

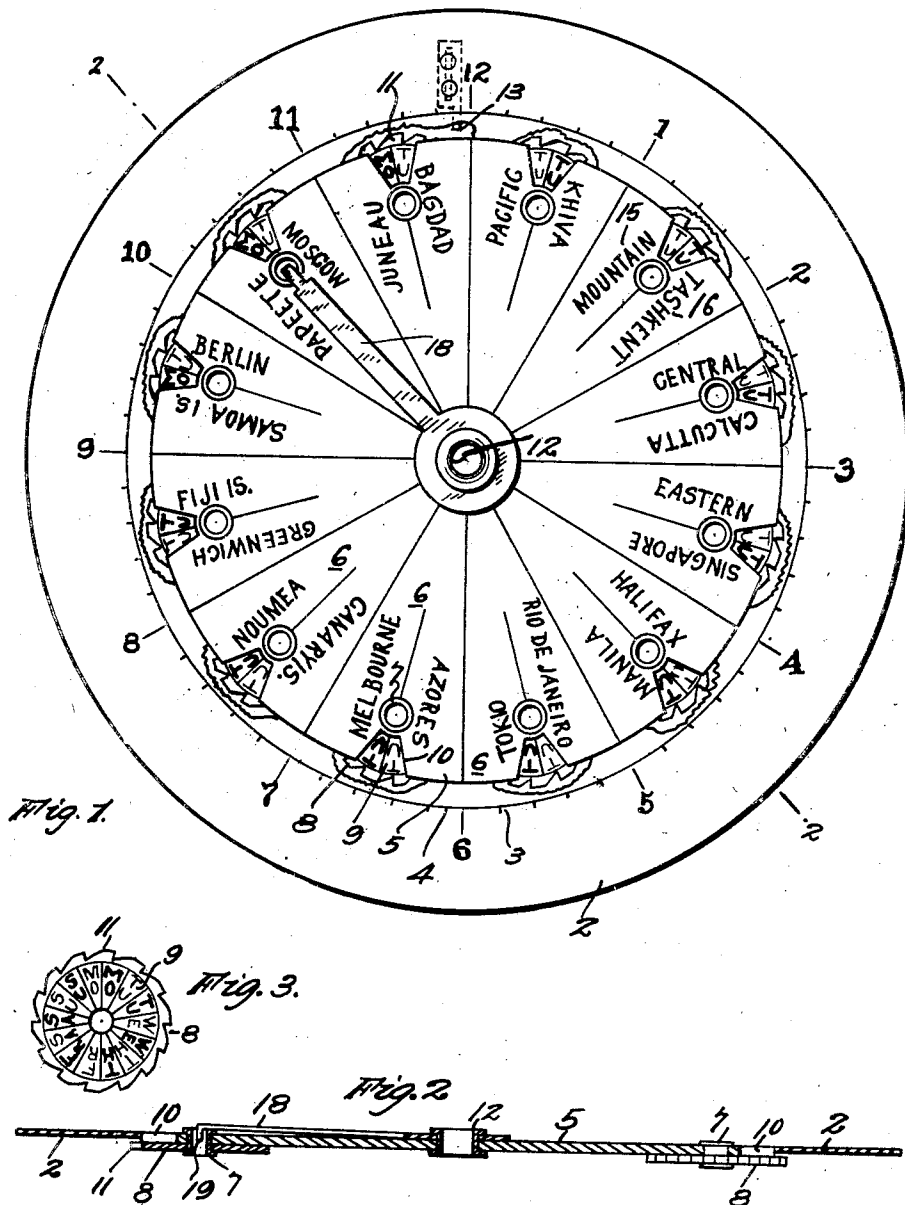
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WORLD TIME INDICATING DEVICE

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WORLD TIME INDICATING DEVICE

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13 Claims. (Cl. 58—43)

This invention is a clock device for indicating, at a glance, the correct time in all of the twenty-four, standard time zones of the world.

An object of the invention is to correctly show the hour and minute time at all of the standard time zones and to show the week-day of the time at the various zones indicated on the instrument; that is, whether the zone is of the same day, or the day ahead or following that of the local zone at which the indicator is in timed use. A further object is to provide an indicator or clock of this type that is highly reliable, is automatic when used in combination with a correct, clock train, is extremely simple in construction and mechanical operation, is springless and devoid of fragile parts, and importantly, is based on a diurnal, conventional, twelve-hour clock-face dial so that it shows standard hour time in the customary manner and avoids the use of any specialized clock hour dial contrivance. Additionally, an object is to provide a device of this class which may be readily attached to the hour-hand shaft of a clock work for motivation and includes a conventionally calibrated hour face to be substituted for the usual face or dial for structural reasons stated hereinbelow. Also, an object is to provide a universal, standard time indicator which may be readily operated by hand or other agent apart from a clock, as may be for instructional, demonstrative, experimental or other purpose.

The invention consists of certain advancements in this art as set forth in the ensuing disclosure and having, with the above, additional objects and advantages as hereinafter developed, and whose construction, combination, and details of means, and the manner of operation will be made manifest in the description of the annexed illustrative apparatus or embodiment; it being understood that modifications, variations and adaptations may be resorted to within the scope, principle and spirit of the invention as it is more directly claimed in the appendage.

Figure 1 is a broken-away, facial plan of the instrument.

Figure 2 is a section on line 2—2 of Fig. 1.

Figure 3 is a facial plan of a day-wheel of the instrument.

A dial which may be of any suitable shape is here shown in the form of a flat annulus 2 with the conventional hours numbers "1" to "12" inclusive, subdivided by the usual minute marks 3 in a ring or circle 4.

Coplanar with the dial 2 and fitted turnably and concentrically in the opening, of the annulus

of which the dial is formed, is a substantial zone disc 5 which is radially lined off into twelve equal sectors 6; the disc preferably being of less diameter than the minute circle 4 so that the latter will show around the rim of the disc 5.

Near the outer edge of each sector 6 there is a medially disposed tubular, bearing rivet 7 on which there is turnably mounted a respective, week-day wheel 8 lying close to the back of the disc 5 and each of which wheels 8 has an identical, indicating face divided into fourteen equal sectors 9, Fig. 3; these all being disposed upward toward their carrying disc 5.

Radially outward from the bearings 7 of the several wheels 8 each respective sector 6 is provided with a window opening 10 through which the index face of the subjacent wheel 8 will be visible to the angular extent of two, contiguous sectors 9. These sectors are characterized by week-day abbreviations as clearly shown in Fig. 3. Each sector 9 represents a half-day and two adjacent sectors 9 are paired and marked with suitable signs for the names of days of the week and so distinguished as to show whether the half-day is before or past meridian. Thus, one pair of sectors shows light letters "Mo" for Monday, a. m. and the next sector 9, to the right, has "Mo" in heavy letters, for p. m. time; the remaining days of the week being likewise contrasted, by abbreviations, in clock-wise order around the day wheel 8.

Each wheel 8 is provided with fourteen rim teeth 11 pitched medially on each related pair of day-sign sectors 9 and these teeth move in an orbit as to the center bearing 12 of the time zone disc 5 so that as the disc is turned by clock train or otherwise, the outermost tooth of each wheel 8 will engage every twelve hours with a fixed, but adjustable finger 13 provided on the back of the hour dial or ring 2. The finger 13 is arranged just to the left of the hour numeral "12". The result of such engagement is to turn each wheel 8 twice each day to change the day-sign from a. m. (light) reading to p. m. (dark) reading and from p. m. to a. m.

The wheels 8 are frictionally held stationary against the back of and are carried by the rotative, zone disc 5, and turn only one fourteenth of a revolution twice a day and only at the moment of engaging the fixed finger 13.

Each sector 6 of the disc 5 is provided with a pair of the name indexes of any suitable place in, or the customary name, of the international, time system subdivision. As here illustrated, each disc sector 6 is provided with two names 15—16 of

places which are twelve hours apart in actual time. These place or zone names are arranged in respective halves of their sectors 6, and are shown as on opposite sides of the wheel bearings 7. The zone names are in contraclockwise order, and the zone disc 5 is always turned clockwise. This is accomplished by providing a bearing 12 which may be readily slipped onto a given, clock hour shaft after the usual hour-hand has been removed.

To facilitate hour indication of the zone part 5 as to the hour ring 2 an hour-hand or pointer 18 is turnably mounted on the disc bearing 12 so that the hand may be rotated to any desired time zone 6 of the running disc 5 and in actual operation of the present indicator the hand 18 is set at the name zone of the place where the related clock is in correct time use. The outer end of the hand 18 changeably interlocks as by a hook 19, Fig. 2, with the desired zone rivet 7, or in other suitable or desired manner, and is thus held in place to turn with the running disc 5.

In adapting the device to a standard (international) time clock the usual face and hour hand thereof are removed and the hour dial (ring) 2 substituted and the zone disc 5 replaces the hour hand. Disc 5 and the day-wheels 8 are then adjusted to correctly show the hour and week-day and its meridian period for the entire standard time system. The hour hand 18 is set correctly and is interhooked into the zone rivet 7 of the zone sector 6 having the place name of the locality in which the clock is situated; unless otherwise for some particular purpose. Thereafter the device will automatically operate to correctly show international time, at any hour, at all of the zones indicated on the name indicating the disc 5. The circumferential position of the medially disposed day-wheel in each zone may be used for fractional reading of hours by reference to the nearest of the minute divisions 3; since each division represents a time period of twelve minutes.

As an example, the drawing, Fig. 1, indicates by the hour hand 18 that the clock is being used in the Moscow-Papeete time zone. It is Tues., 10:30 a. m. in Moscow and Monday, 10:30 p. m. in Papeete. Also, the disc 5 shows that it is Tues., 12:30 a. m. Pacific time and Tues., 12:30 p. m. in Khiva, Russia. In Juneau, Alaska, it is Mon., 11:30 p. m. and in Bagdad it is Tues., 11:30 a. m.

As disc 5 revolves by clock power the day-wheel 8 in the Juneau-Bagdad zone approaches the "12" clock dial mark and just before reaching this hour the center (top) wheel tooth 11 engages stop finger 13 and the wheel 8 is turned one-fourteenth of a revolution on its bearing 7, and as the zone or sector 9 passes "12" o'clock the time at Juneau is changed to Tues., a. m. and that at Bagdad to Tues., p. m. In the same manner, when the Pacific-Khiva zone again reaches the "12" hour mark its day-wheel is stepped over one sector 9, by the stop 13, and Pacific time becomes Tues., p. m., and Khiva is Wed., a. m.

Thus, as each disc, time zone 6 reaches the stationary stop 13 the contiguous day-wheel is set automatically to indicate the a. m. or the p. m. phase or period of the day it is entering. Each day-wheel 8 is set twice in twenty-four hours as it moves to the "12" hour sign.

An important feature of the device is disclosed as follows: The difference in time, for example, between Los Angeles, California, and Manila, P. I., is sixteen hours. The only time that the Los Angeles day and the Manila day is the same

is between 12:01 a. m. and 8 a. m. Pacific time. At all other time Manila is a day ahead of Los Angeles and in computing time between places that is an important factor. The only time when it is the same week-day all over the world is from 11:00 p. m. to 12 midnight in the Fiji Islands zone, and during that hour it is the same day all over the world. But from 12 midnight to 11:00 p. m. Fiji Islands time it is always yesterday or tomorrow in some other place zones compared to Pacific time. This time relation is clearly indicated by and is a distinctive feature of the function of the present invention.

This indicator can be used in any one of the twenty-four, international time zones of the world as it gives the exact relation of any one with all the others. The running hour hand 18 is used to indicate the hour of the local, clock zone and the efficiency of the driving clock, to which the disc bearing 12 is attached, to show local time is in nowise impaired. It is understood that the hour bearing 12 may be considered as a part of a driving clock train for motivating the instrument.

In the following claims the expressions "meridian phase", "meridian phase indicator", "a. m. and p. m. phase" are to be understood in their usual meaning with reference to time before noon or time after noon, on any given day.

What is claimed is:

1. A world time indicator having relatively movable parts one of which is provided with a normal, twelve-hour clock index and the other part with an equal number of sectors having world time place names, all constantly visible, each sector having two place names of time zones which are diametrically opposite, the place names being arranged in sequence in two series in respect to their relative time zones and so arranged as to be all at one time registered with opposite hours of the clock index to show clock time at the named zone places, and constantly visible means to show week day name and meridian phase of the time with respect to the place names juxtaposed with each hour of the clock index; whereby to indicate at a glance at the indicator the actual meridian time and the week day in all of the time zones named in the sectors of the second or zone part without mental calculation.

2. A world time indicator having concentric, relatively rotative parts one of which is provided with a circular, normal twelve-hour clock index and the other part with a circular arrangement of twenty-four, constantly exposed, world time zone or place names in pairs, each pair consisting of diametrically opposite time zones, the names being arranged in respective series in the order of their time relation and each pair of names having respective means to show day names and the a. m. and p. m. phase thereat, the twelve pairs of place names concurrently registering with respect to opposite hour indices of the index part; whereby to show at a glance at any time the week day and the meridian phase of all time zones shown on the indicator.

3. A world time indicator having a normal twelve hour dial and a relatively turnable, concentric part having a corresponding number of sectors each of which is provided with a pair of constantly visible place names of diametrically opposite world time zones; all of the sectors being registerable with the several hour divisions of the dial so as to indicate at a glance, at any relative position of the name part as to the dial,

the relative time of all of the said time zones named, and each sector having a week day and a meridian phase indicator, and a device for successively turning the indicators at a given dial place.

4. A time indicator having a dial with twelve hour divisions with relative numerical symbols, a concentric disc turnable as to the dial and having twelve time zone sections each having the names of two places in diametrically opposite world-time zones arranged in given order in two respective series and spaced so that all of the sections may be registered at one setting as to the hour dial symbols to show at a glance, at the indicator, the hour at all of the time zone places named on the disc, indicators movably mounted on the said sections and having week day names and meridian phases, and means to successively turn the indicators to change from phase to phase and day names in order.

5. A world time indicator having a normal twelve hour dial, a disc concentrically and turnably mounted as to the dial and having a number of sectors equal in number to the hour divisions of the dial and said sectors each having two world-time zone place names of diametrically opposite time zones so arranged as to all be at one period registered with opposite hours of the dial to show relative time at the name zone places, and each of said sectors having a window opening and a wheel showing through each of said openings and having week-day signs and each day being differentiated to show a. m. or p. m. phases.

6. A world time indicator having a normal, minute-divided, twelve hour dial, a part concentrically mounted as to the dial and rotative relative thereto and having a number of sectors equal to the number of hour divisions of the dial and each sector having two names, of places in time zones twelve hours apart, which names are constantly visible and the pairs of names so arranged as to all be at one period registered with opposite hours of the dial, and each place sector having means provided with indexes to show the days of the week at the relative, time zone, place names thereof.

7. An indicator as set forth in claim 6, and in which the day index means is characterized to show before or past meridian.

8. A time indicator including a normal twelve hour dial and a concentric, rotary disc zone into a number of place naming sectors coordinate to and registerable with opposite hour divisions of the dial to show at a glance at any setting of the disc the time at the zone places named, an actuator element fixed to the dial, and means at each sector showing day names and meridian phases of each day for each of the named places and being successively actuated by, and as the disc is turned past, said element of the dial.

9. An indicator as set forth in claim 8, and including an hour-hand movably attached to the disc and turnable therewith.

10. An indicator as set forth in claim 8, and in which said means includes an indexed ratchet wheel rotatively mounted in each sector.

11. A world time clock having a twelve hour index, and a relatively rotative disc divided into twelve sectors to concurrently register with the twelve hour divisions of the index, each sector having the place names of two diametrically opposite time zones, and each sector having a day index, rotatable wheel divided into sections indexed to show a. m. and p. m. phases of each day of the week in order around the wheel; and each sector having a window opening through which only two of said sections of its wheel may show at one time, and means to periodically turn each wheel one phase during the rotation of said disc.

12. In a world time clock, an index member divided into twelve equal sectors each having the place name of two diametrically opposite, international time zones, the names being arranged in pairs in a common circle, a radial line between the place names in each sector, and a. m. and p. m. phase, day wheels centered on the place name radii.

13. A world time clock including a part indexed into twelve hour divisions, a relatively movable part provided with time zone place names in time zone order and all concurrently registerable with the twelve hour divisions to show the time at all of the places named, and means to show both the week day and the meridian phase at all of the places at any period; the hour, day and phase being observable at a glance without calculation.

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