To all whom it may concern:

Be it known that I, ROLAND FABIAN BERRILL, a subject of the King of Great Britain, residing in London, England, have invented

a certain new and useful Meridian Watch or Clock, of which the following is a specification.

This invention relates to a watch, clock or the like which indicates the meridian of longitude at which it is a given time, say mean noon, whatever may be the time at which the longitude at which the watch is consulted.

Tempieces of this kind, as heretofore proposed, usually comprise a circular scale divided into 360 equal parts, and a hand movable over said scale, but accurate reading of such devices is difficult because the dimensions of the parts into which the scale is divided are necessarily small, and only some of said divisions are numbered.

According to the present invention a figure which represents the unit of the number of degrees longitude of the meridian indicated is continuously displayed, and this number is replaced by the next succeeding number at the end of each period of four minutes. The fractions of a degree are conveniently represented by a hand which moves over a circular scale subdivided into a small number of equal parts, say four, once in every four minutes.

Thus the dial of a watch carries a circular scale which is divided into 36 equal parts numbered consecutively from 0 to 35; the hand of the watch travels over the scale in 24 hours and the watch is also provided with a second device which displays 10 numbers in succession at equal intervals of time in 40 minutes.

Assuming that noon is to be the time indicated, the watch is set by turning the hand at noon to the number of the meridian of longitude of the place at which the watch is used. The successive longitudes (numbered throughout as west of 0) at which the time is noon in the course of the 24 hours will then be indicated, as to the tens or the tens and hundreds, by the division of the scale to which the hand may point and as to units, by the second device.

To subdivide the 36 divisions it is preferable to provide a window in the dial and to mount behind the dial an intermittently revolving plate bearing the numbers from 0 to 9 arranged equidistantly on a circle and which are consecutively displayed through said window as said plate is intermittently rotated. Means are provided to cause this plate to perform one-tenth of a revolution at the end of every 4 minutes to display the said numbers, through said window. These numbers are to be read as the unit numbers of the tens, or tens and hundreds, indicated by the watch hand.

To obtain a further subdivision the dial may have a second circular scale over which a hand moves in 4 minutes thus indicating fractions of a degree.

In the accompanying drawings Fig. 1 shows the dial of a watch constructed according to the invention; Fig. 2 is a view of so much of a suitable form of mechanism as is essential to explain the movement; and Fig. 3 is a view at a right angle to Fig. 2 showing the gearing by means of which the various parts are actuated by a watch mechanism.

On the dial shown is drawn (as is common in watches designed to indicate the time at any part of the world) a zenithal map of the world, the North Pole being the centre of the dial and the dial bears a second circular scale a representing the equator. The main scale a' bears the numerals 0 to 35 equidistantly arranged and to which the hand b points. The circular boundary of the map represents 90° south latitude and the radius joining the figure 0 of the main scale a' and the centre of the dial is Greenwich longitude.

This arrangement has the advantage that the watch hand b indicates on the scale a' that part of the map at which it is the hour for which the watch is set. Thus the dial shown indicates to a user at Greenwich (who has set the watch as aforesaid) by hand b, window c and hand d, (which rotates once in four minutes over the scale a, which is divided into four equal parts, each of said divisions representing a quarter of a degree) that it is now noon at a longitude lying between 137½ and 137¾ and which extends through the northwest portion of North America.

Referring to Fig. 2, which shows one form of mechanism for obtaining the desired movements, the usual watch mechanism a drives the arbor e which carries the hand d one revolution in 4 minutes. This arbor carries the wheel f and the ratio of the members of the train f, g, h, i and k, is such that g revolves once in 8 minutes,
A once in 48 minutes, I once in 240 minutes and k once in 1440 minutes, the hand b being carried by the arbor of this last wheel. The wheel g is keyed or otherwise secured to a pinion m which drives the wheel k. The wheel g and pinion m turn on a sleeve on the arbor n', and the latter is so geared to the arbor e through the gears p and q that it is caused to rotate once in forty minutes. A second sleeve on the arbor n' carries a plate l which bears the numbers 0 to 9 arranged equidistantly in a circle and which are successively displayed through the window c of the dial. The sleeve m also carries a star wheel m' which is connected by a spiral spring n with the arbor n'. The star wheel is engaged by a spring arm o carried on a fixed point. At the end of successive intervals of 4 minutes the tension of spring n overcomes that of spring o and the star wheel is moved through one step to turn plate l through one-tenth of a revolution and thus the next number borne by the plate l is displayed through the window c.

The setting mechanism of the watch moves hand b and plate l together.

Having thus described the said invention and the best means I know of carrying the same into practical effect, I claim:

1. In a time-piece for indicating the meridian of longitude at which it is a given time, a movable device bearing a succession of numerals and adapted to bring each of the said numerals into view in succession, a mechanism adapted to be rotated continuously, and spring-operated means cooperating with the said rotating mechanism and said device to retain the said device for a period of four minutes in a position in which one of the said numerals is in view and to move it at the end of each period of four minutes to bring the next succeeding numeral into view.

2. A time-piece for indicating the meridian of longitude at which it is a given time, comprising a dial bearing a circular scale marked with thirty-six equi-distant consecutively numbered divisions, said dial having an aperture, a hand movable over said scale once in twenty-four hours, a plate rotatable about an axis and bearing a succession of numerals and positioned to display each of said numerals in succession at said aperture, a mechanism adapted to be rotated continuously, and spring operated means cooperating with the said rotating mechanism and the said plate to retain the said plate for a period of four minutes in a position in which one of the said numerals is displayed at said aperture and to move said plate at the end of each period of four minutes to display the next succeeding numeral at said aperture.

3. A timepiece for indicating the meridian of longitude at which it is a given time, comprising a dial bearing a circular scale marked with thirty-six equi-distant consecutively numbered divisions and a second circular scale, a hand which moves over said first-named scale once in twenty-four hours, said dial also having an aperture, a plate rotatable about an axis and bearing a succession of numerals and positioned to display the said numerals in succession at said aperture, a mechanism adapted to rotate continuously, spring operated means cooperating with the said rotating mechanism and the said plate to retain the said plate for a period of four minutes in a position in which one of the said numerals is displayed at said aperture and to move said plate at the end of each period of four minutes to display the next succeeding numeral at said aperture, and a second hand which moves in the course of four minutes over the said second circular scale.

In testimony whereof I have signed my name to this specification.

ROLAND FABIAN BERRILL.