Oct. 22, 1929. N. GIUSTO 1,732,934

UNIVERSAL TIMEPIECE

Filed June 23, 1923 3 Sheets-Sheet 1

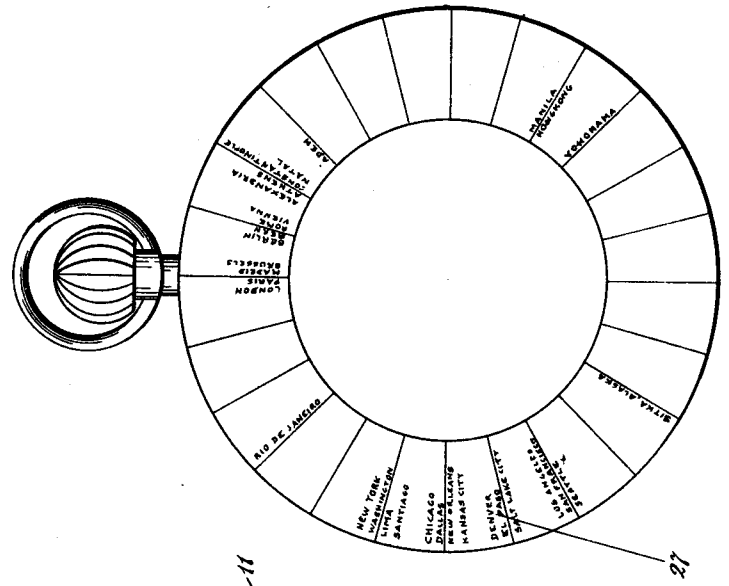


Fig. 3

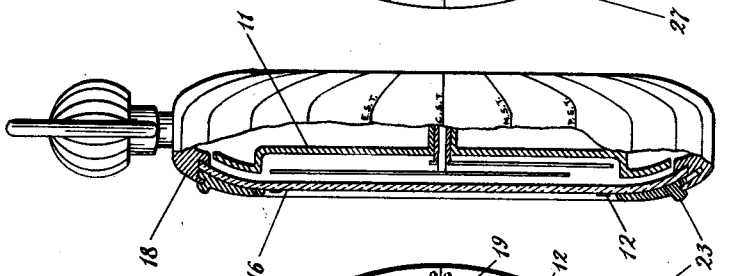


Fig. 2

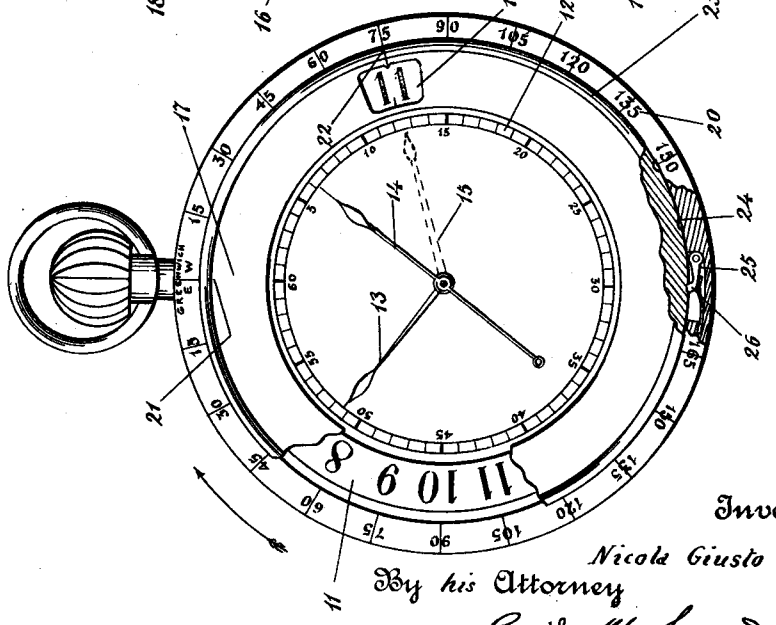


Fig. 1

Inventor
Nicola Giusto
By his Attorney
Guido M. Sacerdote

Oct. 22, 1929. N. GIUSTO 1,732,934

UNIVERSAL TIMEPIECE

Filed June 23, 1923 3 Sheets-Sheet 2

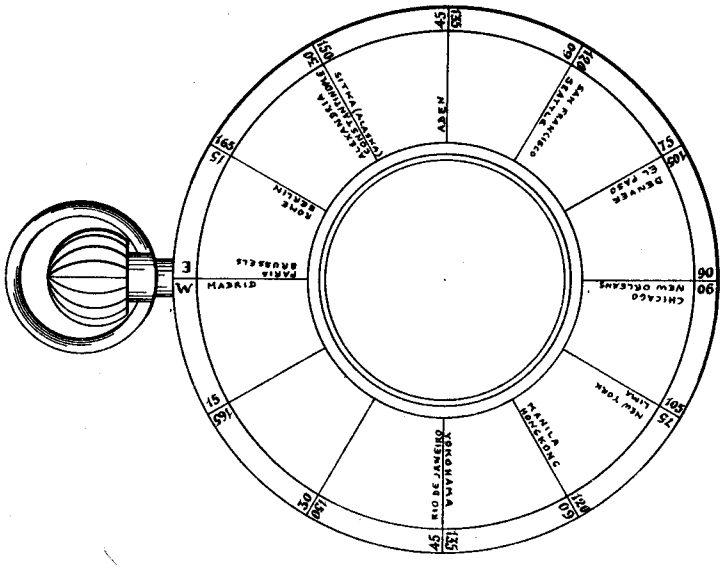


Fig. 6

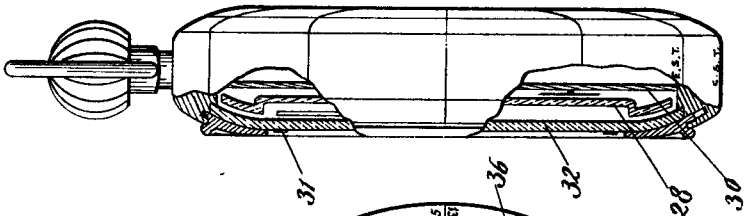


Fig. 5

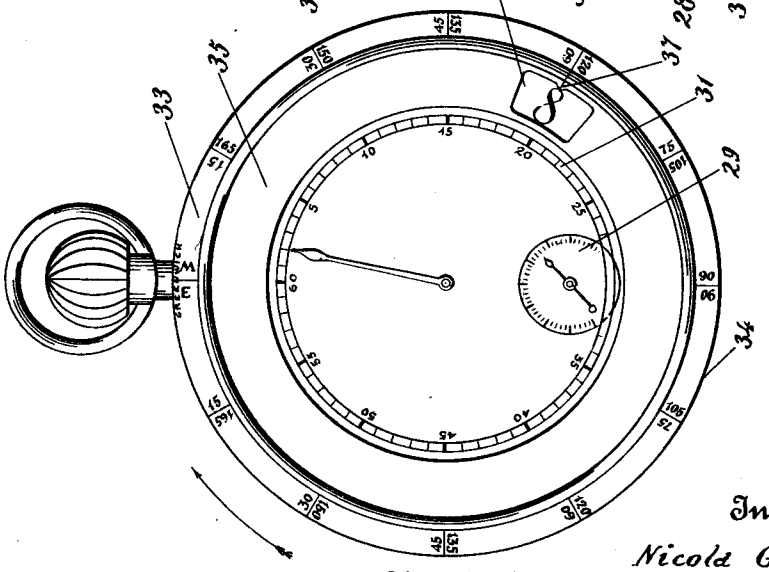


Fig. 4

Inventor
Nicola Giusto
By his Attorney
Guido M. Sacerdote

Oct. 22, 1929. N. GIUSTO 1,732,934

UNIVERSAL TIMEPIECE

Filed June 23, 1923 3 Sheets-Sheet 3

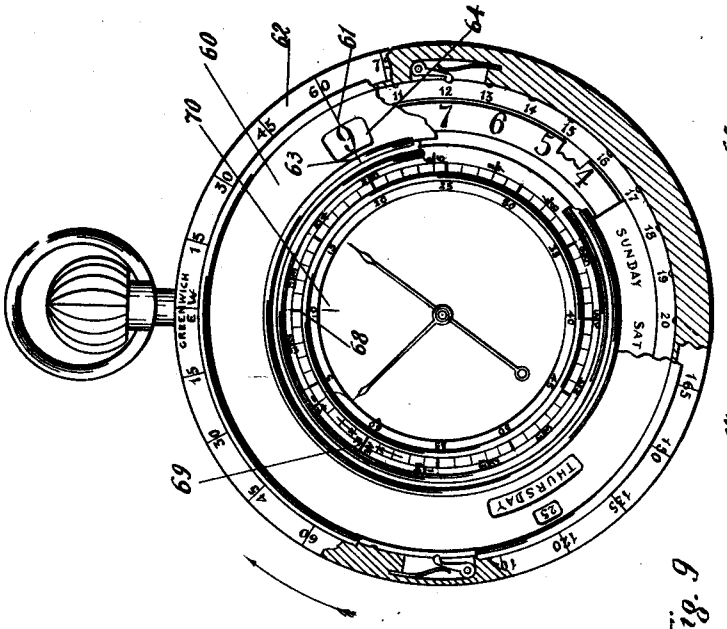


Fig. 9

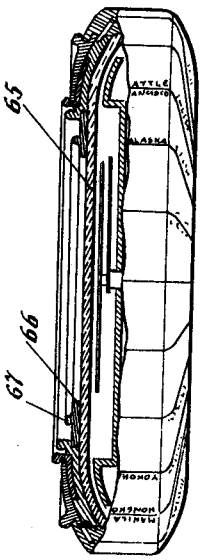


Fig. 10

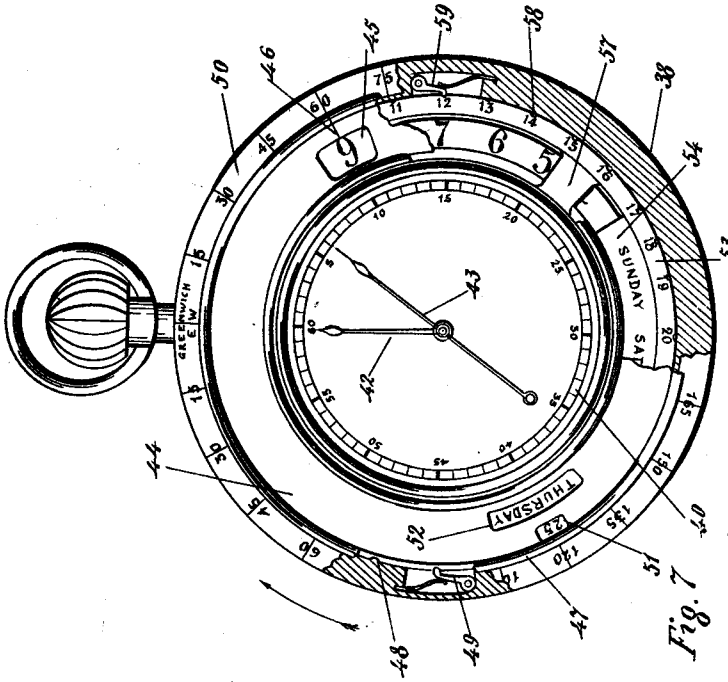


Fig. 7

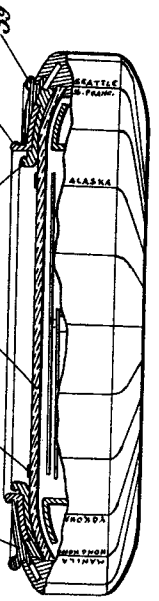


Fig. 8

Inventor
Nicola Giusto
By his Attorney
Guido M Sarendote

Patented Oct. 22, 1929 1,732,934

UNITED STATES PATENT OFFICE

NICOLA GIUSTO, OF NEW YORK, N. Y.

UNIVERSAL TIMEPIECE

Application filed June 23, 1923. Serial No. 647,354.

This invention relates to time indicating apparatus, and more particularly to timepieces having means for adjusting readings in accordance with various geographical positions; and its main object is to provide a timepiece of a novel and improved design, adapted to be instantly adjusted in accordance to its geographical position, without tampering with its mechanism.

Another object of this invention is to provide a timepiece of a novel and simple design, adapted to instantly furnish the various time readings corresponding to different longitudes, free from complicated operation, and easily produced by the employment of watch or clock mechanism of standard design.

A still further object is to produce an easily operated timepiece, which may be readily adjusted to furnish the readings of time in the different time zones, without tampering with its mechanism, and which on account of its simplicity is adapted for use by persons not otherwise conversant with the relations existing between longitude and time, between legal and standard time, etc.

With these and other objects in view, as will more fully appear as the description proceeds, this invention furthermore consists in certain novel and improved constructions and arrangements of parts as will be hereinafter fully described and claimed in the appended claims.

In a patent granted to me June 18, 1916, having for title Time indicating device, Patent No. 1,168,797, I describe various forms of timepieces, the readings of which may be adjusted to conform with various geographical positions; but I have found that the same being of quite special construction as compared with the timepieces ordinarily in use, and their operation requiring some knowledge of the relations existing between time and longitude, their adoption in a large scale is hampered thereby, their operation being rather confusing to the ordinary layman. Their construction, furthermore, while allowing the employment of mechanism of standard design, yet requires changes and modifications in the same which greatly increase the cost of production, and which further limit the usefulness of the device.

The timepiece forming the object of the present invention has been designed, primarily, to do away with all possible complications in construction and operation, so as to produce a device the operation of which may be easily understood by anybody; and furthermore, it has been designed so as to entail the least possible changes in timepieces of standard design, so that methods of quantity production at low cost may be taken advantage of under existing conditions.

In the devices described in my previous patent above-referred to, the indications of time are given by rotating dials in co-operation with stationary hands or indicators; however, I have found that while in this manner the hours may be read quite as easily as by means of the ordinary stationary dial, the readings of minutes and seconds are confusing to the ordinary person, especially when means for adjusting the same are also provided; so that in the timepiece forming the object of the present invention I have employed the combination of a rotating dial for the hours, and stationary dials or dial for minutes and seconds, furnishing indications in the manner with which everybody is familiar, and radically improving the clarity and ease in reading the same.

In the preferred and simplest form, furthermore, I have limited the adjustment of readings to the hours only, this being quite sufficient for the great majority of purposes and requirements. In fact, only in exceptional cases is there any need or real usefulness in having indications of local or mean time, the universal need being for indications of standard or legal time, which is the one adopted by almost all countries throughout the world. Standard time readings of minutes and seconds are the same for all standard meridians, the difference in standard time between two consecutive time zones or belts being exactly one hour; it is therefore apparent that in order to have the various standard time readings it is sufficient to have the possibility of adjusting the hour readings. The standard meridians, accord-

ing to which standard time is reckoned, are those 15° apart starting from the Greenwich meridian; and for purposes of adjustment of the hour readings, it is therefore quite sufficient to have a graduation of longitude limited to standard meridians, without any minor subdivision, which might be confusing to the eye.

For certain special purposes, for instance for adjusting the readings to the ship's time when traveling at sea, it may be desirable to have readings of local time, requiring the adjustment of minor time subdivisions; since the time of the ship, which is changed every day at noon according to its exact longitude, is entirely independent of the standard time system. For the average user, however, even in this case it is entirely unnecessary to adjust the seconds readings, and it will be quite sufficient to provide means of adjustment for the minute readings; which are, however, always obtained by means of a stationary dial in conjunction with a rotating hand of the ordinary type.

In the drawings I also show a timepiece embodying this feature, and I also show the possibility of further enhancing the usefulness of my device by providing simple means whereby indications relating to days and dates may also be obtained without marring its appearance or its simplicity of operation.

Referring to said drawings:

Fig. 1 is a front view, partly sectioned and broken away, of a pocket timepiece embodying my invention in its simplest form, comprising a revolving hour dial making one revolution in twenty-four hours;

Fig. 2 is a side view of the same, partly sectioned;

Fig. 3 is a rear view of the same;

Fig. 4 is a front view of a timepiece comprising a revolving hour dial making one revolution in twelve hours;

Fig. 5 is a side view of the same, partly sectioned;

Fig. 6 is a rear view of the same;

Fig. 7 is a front view, partly sectioned and broken away, of a timepiece similar to the one illustrated in Fig. 1, provided with means for indicating the day and the date, utilizing the same indicator which is used for the hours readings;

Fig. 8 is a side view of the same, partly sectioned;

Fig. 9 is a front view of a timepiece of like description, but provided with an adjustable minute dial; and

Fig. 10 is a side view of the same, partly sectioned.

The timepiece illustrated in Figs. 1, 2, 3, consists of a twenty-four hour watch movement of standard design, which may be readily found in the market, in which a rotating hour dial has been substituted in place of the usual hour hand. Said dial rotates in the usual direction, as indicated by the arrow, and may be provided with one set of figures from one to twenty-four, or with two consecutive sets from one to twelve, as shown in the drawing; however, said figures are written in reverse order to the one usually followed on stationary dials, or, more broadly speaking, in a reverse order to the direction of rotation. 12 designates a minute dial with sixty subdivisions, used in the ordinary manner in conjunction with a rotating minute hand 13, to furnish minutes readings, and in the present instance also used to furnish seconds readings in conjunction with second hand 14, which is co-axial with hand 13.

The readings on the hour dial could be obtained by means of a stationary adjustable hour hand 15, shown in dotted lines in Fig. 1, mounted on the glass 16; but I prefer to use a stationary adjustable circular shield 17, mounted on the case 18, and superimposed to said glass, provided with a window or opening 19 through which one of the figures on the rotating hour dial may be seen.

Minute dial 12, as explained, is stationary, and of the usual design, and therefore, for the sake of simplicity, I prefer to imprint or mark the same directly on the glass 16, as shown in the drawings.

In this manner I avoid the necessity of modifying the mechanism of the watch in order to permit free rotation of the hour dial without interference by the minutes dial; inasmuch as the hour dial, taking the place of the usual hour hand, is mounted on a central shaft, while the minute hand is mounted on a tubular shaft concentric thereto. Under these conditions, the only part of the structure on which a stationary dial may be mounted, outside of the crystal, is the case in which the entire mechanism is housed. However, it is desirable and convenient to mount the annular shield 17 directly adjoining the rim of the case, in order to cause it to register with a stationary graduation of longitude provided on said case, adapted to cooperate therewith in furnishing indications of standard time in various localities; therefore the crystal provides the most convenient means for carrying a minutes dial which is not likely to create confusion by interfering with the readings provided by the hour dial and the longitude graduation.

I accordingly provide on the face of the case, all around the shield, a graduation 20, comprising twenty-four subdivisions of fifteen degrees each, corresponding to the time belts; said graduation starting at a central point 21 indicating the Greenwich meridian, which is the starting meridian of the standard time system, and proceeding on each side thereof up to 180°, when the figures meet. The graduation at the right of the starting meridian is marked West, and the one at the left is marked East; and centrally to win-

dow or opening 19 a mark 22 is provided, adapted to register with any one of the marks on the longitude graduation on the case.

The standard time in any one of the time belts may be readily determined, simply by turning shield 17 to the point where mark 22 meets the mark on graduation 20 corresponding to the time belt in question. In Fig. 1 the shield is adjusted to the eastern standard time, which is the time of the meridian 75° west of Greenwich, and the reading is about 9 minutes of eleven o'clock; if the shield were turned so that mark 22 would register with the central meridian 21, the readings would give the Greenwich time, 9 minutes of four, five hours being the time difference between Greenwich and eastern standard time. Of course, when it is four o'clock in the afternoon at Greenwich, it is only eleven in the morning in New York, and to distinguish between a. m. and p. m. time, I prefer, when using a twenty-four hours dial divided into two sets of twelve, to use light figures for the a. m. indications, and heavy figures for the p. m., as shown in the drawing.

Shield 17 may be operated by means of a beaded rim 23, against which pressure of the finger tips may be applied; and if desired, the edge of said shield may be provided with notches 24 at proper intervals, adapted to be engaged by a spring controlled pawl 25, maintaining the shield at the position to which it is set. Pawl 25 however has a rounded tip 26 which will give way when the shield is caused to rotate by hand in order to adjust its position.

To complete the device, the marks of the longitude graduation may be extended around the edge and to the back of the case, as shown in Figs. 2 and 3, and suitable indications relative to important localities found in the relative time belts, may be inserted. Thus, it is seen that the meridians at 75, 90, 105 and 120 degrees west of Greenwich are marked Eastern, Central, Mountain and Pacific standard time respectively, while the names of important cities using the time of said meridians is engraved on the back of the watch case, at 27.

In Figs. 4, 5, 6, I illustrate a pocket timepiece which is substantially similar to the one just described, with the difference that the rotating dial 28 is a twelve hour dial, which may be made of glass or other transparent substance in order to make visible the seconds dial 29 underneath the same, on plate 30. The minutes dial 31 may also be on plate 30 if desired, or else the same may be printed directly on glass 32 like in the previous instance.

The use of a twelve hour dial naturally entails the use of a longitude graduation with only twelve subdivisions each corresponding to a time belt; but the same graduation may be used, as shown, for the meridians to the east and the meridians to the west of Greenwich, by marking the degrees in two oppositely running series on graduation 33, around the case 34, and adjacent to shield 35. Like in the previous case, shield 35 is provided with an opening or window 36, through which one of the figures of the underlying hour dial may be seen; and the same is also provided with a mark 37 corresponding to the center of said opening, adapted to register with the markings of the longitude graduation, and thereby to determine the time readings corresponding to the various time belts.

The edge and the back of the watch case may also preferably be utilized for indications relative to important localities to be found in the various time belts.

In Figs. 7 and 8, I illustrate a pocket timepiece similar to the one shown in Figs. 1, 2, 3, comprising a case 38, a rotating twenty-four hour dial 39, a minutes dial 40 marked directly on glass 41, a minute hand 42, a second hand 43 co-axial therewith, and an annular shield 44 provided with a window or opening 45 and a mark 46, and formed with a beaded rim 47 for its operation. Said shield is also shown provided with notches 48 along its edge, properly spaced, and co-operating with a spring controlled pawl 49 to hold the shield in its various positions. A longitude graduation 50 comprising twelve subdivisions 15° apart to the right and twelve subdivisions spaced 15° to the left of the central or Greenwich meridian, is provided around the face of the case, and used for the adjustment of the shield to furnish the readings of standard time of any standard meridian.

The feature differentiating the device illustrated from the preceding ones, is the addition of simple hand operated means for giving the readings of the day and date, through additional suitable openings which may be provided in shield 44; this addition having been suggested by the fact that except at the point where window 45 is, the shield 44 presents an uninterrupted blank annular surface, which may be conveniently utilized for additional useful indications, without undue interference with the main object, and without danger of confusion arising.

I have therefore provided annular shield 44 with an opening 51 through which the day of the month may be read, and another opening 52 through which the day of the week may likewise appear; and between shield 44 and glass 41 I have inserted a ring 53 with the markings of numbers from 1 to 31, adapted to register with opening 51, and a circular segment 54 of a smaller diameter, with the markings of the days from Monday to Sunday, adapted to register with opening 52.

The length of said segment is such that when the end at which Monday appears is underneath opening 52, the other end at which Sunday is marked does not quite reach open-

ing 45, so that the readings on the hour dial are always unhampered; and ring 53 has a narrow width, its inner diameter about registering with the outer edge of opening 45, the readings through which are thus not interfered with.

Segment 54 is operated by hand, by means of a circular beaded edge 55 integral therewith; and ring 53 is similarly operated by means of an inner beaded circular edge 56, connected to the same by a bridge portion 57, located so that when either extreme marking on ring 53, 1 or 31, is underneath opening 51, said bridge portion does not quite reach under opening 45 at one side or the other; thus assuring continuous non-interference with the readings through window or opening 45.

Ring 53 may also, if desired, be provided with edge notches 58, co-operating with a spring controlled pawl 59 to hold the ring at the set position.

The date readings thus obtained are changed by hand every day, and are a fit complement to the time readings normally provided by the timepiece.

The timepiece illustrated in Figs. 9, 10, is the exact counterpart of the one just described, with the further addition of means for adjusting the minutes readings. As stated in a previous paragraph, in certain cases, like on a ship at sea, local time is used for the daily routine, and in such cases the minutes readings vary from day to day and from place to place. The variations of time for the minor subdivisions of longitude are, as is well known, in proportion of four minutes for each degree of longitude; fifteen degrees of longitude corresponding to one hour, or sixty minutes of time.

Therefore, besides providing shield 60 with an outer mark 61 adapted to register with markings of longitude graduation 62, I also provide the same with an inner mark 63 central to window or opening 64; and instead of marking the minutes dial on the glass 65, I provide an additional ring 66 centrally and rotatably mounted thereon, adjustable by means of a beaded portion or rim 67 integral therewith, and bearing the minutes dial 68. Concentrically to said minutes dial, said ring 66 also bears a graduation 69 consisting of 15 subdivisions of 24° amplitude each, which stands for the longitude graduation corresponding to an hour in time. Each subdivision of the same corresponds therefore to four minutes difference in time. Said subdivisions are marked from 1 to 15 in both directions, one series being for the East and the other being for the West, and are adapted to register with marking 63 on the shield.

Said minutes dial can therefore be adjusted for fractional differences of longitude either way, by setting the same east or west of marking 63 on the shield; or else the same may be adjusted in relation to a mark 70 on the glass, made in correspondence of the Greenwich meridan. The minutes dial must be adjusted in the same direction as the shield; that is, for points west of the standard meridian used it must be turned to the right, while for points east it must be turned to the left, these movements producing respectively a retard and an advance in the readings of the minutes of time.

The usefulness of the device extends equally well to the furnishing of daylight saving time instead of standard time, when desired. For instance, if the timepieces shown in Figs. 7, 9, are normally set on eastern standard time, corresponding to the meridian 75° west of Greenwich, it is sufficient to set mark 46 or 61 to the next subdivision of longitude towards the east, that is at 60° west of Greenwich, as shown, in order to obtain the readings of daylight saving time.

From the foregoing it appears that I provide an arrangement for adjusting the readings of time furnished by a suitable timepiece to the geographical position of any locality in an extremely simple, yet thorough manner; and that the resulting device is so easily operated and understood as to represent a distinct improvement over other types of adjustable timepieces heretofore in use.

It is obvious that minor details of construction may vary from those shown without departing from the spirit of my invention; and therefore I reserve myself the right to carry my invention into practice in all those forms and manners which may enter, fairly, into the scope of the appended claims.

I claim:

1. In a timepiece of the class described, a case, a rotating hour dial, a fixed minutes dial, a longitude graduation on said case, concentric to said hour dial, limited to indications of standard meridians, and hour indicating means, independent of said minutes dial, adjustable in relation to said longitude graduation.

2. In a timepiece of the class described, a case, a rotating hour dial, a fixed transparent covering, a longitude graduation on said case, concentric to said hour dial, hour indicating means adjustable in relation to said longitude graduation, and a fixed minutes dial on said transparent covering.

3. In a timepiece of the class described, a case, a rotating hour dial, a fixed minutes dial, a longitude graduation on said case, concentric to said hour dial, limited to indictions of standard meridians, an annular shield adjustable in relation to said longitude graduation, covering said hour dial and provided with an opening disclosing one of the figures on said dial, and a mark on said shield adapted to register with said standard meridian indications.

NICOLA GIUSTO.