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J. D. LASH

2,563,537

ILLUMINATED INSTRUMENT FACE

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Fig. 1.

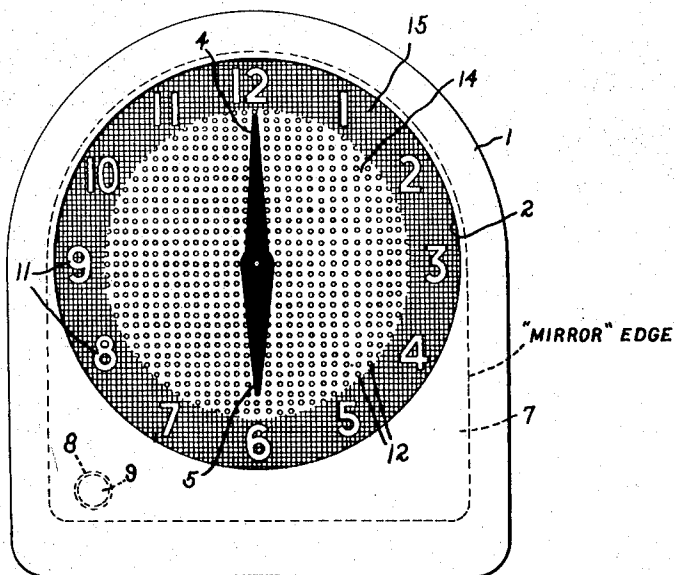


Fig. 2.

"MIRROR" EDGE

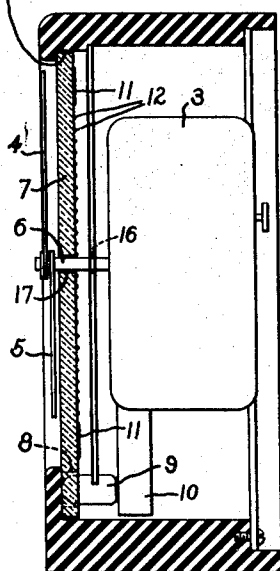
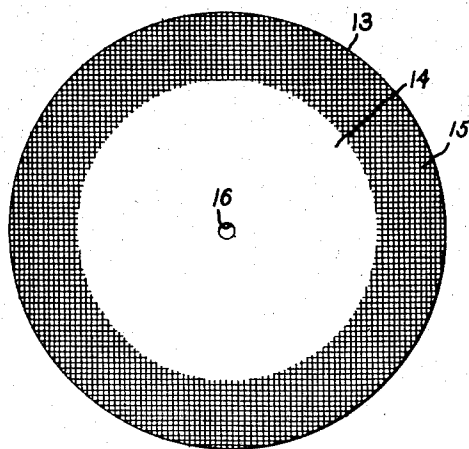


Fig. 3.



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ILLUMINATED INSTRUMENT FACE

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1 Claim. (Cl. 116—129)

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My invention relates to clocks, meters, or other similar instruments, and illuminated faces or dials for such instruments. More particularly, my invention is directed toward the self-illumination of faces for clocks or similar instruments, that is, in which the illumination comes from within the body of the instrument itself and outside illumination sources are not necessary.

One object of my invention is to promote uniformity of self-illumination over the entire face of the clock dial or other instrument face. Another object of my invention is to provide high visibility and readability of the instrument face when outside light, such as daylight, strikes the indicating face of the instrument, and to provide high visibility of the instrument face if the self-illumination source should fail. A further object of my invention is to provide a self-illuminated instrument face which is inexpensive, simple to make, attractive, and effective for the purpose required. Still another object of my invention is to provide a concealed light source for a self-illuminated instrument, the addition of the light source requiring little or no added space in standard clocks, meters or other similar instruments.

The objects of my invention are met generally by applying the edge lighting principle to the faces of clocks, meters, or similar instruments, and by inserting the light source within the transparent plate which forms the instrument face. Other arrangements later described increase the visibility and readability of the instrument face when it is in use.

Other objects and further details of that which I believe to be novel and my invention will be clear from the following description and claim taken with the accompanying drawing in which is illustrated an example of instrument embodying the present invention and incorporating my improved form of edge lighting and other features.

In the drawing, Fig. 1 is a front elevation of a clock according to my invention; Fig. 2 is a side section of the clock of Fig. 1; and Fig. 3 is a front elevation of a background contrast sheet or disk used in the clock of Figs. 1 and 2.

Although I have shown a clock in the drawing, with the usual face, bearing numbers and having hands, it is obvious that the invention may be applied to any instrument having a dial or similar face, and having a hand or pointer which co-operates with indicia on the dial. The clock has a usual opaque outer body or enclosing case 1 in the front of which is an opening 2 through which the face is visible. Of course,

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this face opening may be covered by glass in the usual fashion if desired.

Inside of the instrument case is mounted a motor or other mechanism 3 which drives the pointer of the instrument, in this case the hands 4 and 5 of the clock. A suitable and usual driving shaft 6 extends between the motor and the hands.

The casing of the clock serves as a housing for the illuminating parts for the clock face and shields or conceals the source of light from direct view. The face of the clock is in the form of a dial or face plate 7 located directly in back of the opening 2 of the clock case and having lower portions extending below the face opening and therefore shielded from view by the opaque material of the clock case. The dial plate is made of a transparent material such as the plastic known as "Plexiglas," or it may be clear glass, or the clear plastic sold as "Lucite," or other transparent material with optical characteristics similar to those of the materials mentioned. Within the border of the face plate but outside of the area exposed by the opening 2, I provide a hole 8, for purposes which will later be evident.

The outer edges of the face plate or dial 7 and the entire inside edges of the hole 8 are smoothed and polished. The outside edge of the face plate is then given a mirror finish as by gluing tin foil around this polished outside edge. Obviously, aluminum paint, silvering or other types of mirror finish could be used instead of the tin foil. The purpose of this mirror edge is to reflect light back and forth inside of the face plate, to obtain good utilization of light and uniform illumination of the figures, etc. on the clock dial.

Placed inside of the hole 8 is the source of illumination, shown here as an incandescent or glow type electric lamp bulb 9. As shown, this bulb may be suitably supported within the clock case as by a bracket 10 extending from the housing of the motor 3 and supplied with a suitable source of electrical power in any desirable fashion. When lit, this lamp bulb illuminates the interior of the transparent face plate, the mirror edge on the plate spreading the illumination in a uniform manner.

The indicia on the instrument, in this case the numbers from one to twelve on the dial of the clock, should be easily readable from the illumination supplied by the light source alone. For this reason, I prefer to paint these numbers in white or light-colored opaque paint, preferably of a flat or dull nature. A glossy paint might be used, but the effects are not as good as when

a dull paint is used. These numbers are painted on the back surface of the face plate as shown at 11 for best effect, it having been found that this arrangement gives the best brightness effect. The numbers might be painted in translucent paint on the front face of the plate, but this arrangement would result in lower brightness of the indicia with the rest of the arrangement disclosed.

The central space within the dial is provided with a light dispersing and background producing area 12 shown here as a screen composed of a number of white dots. These dots, like the numbers, are preferably made of opaque white or light-colored paint on the back surface of the face plate, the discontinuous painted area represented by the dots being kept at a minimum for maintaining reasonably uniform lighting of the numbers on the dial while at the same time providing a background for showing the hands of the clock in silhouette. In place of the spaced dots, spaced concentric circles, or a striped or checkered pattern could be used as long as the required level of illumination is maintained.

In place of the light or white-colored paint mentioned above for the numbers and for the central area on the clock dial, it is obvious that silk screening, engraving or color tints could be used.

For better daytime and nighttime visibility, a background sheet or plate 13 is located and supported (as by cementing in the case) in slightly spaced relation from the back of the dial plate within the clock case. This background sheet or disk has a white or light-colored center portion 14 located behind the white dotted area of the dial plate and a circumferential black or dark-colored area 15 behind the number carrying section of the face plate. The background sheet may be made of metal, cardboard, or other suitable stiff material, and the areas 14 and 15 may be made by painting the front surface of the background sheet or by gluing colored sections of paper thereon. This provides an opaque background for the entire face of the clock, which is close to but not in optical contact with the back surface of the dial or face plate. Of course, the drive shaft 6 for the hands extends freely through suitable holes 16 and 17 in the background sheet and the dial plate.

The clock hands 4 and 5 are made of the usual materials such as metal, opaque, and preferably of dark color for contrast with the screened or dotted area on the face plate and the white or light-colored area on the background plate. As shown, the hands of the clock are located in front of the front surface of the face plate.

By using the discontinuous dotted or screened central section instead of a solid area of paint or other reflecting material on the face plate, a uniform illumination over the entire face is obtained without detracting from proper brightness of the numbers, and a light background is provided against which the clock hands are seen easily in silhouette. The white or light background area 14 of the background plate, together with the white or light-colored, dotted or screened area on the dial plate, gives good daytime as well as nighttime legibility to the face of the clock or other instrument. This is important where, as is often the case, outside illumination is at a level higher than the illumination

level of the clock face itself. This is also important in case the internal illumination source fails, and illumination from outside has to be depended upon.

The use of a specular reflecting surface around the edge of the face or dial plate, and the placing of the lamp in the hole through the plate outside of the dial-reading area give maximum utilization of the light and require the minimum of space for the light source. The dark area around the circumference of the background plate in back of the numbers furnishes a contrasting field against which the light-colored numbers are easily seen both day and night.

If the clock numbers are made of a dark color, they should be placed on the front face of the dial and made opaque, and the screened or dotted area should be extended in back of the numbers with the entire background plate made in white or light color for best results. However, it is not believed that this arrangement is as effective as the arrangement shown, using the light-colored numbers and the dark-colored background therefor.

As will be evident from the foregoing description, certain aspects of my invention are not limited to the particular details of construction of the example illustrated, and I contemplate that various and other modifications and applications of the invention will occur to those skilled in the art. It is therefore my intention that the appended claim shall cover such modifications and applications as do not depart from the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

A self-illuminated clock dial comprising a transparent face plate with a front surface, a back surface and outer reflecting edges, an opaque shield covering the edges of said plate and a portion of the plate from view at the front, indicia of light color painted on the back surface of the plate in an area not covered by said shield, said plate having a hole therein in said shield-covered portion of said plate, a light source located in said hole for illuminating said indicia from the interior of said plate, an opaque pointer of dark color mounted to move over the front surface of the plate opposite said indicia, an opaque light-colored discontinuous screen area comprising spaced opaque dots painted on the back surface of said plate adjacent said indicia under the path of movement of said pointer, and a background sheet close to but optically spaced from said back surface of said face plate and providing a dark-colored background behind said indicia-carrying area of said face plate and a light-colored background behind said screen area for contrasting with said dark pointer.

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