

March 2, 1943.

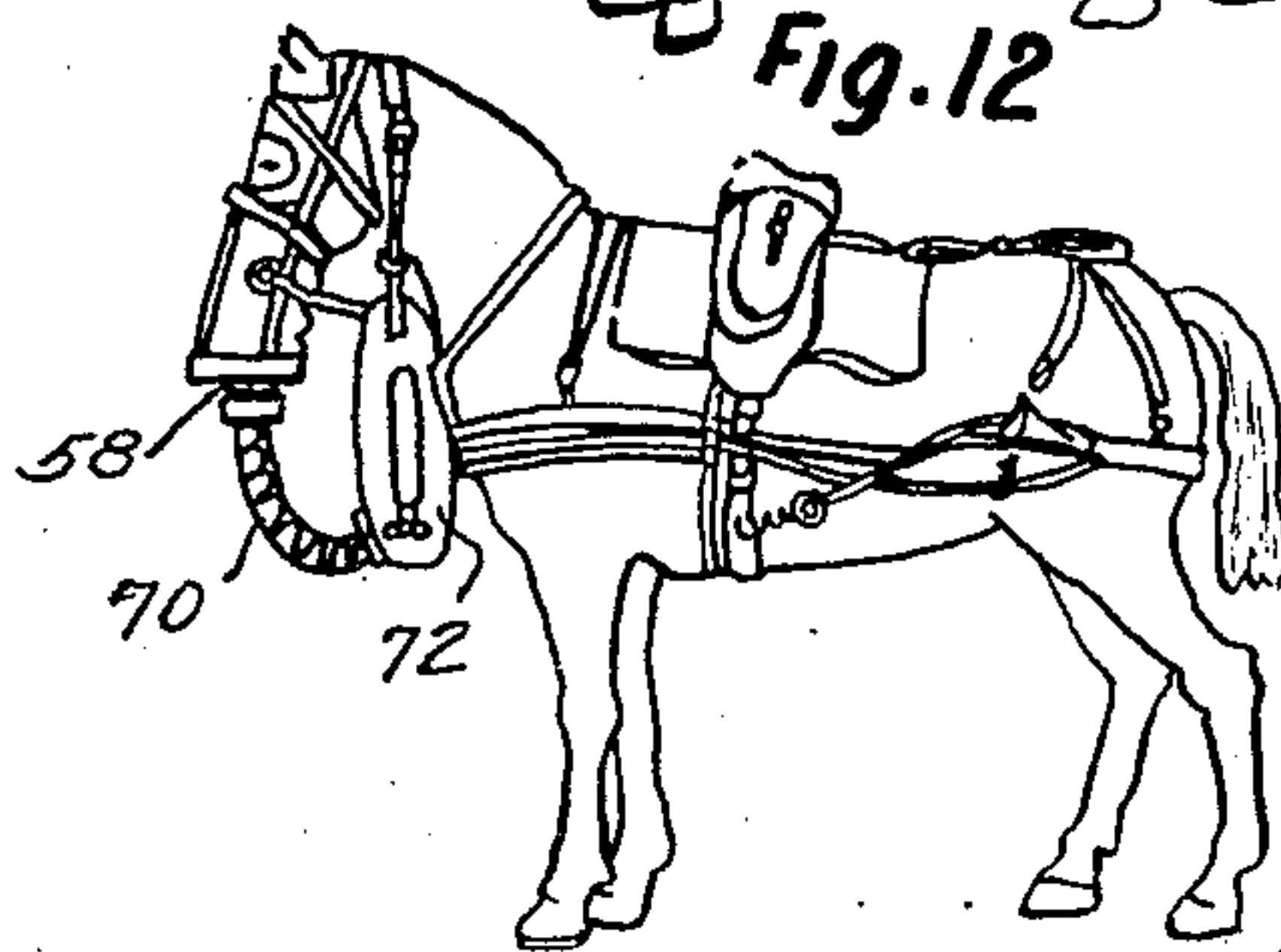
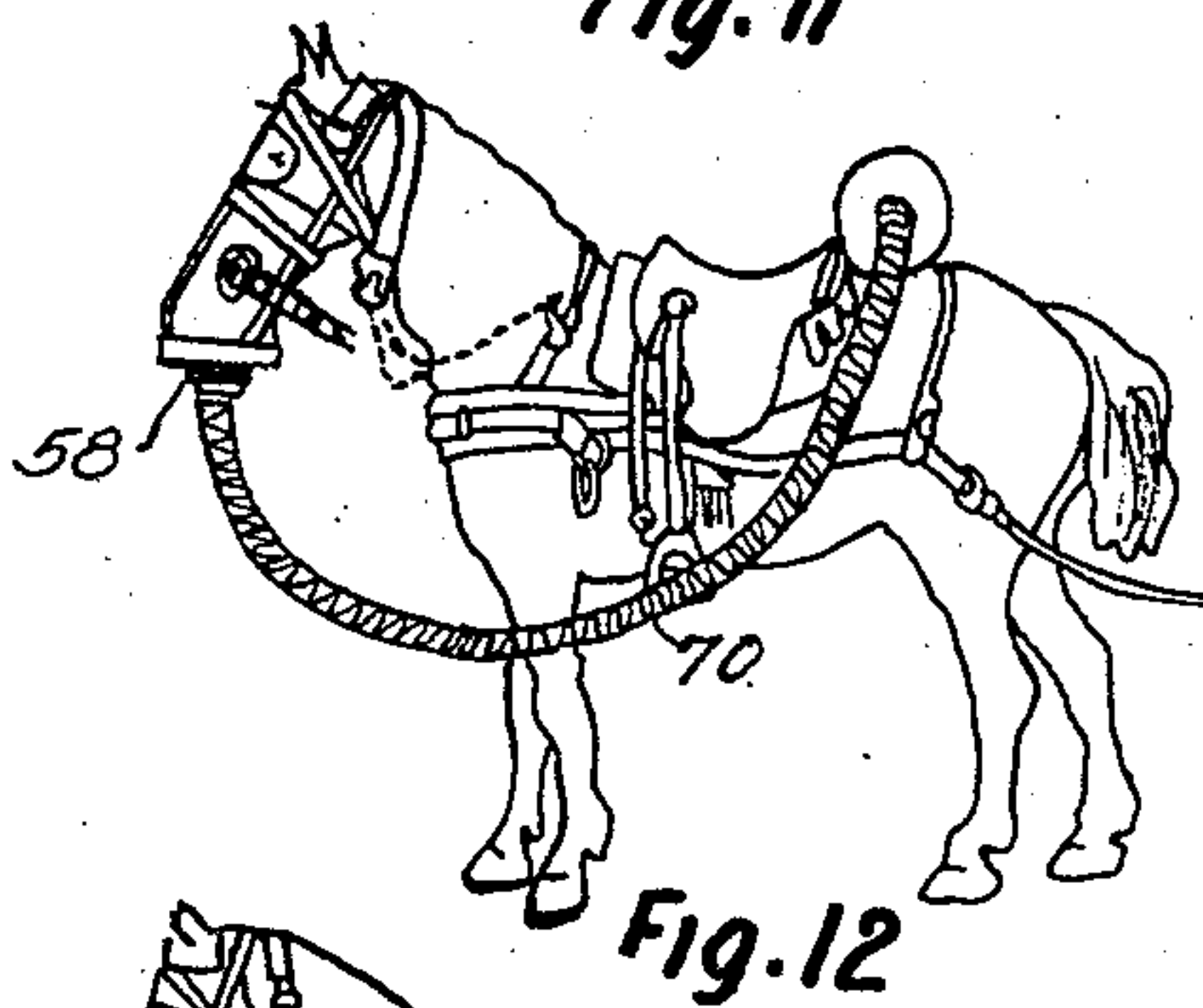
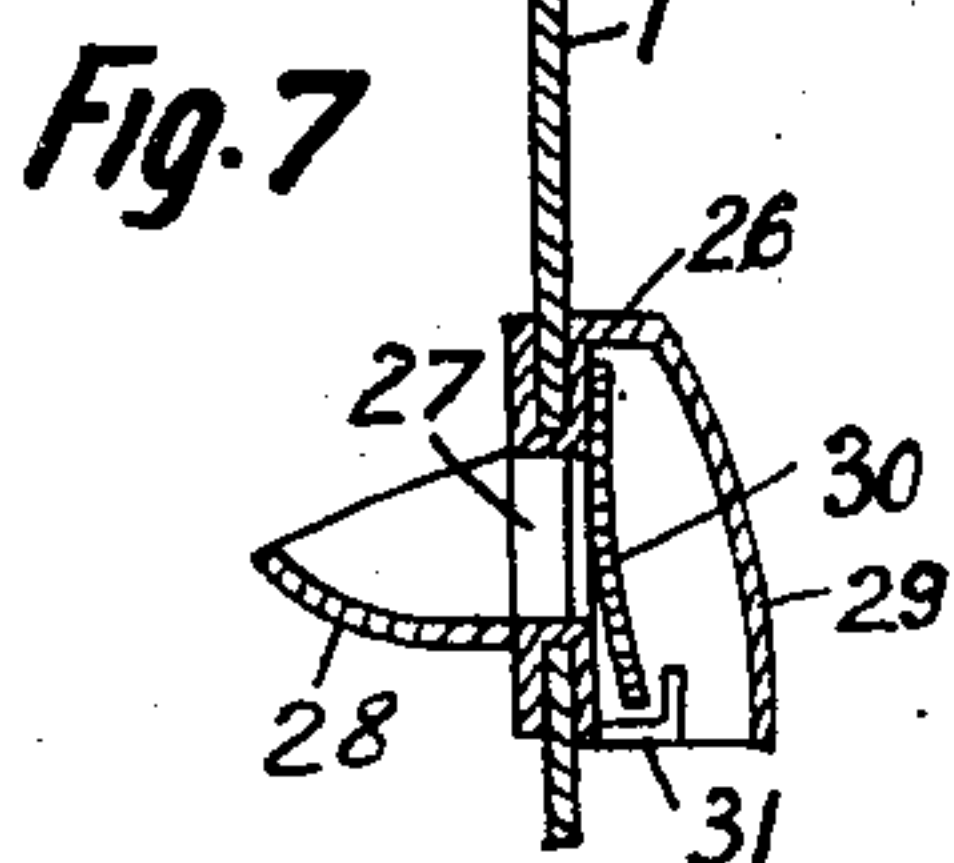
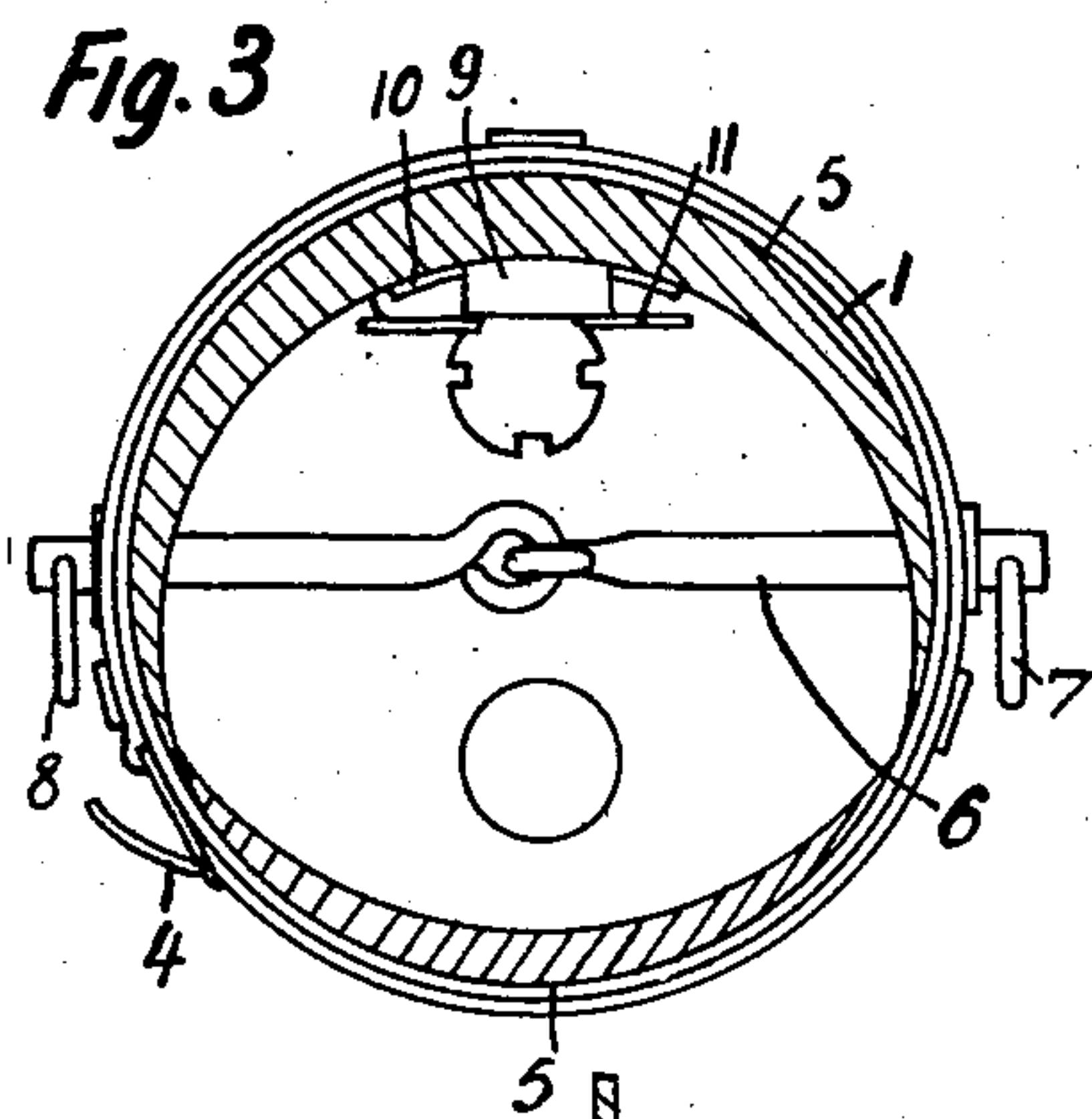
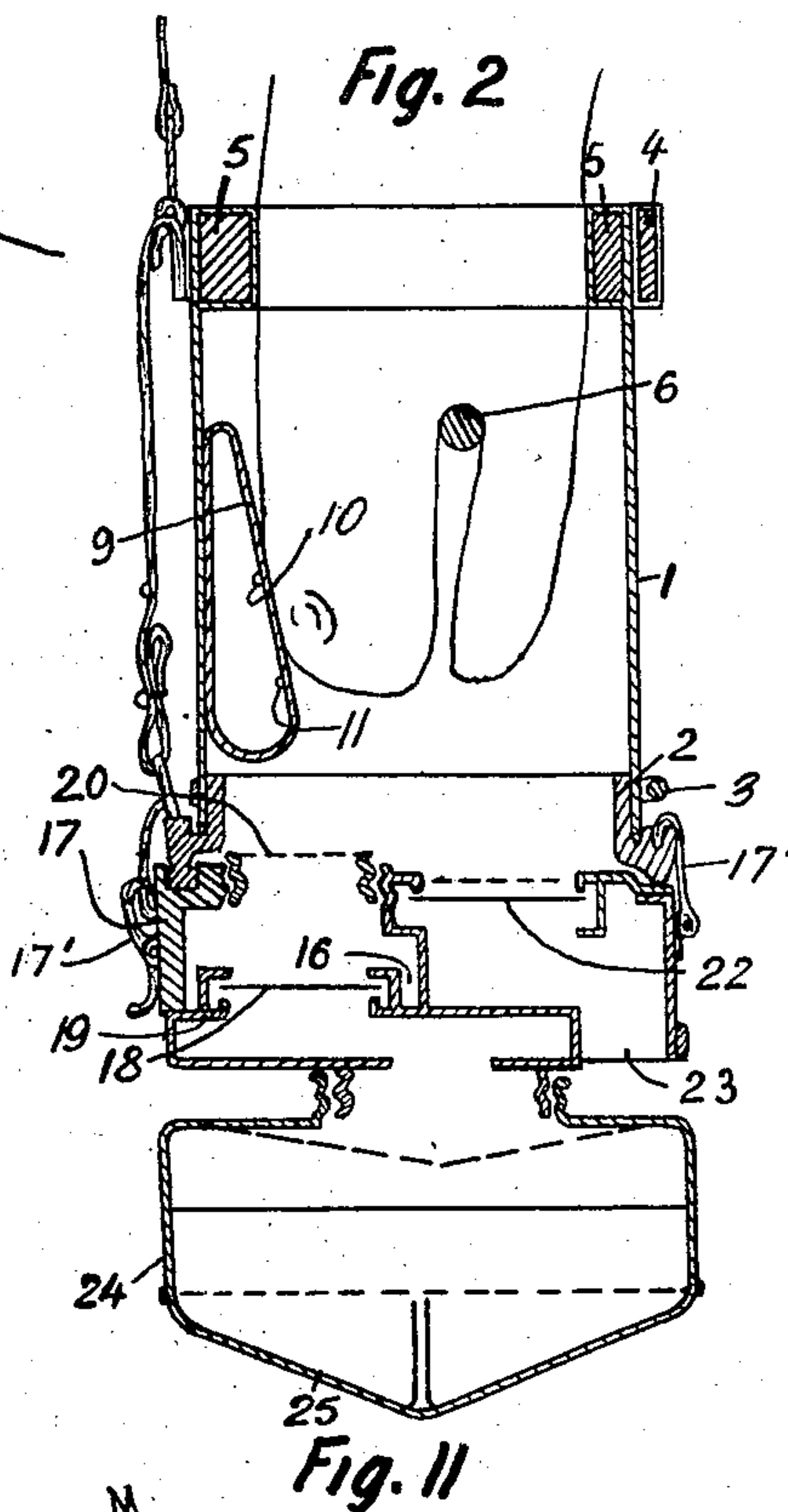
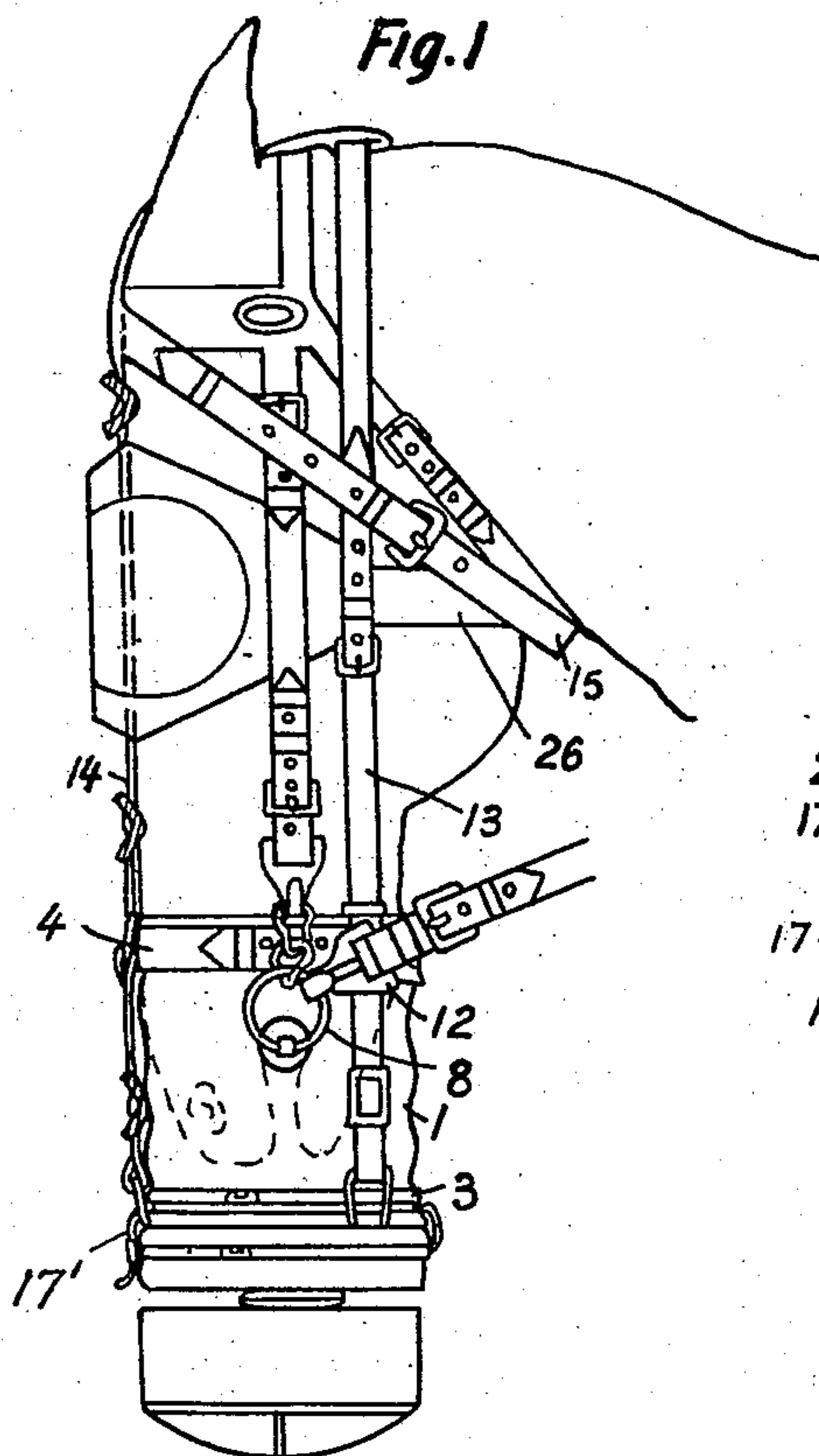
O. HERBIN

2,312,714

GAS MASK FOR HORSES

Filed May 29, 1940

2 Sheets-Sheet 1



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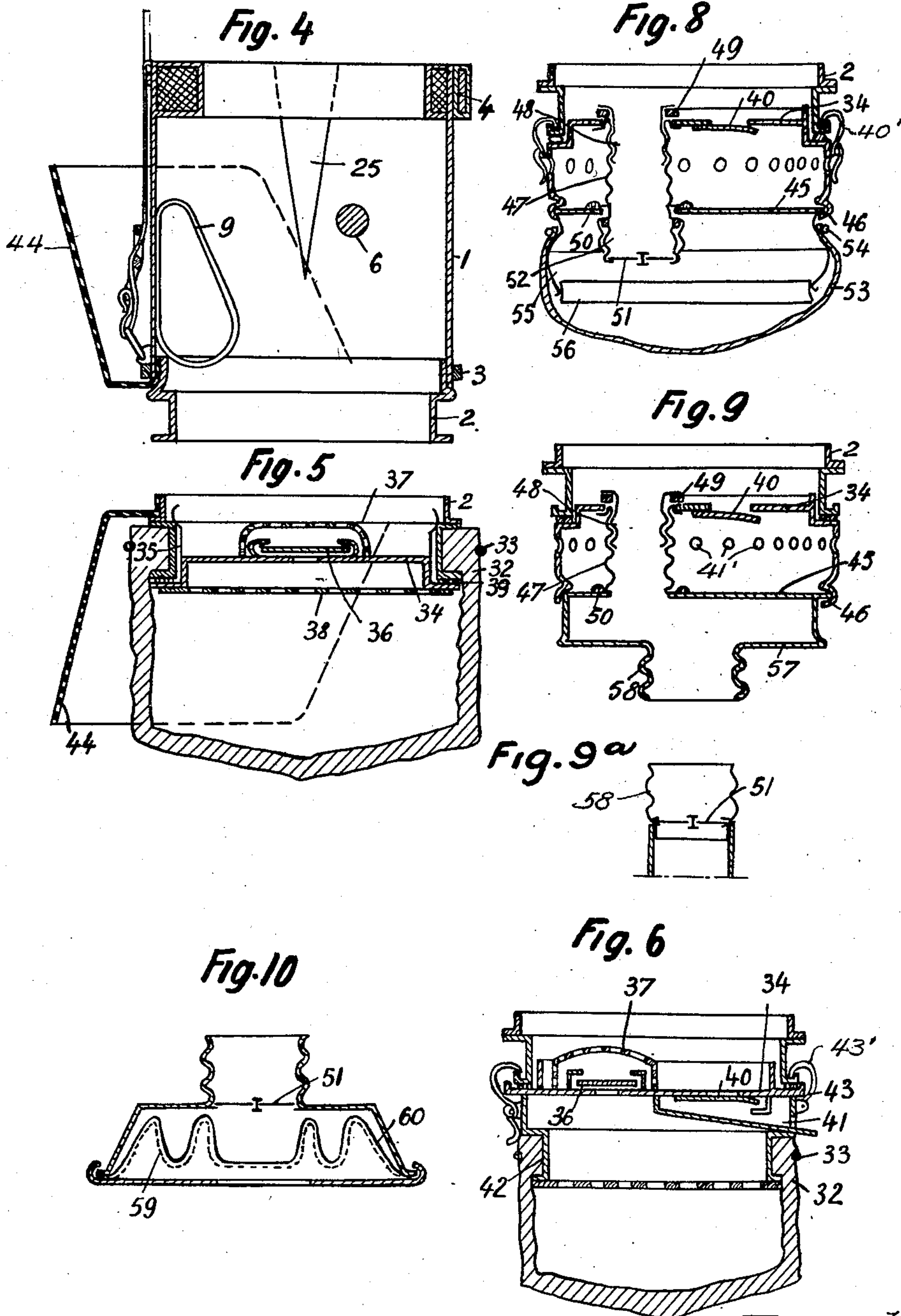
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GAS MASK FOR HORSES

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,312,714

GAS MASK FOR HORSES

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Application May 29, 1940, Serial No. 337,934
In France May 5, 1938

5 Claims. (Cl. 128—141)

The present invention has for its object a gas mask for horses, characterized by its arrangement which enables free use to be made of the reins, and the combination of a part of the mask with the harness of the horse so that the harness thus completed is always ready to receive the filter portion of the mask without in any way hindering the breathing or the feeding of the horse.

The accompanying drawings show diagrammatically, by way of a nonlimitative example, one embodiment of the invention.

Fig. 1 shows a complete view of the mask and of the modified harness; this view also shows that the mask may be completed by protecting spectacles which may be independent or not.

Fig. 2 is a sectional view of the mask shown in Fig. 1.

Fig. 3 is a plan view of same.

Fig. 4 shows a section of a modification of the part of the mask which is combined with the harness, enabling thicknesses of impregnated gauze to be used instead of filter packs. This part is always ready to receive the independent filtering portion.

Fig. 5 is a general view of the mounting of the filter bag.

Fig. 6 shows a modified mounting and

Fig. 7 a method of construction of an outlet valve.

Fig. 8 shows a modification of mounting in which the filter packs are fitted in an intermediate box, forming a valve box, by means of an arrangement of screws and nuts forming air ducts and on which a removable inlet valve may be arranged.

Fig. 9 shows a modification of mounting of said intermediate box, wherein the inlet nozzle is offset in order to enable a filter pack of large diameter to be used.

Fig. 9^a is a detailed showing of a different mounting for the inlet valve.

Fig. 10 shows a filter pack of large area.

Fig. 11 shows a filter box arranged behind the saddle of an artillery carrier horse, said box being connected to the mask through a flexible tube.

Fig. 12 shows a bag of regenerated atmospheric air suspended from the neck of the horse which is harnessed for pulling.

Hitherto, the protection of horses from poison gas had been contemplated more particularly by means of nose-bags made of filtering fabric which hindered the animal's breathing and had the drawback of being difficult to fit in a gas-

tight manner on the horse's head. Such apparatus quickly tired the horse and made it incapable of exerting the necessary strength for pulling heavy material.

The objects of the present invention consist in improvements which are intended to overcome these drawbacks.

A gas mask constructed according to the invention comprises a cylindrical or truncated cone shaped body 1, made of impermeable leather or like material, on which is fixed a metal carrier 2 by any known means, for example by means of a clamping collar 3. Said body is closed by a structure to be described which can be clamped to the body 1 by means of a band 4 and sealed in relation to the animal's head by the pressure of resilient parts 5 made of sponge rubber.

This arrangement enables the mask to be opened sufficiently for the bit 6 to be passed into the horse's mouth. The bit 6 may be made in one or a plurality of parts and is hermetically fixed in the mask and terminally provided with fixing rings 7 and 8 for the reins.

Inside the mask there is arranged a U-shaped metal blade 9 which may carry two metal rings shown at 10 and 11 and which serves to keep the horse's nostrils spaced from the wall of the masks. The member 9 is preferably of metal having an outer wall to fit against the interior of the body 1 and integral top, inner and bottom walls. The inner wall is downwardly divergent from the outer wall, as shown more particularly in Figure 2.

The mask thus constructed is fastened to the normal harness of the horse by means of the rings 7 and 8 of the bit, exactly as if it were a snaffle bit.

The leather thongs forming the snaffle may also be attached to said rings by means of spring-hooks such as that shown at 12.

These supports may be completed by an arrangement of thongs of adjustable height, composed of two thongs 13 which are placed on either side of the horse's head, are secured to a front thong 14 and are preferably completed by a throat-latch 15.

By this means the mask proper is much more efficiently supported and the thongs may end at the fixing ears of the removable filtering portion.

Said filtering portion is composed of a valve box 16 which is connected to the metal part of the leather mask by means of a circular joint 17 and may be secured to said leather mask by any known means, such as hooks 17', which are pref-

erably connected to the complementary thongs of the harness.

Said valve box contains two valves of known system and filters covering said valves. The intake valve shown as 18, which is composed of a mica plate adapted to bear on a seat 19, is protected by a filter 20.

This intake valve is preferably located at the front part of the mask, while an outlet valve 22 is located at the rear in order to permit the outflow of the horse's foam through the outlet hole 23, without thereby impairing the hermeticity of the mask.

The outlet valve 22 is made of rubber, in order to enable it to close hermetically even when foreign bodies are introduced into the valve box. On said box there is adapted to screw a filter box 24, similar to the filter boxes used for human gas-masks, but of larger area.

This box may, however, be completed by a grating and a protector 25 which prevents the animal from dirtying the pack when it brings it into contact with the ground.

Such a mask may be completed by spectacles S which are likewise adapted to be clamped on the head and are hermetically pressed thereon by means of two rings of sponge rubber clamped by a thong 26.

In the modification of Fig. 4, the gas mask is again composed of a cylindrical part or a truncated cone shaped part made of leather or impermeable materials 1, on which there is fixed a metal circle 2 by any known means, for example by means of a sliding clamp 3. The part 1 may be closed by a device of the bellows type, adapted to be clamped by means of a thong 4 and the bellows are preferably arranged on either side of the mask, as shown at 25, hermeticity being obtained by any known means, for example by pressure on the horse's head by means of an elastic or sponge rubber part, as 5'.

The bit 6, which may be made in one or a plurality of parts, is hermetically fixed in the mask and the horse's nostrils are spaced from the wall by means of the member 9.

This fixed part of the mask is connected to the harness, and it is adapted to have fitted thereto a special outlet valve which, moreover, only operates when the mask is completely mounted.

The construction of said valve is shown in Fig. 7, which consists in arranging on the wall of the part 1 of the mask, a metal part 26 which hermetically covers the hole 27 and which terminates, on the one hand in a collecting cup 28, and on the other hand in a protecting part 29, it being possible to obstruct the hole by means of a valve 30, of conventional form, the movement of which is limited by abutments 31.

The cup 28 is intended, during the operation of the mask, to collect the water of condensation or the foam of the horse and evacuate them, the abutments 31 allowing these liquids to flow out without in any way hindering the operation of the valve.

The filtering portion shown in Fig. 5 is composed of a bag 32 made of filtering fabric, which is fixed, when the mask is about to be used, on the circle 2 by means of a flexible thong such as 33 which serves to compress the upper part of the bag in order to ensure hermeticity.

Before placing this filtering bag in position, an inlet valve is arranged inside the circle 2, as shown in Fig. 5, for example by arranging said valve on a plate 34 which may be fixed inside the

circle 2 by means of any number of securing springs shown at 35.

The valve 36 may be protected by an upper strainer such as 37, and by a lower strainer 38 which separate the bag made of filtering fabric from the opening of the valve.

A removable structure is thus obtained which has a large filtering area, is easy to place in position and is hermetic owing to joints such as 39, although such joints are not absolutely necessary.

A modification may be provided as shown in Fig. 6, which consists in mounting on the plate 34, both the inlet valve 36 which is protected by a strainer 37, as stated above, and an outlet valve 40, which is preferably made of rubber and communicates with the outside through a hole 41. The outlet valve 40 is arranged to permit all the foam or condensation water which have been collected in a cup whereof the bottom is formed by the plate 34, to be evacuated.

The bag made of filtering fabric is in this case permanently fixed by means of the thong 33 on a box 42 depending from the plate 34, said box being fixed on the circle 2 of the fixed mask with the interposition of a joint 43 by means of hooks 43' which are identical to those described above.

In this case, the valve plate and the bag 32 made of filtering fabric may be removed as a unit, thereby allowing the animal complete freedom of breathing.

In this latter case, it is unnecessary to provide on the body of the fixed mask any additional outlet valve such as that shown in Fig. 7.

Such valve 40 may be arranged preferably at the rear and towards the bottom of the fixed part of the mask where it is better protected. Similarly, this arrangement facilitates the outflow of the condensation water owing to the position normally taken up by the head of the animal when the horse is at rest.

A large filtering area is thus obtained, which eliminates the greater part of the drawbacks of these fabrics and avoids materially hindering the animal's breathing.

In order to prevent the filtering bag from becoming dirty, it may be protected by an oil-cloth cover, or by arranging on the fixed part of the mask, a protecting device made of rubber or of leather or of any other similar material, such as that shown at 44 and which forms a shield to be fixed to the collar 2 by any known means, for example by means of a clamping collar 3 similar to that previously described.

This shield may be swung down to an operative protective position for the filtering bag, or, when the filtering bag has been removed, the shield may be swung up, as indicated in Figure 4, where it is more protected against damage.

Fig. 8 shows a modification of the metal collar which fits on the metal circle 2 previously referred to.

The removable portion, which may be fitted on the metal circle 2 by means of hooks 40', is essentially a cylindrical box in which the previously mentioned plate 34 again carries a valve 40 of known type; the vertical wall provided with a set of ventilation holes 41'. The bottom 45 of said cylindrical box is fixed to the vertical walls partly by means of the fixed hooks 46 and by the tube 47 formed as a threaded member to receive a tube 48'. The threaded connection between the tubes 47 and 48 insures a sufficient clamping of the parts, fluid-tightness being provided if necessary by a plastic joint 49.

The tube 47 is fixed to the bottom 45 by the

circular weld 50 which is the only weld in the whole apparatus.

A conventional valve 51 is carried by the base of a screw-threaded tube 52, fixed in the tube 47. A bag 53 of filtering fabric may be fixed in a groove in the bottom 45 by a ligature 54. Said bag may be an anti-arsine device and may be lined with impregnated gauze.

An anti-arsine box 56, the contents of which are solid or not, may be fitted by means of an impermeable sleeve 55 which is fixed by means of the same ligature 54. The whole arrangement may be covered with impregnated gauze.

According to Fig. 9, the bottom 45, which is supported as above by means of the hooks 46, the screw-threaded tube 47 and to the nut 48 and by the weld 50, is provided with a double bottom 57 carrying at its center a screw-threaded connection 58. The connection 58 permits a filter pack of large diameter to be used or a connection to be made by means of a flexible tube 70 to a filter box 71 which is arranged behind the saddle of the horse, as in Figure 11, or to the regenerated air bag 72 suspended from the animal's neck, as in Figure 12.

In the case of the filter pack, the inlet valve 51 may be arranged on said pack and in the case of the connection by means of a hose to a filter box arranged behind the animal's saddle or to a bag of regenerated atmospheric air suspended from its neck, said inlet valve 51 may be placed in the screw-threaded connection, as shown in Figure 9a.

Fig. 10 shows a screw-threaded pack of large area, formed by felt or dust filtering paper 59, which is pleated in known manner and lined with impregnated gauze 60 which can be held by means of a grating or by any other means.

The dismantled apparatus may be lodged in a bag provided with three compartments: the first containing the pack and the valve box, the second the mask proper, and the third being formed by a metal box containing the filtering fabrics and the impregnated gauze and optionally the spectacles.

By means of this mask a complete protection of horses is obtained, such protection allowing them freedom of movement and only being a slight hindrance to their breathing, which does not prevent the horses from continuing to fulfil their mission and to give their service.

The mask should remain fixed to the harness so long as the horse is in a dangerous zone and it is sufficient to have in the pockets of the saddle for example or in the carrying bag, the movable part of the mask, to enable the valve box and the filter box to be attached to the mask proper in a few seconds and the complete protection of the horse to be obtained, whereas when said movable part is not fixed to the mask, the horse can eat and drink normally.

By using the device for connecting the filter box to the mask by means of a hose, filter boxes of much greater size may be constructed, without its being necessary to make any alteration in the special harness of the horse.

It is obvious that the shapes, details, raw materials employed and the various arrangements, both for the adjustment of the thongs and for fixing the various parts, the details of attachment, the arrangement of the valves, the strainers, methods of fixing the filtering fabrics, may vary without exceeding the scope of the present invention.

Also, the present mask may be used alone, without a harness.

While there has been described what is at present considered to be the preferred embodiment of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and it is, therefore, aimed in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

I claim:

1. A gas mask for horses comprising a flexible cylindrical member, a band at the upper end of the member for securing the upper end of the member in air-tight relation to the animal's head, a metallic collar clamped to the lower end of the member, a valve box removably connected to the collar, an inlet valve in said box, a filter section over-lying the valve, and an outlet valve carried by the valve box to provide for the exhaling of the animal and the discharge of exhaled matter, the outlet valve being of rubber to ensure its automatic closing after yielding under the exhalation force, and a flexible filtering box removably clamped to the valve box.

2. A construction as defined in claim 1 wherein the valve means and filtering element are removable from the valve box to completely expose the nose of the animal.

3. A construction as defined in claim 1 wherein the inlet valve includes a plate, a seat with which the plate cooperates, and means for limiting the play of the plate with respect to its seat.

4. A construction as defined in claim 1 including a shield removably connected to the valve box, and adapted when in operative position to overlie and protect the filtering element, the shield being mounted to permit it to be turned upwardly to be disposed wholly above the valve box when not in use.

5. A construction as defined in claim 1 wherein the outlet valve overlies a deflecting member to deflect any exhaled material exteriorly of the mask.

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