H. E. DUNCAN.

WATCH READABLE BY TOUCH.

APPLICATION FILED AUG. 17, 1916.

1,222,369. Patented Apr. 10, 1917.

Fig. 1.

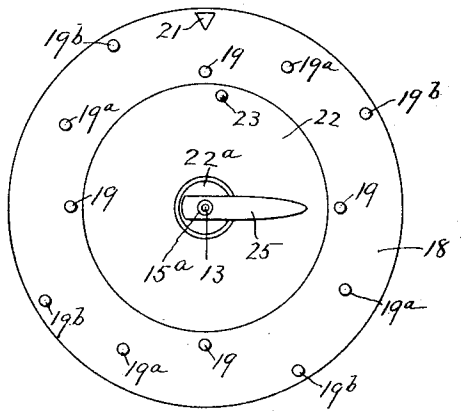
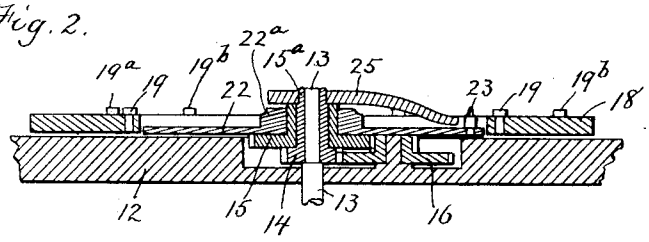


Fig. 2.



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WATCH READABLE BY TOUCH.

1,222,369. Specification of Letters Patent. Patented Apr. 10, 1917.

Application filed August 17, 1916. Serial No. 115,510.

To all whom it may concern:

Be it known that I, HARRIE E. DUNCAN, a citizen of the United States, residing at Waltham, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Watches Readable by Touch, of which the following is a specification.

This invention is embodied in certain improvements in watches adapted to be consulted by the sense of touch without being seen, such watches being intended chiefly for use by the blind.

The object of said improvements is to enable the time to be ascertained more quickly, conveniently and accurately than heretofore.

Of the accompanying drawings forming a part of this specification:

Figure 1 represents a view of the dial side of a watch movement embodying my invention, the case being omitted;

Fig. 2 represents a sectional view of a portion of the movement.

The same reference characters indicate the same or similar parts in all the views.

My improvements hereinafter described, as here shown, are applied to an ordinary watch movement which includes a lower plate 12, a center arbor 13, a cannon pinion 14 secured to the center arbor, an hour wheel 15 journaled on the hub 15^a of the cannon pinion, and an intermediate wheel 16 meshing with the cannon pinion and having a reduced portion meshing with the hour wheel, the latter being the member which in an ordinary watch movement is directly connected with and revolves the hour hand.

In carrying out my invention I provide a touch-readable annular dial, a touch-readable revolving hour indicator, and a touch-readable revolving minute indicator, enabling the watch to be consulted or read by the sense of touch.

The dial 18 is of annular form and attached to the plate 12 by any suitable means. Said dial surrounds a relatively large opening, and is provided with fixed touch-readable hour indicia on its face, said indicia being embodied in a series of studs or projections which are spaced and arranged to denote the hour divisions of the dial, said projections being preferably the heads of studs inserted in the face of the dial. I prefer to arrange the said projections in groups, as shown by Fig. 1, in which 19, 19^a and 19^b represent the studs composing a group, the studs being located at different distances from the inner margin of the dial, the object being to enable a blind user to distinguish a stud of each group from the others of the same group by its distance from the margin of the dial. Each group, occupying a dial sector of considerable length, is readily distinguishable by its location relatively to some known object, such as the stem of the watch case.

As here shown, the inner projections 19 denote respectively the hours 12, 3, 6 and 9, each of these projections constituting one end of a group. The projection 19 denoting the hour 12 may be distinguished from the other projections 19 by a companion projection 21, in radial alinement with it, and of different form, such as triangular, the projections 19, 19^a and 19^b being circular.

The revolving hour indicator is a projection 23 attached to a plate 22, the hub 22^a of which is secured to the hub of the hour wheel in place of the usual hour hand.

The plate 22 occupies the relatively large opening surrounded by the dial 18, and the hour indicator 23 is located in close proximity to the inner edge of the dial, and revolves in a path concentric with said inner edge.

The hour indicator 23 is preferably formed to distinguish it from the fixed dial projections 19, and as here shown is pointed instead of being flat at its outer end.

The minute indicator 25 is an arm attached to the cannon pinion. Said arm is much more bulky or "stocky" than an ordinary minute hand, and is of such length that its outer end revolves in a path that is of smaller diameter than and within the path of the hour indicator 23, so that said outer end is separated from the inner edge of the dial by a space into which the hour indicator 23 projects when the two revolving indicators are in radial alinement, as shown by Fig. 2. The minute indicator is curved inwardly at its outer end portion, so that its terminal or outer extremity is in close proximity to the plate 22, and is preferably somewhat lower than the pointed outer end of the hour indicator 23, so that when the minute indicator and the hour indicator are in radial alinement with each

other, both can be readily felt by the same finger, each revolving indicator being therefore exposed and readable by touch at all times.

The plate 22 constitutes a flat finger rest and guide of considerable area, enabling a finger applied to it to readily locate the projection 23. The inner edge of the dial constitutes an annular finger guide concentric with the path of the hour indicator 23, and facilitating the location of said indicator by a finger moved along said inner edge.

The plate or carrier 22 having the hour-indicator 23, the minute indicator 25, and the annular dial having the hour indicating projections, enable the time to be ascertained with considerable accuracy by the sense of touch. Said parts are free from liability to injury by fingers pressed against them. The plate 22 and hour indicator 23 constitute a particularly effective and desirable substitute for the ordinary hour hand in a touch-readable time piece, the plate having an additional function as a guide.

Owing to the fact that the hour indicator 23 travels in a path of greater diameter than the path of the outer end of the minute indicator 25, said hour indicator is never obscured or covered by the minute indicator, but is at all times exposed and readable by touch, whereas, if the hour indicator 23 were arranged to move under the minute indicator 25 it would be periodically covered by the latter and therefore periodically inaccessible and non-readable by touch.

Having described my invention, I claim:

1. A time piece comprising essentially an annular dial having fixed touch-readable hour indicia on its face, a revolving touch-readable hour indicator movable in a circular path concentric with and of smaller diameter than the inner edge of the dial, and a revolving touch-readable minute indicator movable in a circular path concentric with and of smaller diameter than the path of the revolving hour indicator, and separated from the inner edge of the dial by a space into which the hour indicator projects when said indicators are in radial alinement, each revolving indicator being constantly exposed and its position determinable by touch at all times.

2. A time piece comprising essentially an annular dial having fixed touch-readable hour indicia on its face, a rotary plate located in and substantially filling the opening surrounded by the dial and provided with a touch-readable hour indicator movable in a circular path concentric with and of smaller diameter than the inner edge of the dial, and a revolving touch-readable minute indicator movable in a circular path concentric with and of smaller diameter than the path of the revolving hour indicator, and separated from the inner edge of the dial by a space into which the hour indicator projects when said indicators are in radial alinement, each revolving indicator being constantly exposed and its position determinable by touch at all times, the said rotary plate and the inner edge of the dial constituting finger guides whereby the revolving hour indicator may be located.

3. A time piece comprising essentially an annular dial having fixed touch-readable hour indicia on its face, a revolving touch-readable hour indicator movable in a circular path concentric with and of smaller diameter than the inner edge of the dial, and a revolving touch-readable minute indicator movable in a circular path concentric with and of smaller diameter than the path of the revolving hour indicator, and separated from the inner edge of the dial by a space into which the hour indicator projects when said indicators are in radial alinement, the dial indicia being composed of a single series of spaced projections denoting the hour divisions on the watch face and arranged in groups, the members of which are located at different radial distances from the edges of the annular dial, whereby the respective hours are indicated by the circumferential positions of their projections and a radial distance thereof from the edge of the dial.

In testimony whereof I have affixed my signature.

HARRIE E. DUNCAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."