will acquire an accuracy in making these signals, approaching very close to exactness. The results which will presently be presented, will be sufficient evidence on this point.

All the signals sent to Chicago, from the station visited, were made by myself by pressing the telegraph key with the fingers, so as to make its click, or sound, as nearly coincident as possible with that of a given beat of the sidereal chronometer.

The signals were begun by my calling for a certain number of dots from Chicago, at intervals of ten seconds apart, sufficient to ensure two or more periods of coincidence in the beats of the two chronometers.

This period being thus ascertained, signals were next sent back to Chicago at intervals that would ensure the dots, given by telegraph, being in coincidence with the beats of both chronometers. This interval is equal to the time required for sidereal time to gain one beat, or half a second, on mean solar time, plus the difference of the rates of the two chronometers during said time, taken as these rates stand affected, each with its proper algebraic sign of + (plus) when gaining, or — (minus) when losing.

In this way neither the eye nor the ear is taxed to estimate the value of a fraction of a second of time, which would be necessary if a signal should occur between two consecutive beats of either chronometer.

The reductions from Chicago mean solar to their equivalent sidereal times, with the difference of the rates of the two chronometers incorporated into the calculations, give the fractions of a second of time which appear in the stated differences of longitude between the two stations,—the signals corresponding to coincident beats of the two chronometers being the only ones used for the determination of longitude.

The Longitude of Chicago being well established in comparison with the meridian of Greenwich, it is now assumed as