Feb. 9, 1937. F. L. McNAIR 2,070,087

CLOCK

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Fig. 1

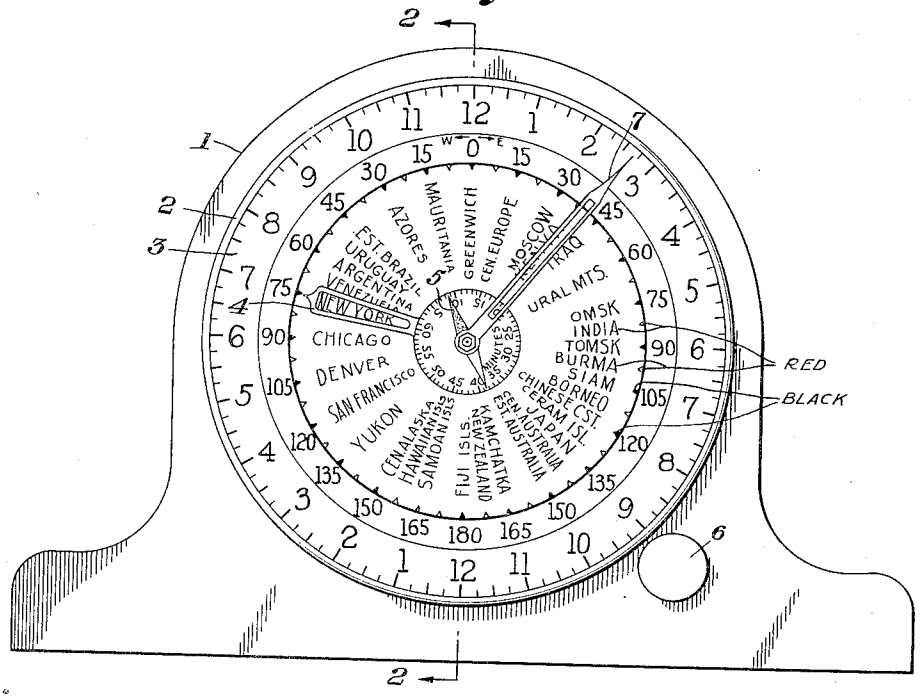
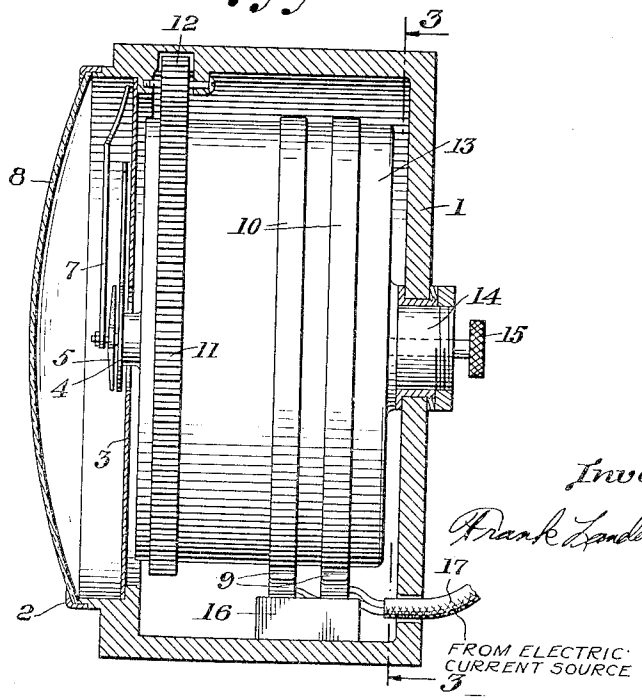


Fig. 2



Inventor:

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CLOCK

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Fig. 3

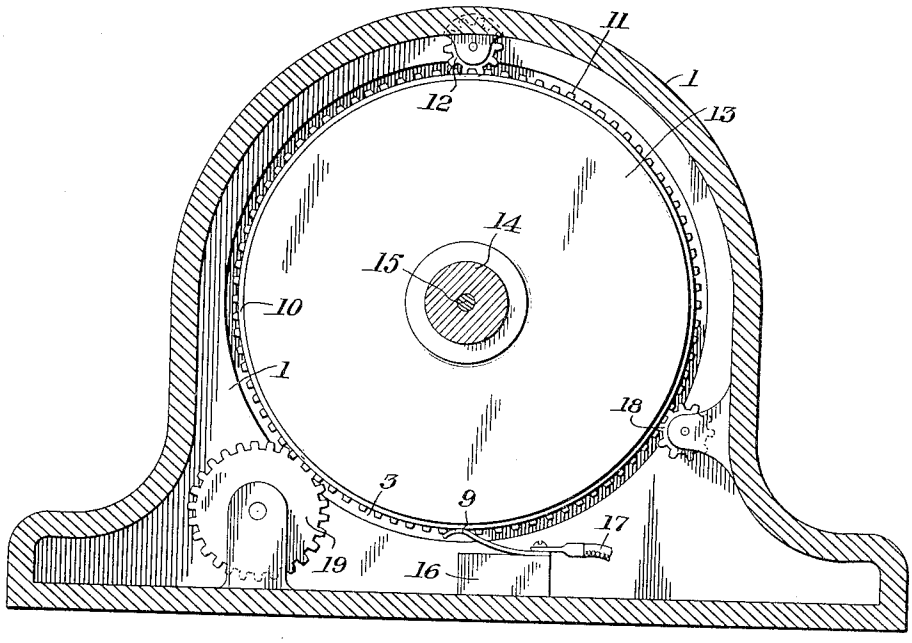


Fig. 4

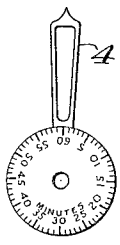


Fig. 5

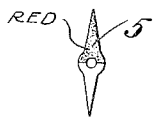
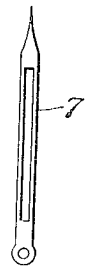


Fig. 6



Inventor:

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Patented Feb. 9, 1937 2,070,087

UNITED STATES PATENT OFFICE

2,070,087

CLOCK

Frank Landon McNair, Natural Bridge Station, Va.

Application July 2, 1935, Serial No. 29,462

1 Claim. (Cl. 58—43)

The invention relates to improvements in electric clocks whereby the user can quickly and easily determine the current time in any country, city or location in the world using the standard time zone system, or where the legal time differs exactly thirty minutes from the time of the neighboring zones.

One form of the invention is illustrated in the accompanying drawings, in which Figure 1 is a view of the face and front of the clock; Figure 2, a sectional view with the inner case 13 in elevation, taken on the plane indicated by the line 2—2 in Figure 1; Figure 3, a sectional view taken on the plane indicated by the line 3—3 in Figure 2; Figure 4, a plan of the combined location hand and minute dial; Figure 5, a plan of the minute hand; and Figure 6, a plan of the hour hand.

The outer case 1 is molded in a single piece from a non-conducting material. In the back of this case are two holes, the larger one at the center to provide for the bearing 14, the purpose of which will be given later, and the smaller one near the bottom to admit the cord 17 which transmits the electric current to the clock movement. The convex glass 8 is held in place by a brass ring 2, which is pressed on.

The inner case 13 is also molded of the same material as that of the outer case 1, and contains the electric movement. The front of this inner case is removable to permit assembling and repair of the clock movement. Case 13 is so mounted within case 1 that it can be rotated clockwise or counterclockwise, relative to case 1, about an axis through its center from front to rear. As is shown in Figures 2 and 3, case 13 is supported at four points; the large bearing 14 at the rear center, the two small rotary geared supports 12 and 18, and the large gear 19. The ring gear 11 is not a separate part, but is molded onto the surface of case 13 as a homogeneous part thereof. Electric current is supplied to the movement through the two brushes 9 which are in constant contact with the two copper rings 10. This arrangement premits rotation of case 13 as far as desirable in either direction without breaking the electrical contact. The rotation of this inner case and the movement contained therein is accomplished by turning knob 6 with the fingers. Knob 6 and gear 19 are fixed to the same shaft, and when knob 6 is turned, gear 19 effects the rotation of the inner case by virtue of its engagement with ring gear 11. The three inner supports for the pinions 12, 18 and 19, and the block 16 are molded onto the inside surface of case 1 as homogeneous parts thereof.

The details of the electric movement are not shown since it is not desired to make any claims regarding this part. However, it is similar to the conventional type of electric clock movement with the exception that it is so geared that the hour-hand 7 makes only one revolution, with respect to case 13, in twenty-four hours instead of two revolutions.

The dial 3 is mounted in the position shown in Figures 1 and 2, and can be held in place by three screws equally spaced around its periphery. An examination of the dial 3 will show that it differs in several respects from the usual dial on conventional type clocks. The hour figures number from one to twelve twice in succession, each series occupying one-half the circumference of the dial. Just within the circle formed by the hour figures is a second circle of figures representing the central meridians of each of the standard time zones. The names of cities, countries, or locations printed around the center of the dial are intended to serve as aids to the memory in recollecting the general area of the world that is covered by each of the standard time zones. Names printed in black represent areas using as legal time that of the standard time zone opposite the central meridian of which they are printed. Names printed in red represent areas whose legal time differs exactly thirty minutes from that of the neighboring zones.

The combination time zone hand and minutes dial 4 is fixed to, and rotates with case 13. The hour-hand 7 and the minute-hand 5 have two separate motions. The first, resulting from the continuous action of the electric clock movement in indicating the correct time; and the second, from the turning of knob 6 which, as previously explained, causes case 13 and the movement contained therein to rotate with respect to the dial 3. When the clock movement is rotated through a given angle, all three hands are rotated through the same angle, the angles between the three hands remaining constant during the rotation.

The accompanying drawings are mostly diagrammatic. Several changes in design would probably be desirable in order to provide working drawings for use in the manufacture of the instrument.

The method of using the instruments is as follows:

Connect cord 17 to a suitable source of electric current and start the clock movement. Turn knob 6 until the time zone hand 4 points to the zone in which the clock is located. Then by means of the small knob 15 at the rear of the

instrument, set the clock in accordance with any accurate source of time for that particular zone. In making this setting it is desirable to use the left half of dial 3 for forenoon and the right half for afternoon time. This will cause the midnight position to coincide on the dial with the position of the 180th meridian or international date line. Only the black end of the minute-hand 5 should be read (unless the clock is located in a country whose legal time differs exactly thirty minutes from the time of the neighboring standard time zones). Now in order to determine the time at any other location in the world using the standard time zone system, or where the legal time differs exactly thirty minutes from the time of the neighboring zones, turn the knob 6 until the time zone hand 4 points to the location at which it is desired to know the time. Note whether the name representing this locality is printed in black or red. If the name is printed in black, read only the black end of the minute-hand. If it is printed in red, read only the red end of the minute-hand. With this rule in mind the desired time can then be obtained by reading the time indicated by the hour-hand 7 and the proper end of the minute-hand 5.

If the instrument has been set as suggested above, all time indications on the left half of the dial 3 will be forenoon, and all time indications on the right half will be afternoon. Only the hour-hand 7 is considered in determining whether the time indicated is forenoon or afternoon. The position of the time zone hand 4 will have no bearing on the question.

When all three hands of the instrument coincide, this condition is an indication that, at that particular instant, the date is the same all around the world. Namely, at this time it is midnight at the 180th meridian. For any other position of the three hands except that of exact coincidence, there are two different dates; one date for one portion of the world, and the other date for the remaining portion. This indication is correct regardless of the portion of the dial 3 in which the coincidence may occur.

I claim:

In a universal clock, the combination with a fixed dial having adjacent to its periphery numerals from "1" to "12" twice in succession, and within the circle of such numerals and adjacent thereto a scale of degrees indicative of longitude, part of the dial being occupied by the names of places and countries, a clock mechanism comprising a minute-hand which operates in the usual manner and an hour-hand that makes one revolution in twenty-four hours, of means for revolubly supporting said clock mechanism and for manually rotating said clock mechanism, and a combined hand and minute dial attached to said revoluble clock mechanism at the center of the aforementioned fixed dial, said hand of the minute dial adapted to overlie any one of said names of places or countries.

FRANK L. McNAIR.