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DIAL ATTACHMENT FOR CLOCKS

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Fig. 1.

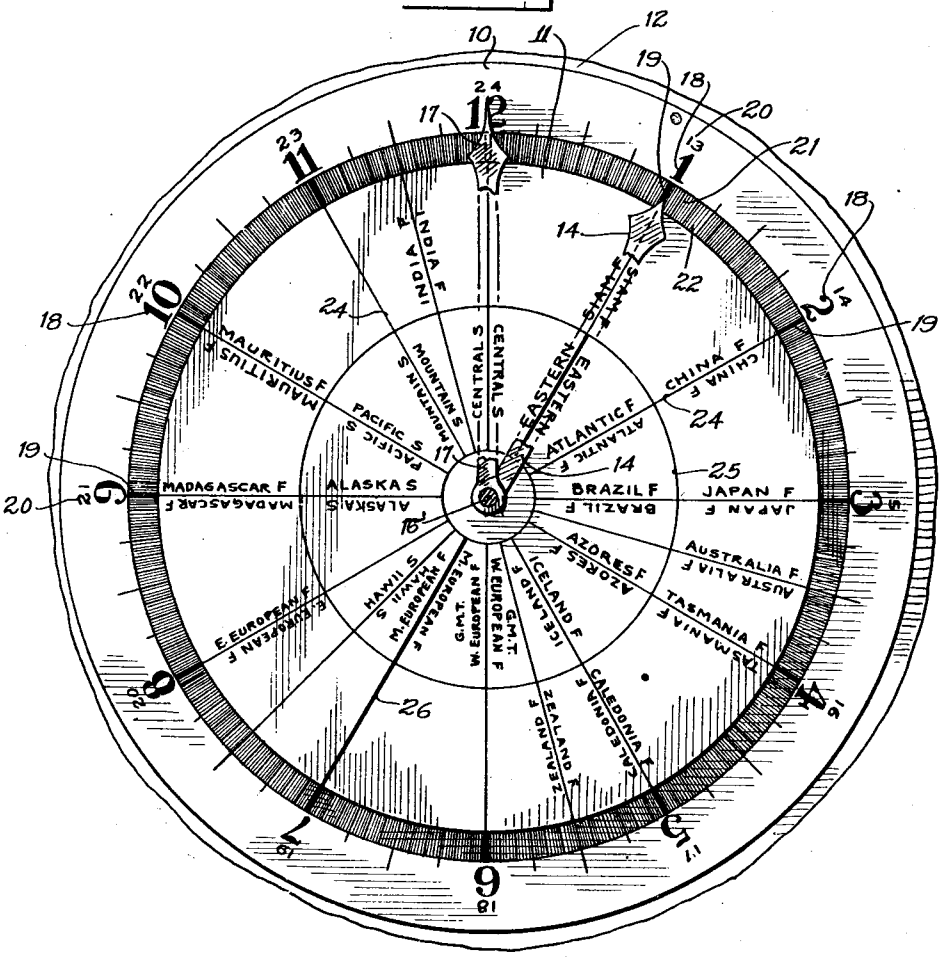


Fig. 2.

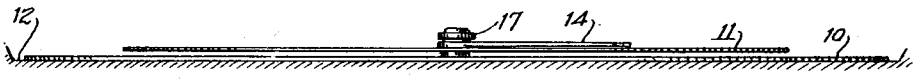
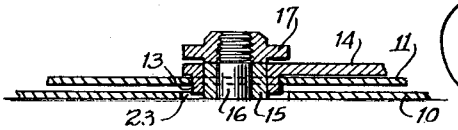


Fig. 3.



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UNITED STATES PATENT OFFICE.

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DIAL ATTACHMENT FOR CLOCKS.

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The present invention relates to indicators, and more particularly to a device for use in connection with a clock for showing the different times at different parts of the earth relatively to the time for which the clock is set.

An object of the present invention is to provide a pair of dials for attachment to the front of an ordinary clock, one dial for permanent mounting on the clock and corresponding to the usual dial and its setting on the clock, and the other dial adapted for attachment to the hour hand to turn therewith for movement with the clock and for indicating with respect to the fixed dial corresponding times in different parts of the world with reference to the time indicated by the clock.

Another object of the invention is to provide a dial for fixed attachment to a clock and which is divided into major divisions corresponding to the twelve hours of the clock and marked correspondingly, and which has each one of its twelve divisions marked into twelve subdivisions indicative of five minute intervals and further subdivided to provide sixty divisions in each major division indicative of the sixty minutes in each hour, and a second dial carried by the hour hand to turn therewith and provided with delineations thereon and radial index lines for various localities and with designations associated therewith to show whether the indicated time in such localities is slower or faster than the time indicated by the hour hand.

A further object of the invention is to provide a fixed dial for a clock and a removable dial for attachment to the hour hand to turn therewith, the removable dial being susceptible of interchange with similar dials having the delineations and designations arranged according to the different particular standard times throughout the world for cooperation with the fixed dial.

The above and various other objects and advantages of this invention will in part be described in, and in part be understood from, the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawing, wherein:

Fig. 1 is a face view of a clock showing a pair of dials constructed according to the present invention applied thereto, the hands of the clock shown partly broken away for illustrating the parts of the dial beneath the hands.

Fig. 2 is an edge view of the same, and

Fig. 3 is a fragmentary enlarged section taken through the central portion of the dials and the arbors or shafts for the hands of the clock.

The device comprises two dials, 10 and 11, the dial 10 for fixed attachment upon the face of a clock 12 while the dial 11 is removably fitted upon and to turn with the hub portion 13 of the hour hand 14 of the clock which is mounted in the usual manner upon a hollow shaft 15. The central shaft 16 of the clock passes through the hollow arbor or shaft 15 and carries thereon the minute hand 17 of the clock.

The fixed dial 10 is of suitable peripheral form to fit against the face 12 of the clock and is provided with a circular row of equidistantly spaced major numerical designations 18 which are twelve in number and are designated according to the usual clock markings indicating the hours of one to twelve. These markings or indications are made relatively large and heavy so as to predominate other data and markings placed on the dials, and are accentuated, preferably, by a relatively heavy radial division line 19, one for each designation 18.

The dial 10 is also provided with an outer circular row of minor numerical designations 20 which show consecutive hour advancements from the twelfth hour and numerically progress from the hour designation one and begin with the number thirteen. The dial 10 is also provided, between each pair of main division lines 19 with twelve equal spaces defined by five minute division lines 21 to show on the dial 10 the five minute positions of the hour hand 14, and these radial division lines 21 are positioned upon the dial such as to be traversed by the pointer of the hour hand 14 and to extend radially beyond the same. The five minute divisions are also subdivided by minute indicating lines 22 into minute divisions adapted to be traversed by the hour hand 14 so that calculations may be made at least to the minute for the different times shown by the dial 11.

The fixed dial 10 is provided with a relatively large central opening 23 for freely receiving therethrough the arbors 15 and 16 and the hub 13 of the hour hand.

The travelling dial 11 is of a diameter

such that its outer circular edge terminates at the inner ends of the radial division lines 19, 21 and 22 of the fixed dial 10 so that the latter are exposed. The dial 11 is provided with a plurality of radial index lines 24 which extend from the central portion of the dial 11 to its edge and which are adapted to radially align with the division lines on the dial 10 for accurately comparing the relative positions of the index lines 24 with reference to the designations on the dial 10. The dial 11 is divided into inner and outer sections by a circular division line 25, concentric to the dial 11 and intersecting all of the radial index lines 24.

Each index line 24 is provided with a time or meridian designation in either one or both of the divisions of the dial 11, and by way of example the radial index line 24 which registers with the second hour designation 18 in Figure 1, is provided with the designation "China F" in the outer division or space of the dial 11 and is also provided with the designation "Atlantic F" in the inner space or section of the dial 11. The divisions between the lines 24, the circular line 25 and the outer edge of the dial 11 represent time twelve hours in advance of or subsequent to the base time, plus one hour for each full division to the point desired. For instance, to determine "China" time the dial indicates "China" time one division in advance of the base time; therefore, "China" time is twelve plus one or thirteen hours in advance of the base time.

On the other hand, the divisions inside of the circular line 25 represent integral hours in advance or subsequent to the base time 26. For instance, the base time is shown as "eastern" time, and if it is desired to determine what hour it is at "Atlantic" time, it is noted that "Atlantic" time is one division or hour from "eastern" time, and the letter "F" determines that the hour is one hour in advance of "eastern" time. The divisions therefore determine the number of hours the determined time is from the base time, whereas the character "S" or "F" determines whether the desired time is in advance or subsequent to the base time. The central portion of the dial 11 is provided with a relatively small opening for frictionally receiving therethrough the hub 13 of the hour hand 14 so that the dial 11 is supported upon the hub of the hour hand and moves as a unit therewith.

The fixed dial 10 may be of paper having the indicia and division lines printed thereon, and the paper may be pasted over the face of an ordinary clock with which the attachment is to be used.

The travelling dial 11 may be a circular disk of thin cardboard having the index lines and the circular division lines together with other data printed thereon to show the different standard times used throughout the world. This dial 11 has the small central opening to fit tightly upon the shaft or hub of the hour hand. The dial 11 may be provided with a diametrically extending heavy line 26 extending across both the inner and outer sections or divisions of the dial and dividing the same into four semi-circular divisions disposed concentrically in pairs. This main division line 26 indicates the meridian or central line adapted to be adjusted in register with the hour hand 14 when fitting the dial thereto, and also determines the relative positions of the radial index lines 24 with respect to the standard time of the clock upon which the device is used. There may be a separate dial 11 for each principal standard time in the world so that the clock may be used in different parts of the world, or the attachment be applied to clocks located in different parts of the world.

In use, the travelling dial 11 is mounted on the hour hand 14 or its shaft with the main division line 26 in longitudinal or radial alignment with the hour hand 14. The disk 11 is thus moved with the hour hand so that the radial index lines assume different positions with respect to the indications on the dial 10.

In reading this world time indicator, and referring to Fig. 1, the dial 11 is for eastern standard time as the designation of the main division line 26 shows. Thus, when it is 1 p. m. for eastern time as shown in Fig. 1, it will be 6 p. m. for western European time, 7 p. m. for middle European time, 7.30 a. m. for Hawaii time, and 8 p. m. for eastern European time. These times are quickly calculated by reference to the major and minor circular rows of numbers 18 and 20 on the dial 10 and by noting that all the times that are up to and including six hours fast or slow with respect to the time for which the dial is made, are read directly from the circular row of large numbers 18. It will also be noted that to read from the dial 11 it is only necessary to remember that if eastern or central standard time is being used, there is a difference of twelve hours for all times on the outer circular row of world times in the outer section of the disk 11, which must be algebraically added to the time shown by the clock or large numbers 18 corresponding to the time on the inner circular row of times. From Fig. 1, it is therefore seen that when it is noon, eastern standard time, it will be three o'clock p. m. in the Azores, and three a. m. of a new day in Tasmania, as both of these times are faster than eastern standard time.

For dials made for mountain time, there will be twenty four hours different for Zealand time, and for dials made for Pacific time there will be a difference of twenty four

hours for Zealand and Caledonia times. In these cases this difference will have to be added as above described. The outer circular row of numbers 20 assists in determining these added times by indicating the hours to be added to the hour number 18 shown by the hour hand 14 at the time of reading.

The divisions between the lines 24, the circular line 25, and the center of the dial 11 contain the names of standard times which are on that half of the earth of which the standard time for which the dial is made, is the center. For instance, in the example shown, the dial is for eastern standard time. That is, it could well be used in Washington, D. C., or any place having eastern standard time. It will be noted that the times delineated in the inner section of dial 11, such as Atlantic, Brazil, Azores, Iceland, and W. Europe, are all in the inner section of the dial, and considering the meridian of eastern standard time as the center, these are all on the half of the world of which such meridian is the center and all are east of such meridian, all being marked with an "F" to show that the time is fast or after the eastern standard time. It will be noted that this inner division also contains central, mountain, Pacific, Alaska and Hawaii, all of which are west of the meridian for eastern standard time and all on the half of the earth of which said meridian is the center. In the example shown all of these are marked with an "S" indicating that the time is slow or before the eastern standard time. All times delineated in the outer section of the dial 11 are on the half of the earth opposite the half of which the meridian for eastern standard time is the center.

With this in mind the user may determine the time of the day such as noon, midnight, a. m., or p. m., in the countries having the times delineated, it being obvious that if the selected country is in the inner section of the dial it is on the hemisphere of which the time for which the dial is made, is the center. If the selected country is in the outer section it is on the opposite hemisphere.

While, in the example shown, all the times in the inner section of dial 11 and to one side of the line 26 are marked "F" and those to the other side "S", this would not always apply. A dial made for Pacific time would show "Alaska S"; "Hawaii S"; New Zealand F" and "Caledonia F" to one side of line 26 and in the inner section of the dial, since, with the meridian for western standard time, both New Zealand and Caledonia are to the west of such meridian and on the half of the earth of which such meridian is the center, but time there is fast or before that of such meridian, the international date line extending as it does, between New Zealand and Hawaii.

It is of course understood that various changes and modifications may be made in the details of construction and marking of the dials to adapt the same for use in different parts of the world and for making more or less minute readings, of the times to be calculated, such changes and modifications being contemplated as within the spirit of the invention and limited only by the scope of the following claims.

What is claimed is:

1. A dial attachment for clocks comprising, a fixed dial including the twelve hour delineations of a clock, and a dial coaxial and movable with respect to said fixed dial and having delineated thereon radial lines, a circular line dividing the movable dial into inner and outer sections, a diametrical heavy line to point to any of the delineations of the fixed dial and to indicate time and meridian for a certain selected standard, indicia in the inner section of the movable dial and associated with said radial lines to designate other standard times of localities that are on the half of the earth of which said meridian is the center, said indicia pertinent to the other standard times arranged relative to said heavy line so that those east of the said meridian are to one side of the heavy line and those west of the meridian are to the other side of said heavy line, indicia in the outer section of said movable dial and associated with said radial lines to indicate other standard times of localities that are on the opposite half from the first mentioned half of the earth, and markers associated with each of said indicia pertinent to other standard times to indicate whether the time is fast or slow relative to the selected standard.

2. A dial attachment for clocks comprising, a fixed dial including the twelve hour delineations of a clock, and a dial coaxial and movable with respect to said fixed dial and having delineated thereon radial lines, a circular line dividing the movable dial into inner and outer sections, a diametrical heavy line to point to any of the delineations of the fixed dial and to indicate time and meridian for a certain selected standard, indicia in one of said sections of the movable dial and associated with said radial lines to designate other standard times of localities that are on the half of the earth of which said meridian is the center, said indicia pertinent to the other standard times arranged relative to said heavy line so that those east of the said meridian are to one side of the heavy line and those west of the meridian are to the other side of said heavy line, indicia in the other section of said movable dial and associated with said radial lines to indicate other standard times of localities that are on the opposite half from the first mentioned half of the earth, and markers associated with each of said indicia pertinent to other standard times to indicate whether the time

is fast or slow relative to the selected standard.

3. A dial attachment for clocks comprising, a fixed dial including the twelve hour delineations of a clock, and a dial coaxial and movable with respect to said fixed dial and having inner and outer sections, and a pointer for cooperation with the delineations of said fixed dial to indicate a base standard time and a selected meridian, indicia in one of the sections of said movable dial to designate other standard times of localities that are on the half of the earth of which said meridian is the center, said indicia pertinent to the other standard times arranged relative to the axle of said pointer so that those east of the meridian are to one side of said axis, and those west of the meridian are to the other side of said axis, indicia in the other section of said movable dial to designate other standard times of localities that are on the opposite half from the first mentioned half of the earth, and markers associated with said indicia to indicate whether the time is fast or slow relative to the base standard time.

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