Dec. 10, 1935. E. R. FOWLER 2,023,677

TIME GLOBE

Filed Oct. 30, 1931 2 Sheets-Sheet 1

Fig. 1.

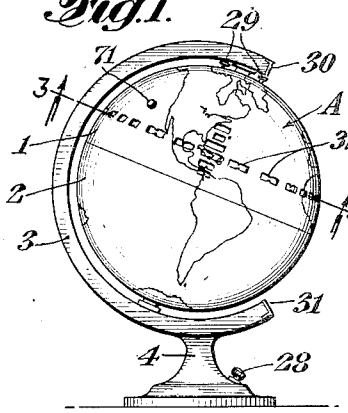

Fig. 2.

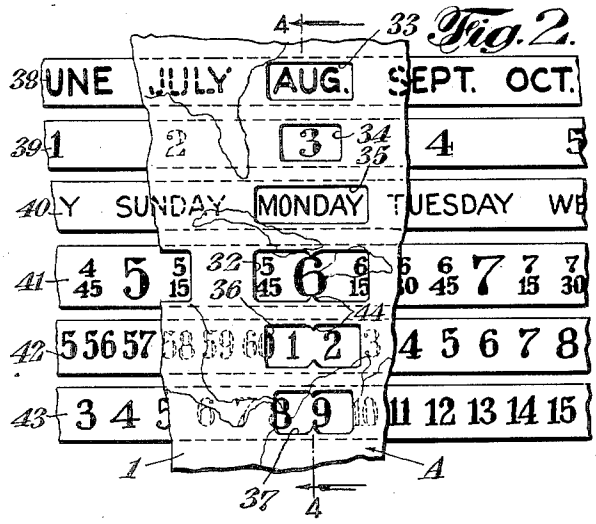

Fig. 3.

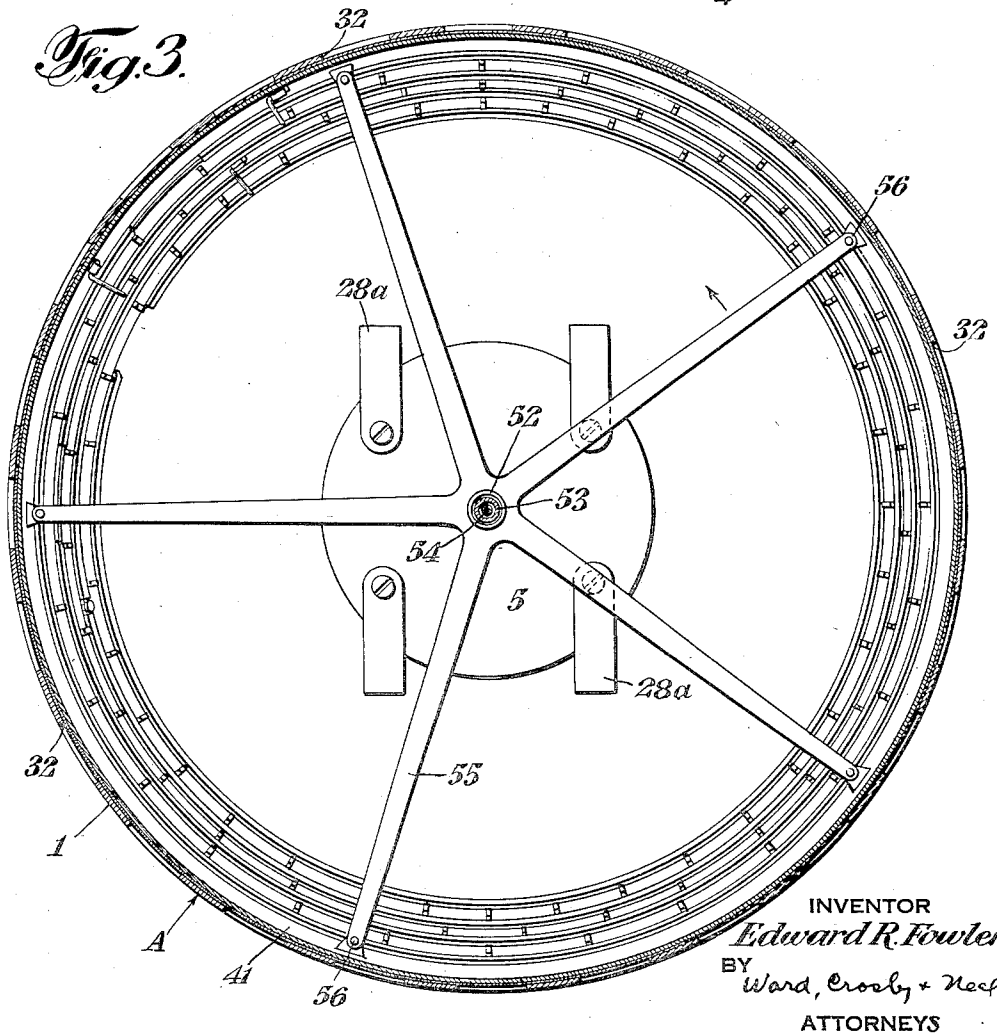

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Fig. 4.

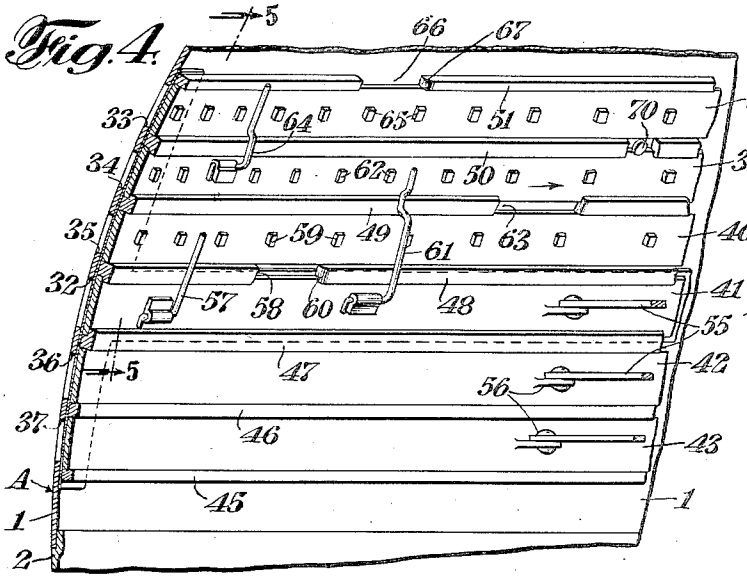


Fig. 5.

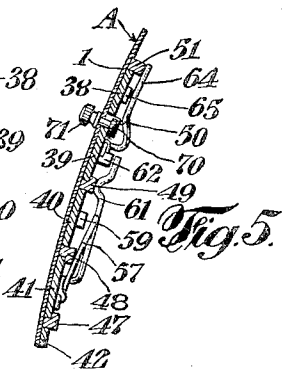


Fig. 6.

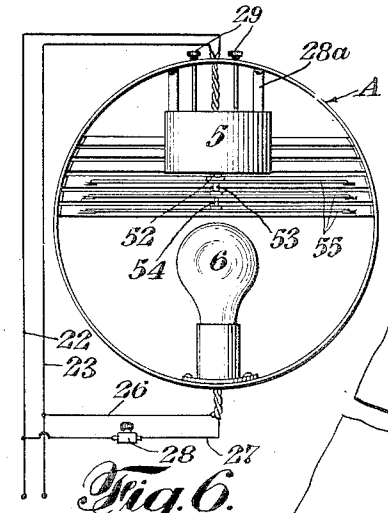
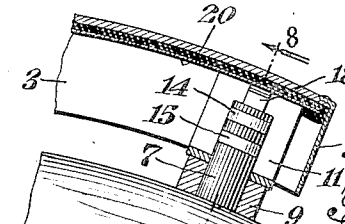


Fig. 7.



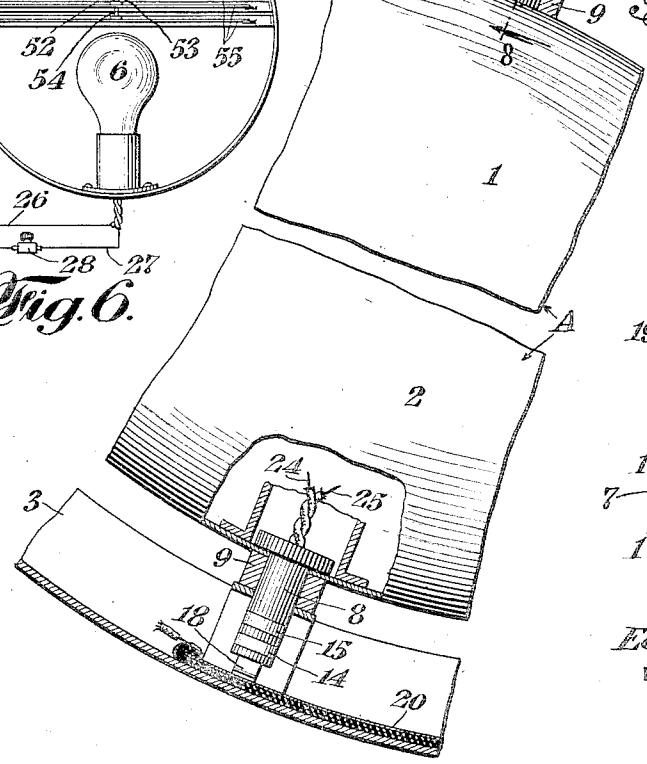
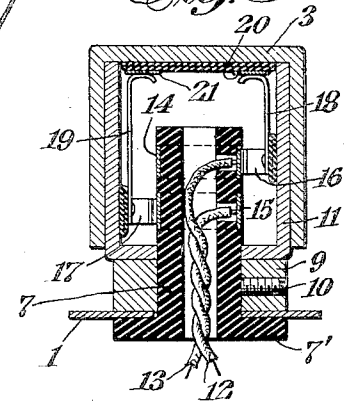


Fig. 8.



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Patented Dec. 10, 1935 2,023,677

UNITED STATES PATENT OFFICE

2,023,677

TIME GLOBE

Edward R. Fowler, Yonkers, N. Y.

Application October 30, 1931, Serial No. 572,027

12 Claims. (Cl. 58—44)

My invention relates to improvements in time globes or clocks in which moving bands or dials in conjunction with an ordinary terrestrial globe, ball, cylinder or other shaped case, either stationary or revolving, are made to show the month, date, day and time in the time zone in which the globe or clock is located and the correct time at the various time zones of the earth, or the same time and date at various points of a pedestal clock such as used at information booths or on pinnacles or steeples of buildings.

This clock when used with a terrestrial globe will show at any predetermined location such as the Eastern time zone, the month, day of month, day of week, hour of day in quarters, and the exact minute and second. At the same time it will show the hour (in quarters) at each of the other twenty-three time zones of the earth.

Furthermore, all irrelevant or inaccurate sections of the various time bands are concealed from view and the rotation of the globe and the adjustable tilting of its axis does not affect the operation of the clock or the accuracy of the time information.

The clockwork may be of any conventional type but preferably of the standard electric synchronous type with suitable gear reduction to compensate for the multiple sets of time information on the time bands. It is preferred to use a clock mechanism in which the hands are made to turn counterclockwise by any suitable means.

Where the device is used in conjunction with a terrestrial globe, all of the calendar and time information will be visible naturally as printed in type from the month of the year down to the seconds. This information in its entirety will appear at that time zone in which the clock is to be stationed and used, this being accomplished by the proper affixation of the map on to the perforated globe shell. The openings at the other time zones show only the hour band with its quarter hours, and day or night, as well understood, may be indicated by the shading of this band.

I attain these results by the mechanism illustrated in the accompanying drawings, in which

Fig. 1 shows a time globe constructed in accordance with my invention for use in the time zone in which New York City is located;

Fig. 2 shows the portion of the globe in which the calendar and time apertures are located and portions of the calendar and time bands;

Fig. 3 is a section through the hour apertures as indicated by line 3—3 of Fig. 1;

Fig. 4 is an interior view of portions of the calendar and time bands in the globe showing the transfer mechanisms between the hour and day and date bands, and between the date band and the month band, and means for manually advancing the date and month bands;

Fig. 5 is a section on the line 5—5 of Fig. 4;

Fig. 6 is a diagrammatic view of the globe calendar and time bands and the lamp and the circuit diagram for the clock and lamp;

Fig. 7 is a vertical view through the means for mounting the globe in the meridian and shows the circuit connections, and

Fig. 8 is a cross section on the line 8—8 of Fig. 7.

In the drawings I have illustrated a preferred embodiment of my invention which includes a globe A preferably made of upper and lower hemispherical sections 1 and 2 in the usual manner, the sections being covered by a map of the world. It is within the purview of my invention to draw or print the map directly on the surface of the shell, or apply a printed map on the surface of the shell as usual. A satisfactory modified construction of the latter consists in cutting out the portions of the map overlying the apertures in the shell and in securing such portions or larger duplicates thereof on the inner surface of the shell over the apertures. This globe is supported for rotation, by means which will be described more specifically later, in a meridian 3 which may be of any usual suitable construction except as to features later pointed out and which is supported on a base 4 of any suitable construction, such for example as illustrated in Fig. 1.

I prefer to make the meridian support 3, as illustrated in Figs. 7 and 8, of channel construction which communicates with the interior hollow portion of the base 4 into which the wires carrying the current for operating the clock 5 and for energizing a lamp 6 are led by any suitable plug and socket devices or in any other desired manner. The upper and lower hemispherical sections 1 and 2 of the globe A are provided at points corresponding to the north and south poles with apertures which receive the inner ends of short shafts of non-conducting material 7 and 8 which are of identical construction so that a description of one will suffice. The shaft 7 is provided with a shoulder 7′ which engages the inner surface of the section 1, as shown in Fig. 8, and which is held against such section by means of a collar 9 on the shaft 7, preferably held in place by a set screw 10.

The shaft 7, as shown in Fig. 8, is rotatably mounted in a channel shaped member 11 which is slidable within the channel of the meridian 3

and may be constructed to engage it frictionally so as to be held in any position into which it is moved as the globe is adjusted with respect to the vertical on the meridian 3.

Identical means is employed for securing the shaft 8 to the lower hemispherical section 2 and to rotatably and slidably support it in the meridian 3, as the means described in connection with the shaft 7. By means of this construction the globe, as is evident from Fig. 1, may be orientated to any desired angle within the limits provided, as is apparent from Fig. 1. It is obvious, of course, that the meridian 3 may be made as a continuous circle, if desired, which would increase the limits within which the globe could be tilted.

As stated before, the clock used is preferably an electrical synchronous clock and it is also preferable to provide a lamp in order that the information may be read readily at any time of the day or night, and that also the map may be continued across the apertures, if so desired.

As indicated in Fig. 6, the circuit wires for the clock are preferably brought in through the top of the globe, while the circuit wires for the lamp are brought in through the bottom of the globe. For this purpose both of the shafts 7 and 8 are hollow so as to form conduits for the circuit wires, as indicated in Figs. 7 and 8. As shown in Fig. 8, the terminal wires 12 and 13 for the clock 5 are preferably connected to conducting rings 14 and 15 suitably supported on the shaft 7. If the shaft is made of conducting material the conducting rings 14 and 15 are suitably insulated from each other and from the shaft 7. Spring brushes 16 and 17 suitably supported on the walls of the channel member 11 and insulated therefrom by any suitable means cooperate respectively with the rings 14 and 15. The spring brushes 16 and 17 are in electrical connection with brushes 18 and 19 which cooperate with conductor ring sections 20 and 21 suitably supported on the inner face of the meridian 3 and insulated therefrom by any suitable means. Circuit connections from a source of supply are connected respectively to the rings 20 and 21, such circuit connections being indicated in Fig. 6 as 22 and 23 and which, as is obvious from Fig. 1, may lie in the channel of the meridian 3 and extend into the base member 4.

As indicated in Figs. 6 and 7, the wires 24 and 25 connected to the terminals of the lamp filament may be connected to the corresponding circuit wires 26 and 27 in the base in the same manner in which the connection is made from the clock. It may be desirable to provide a switch button 28 in the lamp circuit, as indicated in Figs. 1 and 6. By means of the construction so far described it is possible to employ a globe of ordinary construction and to mount it for rotation and orientation in the meridian 3 so that the same may be rotated and orientated without affecting any of the circuit connections leading to the clock and lamp.

While I have shown and described an electric clock as the time mechanism it is obvious, of course, that a mechanical clock can be employed if so desired. The clock may be suspended from the upper section by means of straps 28a and manipulative means for starting the clock and setting the time may be extended out through the upper section, as indicated at 29 in this figure. All of the mechanism, except the lamp, may be located in the upper section and limiting members 30 and 31 on the meridian 3 may be made removable so that the globe can readily be dismounted from the pedestal and the sections disconnected for permitting access to the lamp and the clock and time bands.

As indicated in Fig. 1, the globe is provided with a series of twenty-four apertures 32 extending around the circumference, preferably in the position indicated in Fig. 1. In vertical alignment with any one of these apertures there are apertures 33, 34 and 35 through which the month, date and day of the week respectively may be displayed, and below the aperture 32 are apertures 36 and 37 through which minutes and seconds may be displayed. If the globe is built for use in New York for example, the map will be applied to the globe so that the apertures 33, 34, 35, 36 and 37 and one of the apertures 32 will lie at the center of the time belt in which New York city is located. For any other city in any other time belt the map will be applied so that these apertures will be located at the center of the time belt in which the globe is used. I may apply the map in the usual manner and have it cover all the apertures on the globe in order that the map may be complete and the globe may be used as an ordinary terrestrial globe, if desired, The globe is usually made of thin material so that the distance between the inner surface of the globe and the outer, or other material on which the map is printed, will be very short.

Diffusion of light through the portions of the map covering the apertures makes it difficult to read the indicia. The diffusion may be substantially eliminated by cutting out such portions and then securing such portions or duplicate enlarged portions over the apertures on the inner surface of the globe. In addition, the increased slope of the globe from the Equator upwardly relative to the axis of rotation about which it moves when being examined has been found to make it difficult to clearly view the indicia through the transparencies of said openings unless the indicia are closely proximate to the inner surface of the transparencies. This has been accomplished by forming the individual indicia-carrying bands having substantially the same slope as the adjacent portions of the globe, i. e. the side of the band nearest the pole being of smaller diameter than the side of the band nearest the Equator; and in the preferred embodiment the contour of the band conforms substantially to a sector of a sphere.

For the purpose of displaying the calendar and time information I employ a circular band for each item of information to be displayed. As shown in Figs 2 and 4, the band 38 carries the names of the months, the band 39 the dates of the month, the band 40 the days of the week, the band 41 the hours and quarter hours, the band 42 the minutes, and the band 43 the seconds. Each of these bands may consist of relatively thin material which may be stenciled, or the material of the bands may be preferably transparent and the numbers and days of the week and the names of the months may be suitably printed thereon. The month band 33 may be provided with the names of the months in three series, the date band 39 may be provided with one series of numbers 1 to 31, the band on which the names of the days of the week are printed may carry four series of such names, the hour band may carry two series of numbers 1 to 12, the minute band may be provided with two series of numbers 1 to 60, and the second band may be provided with two series of numbers 1 to 60.

I prefer, in connection with the hour band, when used in a terrestrial globe, to indicate the quarter hours by printing the quarter hour below the hour, such as

$$\frac{6}{15,}\ \frac{6}{30,}\ \frac{6}{45,}$$

which may be read as 6:15, 6:30, 6:45 without any confusion. By doing this I can make the aperture **32** of such an extent as to avoid any confusion in reading the hour shown through such aperture. As the second, minute and hour band travel continuously I preferably provide indicating pointers at the top or both top and bottom of the apertures, as indicated at **44**, Fig. 2.

As indicated in Fig. 4, the various bands are shaped to conform to the globe and are of a size to lie substantially in contact with the inner surface of the globe. As the second, minute, day and month bands do not communicate driving power to any other bands they may be suitably guided between parallel faces on rings **45**, **46**, **47**, **48**, **49**, **50** and **51**. As the hour band **41** drives the day and date bands and through the latter the month band it is desirable to provide the guiding rings **47**, **48**, **49** and **50** with flanges overlapping the hour band **41** and the date band **39** so that these rings under driving load will not tend to distort and draw away from the inner surface of the globe.

As indicated in Fig. 6, the clock **5** is provided with concentric shafts—an hour shaft **52**, a minute shaft **53** and a second shaft **54**. Connected to each of these shafts is a five spoked spider such as indicated at **55**, Fig. 3. The outer ends of the spokes may be connected to the respective band as indicated at **56**, Fig. 3, which shows the hour spider connected to the hour band **41**. Any other kind of connection may be used between the spiders and the respective bands. The second band **43** will be rotated once every two minutes, the minute band once every two hours, and the hour band every twenty-four hours. These bands are driven from the clock through the concentric shafts in the usual manner. As the hour band completes its rotation a spring transfer arm **57**, Fig. 4, snaps into the cutout portion **58** of the ring **48**. As it moves into this cutout portion it engages behind one of a series of lugs **59** carried by the day band **40**. As the hour band moves through a distance representing one hour it moves the day band one step to change the day of the week displayed through the opening **35**. At the completion of this required amount of movement the transfer arm **57** is cammed out of the cutout portion by a cam **60** on the ring **48** and is thereby disengaged from the lug **59** on the day band **40**. By means of this construction the day of the week is shifted every twenty-four hours.

As stated before, the date band **39** carries the numbers 1 to 31 and this band is operated from the hour band at intervals of twenty-four hours to change the date of the month. The mechanism includes a transfer arm **61** which is mounted on the hour band **41** and extends over the date band **39** clearing the lugs **59** on the day band **40** and being constructed to engage behind lugs **62** on the date band **39** as the arm **61** is carried forward into the recess **63** in the guiding ring **49**. The construction is such that the date will be advanced once for every change of day at intervals of twenty-four hours.

For the purpose of displaying the month and for automatically effecting the shifting of the month band **38** I have provided a transfer mechanism which will shift the month band as the date band is shifted from 31 to 1. This mechanism comprises a transfer arm **64** mounted on the date band **39** and adapted to engage behind lugs **65** on the month band **38** as it is moved into the recess **66** in the guiding ring **51**. It will remain in this recess long enough to carry the month band one step after which it will be cammed out by a cam **67** on the guiding ring **51**. The shifting of the month band is automatic in cases in which the instant month has thirty-one days. To take care of other cases in which the instant month has twenty-eight, twenty-nine or thirty days I provide a rotatable friction disk **70** which may be frictionally engaged with the date band by pulling on a knurled finger piece **71**, Fig. 1, and which upon rotation may cause the date band to advance one, two or three steps, depending upon the difference between thirty-one and the number of days in the instant month.

I have also contemplated makng the shell of transparent material and affixing the map to the inner surface of the shell. In this case the reading point or openings may be circumscribed by a line or shading or may be indicated by a dark band provided with pointers. When a shell of ground glass or translucent composition is used, the reading points of the shell may be transparent and the outer surface may receive any other permanant or transient information in writing or otherwise, in relation to the terrestrial information on the map made visible through the shell.

It is obvious, of course, that the date band may be shifted manually without shifting the month band to correct the date as, for example, where in the absence of or neglect by the user the month band was not shifted manually when required through shifting of the date band at the end of a month of less than thirty-one days. In this case the month band will exhibit the correct month, but the date band will indicate too low.

It is obvious that my invention may be applied to a conventional clock and that if desired I may employ suitable transfer mechanism to drive the minute band intermittently from the second band, and the hour band intermittently from the minute band.

At time belts other than that in which the time globe is used, the indication in quarter hours which I have provided, generally indicates the time as accurately as desired. The correct time at any time belt may, however, be read by reading the quarter hour at this time belt in connection with the minute and second band exhibited in the time belt in which the time globe is used. By designating the hour and quarter hour as shown, there can be no confusion as to the hour and quarter hour at any of the time belts.

While I have shown one form of invention which I regard now as acceptable and a preferred form, it is understood, however, that the principles of the invention may be carried out by different embodiments, and that it is not my intention to limit the claims to the specific construction disclosed.

What I claim is:

1. In a time globe provided with a series of aligned vertically spaced apertures through which may be displayed time and calendar information, a map printed or otherwise affixed thereon in such a manner that the apertures will lie at the center of the time belt of the locality in which the time globe is used, and means located within the globe carrying time and date information cooperating with said apertures.

2. In a time globe provided with a series of aligned vertically spaced apertures through which may be displayed time and calendar information, a map printed or otherwise affixed thereon in such a manner that the apertures will lie at the center of the time belt of the locality in which the time globe is used, means located within the globe carrying time and date information cooperating with said apertures, one of said apertures displaying the hour, and other hour apertures located in the remaining time belts in line with said first hour aperture.

3. The combination with a globe provided with a plurality of apertures spaced vertically and disposed outwardly from the equator a substantial distance toward a pole of said globe and through which information may be displayed, information carrying bands of substantially circular form within the globe, the side of each of said bands nearest said pole being substantially smaller in diameter than the side nearest the equator, and means for supporting said bands for movement across said apertures.

4. The combination with a time globe, of a series of vertically spaced apertures through which may be displayed the hour, minute and second of time and with a continuous circumferential series of hour apertures in line with said hour aperture, each of said hour apertures being located within a time belt, and hour, minute and second bands supported within said globe for movement past said vertically spaced apertures, said hour band being constructed as a section of a smaller globe and of a size to lie substantially in contact with the inner surface of the globe to cooperate with said hour apertures.

5. The combination with a time globe having a translucent portion spaced a substantial distance from the equator toward a pole of said globe, of an information carrying band of substantially circular form positioned opposite said portion and having the side nearest said pole of relatively smaller diameter than the side nearest said equator so as to permit said band to lie closely contiguous to the inner surface of said translucent portion, means for supporting said band in position within said globe, and means for operating said band to bring said information closely adjacent to said translucent portion.

6. The combination of a time globe, of an hour band and a day band, said bands conforming in shape to sections of said globe and of a size to lie substantially in contact with the inner surface of said globe, a clock mechanism for driving said hour band, and a transfer mechanism operated by said hour band for moving said day band at time intervals of twenty-four hours.

7. The combination with a time globe, of an hour band and day and date bands, said bands conforming in shape to sections of said globe and of a size to lie substantially in contact with the inner surface of said globe, a clock mechanism for driving said hour band, and a transfer mechanism operated by said hour band for moving said day and date bands at time intervals of twenty-four hours.

8. The combination with a time globe, of an hour band and day, date and month bands, said bands conforming in shape to sections of said globe and of a size to lie substantially in contact with the inner surface of said globe, a clock mechanism for driving said hour band, a transfer mechanism operated by said hour band for moving said day and date bands at time intervals of twenty-four hours, and a transfer mechanism carried by the date band for operating said month band to change the month.

9. The combination with a time globe, of an hour band and day, date and month bands, said bands conforming in shape to sections of said globe and of a size to lie substantially in contact with the inner surface of said globe, a clock mechanism for driving said hour band, a transfer mechanism operated by said hour band for moving said day and date bands at time intervals of twenty-four hours, a transfer mechanism carried by the date band for operating said month band to change the month, said last mentioned transfer mechanism being adapted to operate at date intervals of thirty-one days, and means accessible from the exterior of the globe for operating said date band to change the month when the days of the instant month are less than thirty-one in number.

10. The combination with a time globe, a meridian for supporting said globe, a rotatable and slidable connection between said globe and said meridian whereby the globe may be rotated and orientated in the usual manner, time information bands located within the globe an electric clock mechanism located within the globe for driving said time bands, and electrical connections for operating said clock extending through said rotatable and slidable connection between the globe and the meridian.

11. The combination with a time globe, a meridian for supporting said globe, a rotatable and slidable connection between said globe and said meridian whereby the globe may be rotated and orientated in the usual manner, time information bands located within the globe, an electric clock mechanism located within the globe for driving said time bands, electrical connections for operating said clock extending through one of said rotatable and slidable connections between the globe and the meridian, a lamp within said globe, and electrical connections for said lamp extending through the other of said rotatable and slidable connections between said globe and said meridian.

12. In a combination time and geographical device, a body having a series of vertically spaced translucent portions through which may be displayed indicia of said device, the outer surface of said body depicting a geographical map lying in part over said portions, said portions being arranged in a series contiguous to the center of a predetermined time belt, relatively movable means positioned adjacent the inner surfaces of said translucent portions and carying said indicia positioned respectively opposite and closely proximate to said translucent portions, and means for moving said indicia carrying means in timed relationship to the areas of said map lying over said vertical series of translucent portions.

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