Sept. 2, 1930. F. W. WHITE 1,774,579

CLOCK

Original Filed March 26, 1927

Fig. 1.

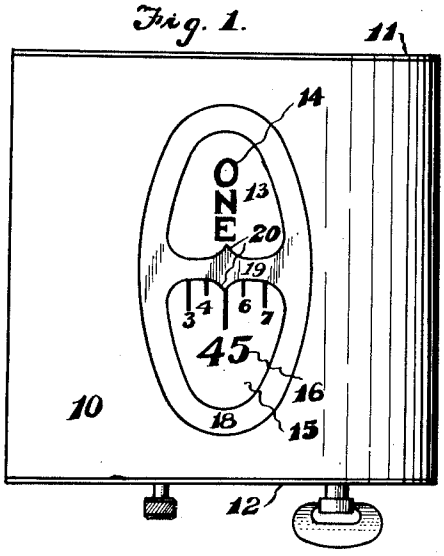


Fig. 2.

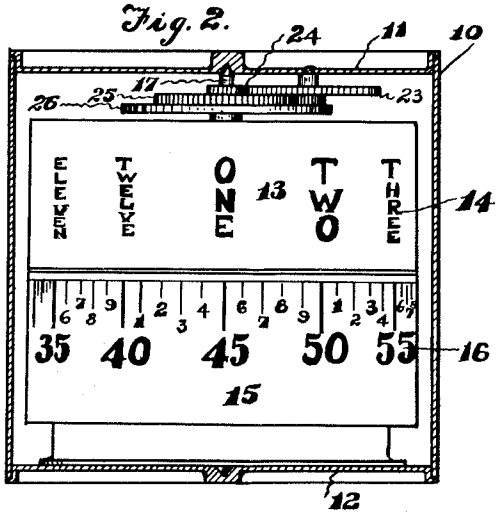


Fig. 3.

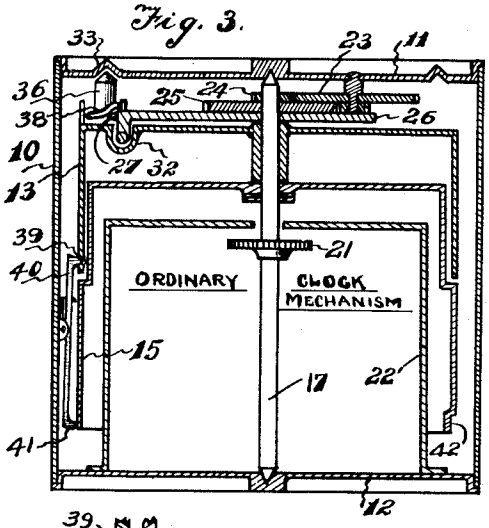
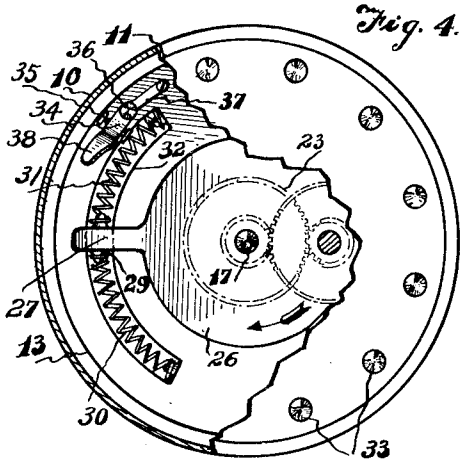


Fig. 4.



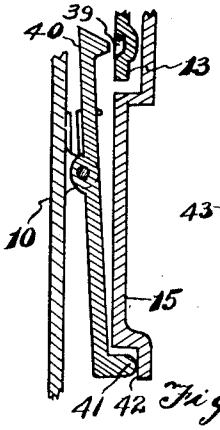
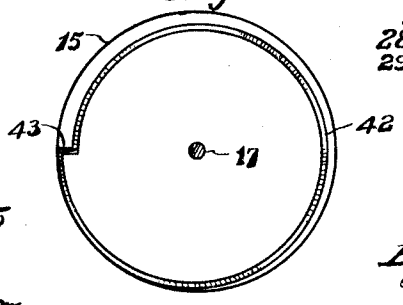


Fig. 6.

Fig. 7.



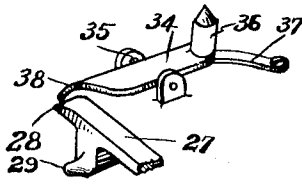


Fig. 5.

Inventor
Francis Wilfrid White
By Frederick C. Bromley
Attorney.

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UNITED STATES PATENT OFFICE

FRANCIS WILFRID WHITE, OF ORANGE, NEW JERSEY

CLOCK

Application filed March 26, 1927, Serial No. 178,662. Renewed June 30, 1930.

The invention relates to improvements in clocks as described in the present specification and shown in the accompanying drawings which form part of the same.

The invention has for its object the provision of a clock particularly suitable for an automobile, one which renders the reading of the characters boldly legible in order to facilitate reading of the time, equal prominence being given to both the minutes and hours, the actual time appearing to view through a window in the dial face of the clock, the remaining time indicating characters being concealed within the casing.

On account of its being customary to mount an automobile clock upon the instrument board of a car which is situated at some little distance from the driver, these features are of particular value on account of their rendering the time readable at a glance.

A feature of the invention resides in the novel mechanism employed for intermittently operating the hour dial which includes a locking device for precluding accidental movement of the hour dial incidental to vibrations of the automobile.

With these primary objects in view other objects of the invention will appear as the description proceeds.

Referring to the drawings, Figure 1 is a face view of the clock.

Figure 2 is a vertical sectional view through the casing thereof showing the two dials.

Figure 3 is a vertical sectional view through the casing and dials.

Figure 4 is a plan view of Figure 1, part of the casing being broken away to show to better advantage the clock mechanism.

Figure 5 is a perspective detail of the cam release mechanism shown in Figure 4.

Figure 6 is a detail sectional view of a locking device for preventing accidental movement of the hour dial.

Figure 7 is a plan view of the underside of the minute dial depicting a quick drop cam formed thereon.

Like numerals of reference indicate corresponding parts in each of the figures throughout the drawings.

In the drawings the reference numeral 10 indicates in a general manner the casing, which may be of any suitable design but is shown as cylindrical in the drawings and is provided with a top 11 and bottom 12. Within the casing are a pair of substantial dials, the upper 13 of which is the hour dial and has graduations thereon permanently displaying the hours from 1 to 12 as at 14; whereas the lower dial 15 is divided into minutes by characters 16. The two dials are of hollow cylindrical construction as clearly shown and the indicating characters are permanently displayed thereupon. The two dials rotate on a common axis and are mounted upon a main spindle 17 journalled in bearings in the top and bottom members 11 and 12.

The front of the casing is a face 18 shown in the form of a window of a size to permit of the reading of the minute and hour of time. While this face is shown in the drawings as of an oval configuration it may be of any other suitable shape if so desired. The window, or sight opening, is divided between the hour and minute dials by a bridge 19 forming pointers 20, one pointing to the hour and the other to the minute. This bridge further serves to conceal from view the demarcation between the two dials.

The minute dial is rigidly secured to the spindle 17 whereas the hour dial is loosely mounted thereon so as to turn independently of it. The spindle has a gear 21 for connection with the ordinary clock mechanism which is contained within a casing 22 interiorly of the minute dial. The clock mechanism is merely indicated in the drawings as it is of generally recognized construction.

At the top of the hour dial a train of gearing 23 is provided, the driving pinion 24 of which is keyed to the spindle, while the driven gear 25 is securely fastened to a follower plate 26 so as to rotate it one-twelfth of a turn to every complete revolution of the minute dial, so that by this ratio it is necessary for the minute dial to make twelve turns in order to turn the follower plate one convolution.

The follower plate carries a follower 27 extending radially therefrom and having its end or nose 28 rounded off as clearly discernible in Figure 5. On each side of the follower is a pilot 29; one of these pilots engages a helical compression spring 30 while the other engages a similar spring 31. These springs are lodged in an arcuate channel 32 which is curved on the radius of a circle, the centre of which is concentric with the spindle. The other ends of the springs 30 and 31 engage pilots projecting from the end faces of the channel so that as the follower moves circularly it exerts pressure against one or other of the springs tending to rotate the hour dial.

Spaced at regular intervals in a circle are indents 33 provided in the stationary top 11 of the casing, there being 12 of such indents each one corresponding to a movement of one hour of the hour-dial.

Carried by the hour-dial 13 is a rocker 34 pivoted in brackets 35 intermediate of its length. One end of the rocker carries an upwardly projecting detent 36 which is disposed so as to engage successively with the indents 33 as the hour-dial is progressively rotated. This detent is spring-urged by a flat spring 37. The function of the detent is to engage in the indent corresponding to a certain hour and to hold the hour dial stationary for that hour. Upon the hour elapsing the detent is withdrawn from the engaged indent in order to permit the hour dial to turn so as to register the ensuing hour. The mechanism for operating the detent comprises the provision of a cam 38 upon the opposing end of the rocker 34. This cam is upwardly curved and positioned in the path of the follower 27 so that as the follower rotates it will engage the cam and tilt the rocker, thus withdrawing the detent from its indent. The cam 38 is so positioned that it requires a movement of one-twelfth of a circle, or in other words the elapse of an hour, before the follower engages the cam to trip the detent.

In the operation of the clock, upon setting it in motion the minute dial is rotated by the spindle 17 and the minutes indicated, by the pointer 20, on the minute dial 15. The rotation of the spindle causes the follower 27 to advance towards the cam 38 increasing the compression of the spring 31 which tends to urge the dial forwardly, and, as the minute dial approaches the end of the hour, the follower contacts with the cam 38 raising the rocker at one end so that by the time the end of the hour is actually arrived at the detent will be withdrawn from the engaged indent.

Having released the detent, the spring 31 urges the dial forwardly until the succeeding indent is reached, whereupon the spring pressed detent engages same and restrains the dial from further movement. At the end of the ensuing hour a similar operation takes place, thus intermittently causing the dial to move and each movement bringing into view the next hour, whereas the minutes are progressively indicated as the minute dial uniformly rotates.

Referring more particularly to Figures 3, 6 and 7; the locking device for preventing accidental movement of the hour dial comprises indents 39 arranged at intervals around the hour dials 13 which correspond in spacing to the indents 33. These indents are engaged by a detent member 40 which is pivoted on one side of the casing 10 and has a follower 41 that bears against the quick-drop cam 42 formed integrally around the skirt of the minute dial. The detent is normally urged away from the indents 39 by spring pressure. This mechanism is so arranged that as the minute dial rotates, the cam forces the follower outwardly thus moving the detent member 40 into engagement with the indent 39 that falls in register therewith. As the minute dial approaches the end of the hour the follower has climbed to the crest of the cam thus tightly pressing the detent into the aperture of the hour dial and locking same against movement. Upon the turn of the hour the follower passes the crest 43 of the cam permitting of the spring urging the detent out of engagement with the hour dial which hour dial is then free to partially turn to the ensuing hour. This movement brings the immediately following indent into position for repeat action.

What I claim is:—

1. In a clock, a rotary dial, a stationary member provided with a series of indents circularly spaced, a spring-urged detent carried by said dial for engagement with the indents and means for releasing the detent from any one indent and turning the dial until the immediately next indent is engaged thereby.

2. In a clock, a rotary dial, a stationary member provided with a series of indents circularly spaced, a spring-urged detent carried by said dial for engagement with the indents, a cam connected thereto, a follower plate mounted concentrically with the dial and adapted to be progressively rotated, a spring connecting the follower plate to the dial and a follower borne by said plate for actuating the cam.

3. In a clock, an hour dial, a minute dial, a follower plate mounted coaxially with said hour dial, a gear train connecting said plate to the minute dial, a spring connecting the plate with the hour dial, a detent resiliently carried by said hour dial, a stationary member provided with a series of indents circularly spaced for engagement with the detent, a cam associated with said detent and a follower projecting from the aforesaid plate for engagement with the cam.

4. In a clock, an hour dial, a minute dial, a follower plate mounted coaxially with said hour dial, a gear train connecting said plate to the minute dial, a spring resiliently connecting the plate to the hour dial, a rocker pivoted intermediate of its length to the hour dial, a spring-pressed detent rigidly supported upon one end thereof, a cam disposed at the other end thereof, a stationary member provided with a series of indents circularly spaced for engagement with the detent and a follower projecting from the aforesaid plate for engagement with the cam.

5. The combination in a clock, of a continuously driven minute dial, an hour dial coaxially mounted, a detent member pivoted intermediate of its length to a stationary supporting element and extending from one to the other of said dials parallel to their axes of rotation, one end of said detent member being adapted for engagement in indents provided at intervals around the hour dial, the other end thereof constituting a follower, a quick-drop cam constructed integrally around the minute dial, said cam being characterized by an abrupt radial face from which the cam surface spirally extends and at which it ends in a crest, and a spring normally retaining the follower in engagement with said cam surface.

Signed at the city of Toronto, Canada, this 19th day of March, 1927.

FRANCIS WILFRID WHITE.