Aug. 8, 1939 W. I. KETTERSON 2,169,099

MIRROR CLOCK

Filed July 7, 1938

Fig. 1.

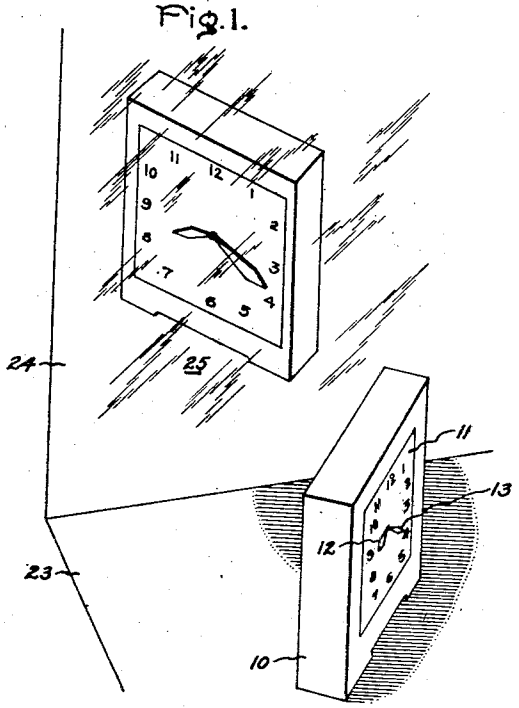


Fig. 2.

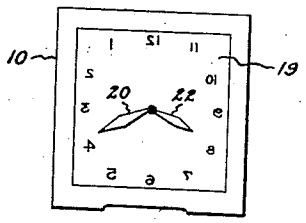


Fig. 4.

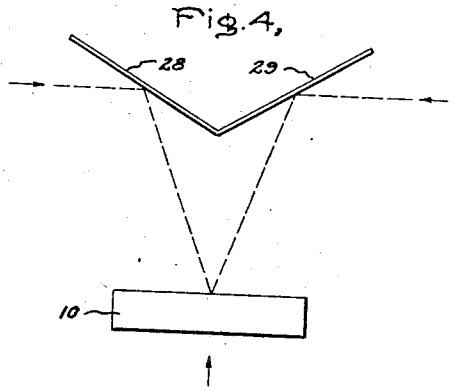


Fig. 3.

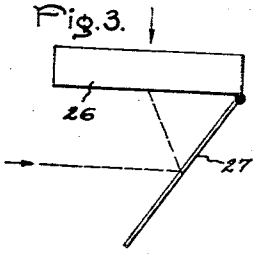


Fig. 5.

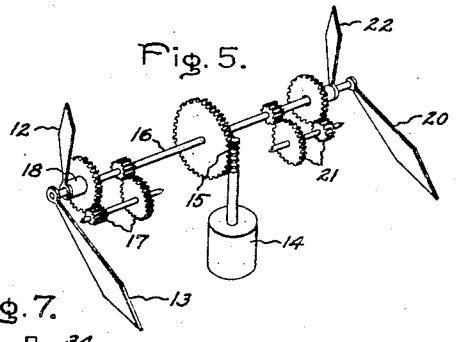


Fig. 6.

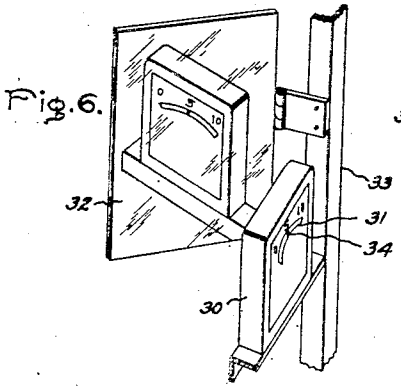
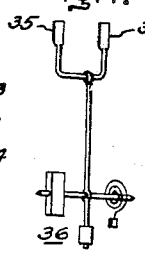


Fig. 7.



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UNITED STATES PATENT OFFICE

2,169,099

MIRROR CLOCK

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Application July 7, 1938, Serial No. 217,899

6 Claims. (Cl. 58—2)

My invention relates to a two-faced indicating instrument such as a clock, together with reflecting mirror means whereby the indication of the clock or other device may be observed in its proper perspective from various different view points.

The features of my invention which are believed to be novel and patentable will be pointed out in the claims appended hereto. For a better understanding of my invention, reference is made in the following description to the accompanying drawing in which Fig. 1 represents a two-faced clock setting on a table having a mirror back showing how the time may be correctly read from the image of the rear face of the clock; Fig. 2 shows the rear face of the clock represented in Fig. 1; Fig. 3 represents a plan view of a form of my invention where the reflecting mirror is hinged to the rear of the clock casing; Fig. 4 shows a plan view of a double mirror arrangement and indicating device arranged for observation from three directions, 90 degrees apart; Fig. 5 shows a clock driving arrangement for the front and rear sets of hands; Fig. 6 shows a switchboard measuring instrument such as an ammeter to which my invention has been applied; and Fig. 7 shows a form of forked indicating pointer that may be used in the instrument of Fig. 6.

Referring principally to Figs. 1, 2 and 5, 10 is a clock casing having a usual form of front clock dial 11 and hour and minute hands 12 and 13. The hands are driven from any suitable timing motor such as a synchronous electric motor represented at 14 in Fig. 5. In this clock drive, 15 represents reduction gearing between the motor and minute hand shaft 16. 17 represents the usual back gears between the minute hand shaft and a hollow shaft 18 on shaft 16 for driving the hour hand 12 at the desired rate. These hands are driven in a clockwise direction in the usual manner.

The clock is also provided with a dial 19 in its rear wall on which the time graduation scale is arranged counterclockwise or reversed, as compared to the front scale, when this rear face is directly observed, as shown in Fig. 2. Also, the numbers on the clock face are reversed so that a reflected image of such rear clock face will appear as a normal clock face with the numerals arranged clockwise and properly oriented. The rear dial is also provided with minute and hour hands 20 and 22. The minute hand 20 is mounted directly on minute hand shaft 16 which extends through the clock from front to back at right angles to the clock faces and drives both minute hands 13 and 20 in a clockwise direction as these hands would appear if considered as viewed from a direction in front of the clock. Looking directly at the back face of the clock, the rear minute hand will, of course, rotate in a counterclockwise direction. A second back gear 21 between shaft 16 and a hollow shaft on the rear of shaft 16 drives a rear hour hand 22 in the same direction as hand 20 but at the lower speed of one revolution in twelve hours. The visual arrangement of the rear clock dial and hands is a reversed image of the front arrangement. It is seen that the double clock-driving mechanism is very simple. The two back gears and two sets of hands may be duplicates and there is no reversing gear arrangement such as has previously been used on double-faced clocks intended to be observed from opposite directions.

In Fig. 1 the two-faced clock just described is represented as setting at an angle on a table 23 having a mirror back 24, such that the normal front clock face 11 may be read directly from the front and the reflected image of the rear clock face appears in the mirror at 25. In reflecting the rear clock face, the time graduation arrangement and the direction of rotation of the hands thereof are reversed in the image so that the image appears as a normal clock face with the pointers in their proper positions and rotating in the proper direction and at the proper rates to tell time. Where, as usual, the front direct view of the clock and the reflected rear image of the clock are intended to indicate the same time of day, the front and rear minute hands will be in alignment and likewise the front and rear hour hands will be in alignment, as shown in Fig. 5. However, the front clock face may, for example, indicate daylight saving time and the image standard time, should that be desired, simply by properly setting the front and rear clock hands accordingly.

It is now evident that the clock represented, when placed in front of a mirror, will indicate time correctly and can be readily observed from various different angles of a room, and that the most suitable position of the clock and reflected image for time observation purposes in any particular room can be easily arrived at by angular adjustments of the clock with respect to the mirror, tilting the clock or mirror, etc.

In Fig. 3 I have shown a plan view of a clock 26 which will have front and rear clock faces as described, with a mirror 27 hinged to the rear of the clock case, the mirror surface facing towards the back of the clock. This mirror may also serve as a supporting device to help hold the

clock upright. As adjusted in Fig. 3, the clock is arranged to tell time to observers looking in the general direction indicated by the two arrows.

In Fig. 4 I have shown a plan view of my double-faced clock 10 in combination with two angularly disposed mirrors 28 and 29 at the rear thereof. Time may be conveniently observed by this arrangement from three directions, 90 degrees, more or less apart. The three arrows in this figure point in the directions in which different persons may look simultaneously to observe the time of day.

The invention is not confined to clocks but may be applied to other types of indicating instruments. In Fig. 6 I have represented at 30 a switchboard ammeter casing having a front indicating scale and pointer 34. The instrument is secured to supporting structure 33 to which also a mirror 32 is secured. The mirror and instrument are preferably relatively adjustable in order that the angle between the mirror and rear of the instrument may be varied for best observation purposes. The rear of the instrument will be provided with a reversed scale and with an indicating pointer opposite the front scale and pointer. The reflected image of the rear of the instrument is shown in the mirror 32.

The two pointers will be operated by the same moving instrument armature so that no expensive departure from usual instrument design practice is required. For example, the double pointer arrangement may take the form shown in Fig. 7. Here, I have represented at 36 a usual form of armature assembly structure for a magnetic vane ammeter. The front pointer 34 may have a rear extension to form the rear pointer indicator 35.

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

1. An indicating instrument comprising a casing having front and rear scale graduations arranged opposite each other, movable pointer means cooperating with the two scales, common means within said casing for simultaneously moving the indicating means with respect to their scales in the same direction, and mirror means to the rear of said casing for reflecting an image of the rear scale and pointer, said rear scale having its graduations arranged so that when reversed by mirror reflection its image has the same scale arrangement as the front scale.

2. An indicating instrument having a casing, graduated scales on opposite sides of said casing facing to the front and rear respectively, pointers cooperating with both scales, common means within said casing for simultaneously moving both pointers with respect to their scales, the rear scale and pointer having substantially the appearance of a mirror image of the front scale and pointer and a mirror adjustably positioned with respect to the rear scale and pointer for reflecting an image thereof.

3. An indicating instrument comprising a casing, graduated scales in the front and rear walls of said casing and facing the front and rear respectively, a shaft in said casing extending at right angles to said scales, pointers for each of said scales secured to said shaft, means in said casing for rotating said shaft, the pointer and scale arrangement at the rear having substantially the appearance of a mirror image of the front scale and pointer arrangement, and a mirror hinged to the rear of said casing to one side of the scale with its mirror surface towards the rear scale and serving to reflect an image of said rear scale and pointer at an angle.

4. An indicating instrument comprising a casing, front and rear indicating scales in the front and rear walls of said casing, pointers cooperating with each scale, common measurement means within said casing for simultaneously moving said pointers with respect to their scales, the appearance of the rear scale and pointer being substantially that of a mirror image of the front scale and pointer, and a pair of mirrors positioned to the rear of said casing with their mirror surfaces reversely inclined towards the casing so as to reflect images of the rear scale and pointer in opposite directions generally parallel to the rear scale.

5. An indicating instrument comprising a casing having a clock dial in a front wall thereof, a dial in the rear wall of said casing which in appearance is a mirror image of the front clock dial, minute and hour hands cooperating with each dial, a minute hand shaft within said casing extending substantially through said casing from the front to the rear, the minute hands for the front and rear dials being secured to said shaft, a pair of hollow hour hand shafts to which said hour hands are secured on opposite ends of said minute hand shaft, a pair of similar speed reducing gear trains between the minute and hour hand shafts adjacent the opposite ends of the minute hand shaft, a timing motor connected to drive the minute hand shaft at a point between the pair of speed reducing gear trains, and a mirror to the rear of said clock casing for reflecting an image of the rear dial and hands in a direction from which the front clock dial can not be observed.

6. An indicating instrument comprising a casing, a clock dial in the front of said casing, time telling hands cooperating with said dial, a clock movement within the casing for rotating said hands at the proper rates to indicate time, a dial in the rear of said casing, time telling hands cooperating therewith, said second group of hands being driven by the clock movement at the same rates and in the same directions as the first mentioned hands, and a mirror for reflecting an image of the rear dial and its hands in a direction from which the front dial can not be directly observed, said rear dial and hand movement arrangement being such that the mirror image thereof appears as a normal clock face from which clock time may be observed.

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