

March 19, 1935.

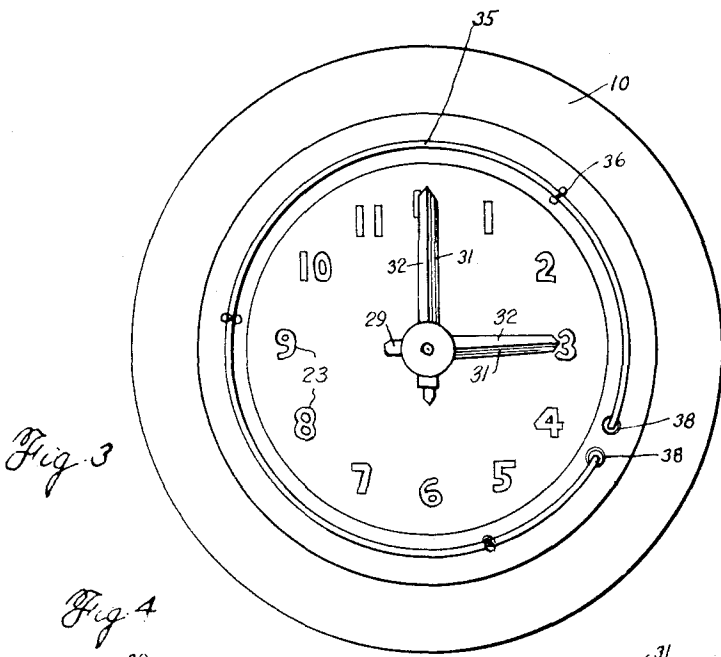
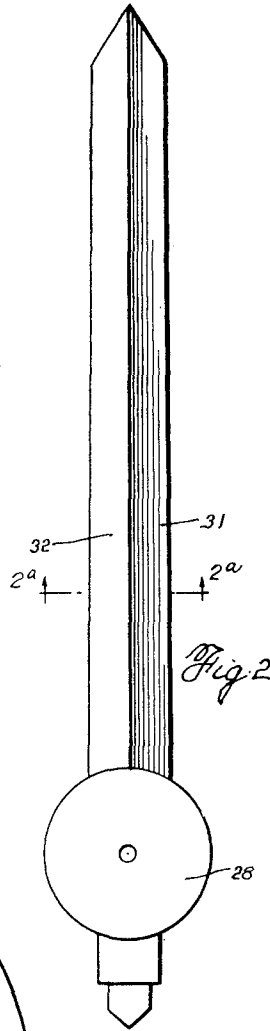
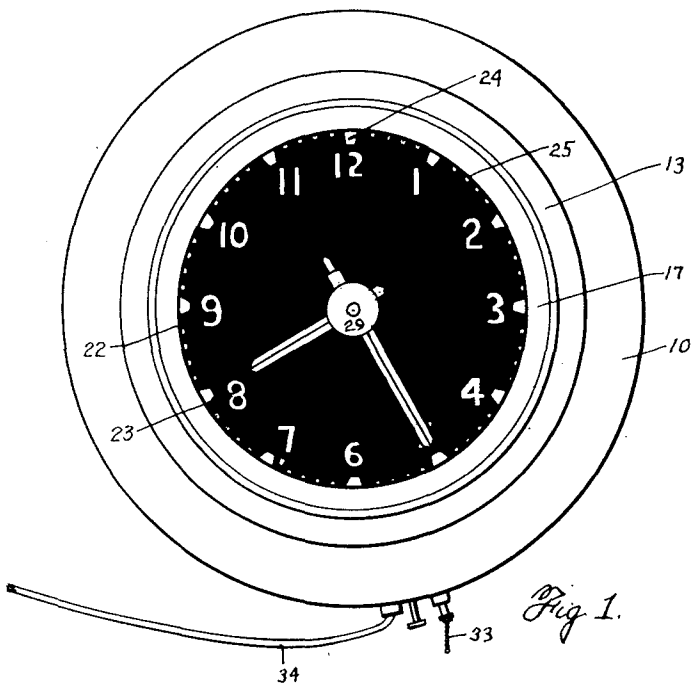
C. W. HOFFRITZ

1,994,950

ILLUMINATED DIAL

Filed March 24, 1934

2 Sheets-Sheet 1



INVENTOR  
Charles William Hoffritz

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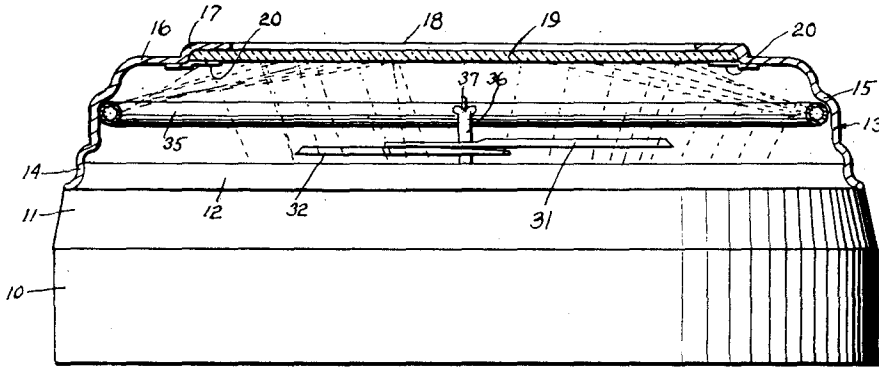
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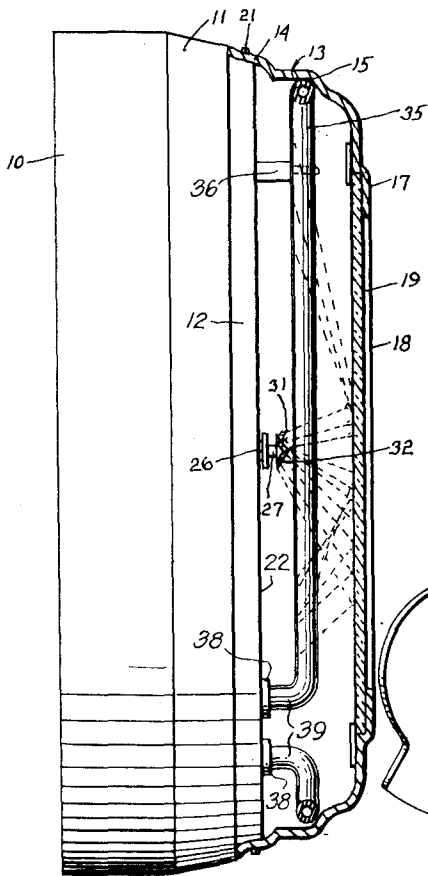
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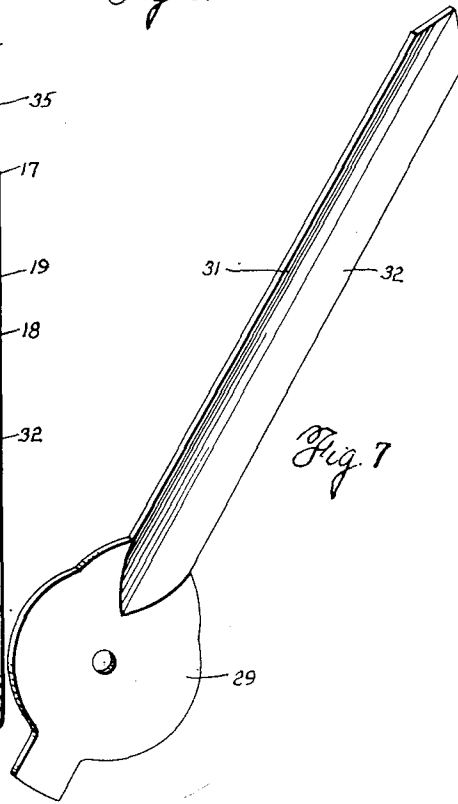
*Fig. 5.*

*Fig. 6*



31 32

*Fig. 7*



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# UNITED STATES PATENT OFFICE

1,994,950

## ILLUMINATED DIAL

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Application March 24, 1934, Serial No. 717,200

4 Claims. (Cl. 240-2)

This invention relates to improvements in illuminated display apparatus and more particularly to clock dials.

A broad object of the invention is to provide a simple and inexpensive illuminated dial having a hand, or hands thereon, in which the hands and/or numerals on the dial are unusually legible, both when not self-illuminated and viewed by daylight, and when self-illuminated at night.

Another object is to provide a dial having an indirectly illuminated hand or numerals or both, which appear to be in themselves sources of illumination.

I achieve the foregoing objects, in a clock, by providing, in a clock dial case, a dial painted black and bearing white hour numerals and carrying white hour and minute hands, and a neon tube so shaped and located in the case as to be invisible when the dial is viewed by observers, the shape of the hour and minute hands being such with respect to the neon tube, and the neon tube being arranged in such a manner with respect to the numerals painted white upon the dial that when the neon light is turned on, streams of colored light will engage across the face of the dial and will impart their color upon the white numerals as well as upon the hour and minute hand without coloring any other part of the displayed surface of the dial. In this manner during daytime the white numerals and white clock hands are clearly visible, and at night they are rendered visible alone as the other parts of the dial are black in appearance, and they are readily distinguishable due to the intense colors imparted to them by the colored rays of neon light.

Furthermore, I prefer in accordance with the invention, to construct the hour and the minute hand so as to have longitudinally extending oppositely inclining angular walls, providing reflective surfaces, so that these angular walls of each hand, in any and all radial positions it occupies on the dial, are exposed to colored light reflections emanating from a circular neon tube concealed out of sight from in front of the dial and received by a glass pane in a cover closing the dial case. The reflected rays of light coming from the tube fall upon the face of the dial but since the numerals and the clock hands alone are white, the remaining surface of the dial being black, these numerals and these clock hands receive the reflected rays of light which impart their color to the same. The colored rays show to the best advantage upon the angular sides of

the clock hands for there is a maximum absence of shadows here. The result is a clock dial the readable parts of which, at night, are highly colored artificially by means of colored light only which may be caused to disappear during the daytime, but when the light is on, the source thereof is unobservable by readers of inscriptions on the dial.

With the above and other objects in view, my invention consists in the combination, arrangement and details of construction disclosed in the drawings, and specification, and then more particularly pointed out in the appended claims.

In the drawings, which are merely illustrative of my invention and in which similar reference characters designate similar parts through the respective views:

Figure 1 is a front view of a clock in accordance with my invention, with the glass pane removed,

Figure 2 is a front view of a minute hand constructed in accordance with my invention,

Fig. 2a is a cross section of the hand shown in Fig. 2, the section being taken in the plane IIa-IIa of Fig. 2,

Figure 3 is a front view of the clock, with the cover removed, showing the neon tube arranged thereon,

Figure 4 is a side view of the hour hand,

Figure 5 is a side view of the clock case, showing the cover and neon tube in cross section,

Figure 6 is a side view of the clock case, showing the cover and neon tube in vertical section, and

Figure 7 is a perspective view of the under side of the hour hand.

I will now describe my invention in detail. The conventional clock case is designated 10 and is closed at its front and back, the outer annular part 11 thereof being formed, if need be, with an annular groove or seat 12, in which an annular cover or cover member 13 is designed to seat. The base 14 of the annular cover fits snugly into the annular seat 12 of the clock case, the outer face of the cover being designated 16. The cover has a bead 17 forming also an annular seat, and in this annular seat is mounted a glass panel 19, designed to close the usual opening in the front of the cover. It will be seen that cleats 20 may confine the transparent or glass panel 19 in position within the bead 17 of the cover. It will be further seen that suitable detachable fasteners 21 are designed to secure the cover in place on the clock case.

The clock dial is designated 22 and it has a

circumferential series of white hour numerals 23, with white markings 24 appearing radially of these numerals and marginally of the dial 22. There are also minute markings, four in number, designated 25 and appearing between the white markings 24, as shown in Figure 1. There is the usual minute arbor 27 of the clock or timepiece, and the hour arbor 26 thereof, it being understood that my invention is preferably located in an electric clock.

The hour hand and minute hand may each consist of an innermost base portion made preferably of flat metal and having a longitudinal stem whose surface is made into oppositely inclined elongated walls, so that the stem is substantially V-shape in cross section as shown in Figure 2a. Thus the base portion of the minute hand is designated 28, while its oppositely inclined walls or sides are designated 31, 32, and the base portion of the hour hand is designated 29 and its oppositely inclined sides or walls are designated 31, 32 respectively. The base portions of both hands are operatively mounted upon the respective hour and minute arbors of the clock. It will be seen from Figure 1 that there is a pull chain switch 33 for opening and closing the circuit to the neon source of light, about to be described, and that a flexible conductor cord extends into the case, and is designated in Figure 1, at 34.

A circular neon tube 35 is spaced in parallel relation with respect to the outer face of the dial 22, being mounted upon anchors 36 of approved design which anchors are secured to the outer wall of the case. It will be seen that the clock case forward wall is formed with a pair of contiguous sockets 38, into which the opposing ends of the neon tube, after being bent, extend as at 39.

It is to be noted that when the cover has been fixedly secured upon the clock case that the various parts will have the following positions. The neon tube 35 will be seated so as to be directly in the annular seat 15 of the cover, the circular portion of this tube being of a diameter larger than the bead 17 of the cover so when an observer views the dial from outside of the glass pane 19 he cannot see this neon tube at all.

The neon tube is spaced in back of the glass panel 19, but is spaced in front of the hour and minute hand and in front of the dial 22. During daylight an observer can see the numerals 23 on the dial readily and conspicuously because they are painted white and show up clearly against the opaque, black background of the dial 22. He also can see the hour and minute hands just as clearly since they too are painted white. The black background afforded by the dial at all points of its display surface except where the painted white numerals and markings appear also serves the useful purpose at night of providing a field of colored light illumination upon the dial.

When the circuit is closed to the neon tube 35, by means of the pull chain 33, the neon emits rays of intense colored light, and streams of colored artificial light emanate from all points in the surface of the circular tube 35, impinging upon the inner surface of the glass panel 19 and

being by the latter reflected back directly upon the dial 22, and the rays of colored light assume a direction or path of projection across the face of the dial from all radial directions from the marginal edge of the dial towards the center thereof. The entire effective display surface of the dial 22 becomes suffused with rays of colored light, and the light will color the numerals and markings on the dial brilliantly changing the whiteness of these numerals and markings to this color. The rays of light will also be diffused in the direction of, so as to fall upon the oppositely inclined elongated walls 31, 32 of each clock hand 28, and 29 respectively, and as shown particularly in Figure 6 the rays of colored light reflected from the glass pane 19 will suffuse these sides with colored lights without the presence of a shadow due to the oblique disposition of each wall 31, or 32 with respect to the vertical disposition of the glass panel 19. In any radial position assumed by the inclined sides of either clock hand, streams of light from the concealed neon tube will be reflected upon same, so that in this manner the entire face of the indicating portions of the hands will be colored. The dial being dark at night except where the colored numerals and hands are concerned, the latter are conspicuously displayed upon the dial at night and can be read at very great distances.

I intend to cover all variations falling within scope of claims.

What I claim and seek protection on by Letters Patent is:—

1. In combination, a case provided with a dial constituting a dark background, contrasting light-diffusive numerals and a hand, said hand being beveled, a luminous gas tube surrounding and spaced outwardly a suitable distance from the dial, and a reflecting ring in front of and concealing the gas tube from the front of said case.

2. A clock case provided with a dial constituting a dark background, contrasting light-diffusive numerals and hands, said hands being beveled, a luminous gas tube surrounding and spaced outwardly a suitable distance from the clock dial, a reflecting ring in front of and concealing the gas tube from the front of the clock, and a glass panel supported by said ring and located in front of and covering the clock dial.

3. In combination, a case provided with a dial constituting a dark background, contrasting light-diffusive numerals and a hand, a luminous gas tube surrounding and spaced outwardly a suitable distance from the dial and hand, a reflecting ring in front of and concealing the gas tube from the front of said case, and a glass panel supported by said ring and located in front of and covering the dial.

4. A clock case provided with a dial constituting a dark background, contrasting light-diffusive hands, a luminous gas tube surrounding and spaced outwardly a suitable distance from the clock dial, a reflecting ring in front of and concealing the gas tube from the front of the clock, and a glass panel supported by said ring and located in front of and covering the clock dial.

CHARLES WILLIAM HOFFRITZ.