article, which took research, time and labor on our part. Among this collection of antiques was a large, brass, hand-made English rim lock, without a cover plate. When the rusty interior parts had all been cleaned and looked again like new, it was revealed that the maker had been a craftsman of unusual talent with a flair for the esthetic, for the faces of the interior parts were beautifully and elaborately engraved in an interesting design.

"Allocated by the owner for use on one of the doors to the elevator, this lock would be in frequent use, but it seemed impossible to place it on the door so that the works could be seen. A week of planning finally produced a detailed drawing, which the owner enthusiastically approved, and fully preserved the lock intact, yet enabled anyone to see both the case and inside works when using the door in the ordinary manner. A molded brass frame and box somewhat similar to a letter hold plate with chute attached, and with an angle return at the front end to go around the door stop, was attached integrally to the rim lock by the machine screws of the lock passing through the case in the usual manner but engaging in a T flange running around the bottom of the box. The outer face of the box was 3/16-in. plate glass, and in the top of it was an enclosed pocket containing two light sockets and lamps, completely wired, the wiring traveling through the door and across the jamb to a switch button. When the light was switched on, all the inside parts of the lock were effectually lighted up enabling all parts of the engraved works to be plainly seen. From the hall side the rim lock looked as normal as any other antique piece of hardware in the house.

"I forgot to mention that the drop handle on the lock case was connected by a spindle in the usual way with a knob attached to a brass flange on the elevator side, which flange was encircled by the glass face. No key operation was attempted from the elevator side. Because of the construction of the glass enclosed box it was necessary to connect the lock to it first and then like a unit lock slide the whole device into the hole cut away in the cross rail of the door. It fitted and worked perfectly when installed and has never caused any trouble as far as we know."

Problem No. 4

A battery of all glass doors! What about hardware? Charles W. Van Tuyl, vice-president and sales manager of Glynn-Johnson Co., Chicago, sent in this most interesting problem and how it was solved. Fig. No. 3 illustrates this actual installation. Let Mr. Van Tuyl tell the story in his own words which he sent me as follows:

* * *

"Clear vision into the building is not only an invitation to enter, but accomplishes the desire of Mr. Architect as well as the owner. Doors with no vertical frames are the answer. A recent installation in New York City, the first of its kind has opened a new field for the hardware engineer. New construction or buildings of long standing can be reconditioned and made most inviting by this treatment.

"The hardware engineer of your contract department is supposed to know and suggest to the architect how to control such entrance and vestibule doors by use of inconspicuous trim. The door proper is made of Herculite glass ¾ to 1¼ in. thick, unexcelled in clearness, brightness and strength. A top quality in structural glass heretofore unknown. The doors are controlled by ingenious concealed hardware incorporated in top bronze channel that fits as a cap on the head of the door. The door when opened is stopped at the desired stopping point and cushioned by a resilient shock absorber in this channel. Should it be desired to have the door held open, a simple turn of the control knob enables the holding feature to engage automatically and hold the door. This holding tension is adjustable to various weights and

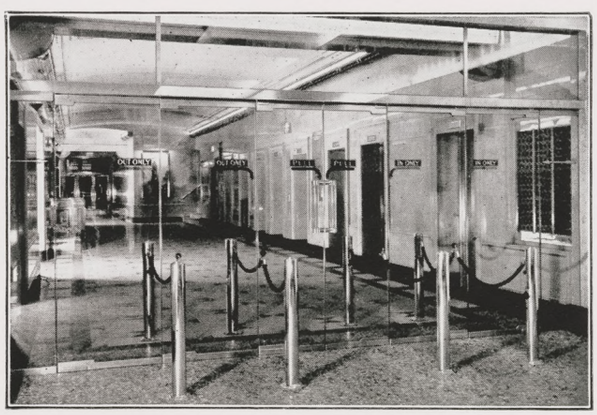


Fig. 3—Battery of glass doors.

sizes of doors. By pulling the door it automatically releases and is closed by the concealed check or closer imbedded in the floor. The Top H channel is so designed as to contain a lock for securing the door, the ball race for receiving the top pivot and the concealed automatic door holder stop and shock absorber. A similar channel is on the bottom for the lower pivot and dead bolt.

"It should be remembered that the Herculite glass door cannot be cut or altered after it is once cut to size and tempered, therefore, all dimensions must be exact and frame must be built to fit doors.

"Door control such as concealed automatic holder stop and shock absorber, H channel with ball bearing race for pivot and lock as manufactured by Glynn-Johnson Corporation, Chicago; Herculite glass manufactured by Pittsburgh Plate Glass Company, of Pittsburgh. Floor closers, single or double acting, by Oscar C. Rixson Company, Chicago."

Chapter 56—*Advanced Course*

INTERESTING HARDWARE PROBLEMS SOLVED

THIS is the third and last of the chapters on interesting hardware problems and how they have been solved. Problems such as these serve to make the builders' hardware business interesting and anyone in the business who encounters problems gets a real kick out of successfully meeting and mastering them.

Russell Gold, assistant general superintendent of the Russell & Erwin Mfg. Co., New Britain, Conn., has sent me in two that he took real interest in solving. He writes:

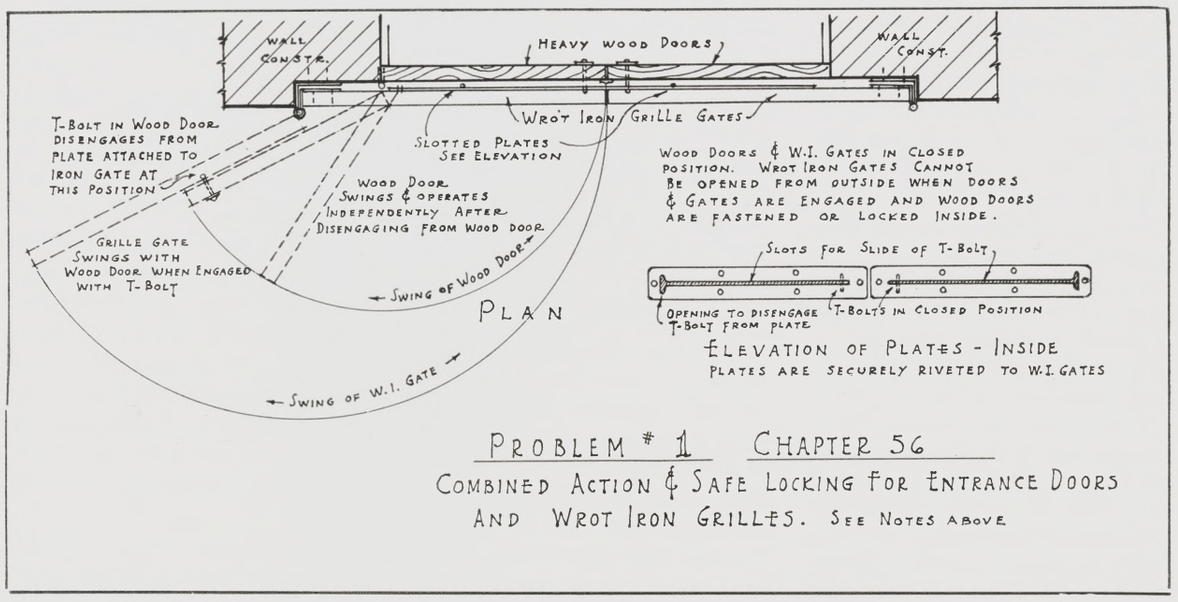
"I can recall two unusual conditions for the application of hardware which I believe would be interesting.

Problem No. 1

"On quite an elaborate mansion they had a series of doors opening onto a porch and wished to protect the opening by installing an iron grille door which would also open out. These grille doors were specified to be locked from the inside and, when opened, the regular doors were to operate independently of grille. This proposition was met by using a T-bolt on the doors and a plate with a T-slot on the grilles. When the doors were open they engaged and when closing they would lock together due to the difference in hinge centers.

Problem No. 2

"We were requested at one time to provide a remote means of control. Specifications were as follows: The door to be controlled was to a vault from a man's library. His secretary was to have access to this vault by keys operating a regular cylinder lock. The owner was to have a remote control in his bedroom arranged between a push button and an elec-



The solution to Problem No. 1

tric strike. The lock in connection with the remote control had no means by which it could be manually operated; therefore, the door was very securely locked by remote control, yet allowed access by the secretary when desired. As I recall it, we used a night latch without cylinder with the electric strike."

Problem No. 3

From Detroit comes another mighty interesting and unique problem—but let Robert Whyte, of the Rayl Co., tell you about it in his own words:

"A short time ago, while we were furnishing a large hospital job, the architect called us and advised that he was giving us an unusual order. It seems that all the doors to be installed, totaling somewhat over 400, were all made of a wood veneer. He previously had taken this problem up with the mill furnishing the doors but had been turned down, and, inasmuch as he had promised the owners the condition referred to would be overcome on the job, he finally pinned it on the hardware man. The problem was this:

"1. All doors were build-up veneer, 1¾ in. thick.

"2. The institution was owned by the State for the mentally defective.

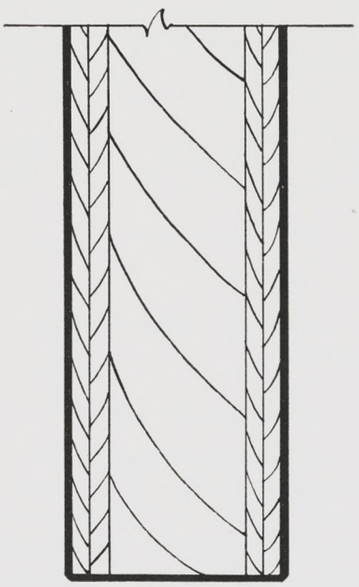
"3. The actions and conditions of the patients required the daily use of very strong cleaning solutions such as caustic soda, etc.

"4. The result was that the moisture with these sodas or acids would soak up in the door, spoiling the finish and causing the veneer to peel off.

"5. The nature of the cleaning solutions and disinfectants would cause steel—plain, galvanized or painted—to rust rapidly and brass or bronze to corrode overnight.

"With the above information in mind, we were told to give them something to stop this condition for all time. Our final result was the use of a black plastic material extending the full width of the doors and made in a 'U' shape to cover both sides of the bottom rail, as well as the bottom of the door. The plastic material selected was absolutely not affected by any solution and required no maintenance whatsoever.

"Result: We have a very satisfied customer, and have received the grateful appreciation of the architect and owner.



Illustrations of U-type plastic used in Problem No. 3

"However, we wish to warn anyone to be particularly careful in their selection of a plastic, as some materials on the market are unfavorably affected by water. A material so affected will throw off a gas with a disagreeable odor and this will corrode brass or bronze very quickly. The plastic material referred to above was manufactured by the Formica Insulation Company, located in Cincinnati, Ohio."

Conrad Lehman, salesman for H. D. Taylor Co., Buffalo, N. Y., encountered a most unusual problem the other day. This is it:

Problem No. 4

"I had an unusual hardware installation a short time ago. One of my customers manufactures meat grinding equipment for use in a big way. This machine handles several hundred pounds of meat at a time. The meat is put into the big hopper which is then revolved at a high rate of speed. Circular cutting knives then cut up this meat suitable for use in frankfurters. The center of the meat hopper has a large opening in it through which the ground meat is pushed when the cleaning blade is lowered. This cleaning blade is hinged to the standard and was originally lowered by hand. As this blade is quite heavy it was considered to be too much of a risk to operate it with female help.

"Our problem was to furnish something that would let the blade down slowly and eliminate this operator risk. A special 73 Yale closer, with heavy liquid, solved the problem. The special part was in the arm construction to fit the drop of the blade and the heavy liquid helped to slow up the closer action. This installation works perfectly and the risk of finding a finger or an arm in your favorite 'hot dog' was eliminated. So more power to the good old door closer."

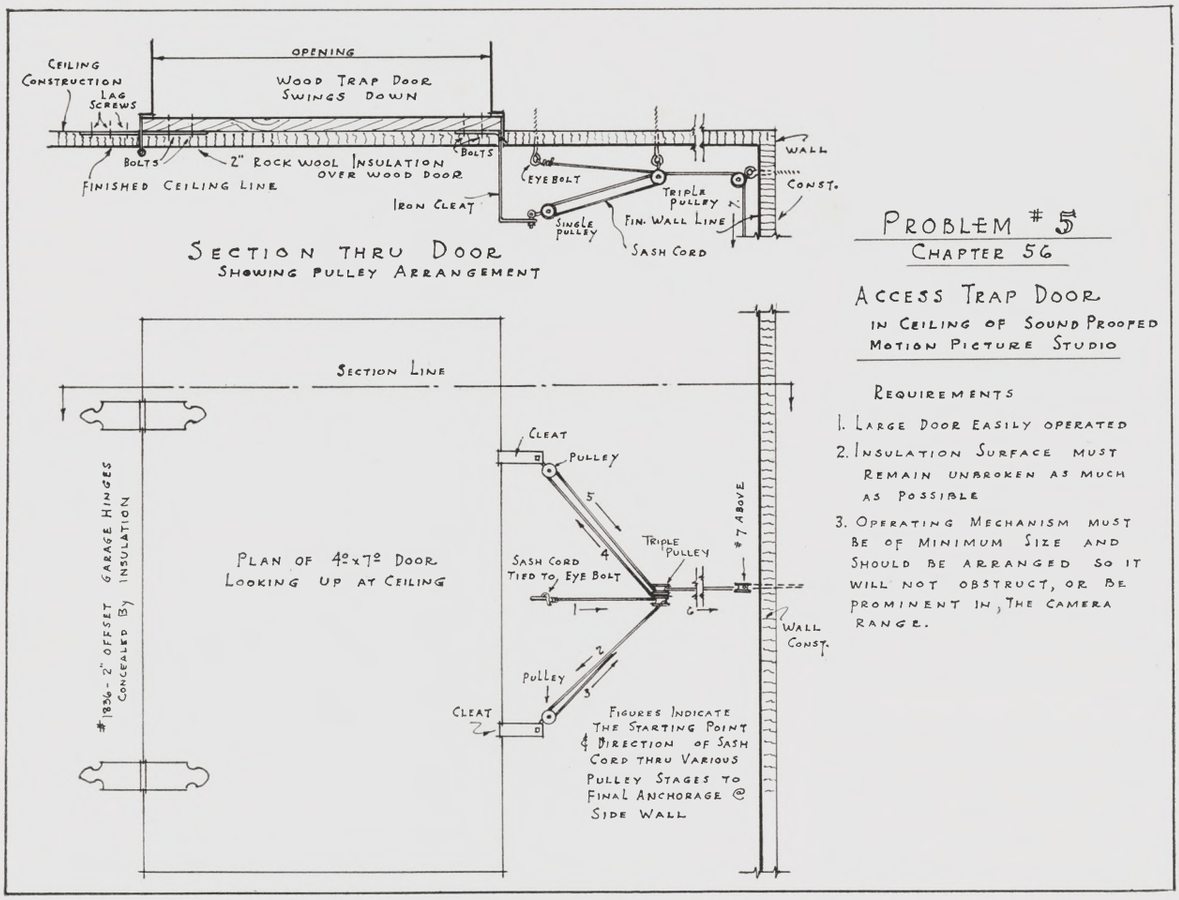
Problem No. 5

The last of the interesting hardware problems and how they were solved comes from a very modest but very well known builders' hardware engineer who would only give me this problem on the strict proviso that his name would not be mentioned. Honoring his wishes, I give you his problem and its solution but not his name.

"The unusual problem we had to overcome was in a sound-proof studio where industrial sound pictures are made. This room was quite large and had a 24-ft. ceiling. The walls and ceiling, including the doors, were covered with two inches of rock wool insulation.

"In the ceiling of this room near the center was a 4 by 7 ft. door which had to be hinged for access purposes. As we have stated, this was a sound-proof studio and there could be no device used that would break or cut through the insulation or obstruct the vision of the camera.

"We overcame this as follows: We had a Richards-Wilcox 1836 garage hinge made with a 2 in.



How Problem No. 5 was solved.

offset. This we applied to the door and jamb by through bolts and had the 2 in. insulation applied over the hinge. To operate the door from the floor we had two iron cleats made in the form of a 'Z' and applied to doors about 2 ft. in from each end, allowing 6 in. to be applied to the door. We allowed a drop of 12 in., with another right angle bend of 5 in. on which an awning pulley was anchored. These cleats were applied to the door under the insulation, the same as the hinges. Next we anchored an eye bolt, and a triple-awning pulley in the ceiling near the edge of the dor and a side pulley at the wall. We threaded a No. 12 Sampson sash cord from the eye bolt through the triple pulley and passing through the pulleys on both cleats, then over to the pulley at the side wall. The cord then extended to the floor and was lashed. Through this system of leverage we had set up we were able to operate this 300-pound door with a pull of 40 pounds."

Chapter 57—*Advanced Course*

LOCK SECURITY

EVERY so often the question arises as to the amount of protection locks really give. Before closing this series, therefore, it seems quite proper that a chapter be devoted to such a subject.

As a matter of fact, the lock industry has contributed a most worthy service to society in the security it has built into builders' hardware.

It is true that locks have been picked; skeleton keys have given unlawful access; many weaknesses in lock construction have been taken advantage of by those who make a practice of stealing. I will admit all that.

It was ever so. Biblical students might turn to the third chapter of Judges in the Old Testament and there read how Eglon, King of Moab, was slain by one named Ehud who, after the murder, locked the door and escaped.

Almost any murder case in these days is the same. Locks and keys often provide feature clues in solving these mysteries.

From the stories in the Bible, from modern mystery novels, in the newspapers or on the radio, one can learn of cases where locks failed to give the security expected. "That's news."

It's news because it is unusual. It has often been said that when a dog bites a man, that isn't news, but when a man bites a dog, "that's news."

For every case where a lock fails to give the expected security there are literally millions of locks serving faithfully, securing life and property over many, many years of trouble-free existence. Do not let the next lock-picking story cause you to lose your sleep. I know of no industry that has contributed dollar value for every dollar received in the form of long-lived merchandise as has the builders' hardware industry.

The builders' hardware replacement field is all too small for those of us who are in the business of selling this material. Every builders' hardware engineer knows that, I am sure.

The ordinary one-tumbler bit key lock offers little security, nor can it be expected to, but use a three- or four-tumbler bit key lock and try to pick it. That will not be so easy. For actual security against picking, I believe it is less vulnerable, as a matter of fact, than some cylinder locks.

A few years ago I well remember how some "smart guy" traveled around different cities upsetting office building managers demonstrating, by the use of an ingenious tool, how easily he could pick a cylinder lock of any manufacturer in a few minutes.

Once in Pittsburgh, at a neighborhood bank, at five minutes to nine, officials found they could not get into the building because of a broken key. The president came rushing over to me for help. He must have the bank open by nine, for he feared even a few minutes' delay beyond opening time might start false rumors and a run on the bank.

The door was guarded with a double-cylinder lock. I had it opened within a minute. It was quite simple, but I will not tell how. I do not feel that educating people how to open cylinder locks is helpful to the industry or the public, but I recall that twenty years or more ago this could be done with almost any cylinder lock. Since that time much has been done to overcome these weaknesses, which I will describe as I continue this chapter.

Henry R. Towne, whom I have quoted before, said in his book, "Locks and Hardware," published many years ago—"No lock has ever been made, or probably ever will be made, that cannot be picked." From my own experience in the past, I would be inclined to agree that he was correct, although much progress has been made in lock manufacturing since Mr. Towne made that statement.

In recent months considerable

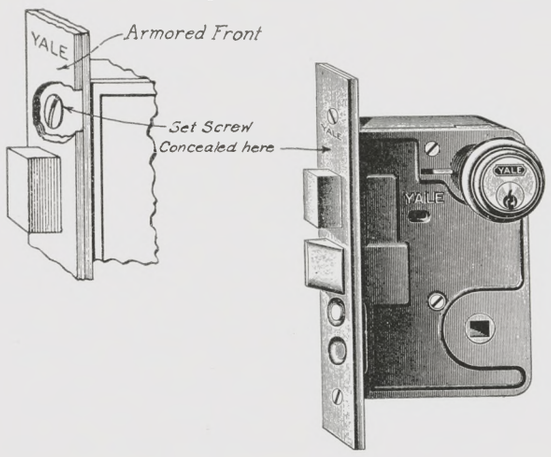


Fig. 1—Armored front lock.

publicity was given to the opportunity of loosening the set screw which holds the cylinder in place and returning at night, removing the cylinder and opening the lock with one's finger.

This method would only work if the door did not fit closely to the jamb. For if there was not sufficient room between the door and the frame, the loosened set screw head would have prevented the door from closing and the screw would be reset before the door was closed and locked for the night. It would even prove a signal to the owner that the door was to be manipulated after closing. A watch might be set and the intended thief captured.

In Fig. 1 is shown one way to overcome that proposed method if it worked on a regular lock. That is by use of the armored front. When an armored front lock is used, even though the front were taken off and the set screw loosened, it would be impossible to put the armored front back on while the set screw was loosened.

In Fig. 2 is shown another way to overcome that method. The set screw illustrated cannot be touched save through the cylinder itself. Loosening the set screw in the face of the lock would do no good at all.

Other methods of protection will occur to you, but space does not permit their discussion here. Ask your own manufacturer how he overcomes these problems.

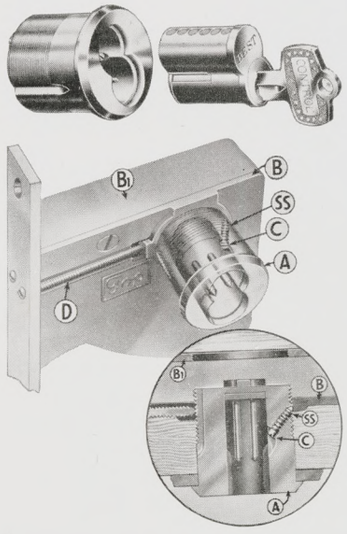


Fig. 2—Protected set screw through cylinder plug.

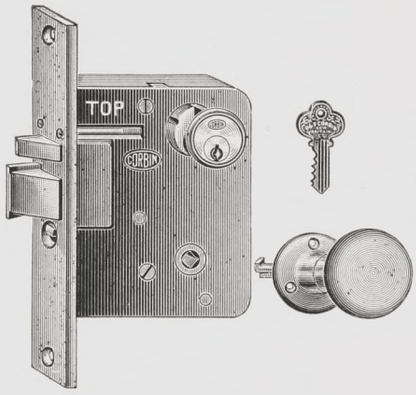


Fig. 3—Auxilary latch lock.

For several years it was customary to use ordinary spring latch cylinder locks for protection. Slipping a knife back of the stop, or, in case doors opened out, attacking the latch bolt directly with a sharp instrument would slide the latch back in a moment and entrance was quickly gained.

This fault was corrected by the use of the auxiliary latch that dead locks the latch bolt. Fig. 3 illustrates what I mean. The development of a dead locking latch bolt also eliminates this trouble.

Cutting off the ordinary cast brass dead-bolt with a saw permitted easy entrance.

Fig. 4 illustrates a method devised to overcome this. Fig. 5 shows still another.

Locks such as are shown in Fig. 6 have increasingly come into use and are now made by many manufacturers.

My chief purpose in this chapter is to point out the fact that manufacturers know long in advance of the general public the weaknesses that occur, and they are often rectified long before even you or I know they exist.

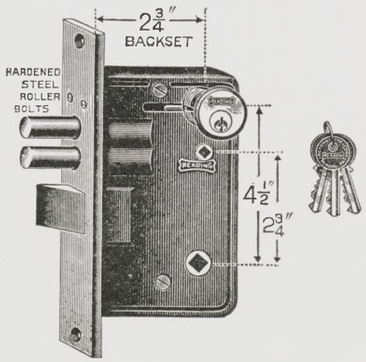


Fig. 4—Hardened steel roller bolt lock.

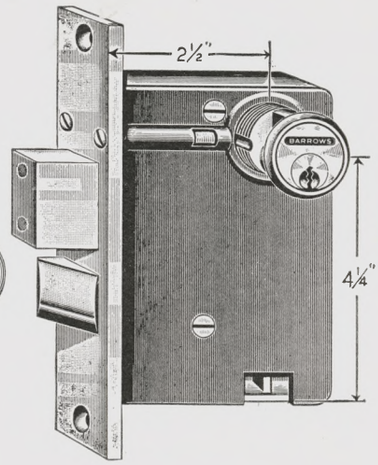


Fig. 5—Lock with hardened pins—extra heavy bolt.

To me the greatest lesson in all this recent publicity on lock manipulation is the opportunity it affords our builders' hardware engineer and every live, up-to-date hardware store to cash in on extra sales.

Older buildings not equipped with the latest methods of lock protection offer you a golden opportunity to do a real selling job by replacing hardware now installed with the latest developments of the trade.

Too often we are inclined to think that our only field is new building, and in so thinking we overlook a tremendously undeveloped field by re-hardwaring old buildings.

When business on new work is not so brisk, just try calling on office buildings, institutions of all kinds and suggest to the building superintendent the advisability of re-hardwaring his building for greater lock protection and other door control. Offer to make a survey of their hardware, and submit without any obligation on their part recommendations for the improvement and protection of their buildings.

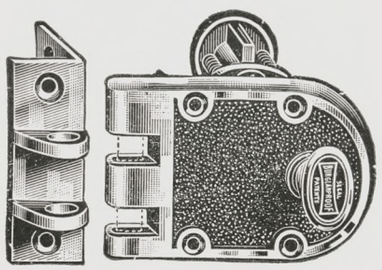


Fig. 6—Jimmy-proof lock.

Chapter 58—*Advanced Course*

PADLOCKS

PADLOCKS are indeed a bread and butter item in every hardware store—starting with the popular 10 cent padlock up to the finest pin tumbler cylinder padlock selling for several dollars each. Every hardware dealer is faced with the problem of how many kinds he should carry to meet the demand.

Padlocks retailing from 10 to 25 cents naturally can offer little value in the way of real protection. They have their place, of course, and will always be in demand because of their price. As the price increases so does the protection and in most cases protection is the real reason for which the padlock is bought.

In many hardware stores I have noticed a tendency to make, figuratively speaking, an international exposition out of the padlock stock. Usually I would suggest few makes and better stocks to meet all price ranges.

It is to be recognized that as a chain is only as strong as its weakest link, so is a padlock only as strong as its most vulnerable point. So it might be well to consider what are the most vulnerable points in a padlock.

Probably the most vulnerable isn't actually in the padlock itself at all, but in the hasp into which the padlock fastens. Certainly an ordinary hasp fastened on with ordinary wood screws offers little protection as long as the screws can be removed with an ordinary screw driver and hasp, padlock, and all removed without ever opening the padlock at all.

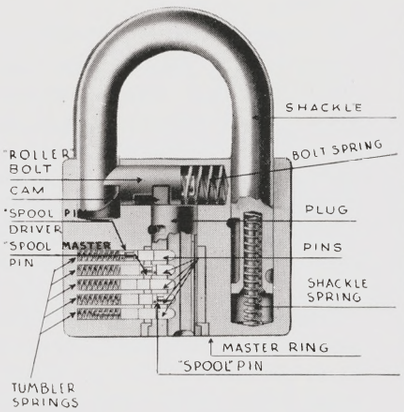


Fig. 3—Cut open illustration of extruded brass pin tumbler padlock.

The finest and strongest padlock in the world would be useless in such a case. So if your customer really wants protection, start with the hasp. If a common hasp is used sell stove bolts with it and have your customer rivet the bolt fast to the nut so that it cannot be easily removed.

Safety hasps have overcome most of the problems of protecting the most vulnerable spot, but even these can be quickly pried loose if the wood screws go into soft wood. Even on a safety hasp stove bolts with washers are good insurance. Padlock eyes into the edge rather than the surface of the door are also good. Fig. 1, illustrating padlock eyes as manufactured by Francis Keil & Son, Inc., shows what I mean. This firm also manufactures a store door safety hasp used with bolts as previously described. See Fig. 2.

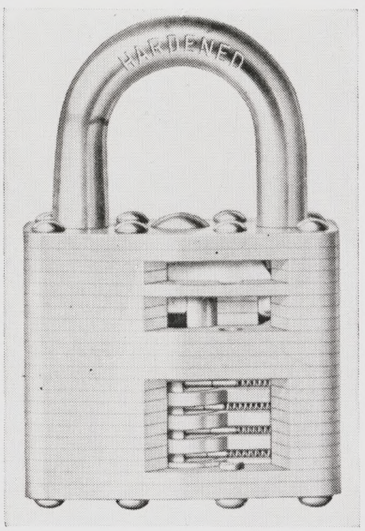


Fig. 4—Master laminated padlock.

Having our hasps properly fastened, we will turn to the padlock itself to look for vulnerable points. Many of the cheaper ones are easily sprung open by a quick blow on the case because the locking mechanism is light and insecure. Heavy sturdy locking levers are important for real security.

To my mind, this point is more important, more vulnerable and less easily detected than any other point in the padlock. Know how the padlocks you see are protected as to the locking lever.

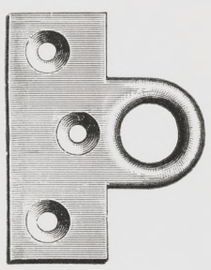


Fig. 1—Padlock eye.

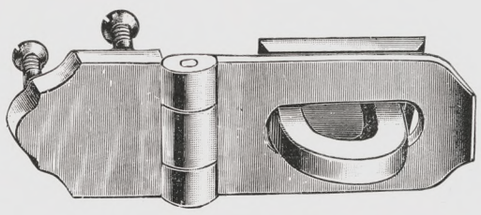


Fig. 2—Store door hasp and staple.

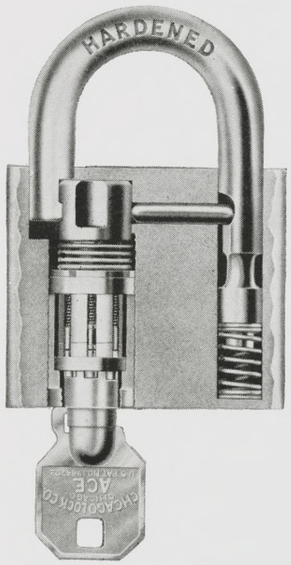


Fig. 5—Chicago Lock Company—Ace padlock.

Next in ease of attack is the shackle. One of soft steel or brass can be sawed off with little trouble and for this reason hardened steel shackles have become a matter of good practice in the higher priced padlocks.

It may seem strange to those students of this course who may be beginners in the study and sale of builders' hardware that I would place hasps, locking levers, shackles ahead of the key way and keys as the most vulnerable points on a padlock, but really they are.

For I would rather have a door locked with a secure hasp, a sturdy locking lever and hardened steel shackle padlock of simple two-lever or warded key way than I would to have the finest pin tumbler key way construction with an ordinary hasp, light locking lever, or soft steel or brass shackle.

The final word, of course, is to have all these good features plus the best type of cylinder pin tumbler lock construction where it is possible or advisable to do so.

Fig. 6—Fraim disk padlock.

It is frequently found desirable to have padlocks with chains attached to insure their not being mislaid, lost or stolen. Almost all of the manufacturers make them that way when so ordered.

The better grade of padlocks can be master and grand-master keyed and the pin tumbler type can be used on the same system as other pin tumblers in a building as outlined and described in Chapter 41.

Fig. 7—Four-disk tumbler spring shackle padlock.

Fig. 3 shows a cut open model of a Corbin Cabinet Lock Co., New Britain, Conn., extruded metal pin tumbler padlock. Note their roller bolt, which in this case becomes what I have previously called and many other manufacturers do call locking lever. This is a patented unique feature in the Corbin line.

This firm, as well as many other manufacturers, features a complete line of padlocks from 10 cents to $8.00 retail value. Space does not permit a complete description of this line or others. I can only hit the high spots in such a chapter as this and no student should assume in any of these illustrations that any attempt has been made to catalog even a portion of any one line.

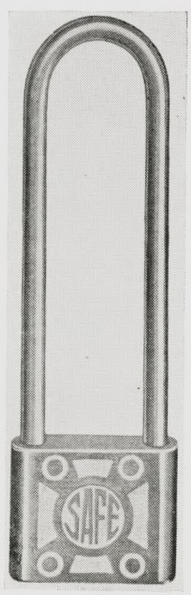


Fig. 8—Bicycle type padlock with long shackle.

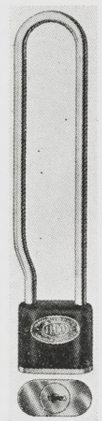


Fig. 9—Bicycle padlock.

For example, the Master Lock Co., Milwaukee, Wis., has been very successful with a padlock built up from a series of steel or brass plates securely wedge riveted together under extreme pressure, such as is shown in Fig. 4. This illustration is only one of the many padlocks this firm makes.

The Chicago Lock Company makes a seven-tumbler padlock which they call their "Ace." This embodies a different principle than is used on any of the other padlocks which are described in this article. Fig. 5 illustrates this principle better than words can.

Another example, Fig. 6, is a five-disk, cylinder padlock made

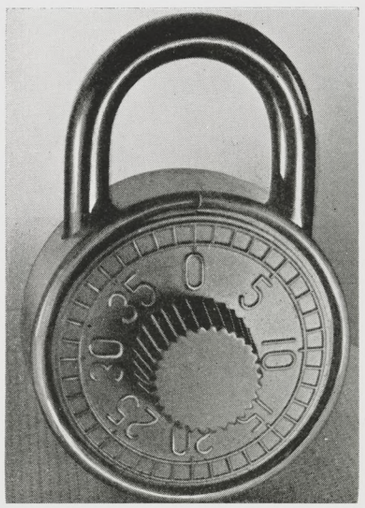


Fig. 10—Eagle combination padlock.

Fig. 11—Keyless combination padlock.

by E. T. Fraim Lock Co., Lancaster, Pa., who also make pin tumbler and many other padlocks as well. In the catalog of the Segal Lock & Hardware Co., New York

Fig. 12—Best padlock with dust cap-removable plug.

City, in Fig. 7 is another popular disk tumbler padlock, a selection from Segal's large line of padlocks. The disk cylinder has proved quite popular in padlock

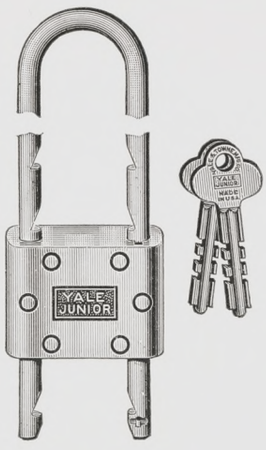


Fig. 13—Yale adjustable ratchet shackle padlock.

construction. It is less expensive than the pin tumbler type.

Fig. 8 shows a bicycle padlock type using a long shackle from the Safe Padlock and Hardware Company, Lancaster, Pa., catalog. It has many uses, of course, besides locking bicycles. Padlocks can be obtained with various length shackles. The bicycle padlock shown in Fig. 9 is manufactured by the Independent Lock Co., Fitchburg, Mass., this being of course only one of many padlocks which it manufactures.

Fig. 10 is a combination padlock made by Eagle Lock Co., Terryville, Conn., large manufacturer of padocks. Combination padlocks, in place of those with keys, are in considerable demand. Another type of keyless padlock shown in Fig. 11 is manufactured by Bemis & Call, Springfield, Mass., which permits easy changing of the combination when desired.

Many combination padlocks have only the combination without

Fig. 14—Forged bronze case padlock.

the master key feature. In many schools and colleges, combination padlocks are specified and used in large quantities. Here is another place much "plus" business can be secured by the wide-awake hardware dealer.

Fig. 12 shows one made by the Best Universal Lock Co., Indianapolis, Ind. The Best line features the removable exchangeable plug, a unique patented feature. This particular illustration also shows a padlock with a dust cap to keep out the dirt.

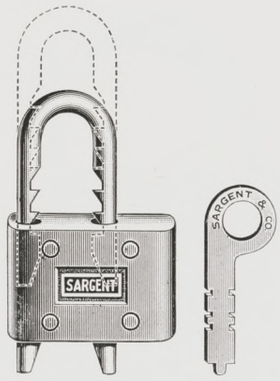


Fig. 15—Sargent tire carrier padlock.

Fig. 13 illustrates an adjustable ratchet shackle Yale padlock and is picked from the catalog of the Yale & Towne Mfg. Co., Stamford, Conn., to show another type. It is not necessary for me to elaborate on the fact which I am sure is known to all our readers that Yale makes a wide, varied line of padlocks and is one of the leaders in the field.

The use of forged bronze in the manufacturing of builders' hardware is becoming increasingly popular. Fig. 14 shows a lock among those padlocks manufactured by the Slaymaker Lock Co., Lancaster, Pa.

Sargent & Company, New Haven, Conn., makes a varied line of padlocks. To show something different, I have selected as Fig. 15 a tire padlock. Much business can be secured from automobile owners on tire padlocks if you will only feature them.

As is always the case when discussing each and every subject throughout the previous 57 chapters, I come to the close of my allotted space for each given subject with a realization of the limitations of space to cover adequately the subject. Chapter 58 is no exception.

There are many other manufacturers of padlocks and many other padlocks of all manufacturers that I cannot find space to discuss. Study your own source of supply for more information because this business is profitable business.

Chapter 59—*Advanced Course*

DID YOU KNOW?

THIS chapter brings us near the close of the Advanced Course of our study. As I contemplated that fact, it occurred to me that I should go through the library of manufacturers' catalogs once more just to check up on anything of importance that I may have missed. In doing this I note a number of interesting things which I am going to jot down as I go along. This chapter might properly be termed a "Did You Know?" chapter.

For example, did you know that the American Cabinet Hardware Co., Rockford, Ill., has an unusually large line of small hinges to meet unusual conditions? Their

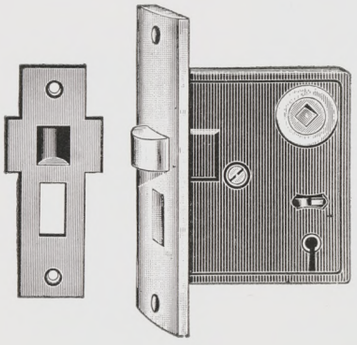


Fig. 1—Knob lock set for double acting doors.

catalog No. 132 shows this line most advantageously.

In the catalog of the Barrows Lock Works, North Chicago, Ill., I ran across a knob lock set for double-acting doors as shown in Fig. 1. That's a rather unusual lock. Did you know where you could get it before?

The Best Universal Lock Co., Indianapolis, Ind., has a patented interchangeable core for all kinds of cylinder locks and padlocks, illustrated in Fig. 2 and Fig. 3, which permits immediate change of keys by removing the cores without disturbing the locks themselves by means of a control key. This company also makes a line of tubular locks which it offers to the trade. Fig. 4 illustrates one of them.

The Casement Hardware Co., Chicago, Ill., first made an automatic top closer for casement windows as shown in Figure 5. I found several manufacturers who now make a similar device. Did you know who first made it?

As I went through the catalog of the Champion Hardware Co., Geneva, Ohio, I ran across a sash fastener, shown in Fig. 6. It is made particularly for double-hung windows in summer cottages and other places where the windows are not equipped with weights or balances. Did you know such a fastener was manufactured or have

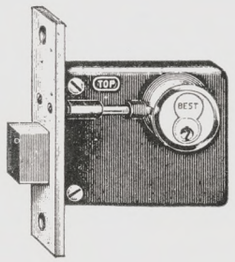


Fig. 3—Mortise cylinder dead lock with interchangeable core.

you depended on the standard old-fashioned window spring bolt for cases of this kind?

It may be a long step from summer cottages to cold storage doors, but, as I continued my alphabetic perusal of builders' hardware catalogs, I picked up that of the Chicago Spring Hinge Co., Chicago, Ill., and found a special folder dealing with a door closer for cold storage doors. It is illustrated by Fig. 7. Did you know there was such a device on the market?

Two manufacturers' catalogs especially impressed me as I went through my library with their effective and attractive presentation of period hardware. I refer to those of P. & F. Corbin, New Britain, Conn., and the Earle Hardware & Mfg. Co., Reading, Pa. Did

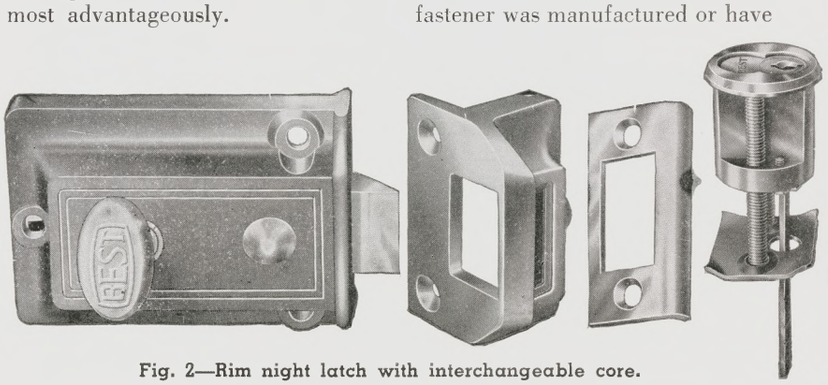


Fig. 2—Rim night latch with interchangeable core.

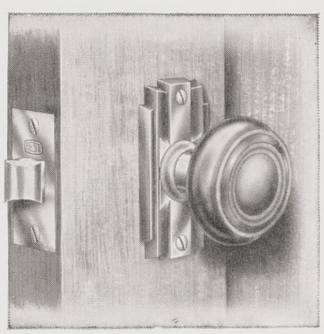


Fig. 4—Tubular lock.

you know these manufacturers have special catalogs on this subject?

Nothing has been said throughout the course about key blanks.

Key blanks do have a place in every builders' hardware stock. Many stores have key-cutting machines and make a nice profit on them. Did you know there was a definite movement to educate locksmiths to use genuine blanks? By that I mean a Corbin blank for a Corbin lock—a Yale blank for a Yale lock, etc.

Dudley Lock Corp.'s, Chicago, Ill., catalog featured a 4 in 1 burglar-proof lock cylinder, shown in Fig. 8, that was unique. Lock picking is a subject of interest in books, on stage and screen. I will not attempt to discuss it here but this catalog will show you how Dudley features the subject and meets the situation. Did you know about a 4 in 1 cylinder?

In my library is the catalog of the H. S. Getty Co., Philadelphia,

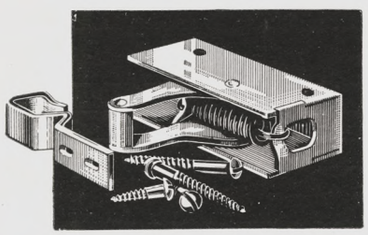


Fig. 5—Top closer for casement windows.

Pa. In it I found an interesting line of builders' hardware for metal doors and windows.

Then in the F's I found a most complete line of friction catches in the catalog of C. L. Frost & Sons, Grand Rapids, Mich. Did you know about this line of friction catches?

As I came down to the G's, I noticed an interesting little item in the catalog of Glynn-Johnson Mfg. Co., Chicago, Ill. This is a unique small rubber door silencer fastened in the door jamb. This is removable and replaceable. Did you know that such an item was available?

The Chas. Hess Co., of Brooklyn, N. Y., has a small but interesting catalog. I was particularly impressed with the unusually large line of hooks this company manu-

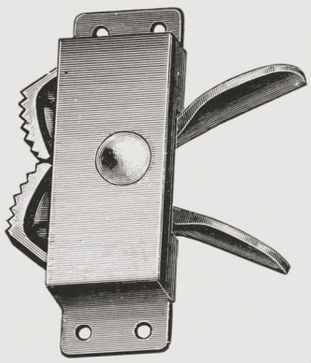


Fig. 6—Sash fastener for weightless double hung windows.

factures such as step ladder hooks, meat hooks, etc. Did you know about this line?

The catalog of the Lockwood Hardware Mfg. Co., Fitchburg, Mass., reminded me, as I came upon Fig. 9 of a Dutch door bolt and Fig. 10, of a Dutch quadrant, that at no point in the entire series had I mentioned hardware for Dutch doors. Do you know what a Dutch door is? Well, it's really two doors—one above the other which can be fastened together by

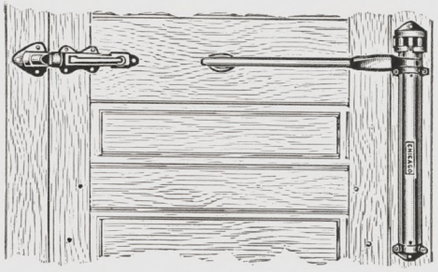


Fig. 7—Door closer for cold storage doors.

these devices to make them operate as a single door. Always remember in addition to the bolt or quadrant to fasten the two leaves together that a Dutch door takes one more butt than a regular outside

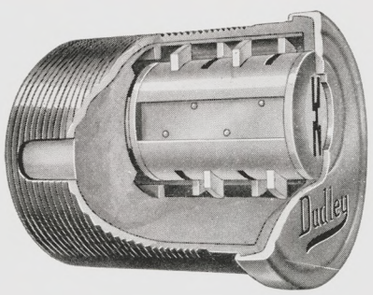


Fig. 8—Dudley armored pick-proof cylinder.

door usually equipped with three butts or a pair and a half—that a Dutch door requires four butts or two pair.

The Macklanburg-Duncan Company, Oklahoma City, Okla., has brought much "plus" business to the hardware trade with their Numetal spring bronze weather strip which can be installed by the home owner without removing windows or doors. Fig. 11 shows the device which has brought a new and profitable line to the dealer for over-the-counter sales which formerly went to installation agents. All types of metal nosing, edgings and mouldings are extensively shown in this firm's catalogs. Did you know about this class of available business?

McKinney Mfg. Co., Pittsburgh, Pa., has recently introduced a new drive tight butt, whereby a carpenter can apply the butt as he would

Fig. 9—Dutch door bolt.

a loose pin butt and then drive in the pin to make it a tight pin butt. Did you know about this?

The Milwaukee Stamping Co., Milwaukee, Wis., manufacturers of the Lawson hinge line, shows in its catalog a garment fixture—see Fig. 12. You will note this device is different from ones we have covered previously. Each hanger has a hook so that the garments are not packed too closely together. Did you know about this fixture?

Ship hardware is, of course, really builders' hardware. We have not, nor will we now, devote any particular study to it, but as I looked through my catalogs I

Fig. 10—Dutch door quadrant.

was impressed with the line of ship hardware shown in the catalog of the Norwalk Lock Co., Norwalk, Conn. Did you know ship hardware was different in many ways from other builders' hardware?

In the catalog of Penn Hardware Co., Reading, Pa., is a unique jimmy-proof lock (Fig. 13). Notice the latch and strike. Did you know such a lock was manufactured?

How manufacturers of builders' hardware sometimes stray from strictly builders' hardware items was impressed on me as I picked up the catalogs of Reading Hardware Co., Reading, Pa., and Russell & Erwin Mfg. Co., New Britain, Conn. In the Reading catalog I

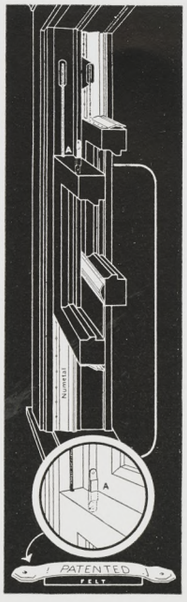


Fig. 11 Numetal weather-stripped double-hung windows.

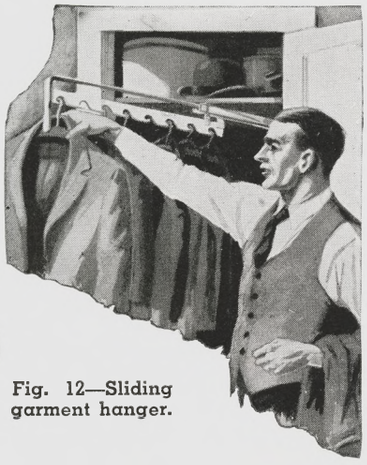


Fig. 12—Sliding garment hanger.

found an extensive line of lawn mowers displayed and in Russell & Erwin's a unique food chopper that opens and permits easy cleaning.

While Sargent & Co., New

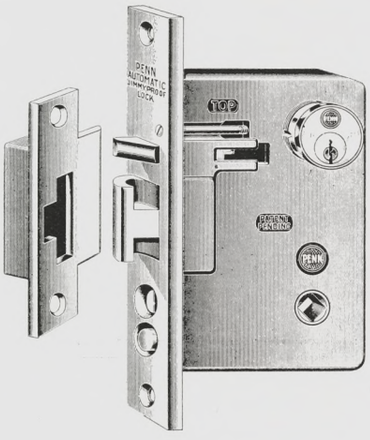


Fig. 13—Jimmy-proof mortise lock.

Haven, Conn., does not show this line in its regular hardware catalog, it is interesting to note in passing that they are among the leaders in the manufacture of casket hardware. Yale & Towne Mfg. Co., Stamford, Conn., also step out from the regular builders' hardware business, being recognized among the leaders in government mail boxes for post office and manufacturers of chain hoisting devices.

Did you know these manufacturers were leaders in these other lines?

But to return to builders' hardware again, we are now down to the S's. Starline, Inc., Harvard, Ill., offers the trade an interesting

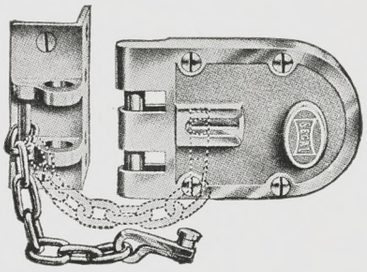


Fig. 14—Jimmy-proof rim night latch.

line of steel cellar windows and structural steel ventilating windows. Did you know you could obtain such a line to win back the business usually lost when metal windows are used?

Then I picked up a catalog of Segal Lock & Hardware Co., New York City, featuring "jimmy-proof" locks. Segal, I am quite certain, was the first to develop a "jimmy-proof" rim night latch (Fig. 14) the bolts working on the same principle as the pin in a butt, bolting the door and frame together. While this type of lock is now made by several manufacturers, it was Segal who first developed this idea.

The A. E. Rittenhouse Co., Inc., of Honeoye Falls, N. Y., has perfected a beautiful, practical and fast-selling line of door chimes. Fig. 15 shows one of the popular ones. Door chimes have taken the shock out of the ringing door bells and are putting extra dollars into the tills of hardware dealers who push them aggressively. They sell readily. Did you know that such a sales-builder was available?

Skillman Hardware Mfg. Co.'s Trenton, N. J., catalog shows a most complete line of rim locks. Fig. 16 from their catalog shows a rim store door dead lock—just one of the many rim locks manu-

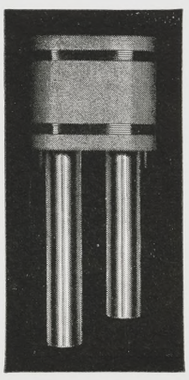


Fig. 15 Electric door chimes.

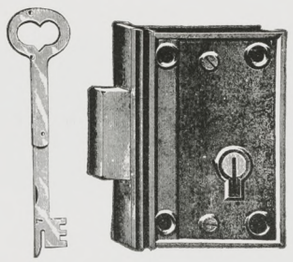


Fig. 16—Rim store door dead lock.

factured by this company. Did you know that Skillman made one of the most complete lines of rim locks in the country? Rim locks, of course, are only part of their line.

Heretofore we have made mention of Soss hinges, but did you know that Soss Mfg. Co., Roselle, N. J., in addition to its regular invisible butt line, make a complete line of special invisible hinges for furniture, cabinets, and metal cabinets? You will find these illustrated in the Soss catalog.

The catalog of Technical Glass Co., Los Angeles, Cal., presents another idea in door knobs (Fig. 17). Glass knobs in eight colors with chromium metal tops. Did you know of this metal and glass door knob?

Finally, I came to W, and picking up the catalog of Western Products, Inc., I noticed a wardrobe hat and coat rack (Fig. 18). Did you know that it was obtainable?

Now we come to the final item I want to mention in the course. The job is done. A large job with hundreds of keys to be taken care of. Did you know that at least two manufacturers have solved this problem with key systems, panels, cabinets and files, systematically filing and recording proper places keys belong. Fig. 19 shows what I mean. This sort of installation on larger work saves endless time and confusion. There are two manufacturers that I know of offering these systems to the trade. They are the Lund Equipment Company of Cleveland, Ohio, and P. O. Moore, Inc., New York City.

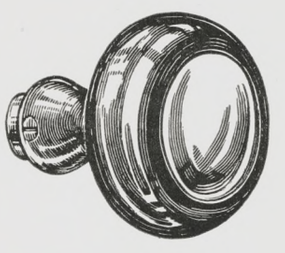


Fig. 17—Glass knob with chromium metal tops.

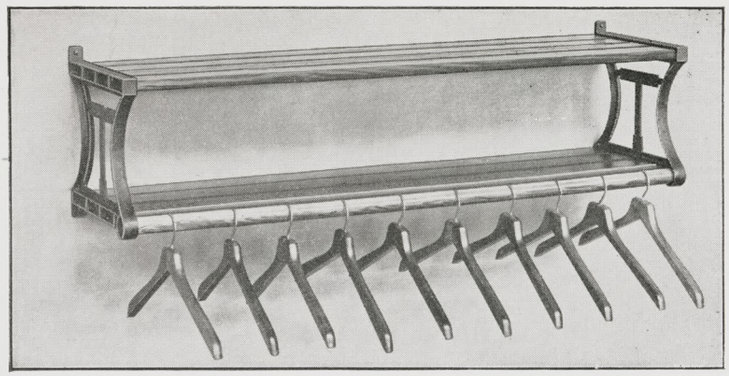
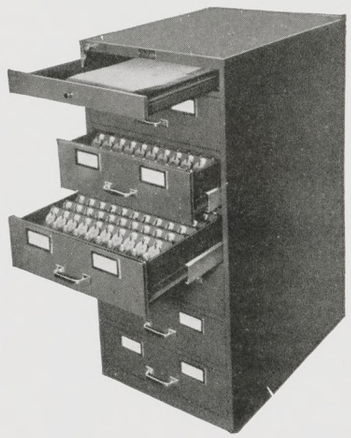


Fig. 18—Wardrobe hat and coat rack.

So we come to the end of the library. Many other manufacturers' catalogs not mentioned in this chapter and many other items in the catalogs of manufacturers who have been mentioned in the chapter have helped me contribute my bit toward making this course instructive by their illustrations.

Just one thing more in closing this chapter. I hope no reader will get the impression that the articles I have mentioned are the only things any of these manufacturers make or even that they are of major importance to those manufacturers.

I also wish to remind our readers that manufacturers who have not been mentioned also make many interesting items.



The whole idea of the ramble through this "Did You Know?" chapter is that I just wanted to point out items here and there that had not been covered before and that I felt would be of interest to you.

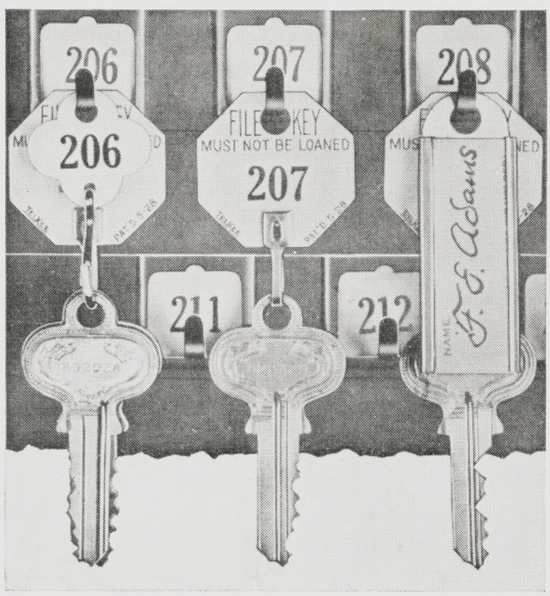


Fig. 19—One type of key cabinet.

Chapter 60—*Advanced Course*

CONCLUSION

WITH the close of this chapter this course is completed. For you, I hope it has changed the word "mystery" to "mastery" — that builders' hardware will now be to you a joy and a pleasure.

No matter how well you have studied what has been written you cannot possibly have mastered the subject unless you have followed the suggestions of further study from other suggested sources which I constantly put up as sign posts on the way along your road.

Before writing this chapter I reread the entire course again. If I ever had it to do over again, I would do many things differently. However, I do believe I have covered generally almost every kind of a problem that will arise.

When I say generally, I mean just that. I would be writing for many years if I went into each and every item as specifically as it deserves for you to fully understand it all. It is now up to you to carry on.

Each job of any consequence presents problems peculiarly its own. Each new customer provides a new opportunity. Each contract successfully and satisfactorily completed gives the reward of a job well done and the satisfaction of having achieved good results.

Before this course is completed some things in it will be out of date. There is something new being developed constantly. It is 30 years since first I entered the builders' hardware business, and its greatest interests to me are the developments of the industry in new goods and the fact that every new job presents new problems to be solved.

Do not fool yourself! You will never know all there is to know about builders' hardware. I know I never have tried to "kid" myself into thinking that I did, or do, or will.

Unbiased Throughout

Throughout the entire course it has been my constant endeavor to present the subject in as unbiased a manner as I possibly could. Nothing that I could do to make this endeavor true was too much trouble. For example, it would have been far easier for me to have used illustrations from only one manufacturer of the goods under discussion, yet I spent hours digging through every one of the various manufacturers' catalogs for illustrations so it would not appear that I was discriminating against or favoring anyone.

When the publishers of HARDWARE AGE suggested my doing this work, I am sure I didn't realize the time, work or research involved nor, as a matter of fact, did they. Now it is completed. How valuable it may be is for you to decide.

While that which I have written may be immaterial, I do contend that the study chart, the comparison lists, the detail sheets, the information compiled together is material and valuable and a contribution to the industry and will be used.

The publishers of HARDWARE AGE deserve a great deal of praise and commendation for the foresight to vision the plan and for the care and attention given in carrying the plan through. I submit to you, the student of this course, that you owe them a deep appreciation and vote of thanks.

HARDWARE AGE has made this contribution to the industry at real expense feeling, I know, that it will help the hardware store keep builders' hardware where it belongs in the hardware stores of this land.

Builders' hardware manufacturers, too, I feel, owe HARDWARE AGE their loyalty and support for the work accomplished in their behalf and interest.

To George H. Griffiths, president and general manager, and to Charles J. Heale, editor and vice-president, as well as their assistants, I want to express my heartfelt thanks—for their encouragement, understanding and patience, bearing with me in the presentation of this work.

To those manufacturers and their representatives who so generously helped me with their suggestions, comparison and suggestion charts, I am truly deeply indebted. Without their support this course would have been of little real value.

To those builders' hardware engineers who gave me those interesting hardware problems and the solutions, I say, "thank you!"

To the many friends who have written me—I express appreciation for their encouragement, but I cannot close this part of my final chapter without expressing my particularly great appreciation to the one man who has checked me back on every chapter of the course, whose suggestions have helped materially all the way through. He is my lifelong friend and former associate, the manager of the builders' hardware department at H. D. Taylor Co. in Buffalo, N. Y.—Rae S. DeRonde.

Also, I would like to pay tribute

to E. W. McHenry, of the John W. Cowper Co., of Buffalo, N. Y., who so faithfully reproduced the complete series of details shown throughout the Advanced Course. This has been splendidly done.

"Taking the Mystery Out of Builders' Hardware," I told you in the opening announcement, was impossible, because there was no mystery in it. It's just good, common horse sense—the ability to understand conditions and use your head.

As in opening this series, I also close by stating that builders' hardware is the foundation of a good hardware business.

It's up to you who have studied this course with me to prove it to your own companies. Sell good hardware that will last and of a proper type to fill the requirements.

Make a profit on what you sell. You are entitled to a fair return on your work.

Missionary work must be done to educate the public in the interest of proper hardware allowances. Take as your slogan, "2 per cent of the cost of the building for finish hardware."

With this course as a background pointing the way, you now come to the point of looking ahead.

It is tremendously important to have this background, the knowledge and the sign posts this course has outlined, but it is far more important from this point on that you do something about it.

At this point my direction stops and you have to chart your own course. It is you who will write the future on the builders' hardware industry, the next textbook on the subject, and do the work that lies ahead.

Men like J. Harold Dumbell, "Doc" Eshleman and other officers and members of the National Contract Hardware Association, who have been, and many who still are, the outstanding builders' hardware engineers of the country, must, in the natural course of human events, be succeeded by someone. Why should it not be you?

It is you, I speak collectively, who must carry on the progress this generation has made in this industry. The way has been paved, the sign posts are up, the machine is rolling along. All it needs to keep going is the spark of your interest, the power of your work, the steering of your sound thinking lubricated by the service your heart wills to give in the work.

What lies ahead of the goal to which you are headed? That's absolutely up to you, but I hope at least part of the goal will be these ten objectives:

1. All builders' hardware engineers — registered, trained and recognized for what they really are—professional men.

2. All builders' hardware engineers, members of the National Association with district subdivisions meeting regularly.

3. All builders' hardware engineers properly paid for the services they render.

4. Proper allowance for builders' hardware on every building.

5. Builders' hardware sold at a fair profit.

6. Elimination of manufacturers' direct competition.

7. Manufacturers making builders' hardware and selling it only through legitimate trade.

8. Fair, clean competitive bidding.

9. Proper hardware furnished always to render service required.

10. Builders' hardware sold only by hardware dealers maintaining proper sample rooms—at least one registered builders' hardware engineer, and dealers who recognize that builders' hardware is the foundation of a good hardware business.

—THE END—

GLOSSARY OF BUILDERS' HARDWARE TERMS

A

ADJUSTABLE KEY—A key for sliding door locks, having a stem or shank adjustable as to its length to adapt the key to doors of various thicknesses.

ANTI-FRICTION AXLE PULLEY—A sash pulley, the axle of which is carried in roller bearing to reduce the friction.

ANTI-FRICTION BOLT—Latch-bolt of a lock, when provided with a device for diminishing the sliding friction of the bolt during the closing of the door.

ARMORED FRONT—A construction in which the regular front of a cylinder lock is covered by an armor plate, secured to the regular front by machine screws to guard the set-screw which checks the cylinder, and also to protect the front of the lock while the door is being painted, or while the lock is being mortised. This latter result is effected by removing the armor plate from the front of the lock during these mechanical processes.

ASTRAGAL FRONT—A lock front having a form coinciding in shape with the edges of a door having an astragal molding.

ASYLUM LOCK—One for use on doors of insane asylums and especially protected against tampering.

AXLE PULLEY—Synonymous with Frame Pulley.

B

BACK PULLEY—Synonymous with Shutter Flap.

BACK PLATE—A plate on the inside of a door and surrounding the orifice leading from a letter drop or plate on front of door.

BACKSET (of a lock)—The offset or horizontal distance from the front of a lock to the center line of its knob or key-hole.

BALL-BEARING BUTT—One having a roller or ball bearing to reduce the friction.

BARN DOOR HANGER—A sheave mounted in a frame or attachment to the bottom of a sliding barn door, traveling on an overhead rail and carrying the door.

BARN DOOR LATCH—A heavy Thumb Latch.

BARN DOOR PULL—A large Cupped Pull for heavy doors.

BARN DOOR ROLLER—A sheave mounted in a frame for attachment to the bottom of a sliding barn door, traveling on a rail laid in the floor, and carrying the door.

BARN DOOR STAY—A small roller, usually carried on a spike or screw, for guiding a sliding barn door.

BARREL BOLT—A cylindrical bolt mounted on a plate having a case projecting from its surface to contain and guide the bolt.

BARREL KEY—Synonymous with Pipe Key.

BAR HANDLE—A door handle consisting of a bar, usually horizontal, supported by one or more projecting brackets.

BELL CRANK—A bent arm, usually a right angle, turning on a pivot attached to a plate, used for altering the direction of bell wires.

BELL LEVER—See Lever Bell Pull.

BELL PULL—A knob, with plate, arranged to pull out longitudinally against the resistance of a spring, its motion being transmitted through wires to a bell.

BEVEL OF LOCK—A term used to indicate the direction in which the bevel of the latch bolt is inclined; "regular bevel" commonly indicating a lock for use on a door opening in, and "reverse bevel" one for a door opening out.

BEVEL OF LOCK FRONT—The angle of the front of a mortise lock when inclined at other than a right angle to the case, to conform to the angle of the edge of the door.

BEVEL OF DOOR—The angle of front edge of door. Regular bevel is usually $\frac{1}{8}$ inch to 2 inches.

BIT (of a key)—A projecting blade which engages with and actuates either or both the bolt and tumblers of a lock. Synonymous with Wing.

BIT-KEY LOCK—One operated by a key having a wing bit.

BITTING—A cut, or indentation, on that part of a key which acts upon and sets the tumblers.

BOLT—A bar or barrier arranged to secure a door or other moving part, and to prevent its opening.

BOOKCASE BOLT—One which automatically fastens or releases one-half of a bookcase door when the other half of the door is closed or opened.

BOSTON SASH FAST—A type of Sash Fast in which the rotating locking bar is held in the locked position by a trigger or thumb-piece, pressure on which permits the bar automatically to unlock.

BOTTOM BOLT—One for use on the bottom of a door and having frictional resistance whereby the bolt is prevented from falling into the locked position unless intentionally moved.

BOX OR SQUARE BOLT—A square or flat bolt mounted on a plate having a case projecting from its surface to contain and guide the bolt.

BOX STRIKE—One in which the aperture to receive the bolt is enclosed or boxed to prevent access from the rear.

BRACKET BEARING—A knob-thimble or socket which, projecting like a bracket, supports the knob close to its head instead of at the end of the knob shank.

BUILDERS' LOCK—One for use in house or building construction.

BUTT (An abbreviation of the term Butt Hinge)—A hinge intended for application to the butt or edge of a door, in contradistinction to a flat or strap hinge for application to the surface of the door.

C

CABINET LOCK—One for use on cabinet work and furniture.

CABINET DOOR HOOK—A hook and its staple, each with a heavy plate for attaching. Used on shipboard to hold a door at either end of its swing.

CAM—A rotating piece whereby the rotary motion of a key or knob imparts reciprocating motion to the bolt of a lock.

CANADA BOLT—A box or other bolt, the sliding bar of which is prolonged considerably beyond the back plate and provided with a separate guide near its other end.

CAP (of lock)—The removable part or lid of a lock. Also called "cover."

CAPPED BUTT—One having on each leaf a cap which covers the fastening screws and is itself attached to the butt by one or more smaller screws.

CARD PLATE—A plate for use on doors or drawers and arranged to hold a label indicating contents.

CASE (of lock)—The box containing the bolts and other mechanism.

CASEMENT ADJUSTER—A hinged or pivoted rod for moving and fastening the hinged sash of a casement or French Window.

CASEMENT FASTENER—A catch for fastening a casement or French Window.

CASEMENT WINDOW—One with side hinged sashes, opening either in or out.

CEILING HOOK—One for use in ceilings, or on the under side of a shelf, and usually having two prongs.

CHAIN BOLT—One for application at the top of a door, and having a chain depending therefrom, whereby the bolt may be retracted against the resistance of a spring which tends to hold it in the locked position.

CHAIN DOOR FASTENER—A heavy chain, one end of which is secured to a plate which may be attached to the edge of the door, the other end of the chain carrying a ball or hook, which may be inserted in a slot formed in another plate attached to the jamb or other half of the door, whereby the door cannot be opened (except slightly) until the chain is released.

CHANGE KEY—That key of a master-keyed lock which differs from all others of the same series, and will operate only its own lock (sometimes called room-key). Used in contra-distinction to "master-key."

CITY LOCK—A nearly obsolete term, used in New York City and vicinity; formerly indicating a superior grade of hand-made locks, but now usually applied to inexpensive grades of rim and mortise locks with brass bolts and steel or brass keys.

CLOSET KNOB—A single knob on one end of a spindle, on the other end of which latter is a rose or plate to secure the knob and spindle to the door; for use on closet doors.

COAT AND HAT HOOK—One with two or more projections, one of which is of sufficient length to receive a hat, the others being usually shorter.

COMBINED ESCUTCHEON PLATE—One containing both a key hole and a knob socket.

COMBINATION LOCK—One having changeable tumblers actuated by a dial on face of door, permanently connected by a spindle with the lock mechanism.

COMBINATION TUMBLER—A circular plate of metal, consisting of a central disk, containing the driving pin for communicating motion from one tumbler to the next, and an outer or annular disk, enclosing the central one, and containing the "gating," these two parts being variably adjustable in relation to each other, thus forming the permutation wheel or tumblers of a combination lock. (Also designated as "wheel").

COMBINED STORE DOOR LOCK—One containing a heavy dead bolt and a latch bolt adapted to be operated by thumb handles instead of knobs.

COMMUNICATING DOOR LOCK—One for use on doors between communicating rooms; usually a knob latch with thumb bolts.

COMPENSATING HUB—A lock hub having an elongated spindle-hole or ball and socket arranged hub to compensate for the shrinking and swelling of a door and to prevent derangement of the lock from these causes.

CONNECTING DOOR LOCK—Synonymous with Communicating Door lock.

CORRUGATED KEY—A sheet metal key of uniform thickness and corrugated longitudinally. One having a sinuous cross-section, and not merely grooved on one or both sides.

COTTAGE LATCH—A small Lift Latch, for use on cupboards and light doors.

CRANK HANDLE—Synonymous with Lever Handle.

CREMORNE BOLT—A fastening for casement or French windows arranged for application to the surface thereof, consisting of a sliding rod, engaging at top and bottom with strikes or plates in the window frame; and provided near its center with a handle or knob the rotation of which causes the upper and lower parts of the bolt to move in opposite directions in locking or unlocking and sometimes provided with an additional horizontal bolt, also operating simultaneously, which serves further to secure the sash at or near its center.

CUPBOARD BUTTON—A small turning bar, adapted to secure a door.

CUP ESCUTCHEON—A door plate, for use on sliding doors, having a recessed panel to afford finger-hold and to contain the knob, or its equivalent, and a key, all of the contained parts being flush with the surface of the plate in order to offer no obstruction to the movements of the door within its recess.

CUPBOARD CATCH—A small spring catch adapted for fastening a light door, and operated by a slide knob or thumb-piece.

CUPBOARD LOCK—One designed for use on doors of cupboards, boxes, etc.

CUPBOARD TURN—A small spring catch adapted for fastening a light door and operated by a rotating knob or handle.

CYCLOID KNOB ACTION—An arrangement of intergeared pivotal levers for transmitting motion from a lock hub to the latch bolt.

CYLINDER (of a lock)—A short cylindrical case containing the key-hole and tumbler mechanism of a lock.

CYLINDER LOCK—One in which the key-hole and tumbler mechanism are contained in a cylinder or escutcheon separate from the lock case.

CYLINDER RING—A rose, or washer, placed under the head of a cylinder lock to enable a long cylinder to be used on thin doors.

CYLINDER SCREW—The set-screw in the face of a cylinder lock for preventing the unscrewing of the cylinder. (Also called set-screw).

D

DEAD BOLT (of a lock)—One having a square head, and moved positively by the key in both directions.

DEAD LATCH—Synonymous with Night Latch.

DEAD LOCK—One having a dead bolt only.

DESK LOCK—One adapted to secure the rolling or hinged lid of a desk.

DETACHABLE KEY—One so constructed that the bits, or portion which actuate the tumblers, may be detached from the shank or handle of the key for convenience in carrying.

DIAL LOCK—Synonymous with combination lock, and now more generally used.

DIRECTION PLATE—One giving information concerning the purpose of the door or opening on which it is used.

DOOR BOLT—A sliding rod or bar, suitably mounted for attachment to a door and adapted to secure it.

DOOR CHECK—A device which combines a spring for closing a door and a compression chamber in which the slow escape of the liquid or air contained therein retards the closing action and prevents the slamming of the door. Sometimes made without a spring to be used in conjunction with spring hinges.

DOOR HOLDER—A device for fastening a door in an open position.

DOOR PULL—A bent handle usually mounted on a plate, and adapted for attachment to the surface of a door.

DOOR STOP—A device to limit the swing, or movement of a door when open.

DOUBLE ACTING BUTT—One which permits a door to swing in both directions.

DOUBLE-ACTING SPRING HINGE—One having a double set of springs opposed to each other, and each tending to move the door into the closed position, the hinges being so constructed as to permit the door to swing in either direction.

DOUBLE-BITTED KEY—One having bittings on both sides, whereby either or both wings or sides of the key may actuate the tumblers.

DOUBLE DOOR BOLT—One having two sliding bars, moving in opposite directions, to secure a door simultaneously at the top and bottom.

DRAWER KNOB—A small knob suitable for use on drawers and cabinet work.

DRAWER LOCK—One adapted for use on drawers. (Also known as a Till Lock.)

DRAWER PULL—A handle or grip adapted to receive the fingers.

DRILL PIN—A round pin projecting from the back plate of a lock and fitted into a hole in the end of the key.

DROP ESCUTCHEON—An escutcheon or key-plate provided with a pivoted drop covering the key-hole.

DROP DRAWER PULL—A pull or handle pivoted at its ends to its attaching plate.

DROP HOOK—Synonymous with Shutter Bar.

DROP KEY—One having a bow, or handle, pivoted to the shank, so that it may drop or fall parallel with the surface of the door.

DROP KEY PLATE—One having a swinging cover, or drop, to protect the keyhole.

DRUGGISTS' DRAWER PULL—A drawer pull combined with a plate to contain a label.

DUPLEX LOCK—A master-key lock of the cylinder type provided with two cylinders on the same side, both acting on the same bolt, but each controlled by a different key, whereby, when used in a series, one of said cylinders, may be operated by the master-key which passes every lock in the series, and the other by a change key, which may be different for each lock throughout the series.

DUTCH DOOR BOLT—One for locking together the upper and lower halves of a Dutch Door.

E

EASY SPRING—A term used to designate the construction of a knob lock in which two springs are employed, one of which (the easy spring) acts only on the latch bolt, while the other acts directly or indirectly on the knob spindle. Motion of the latch bolt is opposed by the easy spring, while both the springs give resistance to rotation of the knobs, thus giving a lively action to the knobs while permitting the door to close easily. The same action may also be obtained with a single spring if suitably connected with the related parts of the lock.

ELBOW CATCH—A pivoted fastening for cupboard doors, one end having a hook to engage with a strike or staple and the other end bent to a right angle to form a handle for releasing the catch.

ESCUTCHEON—Generally a plate containing a key hole.

ESCUTCHEON KNOB—A door knob containing a key escutcheon, the latter actuating the lock or controlling the rotation of the knob. (Used chiefly with Asylum Locks.)

ESPAGNOLETTE BOLT (or bar)—A fastening for casement of French Windows, arranged for application to the surface thereof, consisting of a rotating rod extending from top to bottom, with hooks at each end which engage with pins or plates in the window frame when the bar is rotated, and having a hinged handle near the center whereby the bar may be rotated to fasten or release the sash and which also engages with a strike or keeper which holds the bar in the locked position and further secures the sash near its center.

EXTENSION BOLT—A flush bolt having a short plate to receive a knob or thumb piece, which latter is connected at the bolt end at top or bottom of door by an extension rod inserted through a hole bored in thickness of door.

EXTENSION KEY—Synonymous with Adjustable key.

F

FAST JOINT BUTT—One in which the hinge pin is riveted, or otherwise secured, and the two parts of the butt permanently fastened together.

FENCE—A projecting portion of a lock, usually attached to the bolt, which engages with the tumblers, and enters or passes through the "gating" of the tumblers when the bolt is retracted.

FLAT KEY—A thin flat key, made of sheet or plate metal, usually by stamping. Sometimes provided with longitudinal grooves or indentations on one or both sides.

FLOOR HINGE—A pivot door hinge, arranged to be set in the floor, and usually combining with the door spring and frequently also a door check.

FOLDING KEY—One having a handle and a blade or shank, hinged together, the blade folding into the handle like a jack knife.

FLUSH BOLT—A door bolt mounted behind a plate adapted to be attached to and let into the surface of a door.

FLUSH CUPBOARD CATCH—One which is half mortise; i. e., let in flush with face of door.

FLUSH PLATE—A door plate of any kind intended to be let into the wood flush with its surface.

FLUSH RING—A flush drawer handle of circular form.

FLUSH RING CUPBOARD CATCH—One with a flush ring in place of a knob for actuating the bolt.

FOOT BOLT—A spring bolt for the bottom of a door which, when retracted, is retained by a trigger, the release of which latter permits the spring to shoot the bolt into the locked position.

FRAME PULLEY—A box containing a sheave, and adapted to be mortised into a window frame for carrying the sash cord.

FRENCH ESCUTCHEON—A small circular key-plate containing a key-hole secured by driving or screwing into the wood.

FRENCH HARDWARE—A term used to designate rim locks and bolts of ornamental character, as used in French construction.

FRENCH WINDOW LOCK—A mortise knob lock with small backset, for use on French Windows or doors with narrow stiles.

FRONT (of lock)—The face plate of a mortise lock through which the ends of the bolts are projected.

FRONT DOOR LOCK—A lock for use on entrance doors, having a deadbolt and a latch-bolt; the former controlled from the outside by a key and from the inside by a key or knob; the latter controlled from the outside by a key and from the inside by a knob. Usually provided with "stop work" whereby the outside knob may be set to actuate the latch-bolt or not, as desired.

G

GATING—The opening in the tumbler of a lock into or through which the "fence" passes to release the bolt or permit of its movement.

GRILLE—An ornamental screen of open metal work, wrought or cast.

GUARDED FRONT AND STRIKE—A construction of these parts of a lock such that they may interlock, so as to protect the latch-bolt from attack through the crevice between the door and jamb. Chiefly used in insane asylums.

H

HAND (of locks, etc.)—A term indicating whether the article is adaptable to either a right-hand or left-hand door.

HALF-RABBETED LOCK—A mortise lock, the front of which is turned into two planes, at right angles, thus adapting it to use on a door with rabbet on edge. One having a front in two planes forming a single right angle.

HASP LOCK—A prison lock permanently attached to the hasp of the door and adapted to secure the same when in a closed position.

HINGE—A pair of jointed plates, attached respectively to a door and its frame, whereby the door is supported and is enabled to swing or move.

HINGE PLATE—Synonymous with Hinge Strap.

HINGE STRAP—A plate, usually ornamented, adapted for attachments to the surface of a door, fitting at one end against the knuckle of a butt, and intending to give the effect of a strap hinge.

HORIZONTAL LOCK—One whose major dimension is horizontal.

HOTEL LOCK—A master-keyed knob lock.

HUB—A rotating piece within a lock, containing a central aperture to receive the knob spindle and engaging with the bolt or tail piece in the lock whereby the motion of the knob is communicated to the bolt.

I

INSIDE DOOR LOCK—Synonymous with Room Door Lock.

INSTANT LOCKER—A term applied to a time lock constructed to lock automatically, by spring action, upon the closing of the door.

J

JAMB LOCK—A prison lock designated to be built into the masonry of the door jamb, the bolt when locked being projected from the jamb and engaging with the door.

JANUS-FACE LOCK—A rim lock both sides of which are similarly molded or ornamented, so that either side may be applied.

K

KEY-CHANGING LOCK—A lock actuated by a key, the bits and combination of which are changeable at pleasure.

KEY-PLATE—The plate, either plain or ornamental, having one or more key-holes (but no knob socket), and adapted for attachment to the surface of a door.

KEY-WAY—The aperture, in locks of the cylinder type, which receives the key and engages closely with it throughout its length, as distinguished from the open key-hole of a common lock.

KICK-PLATE—A plate for protecting the surface of a door, and adapted to be applied at or near its bottom.

KNEE BUTT—Synonymous with Pocket Butt.

KNOB—A projecting handle, usually round or spherical, for operating a lock.

KNOB BOLT—A door lock, the bolt of which is controlled by a knob or thumb piece from either or both sides of the door (not one actuated by a key).

KNOB LATCH—A door lock having a spring bolt operated from either or both sides of the door by a knob (not one actuated by a key).

KNOB LOCK—A door lock having both a spring bolt, operated by a knob, and a dead bolt, operated by a key; (a knob lock thus combines in one structure a knob latch and lock).

KNOB ROSE—A round plate, or washer, forming a knob socket, and adapted for attachment to the surface of a door.

KNOB SHANK—The projecting stem of a knob, containing the hole or socket to receive the spindle.

KNOB-TOP—The upper and larger part of a knob, that which is grasped by the hand; usually made of porcelain, glass or wood, or in the better class of knobs, of metal.

KNUCKLE—The enlarged part of a hinge or butt which receives and encloses the hinge pin.

L

LATCH—A lock, the bolt of which is beveled and is self-acting by the pressure of a spring or by gravity.

LATCH-BOLT (of a lock)—One having a beveled head, and actuated by a spring, whereby it is retracted by impinging against the strike, and is automatically thrown forward again by the spring.

LETTER BOX BACK—Synonymous with Letter Box Hood.

LETTER BOX CHUTE—A lining for the opening through a door behind a letter hole plate; usually inclined downward; sometimes combined with a hood or back-plate on rear of door.

LETTER BOX HOOD—A plate for attachment to the rear of a door to conceal the opening through the door from a letter plate and to direct letters downward.

LETTER DROP PLATE—One containing an opening, usually closed by drop or flap, to permit the passing of letters.

LEVER—An abbreviation of the term "Lever Tumbler," and inaccurately used as synonymous with Tumbler.

LEVER BELL PULL—One actuated by lever action in place of by drawing out of knob.

LEVER CUPBOARD CATCH—One consisting of a lever pivoted on a plate, through which it passes, its inner end having a hooked form to engage with a staple, and its outer end formed into a knob or handle.

LEVER HANDLE—A bent handle for actuating the bolt of a lock and used in place of a knob.

LEVER TUMBLER—A lock tumbler having a pivotal action. See Tumbler.

LIFT LATCH—An unencased rim latch consisting of a bar pivoted to a plate and engaging with a hook on the jamb, the bar being operated by thumb piece on the outside of the door and by a lift handle on the inside; usually combined with a door pull on one or both sides of the door.

LOCK—Generically, a fastening of any kind operated by a key. Specifically one having a dead bolt, as distinguished from one having a spring latch bolt.

LOCK SET—A lock combined with its trim; i. e., complete with knobs, escutcheon plates and screws.

LOCKER RING—A pull, for mortising into the edge of a sliding locker door, consisting of a plate containing a ring which may be pushed back flush with the plate or pulled forward for use as a pull to open the door.

LOOSE JOINT BUTT—One having a single knuckle on each half, one of them containing the pin and the other a corresponding hole, whereby the two parts of the butt can easily be separated.

LOOSE PIN BUTT—One having a hinge pin which can be withdrawn to permit the two parts of the butt to be separated.

M

MASTER-KEY (sometimes called pass-key)—The key pertaining to a series of master-key locks which will actuate any and all of the locks.

MASTER-KEYED LOCK—One intended for use in a series, each lock of which may be actuated by two different keys, one capable of operating every lock of the series, and the other capable of operating only one or a few of the locks.

MORTISE BOLT—A door bolt designed to be mortised into a door, instead of being applied to its surface.

MORTISE LOCK OR LATCH—One designed to be mortised into the edge of a door; not applied to its surface.

N

NECKED BOLT—A bolt, the projecting end of which has a bend or offset to engage with a strike or keeper not in line with the body of the bolt.

NIGHT KEY—That one of the two keys of a front door lock which controls the night work and operates the latch bolt.

NIGHT LATCH—A door lock having a spring bolt which cannot be operated from the outside except by a key.

NIGHT WORK—A term used to indicate that part of the mechanism of a front door or vestibule lock which controls the latch bolt, and is actuated by the night key.

NOSE PLATE—A small plate surrounding the nose or escutcheon of a cylinder lock.

O

OFFICE LOCK—Formerly an arbitrary term applied to a knob lock of inverted form; i. e., with key-hole above knob and especially designed for use on office doors. Now applied to any substantial lock with functions essentially suited to office doors.

P

PARACENTRIC—An arbitrary term designating a peculiar form of key and key-way, the cross section of which shows ribs projecting from opposite sides of the key-way past its center line, and extending longitudinally throughout its length; thereby preventing the use of picking tools; the opposite sides of the key being grooved to correspond with the contour of the key-way, and the key and key-way thus being interlocked throughout their length.

PARLIAMENT BUTT—One having T-headed leaves, usually broad.

PASQUIL LOCK—One for the rolling or sliding tops of desks, which resembles a horizontal Cremorne bolt, in having two sliding bolts, moving in contrary directions, and engaging ot each end of the lid or top with the frame of the desk, and controlled by a locking mechanism in the center.

PERMUTATION LOCK—A term formerly applied to a lock having changeable tumblers whether actuated by a key or by a dial.

PIN TUMBLER—A small sliding pin actuated by the key, and dogging the plug, or key-hub, by which motion is transmitted to the bolt.

PIPE KEY—A round key having a hole drilled into its end to fit over a drill pin in the lock. Used chiefly for cabinet locks. Synonymous with Barrel Key.

PLUG (of a lock)—A cylindrical piece containing the key-hole and rotated by the key to transmit motion to the bolt.

POCKET BUTT—A hinge or butt, for three-ply inside shutters, each leaf of the butt being bent at a right angle near its center; for use on the third leaf of the shutter to permit the latter to enter and leave its pocket without jamming.

PRISON LOCK—One designed for use on cell doors, and operated by the key from one side only.

PULL DOWN HANDLE—A light handle for attachment to the underside of the bottom rail of upper sashes for use in moving the latter.

PULL DOWN HOOK—Synonymous with Sash Hook.

PUSH BUTTON—A small movable knob or button, within a socket, the movement of which actuates a bell, electrically or otherwise.

PUSH (or thrust) KEY—One which performs its whole function of setting the tumblers by longitudinal motion without rotation.

PUSH PLATE—A plate for protecting the surface of a door against soiling and wear from handling. Frequently made with the word "Push" incorporated in the design.

R

RABBETED LOCK—A mortise lock, the front of which is formed with an offset or rabbet conforming to the corresponding rabbet on edge of door. One having a front in three planes, forming two right angles.

REACH (of a transom lift)—The distance from center of operating rod to the nearest edge of the transom sash.

RECESS (of a transom lift)—The distance inward from the face of the door casing to the face of the transom sash.

REVERSE BEVEL (of latch bolt)—A term used to indicate that the bevel of a latch-bolt is reversed, or inclined in the opposite direction to that which is regular.

REVERSED—A term applied to articles made of wrought or sheet metal with edges turned back to give the appearance of increased thickness.

REVERSED DOOR—One opening in the opposite direction to that which is usual or regular. Room doors if opening inward are "regular," if opening outward are "reversed." Cupboard doors are regular if opening outward.

REVERSIBLE LOCK—One in which the latch bolt can be reversed to adapt the lock to a door of either hand.

RIM—A term applied to articles of hardware intended to be applied to the surface of doors, windows, etc., in contradistinction to those intended to be mortised into the wood.

RIM LOCK OR LATCH—One which is applied to the surface of the door, not mortised into it.

ROLL BACK—A rotating piece within a lock, permanently attached to the knob-spindle, for transmitting motion to the bolt. Inaccurately used as synonymous with hub.

ROOM DOOR LOCK—A knob lock for doors leading from halls or corridors into rooms. Also called Inside Door Lock.

ROSE—A circular, square, or oblong plate for attachment to a door and contaning a socket for supporting and guiding the shank of a knob.

ROUND KEY—One having a round shank or stem.

S

SASH BALANCE—A spring device used to counter-balance window sashes, and which eliminates the necessity for pulleys, weights and cords in fulfilling this purpose.

SASH CENTER—A pin or bearing for a transom light or other sash turning on a horizontal axis, consisting usually of a pair of plates, one carrying a pin and the other a socket, one plate intended for attachment to the sash and the other to the jamb or frame in which the sash is hung.

SASH CHAIN—A metal chain adapted for use with sliding sashes in place of a cord or rope.

SASH CORD—A small cord or rope used to connect a sliding sash with its counterweight.

SASH CORD IRON—A small casting inserted in the edge of a sliding sash to secure the end of the sash cord or chain.

SASH FAST—A fastening usually attached to the meeting rail of sashes, to prevent their being opened until released.

SASH HOOK—A metal hook usually attached to one end of a wooden rod, and adapted to engage with a hole or socket in the uppersash, whereby the latter may be raised or lowered.

SASH LIFT—A plate, bar or hook, adapted for attachment to a window sash, whereby the latter may be conveniently raised, and lowered.

SASH LIFT AND LOCK—A sash lift provided with a locking lever, which locks the sash by engaging with a strike in the window frame and is released in the act of raising the sash.

SASH LOCK—A fastening controlled by a key, and adapted to secure a sash.

SASH PIN—A form of window spring bolt.

SASH PLATE—Synonymous with Sash Center.

SASH PULLEY—Synonymous with Frame Pulley.

SASH RIBBON—A thin metal band adapted for use with sliding sashes in place of cord or rope.

SASH SOCKET—A metal plate containing a hole or cup adapted to receive a sash hook.

SASH WEIGHT—A weight used to balance sliding sashes usually of cast iron and of long cylindrical form.

SCREEN DOOR CATCH—A light knob latch, similar to a cupboard turn but furnished with a hub, a spindle, and a pair of knobs or lever handles.

SCREWLESS KNOB—A term originally applied to knobs provided with a clamp or vice for attaching them to the spindle and thus dispensing with the old-fashioned "side screw." Now used also to designate any knob which eliminates the "side screw" and substitutes a fastening which obviates all tendency to become loose, even though employing a set-screw.

SECRET LATCH—One operated by a concealed button or other device; for use on office gates, etc.

SET SCREW—One which by checking another screw, or other movable part, prevents it from loosening.

SHANK (of a key)—That part which connects the bit or wing with the bow or handle.

SHANK (of a knob)—That part which contains the hole or socket to receive the spindle and which forms a base for the top or enlarged portion of the knob.

SHELF PIN—A metal pin for supporting a book shelf; called also Shelf Support or Shelf Rest.

SHIP LOCK—One wholly of brass for use on ships; usually of heavy construction.

SHUTTER ADJUSTER—A swinging arm for adjusting and securing shutters in any desired position.

SHUTTER BAR—A fastening for folding blinds consisting of a bar pivoted to a plate and engaging with a hook or stud attached by another plate to the other half of the blind.

SHUTTER BUTT—A small hinge, usually narrow, adapted for use on shutters and light doors.

SHUTTER FLAP—A small hinge, usually broad, intended to be screwed to the surface of the shutter or small door.

SHUTTER KNOB—A small knob for inside shutters.

SHUTTER LIFT—A lift for shutters; similar to a sash lift (but heavier).

SHUTTER SCREW—A heavy thumb-screw for securing one end of a vertical shutter.

SIDE-SCREW—A small screw used for securing a common knob to its spindle.

SLIDER—A small sliding tumbler actuated by the key, and dogging the plug by which motion is transmitted to the bolt.

SLIDING DOOR KEY—One adapted for use with a mortise lock and a cup escutcheon on sliding doors; usually adjustable as to length.

SLIDING DOOR LOCK—A lock for use on a door which slides, and having hook-shaped bolts to engage with its strike.

SLIDING DOOR PULL—A plate or box, arranged to be mortised into the edge of a sliding door and containing a handle, or pull, for use in moving the door from its recess.

SLIDING DOOR RAIL—A metallic rail for carrying and guiding the sheaves of sliding doors.

SLIDING DOOR STOP—A small plate for attachment to floor or ceiling and provided with a stump or projection to limit the motion of a sliding door.

SLIDING TUMBLER—A lock tumbler having a sliding motion.

SOCKET—see Thimble.

SOLID ROLLED—A term used to designate escutcheon plates and other articles made from rolled, or wrought metal of sufficient thickness to show a suitable bevel without turning back the edges (as is done in "reversed" work).

SPACING—The distance between the center of a knob-hub and the center of a key-hole of a lock or its escutcheon plate.

SPINDLE (of lock)—The axis or shaft, usually of square section, which carries the knobs of a lock, and communicates their motion to the latch mechanism.

SPRING HINGE—A hinge or butt containing one or more springs acting to move the door into the closed position.

SQUARE BOLT—A rim bolt of rectangular section.

STEM (of a key)—The round portion of the bit or wing which forms the trunnion or axis of the key, and on which it rotates when in the lock.

STOP (of a lock)—That which serves to fasten the bolt or the knob in the locked or unlocked position, usually the latter.

STOP BEAD SCREW—Synonymous with Stop Screw.

STOP KEY—One for insertion in a key hole from one side to prevent the entrance of a key from the opposite side.

STOP SCREW—A screw for fastening the stop bead of a window to the frame.

STORE DOOR HANDLE—A bent handle, usually mounted on a plate, provided with a lever or thumb handle for actuating a latch bolt, and adapted to be applied to the surface of a door.

STORE DOOR LATCH—One containing a spring latch bolt only, and adapted to be operated by thumb handles.

STORE DOOR LOCK—A heavy lock containing a dead bolt only, and usually operated by a key from both sides.

STRAP HINGE—A hinge, of which one (or both) of the leaves has considerable length, and is adapted for attachment to the surface of a door.

STRIKE—A metal fastening, on the door frame, into which the bolt of a lock is projected to secure the door. Applied both to the flat plate used with mortise locks, and to the projecting box used with rim locks. Synonymous with "striker," "striking plate" and "keeper."

STUMP—A small piece or projection in a lock for the engagement of one part with another, or to receive a screw or rivet. Also, but inaccurately, used as synonymous with "fence."

SUB-MASTER KEY—One capable of controlling a subordinate group of master-key locks, each having a different key of its own, but all in turn controlled by the main or grand master-key. (There may thus be a number of sub-master keys under one grand master-key.)

SUBSEQUENT LOCKER—A term applied to a time lock constructed to lock by the action of the clock work at a predetermined hour subsequent to, and irrespective of, the time of closing the door.

SUB-TREASURY LOCK—One for use on the iron doors of the small chests or boxes within a fire-proof safe, commonly called "Sub-Treasuries."

SURFACE HINGE—Synonymous with Strap Hinge.

SURFACE SASH CENTER—One adapted for application to the surface of a transom sash.

SWIVEL SPINDLE—A spindle having a joint or swivel midway in its length, whereby the knob attached to one end may be made stationary and inoperative, while the knob attached to the other end is left free to rotate, and thus to actuate the latch mechanism.

T

TAIL PIECE—A sliding or vibrating piece intermediate between the hub and latch bolt of a lock for transmitting motion from the former to the latter.

TALON—The notch or opening in the bolt of a lock with which the key engages to throw the bolt.

T-HANDLE—A cross handle for actuating the bolt of a lock and used in place of a knob.

THIMBLE—The socket or bearing on an escutcheon plate to receive the knob shank. Also called Socket.

T-HINGE—A surface hinge of which the chief dimension of one leaf is vertical and of the other leaf horizontal.

THREAD ESCUTCHEON—A small key plate, conforming to the outline of a keyhole and intended to be inserted therein.

THREE-PLY BUTT—Synonymous with Pocket Butt.

THUMB-PIECE—A small knob, usually flat, but sometimes circular in form.

THUMB BOLT—A door bolt operated by a rotating thumb-piece or a small knob.

THUMB LATCH—A door fastening consisting of a pivoted bar which crosses the joint of the door to engage with the strike on the jamb, the free end of the bar being raised to disengage it from the strike on the jamb, by a transverse pivoted bar passing through the door, the latter bar operated on one side by the thumb and on the other by the finger.

TILL LOCK—See Drawer Lock.

TIME LOCK—One actuated automatically by clock work, and having no key-hole spindle or other connection through the door. Also called chronometer lock.

TOWER BOLT—A modified form of barrel bolt, in which the locking bar is shortened.

TRANSOM CATCH—A fastening adapted for use on transom lights.

TRANSOM CHAIN—A short chain to limit the movement of a transom sash; usually provided at each end with a plate for attachment.

TRANSOM LIFTER—An apparatus for actuating and holding a transom light.

TRANSOM PLATE—Synonymous with sash center.

TRIPLEX SPINDLE—A lock spindle composed of three triangular rods, which when combined form a rectangle, and, which give an automatic adjustment by frictional engagement with the knob when expanded by a set-screw.

TUBULAR LOCK—A rim lock having a fixed tube, containing the tumblers, attached to the lock case and usually projecting through the door.

TUMBLER—The obstruction or guard in a lock which dogs or prevents the motion of the bolt, and which is set by the key during the act of locking and unlocking.

TURNBUCKLE—Synonymous with Turn Button.

TURN BUTTON—A rotary bolt or fastening made in various forms. The common form is a simple bar secured by a screw in center on which it rotates. In another form this bar is mounted on a circular plate. The term is also applied to a catch having a sliding bolt operated by a rotating knob or T-Handle.

U

UNIT LOCK—A term applied to a lockset when so constructed that all of its parts (the lock, knobs and escutcheon plates) are permanently combined in a single construction or unit. Synonymous with Union Lock.

UPRIGHT LOCK—One whose major dimension is vertical.

V

VESTIBULE LATCH—A lock resembling a front door lock except in omitting the dead-bolt mechanism. One in which the latch-bolt is actuated from the outside by a key and from the inside by a knob; the outer knob being controlled by a stop.

VENEERED FRONT—A lock front or face consisting of two plates, the lower riveted to the lock case, and the upper (usually of a more expensive material) permanently fastened to the lower. Used in contradistinction to "armored front."

W

WARD—A projection from the case of a key-hole of a lock, tending to obstruct the entrance of the key, and necessitating a coincident depression of grooving in the key.

WARDED KEY—One having grooves or notches, usually in the wing or bit, which coincide with corresponding wards or projections in the lock case or key-hole.

WARDROBE HOOK—One with a single prong, for use on the side walls of closets and wardrobes.

WHEEL (of combination locks)—See Combination Tumbler.

WINDOW PULL—See Sash Pull.

WINDOW SPRING BOLT—A spring-bolt for holding a sliding sash in any desired position, open or shut; used with unbalanced sashes.

WING KEY—One having a projection for operating the bolt or tumblers of a lock.

CROSS REFERENCE INDEX

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

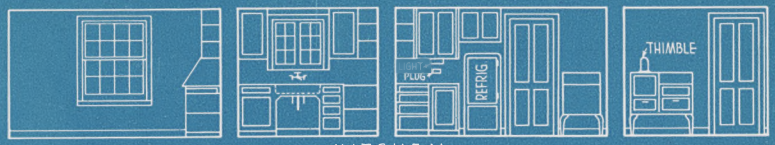
S

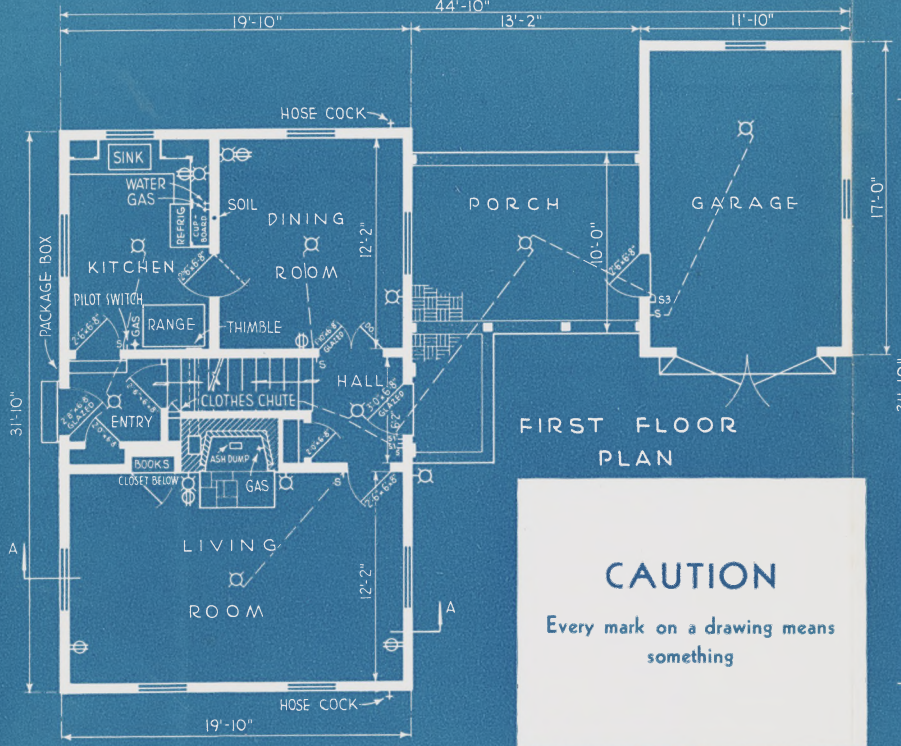
T

U

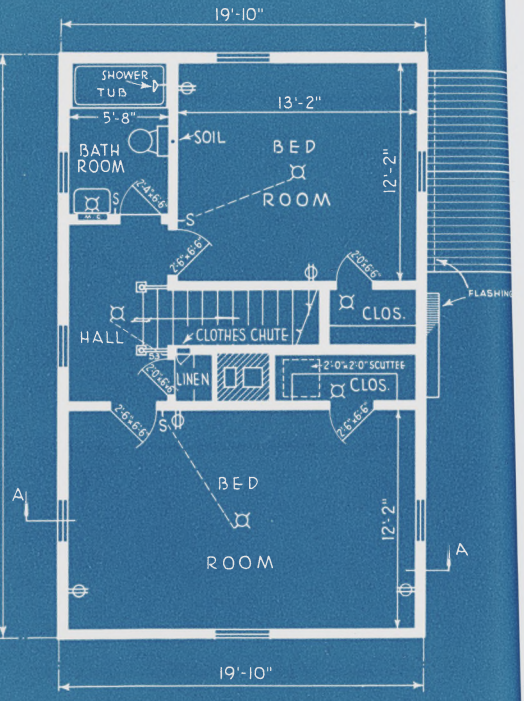
V

W



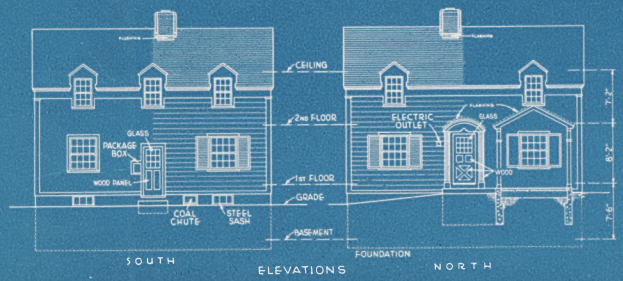


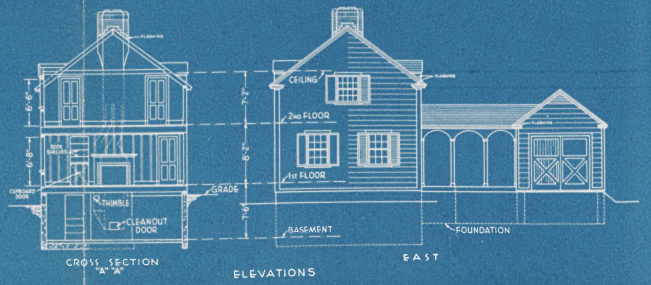
FIRST FLOOR PLAN



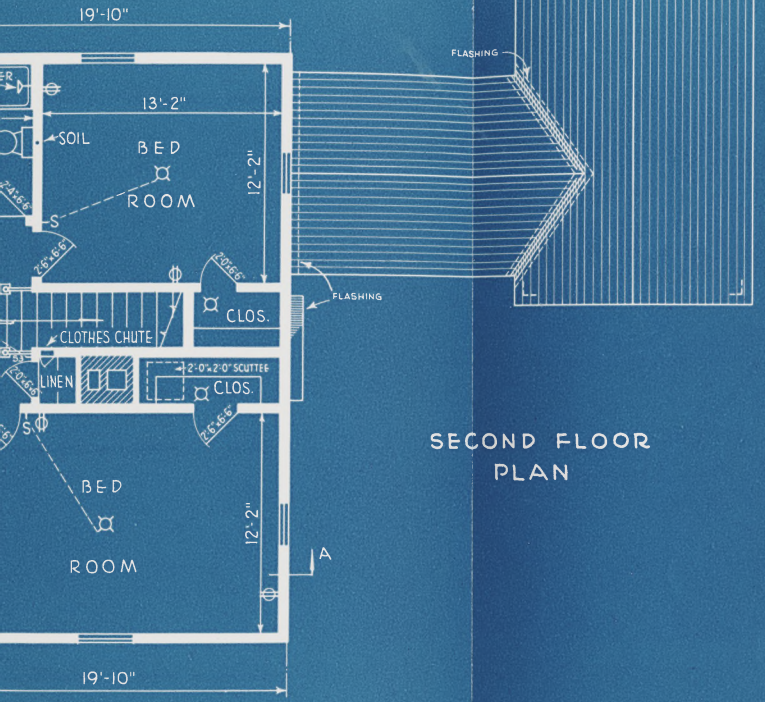
CAUTION

Every mark on a drawing means something

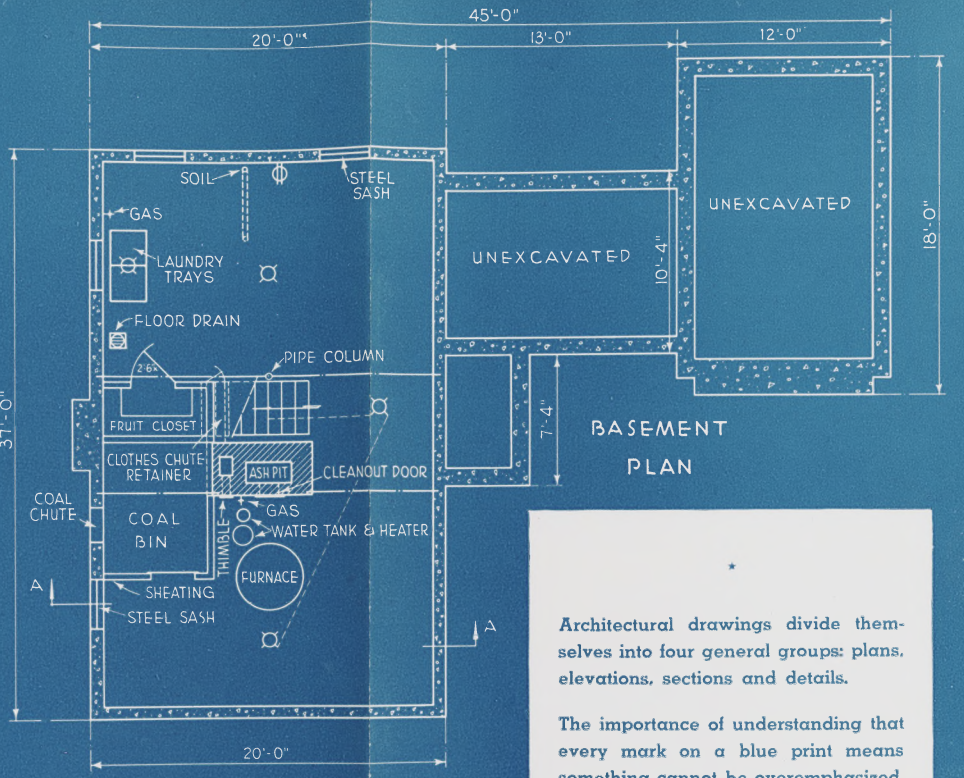




BATH



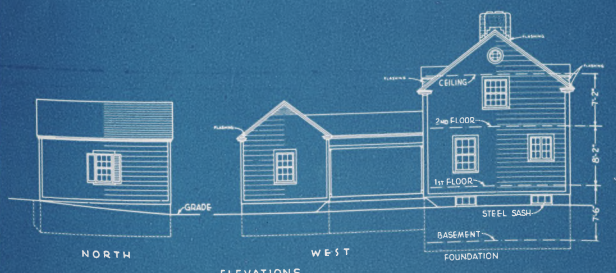
SECOND FLOOR PLAN



BASEMENT PLAN

EAST

TIONS



NORTH WEST

ELEVATIONS

*

Architectural drawings divide themselves into four general groups: plans, elevations, sections and details.

The importance of understanding that every mark on a blue print means something cannot be overemphasized.

In taking off hardware requirements it is equally important that the hardware engineer check elevations and sections as well as plans to insure the hardware fitting properly.

Checking the detail sheets is particularly Important. These sheets take precedence over the smaller scale plans. In case of any discrepancy it is always wise to check with the architect and contractor.

*

	U. S. Standard Symbols	Description of Finishes	American Brass Goods Ca.	American Cabinet Hardware Co.	Barrows Lock Co.	Bommer Spring Hinge Co.
1	US 3	Polished Brass	P.B.	★	A30	A
2	US 4	Dull Brass	D.B.	★	D30	DA
3	US 5	Dull Brass Oxidized and Relieved		★	D31	LA
4	US 6	Sanded Brass Oxidized and Relieved	SDB	★	S31	SLA
5	US 8	Antique Copper	OC	★	A42	MC
6	US 9	Polished Bronze			A20	B
7	US 10	Dull Bronze		★	D20	DB
8	US 11	Dull Bronze Oxidized and Relieved		★	D21	LB
9	US 20	Statuary Bronze		★	D29	OB
10	Special	Oxidized Bronze Relieved Oil Rubbed		★	D23	LB OIL RUBBED
11	Special	Light Statuary Bronze Waxed		★		OB OIL RUBBED
12	US 14	Polished Nickel Plate	N	★	A50	N
13	US 15	Dull Nickel Plate	DN	★	D50	DN
14	US 1B	Japanned	J	★	O10	J
15	US 1D	Dead Black Japanned		★	OD10	DJ
16	US 18	Genuine Bower Barff			17	R
17	US 19	Imitation Bower Barff	F	★	18	R I
18	US 22	Verde Antique Green			S81	V
19	US 23	Silverplate Dull Oxidized Relieved		★	D61	DX
20	US 2H	Hot Galvanized		★		
21	US 25	White Bronze			A100	WM
22	US 2G	Electro Galvanized		★	012	
23	Special	Dead Black on Forged Iron		★		★
24	Special	Half Polished Iron		★	D98	★
25	Special	Rusty Iron		★		★
26	US 26	Polished Chrome Plate	PC	★	A110	H
27	US 26D	Dull Chrome Plate	DC	★	D110	DH

Note—Star denotes Manufacturer can furnish; give descriptio

CHART OF BUILDERS' HARDWARE M

	Detroit Hardware Manufacturing Co.	Dudley Lock Corp.	Earle Hardware Manufacturing Co.	C. L. Frost & Son	Frantz Manufacturing Co.	H. S. Getty & Co.	Glynn-Johnson Corp.	Grand Specialties Co.	Griffin Manufacturing Co.	C. Hager & Sons Hinge Manufacturing Co.	Chas. Hess Co., Inc.	H. B. Ives Co., Iron and Steel	H. B. Ives Co., Brass or Bronze	Knape & Vogt Manufacturing Co.	Francis Keil & Son, Inc., Iron and Steel	Francis Keil & Son, Inc., Brass and Bronze	Lawrence Bros.	Lockwood Hardware Manufacturing Co.	McKinney Manufacturing Co.	Lawson	Milwaukee Stamping Co.	National Brass Co.	National Manufacturing Co.	Norwalk Lock Co.	Payson Manufacturing Co.
	Y	US 3	PB	★	BB	A	3	US 3	BRT BS	B		39¼	35	BS	3½/0	9	BB	13½	BP	6	2	US 3	BRT BRASS	IB	B
	YB	US 4	DB	★	DB	AD	4	US 4	DBS	DB		37	51	B	11/0	23	DB	13	OB	7	6	US 4	DULL BRASS	K	G
	YC	US 5	DBR	★	AB	ADO	5	US 5	OBS	DBO		63	83		20/0	12		43	XB			US 5	ANT BRASS	K3	T
	YR	US 6	SLO	★	DBSS		6	US 6	O BSSB	DBS		63½	83½		21/0	15	DBSS	51	XBS	2	8	US 6	ABSB (NS)	HK3	TW
	CD	US 8	AC	★	AC	C	8	US 8	OC	OC		39	50	OC	8/0	16	OC	7½	AC	9	4	US 8	AC	0	AC
	R	US 9	PBZ	★	BBRZ	B	9	US 9	BZE	A		39¾	34	AP	4/0	10	BZ	1	B	5	3	US 9	BRONZE	I	R
	RB	US 10	DBZ	★	DBRZ	BD	10	US 10	D BZE	DA		01	61	AD	12/0	24	DBZ	34	DE	5½	3½	US 10	DULL BRONZE	DB	DR
	RC	US 11	DBZR	★	ANT. BRONZE	BDO	11	US 11	ANT BRONZE	DAO					13/0	25	DBZR	23	DX	5¾	3½D	US 11		DB3	H
	PA	US 20	S	★	STAT. BRONZE	BY	20	US 20	STAT BZE	AL		28	38	B2	5/0	13	L ST B	38	YL	9½	3¾	US 20	LT STAT BRZE	2	I
	RF	★	ORB	★		BYOR	★	★		DAO OIL RUBBED									DA			★	OIL RUB BRZE	DB2	ORH
		★				BX WAXED	★	★		AL WAXED LIGHT									YL WAXED						
	N	US 14	N	★	N	N	14	US 14	NP	N		60	42	NP	10/0	19	N	5	N	4	9	US 14	NICKEL	NP	N
	NB	US 15	DN	★	DN	ND	15	US 15	DNP	DN		02	22	SN	9/0	6	DN	90	ND	4½	9½	US 15	DULL NICK	DN	DN
		JAP	J		JAP		1B	US 1B	JAPD	J	★	29			A		J	J	J	BJ	BJ		JAP	J	J
					DB JAP		1D	US 1D	DB JAPD	JD		36		BB	B		D	JF	DB	O			DB JAP	DJ	J
	BB	US 18	RP				18			GB		46			7/0	20	GB	31	BB	1G	G1			RI	V
	BC	US 19	1RP	★		BKS	19	US 19	DB E	K		66½	77½		6/0	18	DE	6	EDB	1	1	US 19	EBB	HW	F
	VB		VA			BV1	22	US 22	VERDE ANT	V						7		85	V	VA	VA			VA	U
	SC	US 23				MO	23			SD			54			21		72	PX	SPL	SPL			S	S
					H GALV		24	US 2H	GALV	G	★				C		HG		G				GALV		
	NM	US 25				W	25	US 25		WB						30	WM	95	W	NK	NK			NM	SS
					E GALV		26	US 2G		CP					D			Z	CA					G	Z
	D3B	★		★	E DB		★	★	D BE	IR BLACK	★								DB			★		HW	F
	A3B	★	4-O				★	★	H PI	IR HF. POL	★								K	HPI	HPI	★		20	AF
	R3C	★	4R			W-1	★		RUSTY IRON	IR RUSTY	★								KR						A2MB
	CH	US 26	CR	★	CHR	L	26	US 26	POL CHR	C H R			72	CHP	35/0	35	CHR	96	C	CH	CH	US 26	CHROM	CP	CH
	CHB	US 26D	DCR	★	DCHR	LD	26D	US 26D	DULL CHR	C H R D			74	CHD	36/0	36	DCHR	97	CD	CHD	CHD	US 26D	DULL CHR	DCP	DCH

ock Manufacturers' Finish Symbol or Sample when ordering Goods from Specialty Manufacturer to match Lock Trim. Where no number or symbol is listed above, M

MANUFACTURERS' FINISHES—

	Norwalk Lock Co.	Payson Manufacturing Co.	Penn Hardware Co.	Reading Hardware Corp.	Oscar C. Rixson Co., Steel	Oscar C. Rixson Co., Brass	Oscar C. Rixson Co., Bronze	Russell & Erwin Manufacturing Co.	Safe Padlock & Hardware Co.	Sager Lock Works	Sargent & Co.	Sargent & Greenleaf, Inc.	Schlage Lock Co.	Sharon Hardware Manufacturing Co.	Shelby Metal Products Co.	Shelby Spring Hinge Co., Steel	Shelby Spring Hinge Co., Brass or Bronze	Skillman Hardware Manufacturing Co.	Slaymaker Lock Co.	Stanley Works	Stover Mfg. & Engine Co.	Vonnegut Hardware Co.	Wayne Manufacturing Co.	Yale & Towne Manufacturing Co.	U. S. Standard Symbols	
	IB	B	BB	31	F4P	AP		10	B	A30	B	US 3	US 3	POLISHED BRASS	03	22	23	PB	CZ	C		10	PB	AZ10	US 3	1
	K	G	DB	37	F5P	A1P		9	DB	D30	OB	US 4	US 4	D B	05	26	27	DB	CX	F	DB	9	DB	AY22	US 4	2
	K3	T	DBR	371	F6P	A6P		9C		D31	OE	US 5	US 5			26 OXD. & RELIEVED	27 OXD. & RELIEVED	OB		F4		9C		AY21	US 5	3
	HK3	TW	SB		F6PS	A6PS		09C	C	S31	RD	US 6	US 6	O B S B	09	36	37	SB	CPS	SF4		09C		AX28	US 6	4
	0	AC	AC	24	F12P	A12P	B12P	7½	AC	A42	AB	US 8	US 8	AC	04	24	25	OC	FM	D2	AC	7½	AC	CZ27	US 8	5
	I	R	BBZ	1	F7P		BP	11	BZ	A20	P	US 9	US 9	POLISHED BRONZE	02	20	21	1	BZ	A		11		BZ10	US 9	6
E	DB	DR	DBZ	7	F7		B1P	11D	DBZ	D20	OP	US 10	US 10	DULL BRONZE	08	30	31	D1	BX	A5		11D		BY22	US 10	7
	DB3	H	DBZR	271	F8P		B8P	11C		D21	06P	US 11	US 11			30 OXD. & RELIEVED	31 OXD. & RELIEVED	D1BE		A4		11C		BY21	US 11	8
E	2	I	BBZ4	222	F9P			2	SM	D29	A	US 20	US 20	STAT BRONZE	12	64	65	ST1	BW	B		2	ABSB	BY25	US 20	9
E	DB2	ORH	DBZO	★			B1POR	11W		D23	03P		ORBZ							A9		12		BY23	Special	10
				★				11Z								34 WAXED	35 WAXED							BY24 WAXED	Special	11
	NP	N	BN	80	F14P	A14P	B14P	4	N	A50	N	US 14	US 14	NIC.	11	32	33	NP	DZ	N	N	4	NP	NZ10	US 14	12
	DN	DN	DN	77	F15	A15	B15	14	DN	D50	LN	US 15	US 15	DULL NIC	15	40	41	DN	DX	N5		14	DN	NY10	US 15	13
	J	J	J	J					J	O10		US 1B		JAPD	J	12		JAP	BKJAP	J	J	J		J	US 1B	14
	DJ	J	DJ	DJ						OD10	J	US 1D		DB JAPD		14		D JAP	DL BLK	J1		J1		DJ	US 1D	15
	RI	V	RP	87				46		17	BB	US 18						BB	RP	G		46		FX80	US 18	16
	HW	F	IRP	87½	F13S			47	BB	18	BN	US 19	US 19	DEAD BLK	01	28	29		GRS	H		47		FX90ST BX90BR	US 19	17
	VA	U	V	90	F16PS			36		S81	VA	US 22	US 22			58	59			V		36		BX67	US 22	18
	S	S	DSR	49		A32PS	B32PS	8C		D61	LS	US 23	US 23							E4		8C		SY52	US 23	19
				HG								US 2H							HOTG	R					US 2H	20
	NM	SS	WHITE BRZE	81				44		A100	EM	US 25	US 25			54	55		HZ	NM		44		NZ40	US 25	21
	G	Z	GALV	GL	F2			G		O12		US 2G						ZINC	G			G			US 2G	22
	HW	F	SN7	DB	F3			DB	BB		BN	★	US 19	★				BB		WDB-J1			EBB		Special	23
	20	AF	SN6	489½	F18P	A17PS	B17PS	HP	HI	D98	HF	★	HPI	★		42	43	NB		HY				NX36 NX56	Special	24
		A2MB		389									RI							WRI				NX65	Special	25
	CP	CH	BCH	CP		A19P	B19P	24	BC	A110	CM	US 26	US 26	★	PC	46	47	CH	CHR-Z	CM		24	CHR	DZ19	US 26	26
	DCP	DCH	DCH	DCP		A19PS	B19PS	34	DC	D110	DCM	US 26D	US 26D	★	DC	48	49	DCH	CHR-X	CMD		34		DY10	US 26D	27

sted above, Manufacturer has advised he does not have it. While every care has been taken, Hardware Age assumes no responsibility for correctness of these comparisons furnished by the manufacturers.

HARDWARE AGE — Comparative Chart of Double-Hung Window Hardware

Note—While every care has been taken, we assume no responsibility for correctness of these comparisons furnished by the manufacturer.

	American Brass Goods Co.	Barrows Lock Works	Champion Hardware Co.	Clinton Lock Co.	P. & F. Corbin	Earle Hardware Mfg. Co.	Frantz Mfg. Co.	C. Hager & Sons Hinge Mfg. Co.	H. B. Ives Co.	Lockwood Hdwe. Mfg. Co.	National Brass Co.	National Mfg. Co.	Norwalk Lock Co.	Payson Mfg. Co.	Penn Hdwe. Co.	Reading Hdwe. Corp.	Russell & Erwin Mfg. Co.	Safe Padlock & Hdwe. Co.	Sager Lock Works	Sargent & Co.	Sharon Hardware Mfg. Co.	Shelby Metal Products Co.	Shelby Spring Hinge Co.	Shillman Hdwe. Mfg. Co.	Slaymaker Lock Co.	Yale & Towne Mfg. Co.
Sash Fasteners																										
Wrought Steel 2½ in.	2361	P01710	800	5115	1832	....	320	....	....	....	1251	600	....	92	....	....	....	....	04710	....	70	59	40 00 0 Series	....	....	B2438
Wrought Steel 3 in.	....	....	900	....	....	....	....	....	....	....	....	....	....	93	....	....	....	....	....	....	....	....	....	....	....	....
Wrought Bronze 2½ in.	....	01710	815	5114	1832½	....	....	....	....	....	....	....	....	092	....	....	....	....	4710	....	70 Solid Brass	....	40 01 0 Series	....	....	D1438
Wrought Bronze 3 in.	....	....	915	....	....	....	....	....	....	....	....	....	....	093	....	....	....	....	....	....	....	....	....	....	....	....
Cast Iron 2½ in.	2362	P1701	400	5113	1829	T503	....	....	0639¾	2922	1252	....	9286	80	878T	P667	7110	51¾	04701	154	....	....	....	500	002090	2441
Cast Bronze 2½ in.	....	1701	415	5112	1829½	703	....	....	0734	2930	1253	....	8287	080	578	P1667	110	51¼	4701	258	....	....	....	B500	2090	1441
Cast Iron 2¾ in.	....	P1702	450	5111	1830	T513	....	....	839¾	2970	....	....	9276	87	879T	P668	7120	....	04702	354	....	....	....	....	....	2442
Cast Bronze 2¾ in.	....	1702	465	5110	1830½	713	....	....	834	2978	....	....	8277	087	579	P1668	120	51	4702	358	....	....	....	....	2092	1442
Cast Iron 3 in.	....	P1703	....	....	1831	T523	....	....	939¾	....	....	....	9296	88	888T	P768	7130	....	04703	454	....	....	....	....	....	2443
Cast Bronze 3 in.	....	1703	....	....	1831½	723	....	....	934	2985	....	....	4296	088	588	P1768	130	52	4703	458	....	....	....	....	....	1443
Sash Lifts—Bar Type																										
Cast Iron 4 in.	324	P1524¾	3300	5083	03296	T504	316-4 in.	....	02639¾	5463	213	160	T9108	1001	851T	P0204½	T7033	37½	04201	412	214	65	50 00 4 Series	46	002497	2353
Cast Bronze 4 in.	....	1524¾	3315	5082	09296	704	....	....	02634	8463	2135	....	8108	01001	551	P01204½	033	37	4201	812	....	....	50 01 4 Series	B46	2497	1353
Cast Iron 5 in.	325	P1524	3200	5081	3297	T505	....	....	2739¾	5464	214	....	....	1003	861T	0304 Bristol	T7035	....	04203	430	215	66	50 00 5 Series	45	....	2363
Cast Bronze 5 in.	....	1524	3215	5080	9296	705	....	....	2734	8464	2145	....	8107	01003	563	1304 Bristol	037	73	4203	810	....	....	50 01 5 Series	B45	2498	1363
Sash Lifts—Hook Type																										
Wrought Steel 1⅝ in.	2511	P01551	3010	35	11845	....	310	1486	1439¾S	5413	1400	135	9617½	1070	957T	P268¼	T7178¾	825½	04251	2431	684	70	42 00 1 Series	....	....	B2340
Wrought Brass 1⅝ in.	....	01551	3015	34	2180	....	....	....	1435S	8413	....	135	8617½	01072	657	P1268¼	178¾	825	4251	2831	684 Solid Brass	....	42 01 1 Series	....	....	D1340
Cast Iron 1¾ in.	....	....	....	....	3184	....	....	....	01539¾	5477	....	....	T99615	....	857T	P0268	T7055	....	....	436	....	....	....	1200	....	....
Cast Bronze 1¾ in.	....	....	....	....	2184	258	....	....	01534	8477	....	....	8615	01073	556	P1268	055	635	....	836	....	....	....	B1200	9010	GR1343
Sash Lifts—Flush Type																										
Wrought Steel 3 in.	2513	P01546	1710	1-331	13215	OB501¾	....	....	2439¾S	5442	....	140	9813¼	1096	DB942	P318¼	T7154	640½	04301	1485TC	683	60	53 00 3 Series	....	....	B2345
Wrought Bronze 3 in.	....	01546	1715	1-330	2215	OB701¾	....	....	2434S	8442	....	....	813¼	01096	DB642	P1318¼	154	640	4301	1885TC	....	....	53 01 3 Series	....	9003	D1345
Cast Bronze 3¼ in.	....	61546	....	1-332	02226¼	BW701¾	....	....	2334B	8443	....	....	813	....	DM542	P1314	054	641	4305	1877	....	....	....	B1228	9007	GR1350
Window Bead Screws																										
Wrought Steel Round Head Flat Washer	....	P3610	470	....	0182	....	....	....	W39¾	....	....	....	501	....	911	124	7028	....	04610	4	....	....	79 00 1 Series	....	....	2007
Wrought Bronze Round Head Flat Washer	....	3610	475	....	182	....	....	....	W34	....	....	....	601	....	611	134	28	....	4610	6	....	....	79 01 1 Series	....	....	7
Wrought Steel Flat Head Flat Washer	....	P3612	480	....	0182½	....	....	....	SW39¾	....	66	....	....	535	909	224	7120	....	04612	34	....	45	79 00 2 Series	....	....	2008
Wrought Bronze Flat Head Flat Washer	....	3612	485	....	182½	....	....	....	SW34	....	77	....	....	0535	609	234	120	....	4612	36	....	....	79 01 2 Series	....	....	8
Wrought Steel Adjustable Flush Cup	....	P3611	490	....	0184	....	....	....	639¾	662	....	....	502	538	920	24	7284	....	04611	14	....	....	79 00 3 Series	....	....	2012
Wrought Bronze Adjustable Flush Cup	....	3611	495	....	184	....	....	....	634B	660	....	....	602	0538	620	34	284	....	4611	46	....	....	79 01 3 Series	....	....	12
Sash Pull Hooks																										
Cast Iron	....	P1572	1550	051	3286	....	....	....	1739¾	5494	....	....	99201	251	809T	P315	T7027	....	04602½	48	....	....	....	....	....	2270
Cast Bronze	....	1572	1555	050	2286	....	....	....	1734	8494	....	....	82200	0251	509	P1315	27	....	4602½	98	....	....	....	....	....	1270
Sash Pull Plates																										
Wrought Steel 1 in.	....	P1560	1520	....	3186½	....	....	....	1839¾S	....	....	....	9220¼	....	930T	P307¼	T7031	....	04401	400	....	....	....	....	....	B2240
Wrought Bronze 1 in.	....	1560	1525	....	2186½	....	....	....	1834S	....	....	....	8220¼	0273	....	P1307¼	31	....	4401	800	....	....	....	....	....	D1240
Cast Iron 2 in.	....	P1565	1530	....	3387	....	....	....	9839¾	....	....	....	9200¼	270	831T	P310	T7022	....	04405	1402	....	....	....	....	....	2248
Cast Bronze 2 in.	....	1565	1535	....	1287	....	....	....	9834	8610	....	....	8200¼	0270	531	P1310	22	....	4405	1802	....	....	....	....	....	1248
Sash Pole Sockets																										
Cast Iron 2⅜ in.	....	P1550	1540	51	3290	....	....	....	05839¾	5451	....	....	9197	259	837T	P300	T7015	....	04501	154	....	....	....	....	....	2269
Cast Bronze 2⅜ in.	....	1550	1545	50	1290	....	....	....	05834	8451	....	....	8197	0259	537	P1300	15	....	4501	158	....	....	....	....	....	1269

HARDWARE AGE

Office Buildings

EDITORS' NOTE:—This suggestion chart is not to be confused with comparison charts published elsewhere in this book. This chart includes the ideas of individual manufacturers as to the proper locks to specify from their own catalogs. No attempt is made in these suggestion charts to make comparisons of the items of one company with the quality of lines made by other manufacturers.

Suggestion List—Office and

KEY TO CHART
A Type—Best Lock Regardless of Price.
B Type—Medium-Priced Lock for Medium-Priced Bldgs.
C Type—Least Expensive Lock for Low-Priced Bldgs.

	Barrows Lock Works	Clinton Lock Co.	P. & F. Corbin	Lockwood Hardware & Mfg. Co.	Norwalk Lock Co.	Penn Hardware Co.
Main Entrance						
A	192110 x D110	X2DB & X2DPB x J8060	2252 x 130		Door Pull & Push Bar Comb. x 1505½ Lock	5949RE x Lock 7376 x 2/CE588
B	192491 x D110	79-J4280	6474 x handle 75284	JA2802	Pull & Push Plate x 1505½ Lock	EB6634
C	S163162 x A30	11-4280	1349½ x handle 75283 x knob 1419	JA2802	3746 x 7040 Hudson	DB6633
Vestibule and Corridor Doors and Individual Office Doors						
A	192990 x D110	Cast 79-7030	740 564	JA2003½	3761 Compo	DR573
B	163378 x 17	Cast 79-7020	8551 x knobs 1519½TS x roses	JA2003½	2761 Compo	7551 x 52¼ x DR508 x DR508T
C	12340 x D30	79-V7000	0563 x knobs 1419 x roses	MD4011½	2751 Lenox	DK686—8505
Private or Inner Office Doors						
A	192990 x D110	Cast 79-J7000	740 564	JA2021	3761 Compo	DR573
B	163378 x 17	Cast 79-7000	8551 x knobs 1519½TS x roses	JA2021	2761 Compo	7551 x 52¼ x DR508 x DR508T
C	12340 x D30	79-7000	0563 x knobs 1419 x roses	MD4023	2751 Lenox	DK686—8505
Communicating Doors						
A	192987 x D110	Cast 79-530	740 474	JA2501	3722 Compo	DR537—3369
B	163987 x 17	Cast 79-520	8300 x knobs 1519½TS x roses	JA2501	2722 Compo	DR537—3359
C	12977 x D30	79-520	159—¾ x knobs x 1419 x roses	MD4513	6587 Lenox	DK638
Closets						
A	192241 x D110	Cast 79-3010CS	740 564	1084 x 9174 x JA233	3761 Compo	1667 x 52¼ x DR507¼B
B	163230 x 17	Cast 79-3030CS	8551 x knobs 1519½TS x roses	1084 x 9174 x JA233	2761 Compo	1667 x 52¼ x DR507¼B
C	12220 x D30	79-3000CS	0563 x knobs 1419 x roses	1034 x 9174½ x MD433	011 Lenox	1667 x 63¼ x DK605¾B
Lavatories						
A	192994 x A110 x D110	Cast 79-402 x Cast 79-184 x 8050	740 854	5155¾ x 9174 x JA219	3765 Compo	DR573
B	163860 x A110 x 17	79-440 x 79-182 x 960¾	8534 x knobs 1519½TS x roses	5155¾ x 9174 x JA219	2765 Compo	DR573
C	1449 x A50 or 1649 x D30	444 x 79-182	563—½ x knobs 1419 x roses		8000 Push Plate x 1365 Pull	DR575—15 x 3 x DR576—15 x 3
Stair Wells						
A	192997 x D110	Cast 79-402 x Cast 79-184 x 8050	740 544	5165¾ x 9174 x JA219	3765 Compo	DR573—7743
B	163997 x 17	79-440 x 79-182 x 960¾	0569—½ x knobs 1519½TS x roses	5165¾ x 9174 x JA219	2765 Compo	DR573
C	1453 x D30 and 1653 x D30	444 x 79-182	90—¾ x knobs 1419 x roses		8000 Push Plate x 1361 Pull	DR575—15 x 3 x DR576—15 x 3
Janitor's Closet						
A	192860 x D110	8050½ x 444 Pull	740 564	JA2021	3761 Compo	DR573
B	163860 x 17	960¾ x 444 Pull	8551 x knobs 1519½TS x roses	JA2021	2761 Compo	DR573
C	12340V x D30	79-4080¾	0563 x knobs 1419 x roses	MD4023	2751 Lenox	DK686—8505
Slop Sinks						
A	192241 x D110	Cast 79-3010CS	740 564	5100¼ x 9174 x JA219	3761 Compo	1658 x 52¼ x DR507¼B
B	163230 x 17	Cast 79-3030CS	8551 x knobs 1519½TS x roses	1084 x 9174 x JA233	2761 Compo	1667 x 52¼ x DR507¼B
C	12210 x D30	79-3000CS	0563 x knobs 1419 x roses	1034 x 9174½ x MD433	2701 Lenox	1667 x 63¼ x DK605¾B
Pipe Chase—Wire Shafts, etc.						
A	237 x ½ Pr. 192002 x 1/192105 x 1/41B x D110	8050½	0567—¾ x knobs 1519½TS x roses	2217	3761 Compo	DR573
B	1141 x 17	960¾	0547—¾ x Pull 02209¼	2217	2761 Compo	7341
C	1173T x D30	5044	456—¾ x Pull 02209¼	2217	8392 Lock	5300—4"

Apartment Buildings

KEY TO CHART
A Type—Best Lock Regardless of Price.
B Type—Medium-Priced Lock for Medium-Priced Bldgs.
C Type—Least Expensive Lock for Low-Priced Bldgs.

	Barrows Lock Works	Clinton Lock Co.	P. & F. Corbin	Earle Hardware Mfg. Co.	Lockwood Hardware Mfg. Co.	Norwalk Lock Co.	
Main Entrance							
A	192110 x D110	X2DPB—X2DB	2256 x 01329 with ½ pr. knobs 1921½ x rose inside	216¾ Push Bar x 6205 Lock		Door Pull & Push Bar Combination Set	5949RE
B	192985 x D110	Cast 79-4310	6474 x handles 75283	9201 Lock x 2 Hdles. EP1629	JA2807	3782 x 7040 Hudson	DM663
C	1453 x A30 and 1653 x A30	Cast 79-3010	1347½ x handles 75283	6204 Lock x 1000 Push Plate x 7606½M Pull		Pull & Push Plate	DM670
Vestibule Entrance							
A	S192985 x D110	Cast 79-7030	8534	8200 Lock x 2 Handles EP1629	JA2003½	3782 x 2/7040 Hudson	DR573
B	S163177V x A30	Cast 79-V7000	1339½	EP1629 Handle x 8000 x EP1629 knob	JA2003½	3735 x 1/7040 Hudson	7551 x
C	S12177V x D30	79-V7000	1339	AE61747	MD4011½	3751 x Lenox	DK674
Entrance to Apartments							
A	192867 x D110	Cast 79-J7000	6443	EP1629 knob & Escut. x 9140 x EP1629	5045 x 9174 x JA219 x JA223	Segal Duplex 88000 Warren	9431H
B	163340 x A30	79-J7000	6843	EP1629 knob & Escut. x 5100 x EP1629	5100 x 9174 x JA219 x JA223	Segal 38000 Ruppert	DR595
C	12340 x D30	79-7000	1343	AE51747	T5000 x 9174½ x MD419 x MD423	Segal C666 x 011 Lenox	DK696

Author's Note: For all the interior doors in apartments refer to Comparative Schedule inside locks in Chapter 17 of the Intermediate Course. Do not overlook plus business on this class of work as outlined in the Intermediate Course, such as Chain Door Fasteners, Garment Hangers, Apartment N

d Apartment Buildings

Note—While every care has been taken, we assume no responsibility for correctness of these suggestions furnished by the manufacturer.

	Reading Hardware Corp.	Russell & Erwin Mfg. Co.	Sager Lock Works	Sargent & Co.	Schlage Lock Co.	Skillman Hardware Manufacturing Co.	Yale & Towne Mfg. Co.
	Door Pull & Push Bar Combination Sets	Push Bars with Dead Lock	3731 D110		C60PD Mon	TRX—Double bar sets	3001
	Door Pull & Push Bar Combination Sets	3052½ Enfield	PB83591 x D110	8816MB	D60PD	L7775	7426¼
	Plymouth 15644	3098 Enfield	PN92584 x A30	3751HB	A51WD	7-5555	7432¼
	Concord 500	2166 Enfield	PB1790 x D110	8805½MB	C51PD	7780¼ x TRX	3000
	Lock 01708 x knobs P002126C x Escutcheons Concord 8″ x 2½″—1382C	11456 LY7 Enfield	CE1781 x 17	6805½ x 1853 x 7856MB x 7855½MB	D51PD	H4442½	7656
	Lock 01602½ x knobs P004426¼ x Escutcheons Concord 7½″ x 2¼″—1372¼ x B1372¼	11248½ RY4 Roxbury	AW1670 x D30	4745½SB	A51WS	HH549 x 5246	7790
	Concord 500 less Auxiliary Bolt	2166¾ Enfield	PB1790 x D110	9805½ MB	C30S	7772½ x TRX	3050
	Lock 01708 or 1601 x knobs P002126C x Escutcheons Concord 8″ x 2½″ 1382C	11456 LY7 Enfield	CE1781 x 17	6805½ x 1853 x 7856MB x 7855½MB	D30S	4442½ x H25	7656
	Lock 01602½ x knobs P004426¼ x Escutcheon Concord 7½″ x 2¼″ 1372¼	11248½ RY4 Roxbury	AW1670 x D30	4745½ SBF	A30S	HH441½	7790
	Concord 705	2135 Enfield	PB19452 x D110	9675MB	C62PD	7776 x TRX	3207
	Lock 1182 x knobs P002122C x Escutcheons Concord 8″ x 2½″ T1244C	236½ LY2 Enfield	CE1452 x 17	4675 x 1852 x 823MB x 2	D41D	H6231	7526¼
	Lock 1181 x knobs P004422¼ x Escutcheon Concord 7½″ x 2¼″ T1241¼	233½ RY1 Roxbury	AW1482 x D30	4679 x 1762F x 842SB x 2	A42S	HH549 x 5231	1523
	Concord 510 or Concord 520 less stops	2145 Enfield	PB1141 x D110	9645MB	C20S	7772½ x TRX	3267
	Lock 01714¾ x knobs P002122C x Escutcheon Concord 8″ x 2½″ 1372C x T1373C	025 LY1 Enfield	CE1140 x 17	4645 x 1852 x 821MB x 2	D20S	H4442½ x CL	7656
	Latch 1048 x knobs P004422¼ x Escutcheon Concord 6″ x 2″ B1141¼	029 RY1 Roxbury	AW1120 x D30	4634 x 1762F x 8215B x 2	A20S	HH549 x 5246 x CL	7790
	Concord 800	P2158½ Enfield	PB1794 x A110 x D110	8816MB	C40S	7772½ x TRX	3001
	Lock 01817 x knobs P002126C x Escutcheon Concord 8″ x 2½″ 1396C	11458—⅝ LY7 Enfield	CE1800 x A110 x 17	6817 x 1853 x 7856MB x 7855½MB	D40S	H4442½	7646¼
	Lock Set Concord 7480	Pull 474½ Plate 1016—15 x 3½	3652—12 x 3 x A50=3852—12 x 3 x D30	4745½SB x 6718	A40S	Push & Pull—No Lock	7792¼
	Concord 800	P2158½ Enfield	PB1797 x D110	8816MB	C80PD	7780¼ x TRX	3001
	Lock 01811CT x knobs P002126C x Escutcheons Concord 8″ x 2½″ 1382C	1457½ LY7 Enfield	CE1797 x 17	6816 x 1853 x 7856MB x 2	D10S	H4442½	7737¼
	Pull & Push Plate—No Lock	Pull 474½ Plate 1016—15 x 3½	3652—14½ x 3⅛ 3852 14½ x 3⅛ x D30	4745½SB x 6718	A10S	Push & Pull	7738
	Concord 520 less stops	P2116 Enfield	PB1800 x D110	8816MB x 1 Cylinder	C81PD	7776 x TRX	3152
	Lock 01708 or 1601 x knobs P002126C x Escutcheon Concord 8″ x 2½″ 1382C	11456 LY7 Enfield	CE1800 x 17	6805½ x 1853 x 7856MB x 7855½MB	D81PD	H4442½	7656
	Lock 01602½ x knobs P004426¼ x Escutcheon Concord 7½″ x 2¼″ 1372¼ x B1372¼	11248½ RY4 Roxbury	AW1670V x D30	4745½SBF	A81WD	HH549 x 5246	7790
	Concord 510	2145 Enfield	PB1141 x D110	8645MB	C10S	7772½ x TRX	3257
	Latch 01025¾ x P002122C x Escutcheon Concord 8″ x 2½″ B1372C	025 LY1 Enfield	CE1140 x 17	4645 x 1852 x 821MB x 2	D10S	H4442½	1031
	Latch 1048 x knobs P004422¼ x Escutcheons Concord 7½″ x 2¼″ B1241¼	026 RY1 Roxbury	AW1130 x D30	4634 x 1762F x 821SB x 2	A10S	HH549 x 5246	1000
	Concord 520 less stops	P2116 Enfield	187 x ½ Pr. PB102¼ x 1/PB17 x 1/01937 x D110	8816MB x 1 Cylinder	B250PD	7772½ x TRX	3152
	1620 x Cyl. Ring C	1203	966 x 17	4861	B260P	H4442½	325
	Bolt P1222	078¾	981T x D30	Catch 4825	A81WS	HH549 x 60	44

	Penn Hardware Co.	Reading Hardware Corp.	Russell & Erwin Mfg. Co.	Sager Lock Works	Sargent & Co.	Schlage Lock Co.	Skillman Hardware Mfg. Co.	Yale & Towne Mfg. Co.
	9RE x Lock 7376 x 2/CE588	Door Pull & Push Bar Combination Sets	Push Bars with Dead Lock	3731 x D110		C60PD Lex	7-7775 x Dummy Trim	7426¼
	5533	Latch 1456 x Handles Clinton 2444 less cylinder collar	3052½ Enfield	PB92885 x D110	3751HB x 953	E200PD	4-5555 x Dummy Trim	7646¼
	1575—15 x 3 x Door Pull DM576—15 x 3	Pull and Push Plate	Pull 474½ Plate 1016—16 x 3½	3654—3854—14½ x 3⅛ x A30		800 Enro x 721	HH4442½	7656
	573	Lock 1585 less stops with Electric Strike x Clinton 2444 less thumb piece x knob P002126C x Escutcheon Concord B1241C	2166 Enfield	PB92885 x D110	8805½MB	C60PD	7-7775½ x Dummy Trim	3001
	1 x 52¼ x DR508 x DR508	Lock 1603 with Electric Strike x knobs P002126C x Escutcheons 8″ x 2½″ Concord 1372C x B1372C	11458½ LY7 Enfield	PN91630V x A30	6805½ x 1853 x 7856MB x 7855½MB	A51PD	4-5555½ x Dummy Trim	7792¼
	674	Lock 01708 x knobs P004426¼ x Escutcheons 7½″ x 2¼″ Concord 1382¼ x B1382¼	11456 RY4 Roxbury	AW91630V x D30	4745½SBF x 6705½	A51WS	HH4442½	7791
	1HM x 52¼ x DR508 x DR508T	Lock 01676 x knobs P002126C x Escutcheons 8″ x 2½″ Concord 1372C x T1373C	1233AEM LY7 Enfield	PB1525 x D110	6880 x 1853 x 7856MB x 7855MB	D51PD	TRX7780¼	1677
	596	Lock 01604 x knobs P002126C x Escutcheons Concord 8″ x 2⅜″ 1372C x T1373C	1238 LY7 Enfield	CE1670 x A30	6783 x 1853 x 7856MB x 7855MB	A51PD	FP4442	1643
	696—9500	Lock 01602 x knobs P004426¼ x Escutcheons Concord 7½″ x 2¼″ 1372¼ x T1373¼	11248 RY4 Roxbury	AW1670 x D30	4745SBF	A52WS	HH441	7750

at Numbers, etc.

HARDWARE AGE

KEY TO CHART

A Type—Best Lock Regardless of Price.
B Type—Medium-Priced Lock for Medium-Priced Bldgs.
C Type—Least Expensive Lock for Low-Priced Bldgs.

HOSPITALS

	Barrows Lock Works	Clinton Lock Co.	P. & F. Corbin	Lockwood H Mfg. Co
Main Entrance Door				
A	985	4260	6474	8798
B	495V	V7010	1347 ½	8796
C	177V	1270	1349 ½	8798
Ambulance Entrance Doors				
A	1122	7050 ½	6474	2240
B	1142	8050 ½	6843	2228
C	1142	960	1343	2218
Stair Hall Entrance Doors				
A	997	7030	2586	5165 ¾
B	996	V7000	8554	5165 ¾
C	340V	V1250	0563 ½	5165 ¾
Patient's Room (Private) Door				
A	996	7030S	6013 x 1825	2227
B	891	V7000S	132 ½ x 1825	2227
C	953	V1250S	132 ½ x 1825	2161
Contagious Room Door				
A	996KR	7030S	6013 x 1825	2227
B	892	V7000S	132 ½ x 1825	2227
C	873	V1250S	132 ½ x 1825	2161
Ward Door				
A	892	7040	6013 x 1825	
B	230	3010	132 ½ x 1825	
C	210	3030	132 ½ x 1825	
Diet Kitchens & Pantry Room Doors				
A		7030	6012	
B		V7000	132 ½	
C		V1250		
Utility & Linen Room Doors				
A	1143	7050 ½	580 ¼	2227 or 5130
B	1143	8050 ½	0563	2217 or T503
C	1163	960	1365 ½	2161 or 5576
Operation Room Door				
A	1122	7050 ½	6013 x 1825	2229
B	1143	8050 ½	132 ½ x 1825	2218
C	1163	960	132 ½ x 1825	2161
X-Ray & Sterilizing Rooms Doors				
A	1123	7050 ½	6013 x 1825	2229
B	1143	8050 ½	132 ½ x 1825	2218
C	1163	960	132 ½ x 1825	2161
Public Toilet Door				
A	996	7030	8534	2229 or 5155
B	994	V7000	563 ¼	2218 or T505
C	1453 and 1653	3010	1365 ½	
Private Room Toilet & Bath Doors				
A	891	7000	233 ½	1084
B	877	500	090	1048
C	210	500	049	1034
Private Room Closets				
A	891	7000	580 ¼	5100 ¼
B	340 ½	V7000	049	T5000 ½
C	873	4060	045	3602
Kitchen Room Door				
A	891	7000	580 ¼	5130
B	891	V7000	0563	T5030
C	873	4060	1365 ½	5556
Communicating Door				
A	9987	7000S2	444 ½	5538
B	987	530	159 ¼	5538
C	977	520	159 ¼	3605
Porch & Solarium Doors				
A	892	7000S2	580	5120 x 1 Cyl.
B	891	8050	1365 ½	T5020 x 1 Cy
C	873	4060	795 ⅞	5556
Laboratories				
A	891	7000	580 ¼	5130
B	340 ½	8050 ½	0563	T5030
C	873	960	1365 ½	5556
Pipe Chases—Wire Shafts, etc.				
A	1143	8050 ½	0547 ¾	2227
B	1163	960	0548	2217
C	1172T	3030	6011	2161

ASYLUM BUILDINGS

Main Entrance Door				
A	985	4280	0288	
B	492	7050	6822	8798
C	892	8050	1343 x 2 Cyl.	8798
Corridor—Communicating Corridor Doors				
A		7000S2		
B		4030		
C		4060		
Exercise & Stair Doors				
A	985	7000S2	1262 x knobs 1519 ½ PH	
B	892	4030	0695 ⅞ x knobs 1419PH	5120
C	893	4060	1261 x knobs 1419PH	5556
Inmates Room Door				
A	1252	7030S2	1262 x knobs 1519 ½ PH	1098
B	1272	7000S2	1264 ½ x knobs 1419PH	1098
C	1163	V7000S2	1266 ½ x knobs 1419PH	1098
Attendant Room Door				
A	994	7000	8323 x knobs 1519 ½ PH	5120
B	860	V7000	0695 ⅞ x knobs 1419PH	T5020
C	893	V1250	1266 ½ x knobs 1419PH	5556
Therapy Room Door				
A	994	7000	8322 x knob 1519PH	5100 ¼
B	340V	V7000	0695 ⅞ x knob 1419PH	5100 ¼
C	340V	V1250	1266 ½ x knob 1419PH	T5000 ¼
Toilet & Bath Room Doors				
A	891	7000	580 ¼ x knob 1519 ½ PH	2228 or 5155
B	891	V7000	1233 ½ x knob 1419PH	2217 or T505
C	973	V1250	285 ⅞ x knob 1419PH	2165 or 5556

EDITOR'S NOTE: This suggestion chart is not to be confused with the comparison c
includes the ideas of individual manufacturers as to the proper locks to specify from th

od Bldgs.
Bldgs.

SUGGESTION LIST—HOSPITAL AND ASYLUM BUILDINGS

Lockwood Hdwe. Mfg. Co.	Norwalk Lock Co.	Penn Hardware Co.	Reading Hardware Corp.	Russell & Erwin Mfg. Co.	Sager Lock Works	Sargent & Co.	Schlage Lock Co.	Skillman Hdwe. Mfg. Co.	Yale & Towne Mfg. Co.
8798 8796 8798	8398 3755 2755	EK5634 EK5534 DB0633	1637 1637 1622	9152 1/2 1223 11223	885 595V 630V	976 961 1/2 761 1/2	C60PD Mon E200PD A51WD	L-7775 4-5555 HH442 1/2	7426 1/4 7432 1/4 7438
2240 2228 2218	1505 1/2 8398 8392 1/2	7362 x 531 x R675—15 x 3 1/2 7342 x 531 x R675—15 x 3 1/2 7322 x 531 x DB675—14 1/2 x 3 1/4	1637 1622 1622	1207 1/2 1205 1/2 1203 1/2	969 1/2 966 1/2 966 1/2	4888 4825 4865	905 903 A70WD	TRX7780 1/4 H4442 1/2 HH442 1/2	304 1/4 316 1/4 324 1/4
5165 3/4 5165 3/4 5165 3/4	3765 2765 2765	7765M x 52 1/4 x DM508 DM573 DB674	1808 01917 1601	11457 1/2 11258 1/2 11248 1/2	767 796 670V	7808 6818 6745 1/2	C60PD 3/4 D60PS A51WS	TRX7780 1/4 H4442 1/2 HH442 1/2	7737 1/4 7792 1/4 7648
2227 2227 2161	3761 2761 2751	7562 x 52 1/4 x DM508 7552 x 52 1/4 x DM508 DB684	2708 01708 1308	1458 5/8 11258 5/8 444 3/4	796 691 810 3/4	4999 x 1 Cyl. 4999 4736	C66PD 3/4 A10S + B260P A55WS	7780 1/4 x L-TRX 5246 x 3585 6012 x 3683	747 1/4 7760RL 772
2227 2227 2161	3716 2716 6531 1/2	7562 x 52 1/4 x DM508 7552 x 52 1/4 x DM508 DB626—2478	2708 less stop works—knobs rigid—two cyl. 01708 less stop works—knobs rigid—two cyl. 1422	1225 1/2 11224 1/2 382 3/4	796KR 692 370 3/4	4999 x 2 Cyl. 4999 5639	C82PD 3/4 A10S + 903 A70WS	7780 1/4 x L-TRX 5246 x 3585 6012 x 3683	748 1/4 7660 1/4 1500
	8398 8392 1/2 8171 1/2	DM573 1667 x 52 1/2 x DM507 1/4B DB616—1597	2708 01025 3/4 1048	025 025 029	692 140 130	7828 4645 4634	C72PD A10S A10S	7-7775 1/2 442 1/2 x 3585 60 x 3683	7660 1/4 RL 1000 1022
			02728 01714 3/4 1422				C51PD A10S + B250PD A51WS	7-7775 1/2 442 1/2 x 3585 60 x 3683	304 1/4 323ST 277
2227 or 5130 2217 or T5030 2161 or 5576	8390 8392 1/2 8171 1/2	7321 7341 7321	02728 1658 1092	1203 3/4 1203 0783	966T 966T 963 3/4	4841 4821 4949	C71PD A10S + B260P A70WD	7772 1/2 TRX 5246 x 3585 6012 x 3683	323ST 325 277
2229 2218 2161	8398 8392 1/2 8171 1/2	7362 x Door Pull 531 x R675—15 x 3 1/2 7342 x Door Pull 531 x R675—15 x 3 1/2 3958 x DT601 5/8	1637 1622 1092	1205 1/2 1203 1/2 0786	969 1/2 966 1/2 963 3/4	4845 4825 4949	905 903 A51WS	7780 1/4 x L-TRX H4442 1/2 442 1/2 x 3683	304 1/4 324 1/4 297
2229 2218 2161	8398 8392 1/2 8171 1/2	7362 x Door Pull 531 x R675—15 x 3 1/2 7342 x Door Pull 531 x R675—15 x 3 1/2 3958 x DT601 5/8	TK1637 1620 1092	1205 1203 0786	969T 966T 963 3/4	4841 4821 4949	B250PD B260P A51WD	7772 1/2 x TRX 5246 x 3585 6012 x 3683	305 325 297
2229 or 5155 1/2 2218 or T5055 1/2	3765 2765 8067	DM531—3169 DM531 531 x DB675—14 1/2 x 3 1/8	1637 1622 Pull & Push Plate	11258 1/4 11258 5/8 Pull 474 1/2 Plate 1016—16 x 3 1/2	796 794 3054—15 x 3 and 3854—15 x 3	7816 7816 x 1 Cyl.	C55PS D55PS	7780 x TRX 442 1/2 x 3585 441 1/2 x 3683	7792 1/4 7792
1084 1048 1034	3715 2715 6531 1/2	DM531—3189 DM531—3169 DB632	02728 1282 01180	236 233 029	691 450 130	6825 4665 4634	D73PD A40S A10S	6012 3/4 x TRX HH549 x 6012 3/4 6012 3/4 x 3683	7660RL 1535 1022
5100 1/2 T5000 1/2 3602	3715 2715 6531 1/2	7564 x 52 1/4 x DM508 x DM508T 7251 x 52 1/4 x DM508 DB648	02728 01714 3/4 1422	11248 11248 1/2 382 3/4	691 671 370 3/4	6825 5639 5269	D71PD A10S + B260P A71WS	7772 1/2 x TRX HH442 1/2 59 x 3683	7660RL 7701 1503
5130 T5030 5556	3715 2715 6531 1/2	7551 x 52 1/4 x DM508 7551 x 52 1/2 x DM508 DB626-2478	02728 01714 3/4 1422	11224 11224 382 3/4	691 691 370 3/4	6825 5639 5269	D51PD A10S + B260P A51WS	7780 1/4 x TRX HH442 1/2 44 1/2 x 3683	7660 7660 1500
5538 5538 3605	3723 2723 6587	DM537-3369 DM537-3359 DB638	2728 1182 1184	236 1/2 236 1/2 229 1/4	9452 452 482	6873 4675 4679	D62PD A42D A42S	7776 x TRX 5231 x 3585 5231 x 3683	7526 1/4 1525 1524
5120 x 1 Cyl. T5020 x 1 Cyl. 5556	3716 2717 6531 1/2	7562 x 52 1/4 x DM508 1/2 7552 x 52 1/4 x DM508 1/2 DB648	2710 1601 1308	11224 1/2 11224 1/4 382 3/4	692 691 370 3/4	6826 5639 5269	C66PD A10S + 903 A70WS	7780 x L-TRX HH442 1/2 441 1/2 x 3683	7660 1/4 7661 1500
5130 T5030 5556	3715 2761 6531 1/2	7562 x 52 1/4 x DM508 1/2 7552 x 52 1/4 x DM508 1/2 DB648	02728 01817 1422	11458 5/8 11258 5/8 382 3/4	691 671 370 3/4	6825 5639 5269	C73PD D70PS A70WS	7780 1/4 x TRX HH442 5246 x 3683	7660RL 7792 1500
2227 2217 2161	3761 2761 8392	7341 3958 x DN501 5/8 5300-3"	1620 1621 1092	1203 0786 078 3/4	966T 963 3/4 980T	4821 4949 4825	B250PD B260P	7772 1/2 x TRX HH442 1/2 60 x 3683	325 297 44
8798 8798	3746 2746 2716	EB5634 x Grips 5647 EB5634 7552 x 52 1/4 x DM510 1/2	1545	2125 1/2 9098 11224 1/2	885 592 692	976 933 6826	C66PD Mon D66PD Mon D66PD	7-7775 4-5555 HH442	3450 7432 1/2 7660 1/4
	8398 8392 1/2 8171 1/2		1092				C10S + 905 D10S + 905 A10S + 903		3450 7660 1/4 1570
5120 5556	3716 2716 8171 1/2	EB5634 7552 x 52 1/4 x DM508 DB626—2376	1714 3/4	2125 1/2 11224 1/2 1384 3/4	885 692 380 3/4	6826 6726 6129	C66PD D66PD A10S + 903	7780 x L-TRX HH442 1/2 HH441 1/2	3450 7660 1/4 1570
1098 1098 1098	3762 no stops in face. 2762 no stops in face. 8339 1/2 Special	7584 x 52 1/4 x DM508 S7476 S7472	1129 3/4	2197 1094 1/4 1090	974 1/2 967 1/2 963 3/4	4999 x 1 Cyl. 4999 4984	905 1/2 905 1/2 903 1/2	7780 3/4—TRX H5246 HH549 x 5230	3504 1591 1581
5120 T5020 5556	3761 2761 8531 1/2	7264 x 52 1/4 x DM508 7261 x 52 1/4 x DM508 DB626—2376	1214	2159 1/2 11456 1384 3/4	794 800 380 3/4	7816 6816 6129	C80PD D80PD B255PD	7780 x TRX H442 HH441	3001 7648 1570
5100 1/4 5100 1/4 T5000 1/4	3761 2761 8531 1/2	7264 x 52 1/4 x DM508 7264 x 52 1/4 x DM508 7264 x 63 1/4 x DB608	01350	2159 1/2 11248 1/2 11248 1/2	794 670V—OKR 670V—OKR	7816 x 1 Cyl. 6817 6129	C80PD D80PS B255PS	7780 TRX H442 HH441	3001 7791 7791
2228 or 5155 1/2 2217 or T5055 1/2 2165 or 5556	3715 2715 6570	7561 x 52 1/4 x DM508 x DM508T 7551 x 52 1/4 x DM508 x DM508T 3558 x 63 1/4 x DN607 x DB607T	1188	2159 11224 1/4 0022 3/4	691 691 455 3/4	7827 No T.K. 6825 No T.K. 6113	C73PD D73PS A10S x B260P	7780 TRX H442 1/2 HH441 1/2	3152 7661 1448

nparison charts published elsewhere in this book. No attempt is made in this suggestion chart to make comparisons of the items of one company with the quality of lines made by other manufacturers. This chart fy from their own catalogs. Note—While every care has been taken, we assume no responsibility for correctness of these suggestions furnished by the manufacturer.