June 1, 1937. E. BOURQUIN 2,082,612

ADVERTISING CLOCK

Filed Oct. 20, 1936 2 Sheets-Sheet 1

Fig. 1.

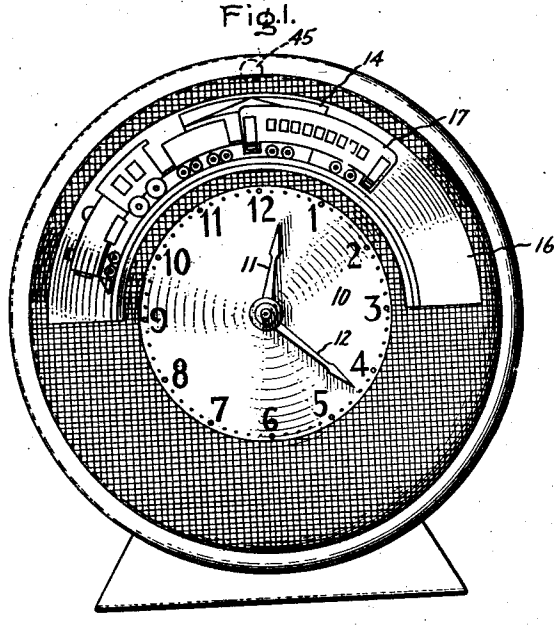
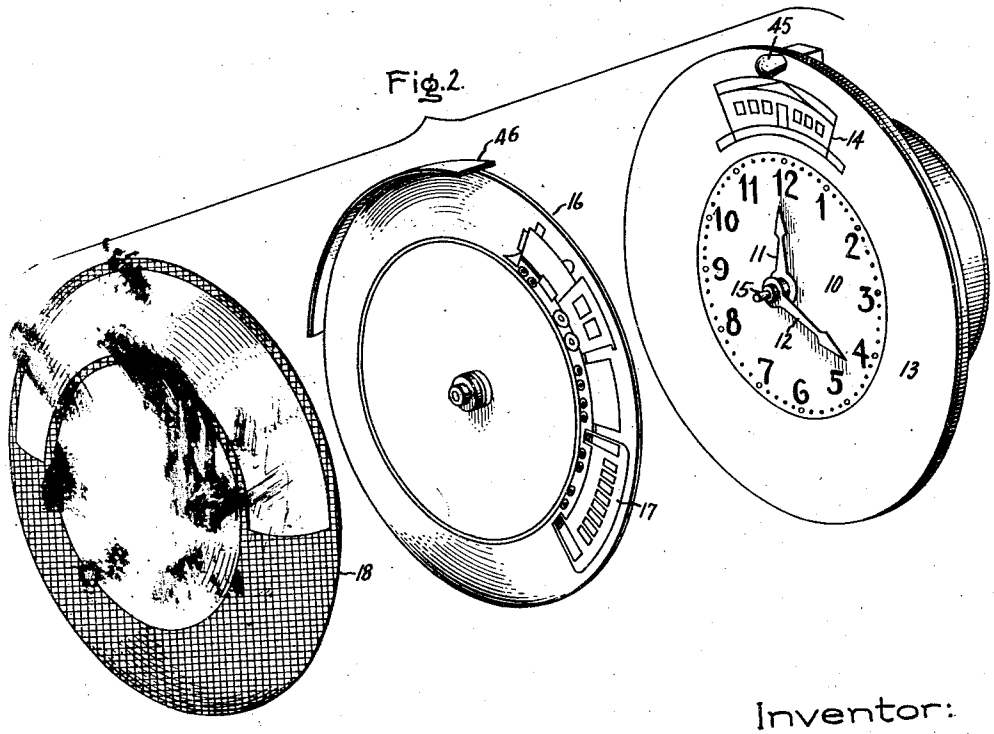


Fig. 2.



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Fig. 3.

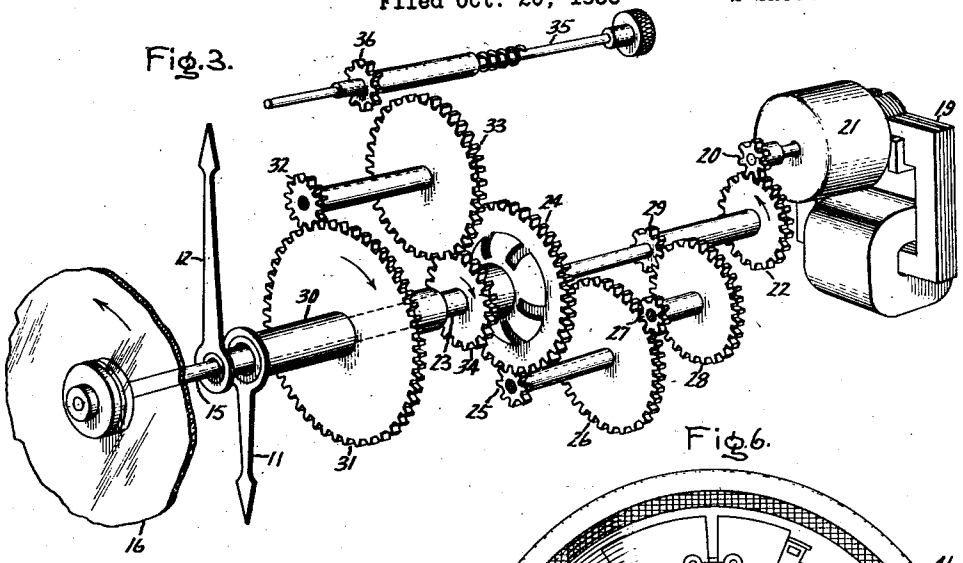


Fig. 6.

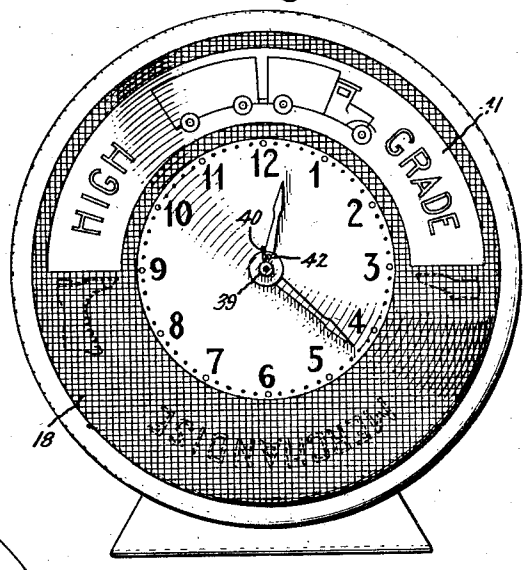


Fig. 5.

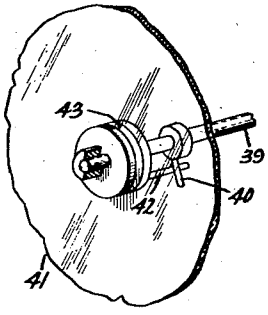


Fig. 7.

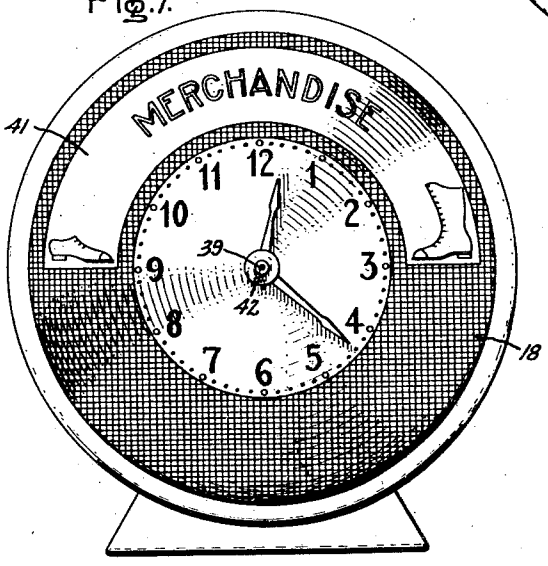
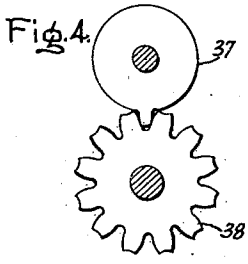


Fig. 4.



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Patented June 1, 1937

2,082,612

UNITED STATES PATENT OFFICE

2,082,612

ADVERTISING CLOCK

Edgar Bourquin, Framingham, Mass., assignor to Warren Telechron Company, a corporation of Maine

Application October 20, 1936, Serial No. 106,593

7 Claims. (Cl. 40—34)

My invention relates to clocks which are equipped with motion-display facilities driven by the clockwork. Such a clock may be used as an advertising device, as a clock particularly adapted for children, as an amusement-display clock, etc.

In carrying my invention into effect, I provide, in addition to an ordinary time-telling clock, motion-display means driven by the clockwork. The motion-display screen may be driven continuously or intermittently and may display advertising matter, pictures, etc. I have found that attractive motion-display means may be driven by the ordinary electric clock motor with the clock mechanism without interfering with clock accuracy and at little additional cost to the clock.

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 drawings, Fig. 1 of which represents a face view of a children's nursery clock; Fig. 2 shows an exploded view of the screen elements that make up the motion-display feature of the clock shown in Fig. 1; Fig. 3 illustrates a driving mechanism suitable for the clock and motion-display screen of Fig. 1; Fig. 4 illustrates an intermittent motion drive feature that may be incorporated in a drive train, such as shown in Fig. 3; Fig. 5 illustrates a single lost motion driving connection by the use of which a variety of motion-display effects may be had; and Fig. 6 and Fig. 7 illustrate face views of the same advertising clock with its display screen in different rotary positions. The display screen of this clock is unbalanced and is driven by the lost-motion device shown in Fig. 5 such that, at times, it has a pendulum motion.

Referring to Figs. 1 and 2, I have here shown a structure which includes an ordinary time-telling clock, the dial of which is shown at 10, the hour hand at 11, and the minute hand at 12. The clock dial plate, which is stationary, has an annular extension 13 surrounding the clock dial, which forms a background for the motion-display features. This background plate may have pictures or reading matter thereon as a part of the display scheme. In the example illustrated, I have provided a picture of a building thereon at 14 to represent a railway station.

Fastened to a fast-moving shaft 15 and covering the front of the clock dial and plate 13 is a light-weight disk 16 which may be made of celluloid or other suitable material. The disk 16 may be and preferably is of transparent material in order that the clock dial and hands may be seen through its central window portion. If an opaque material is used, the central window will be cut therein except for thin supporting spokes that do not obscure the clock dial and hands. The outer annular portion of disk 16 has suitable pictures or lettering thereon, depending upon the display desired. In the children's clock represented, the annular display portion of disk 16 carries a representation of a railway train 17 on its track.

Spaced from the display disk and covering the front of the casing containing the clock and display features is a stationary glass crystal 18 through which the clock dial may be seen. That annular portion of crystal 18 surrounding the clock dial may be made partially nontransparent by paint, as indicated by the cross-hatched portion thereof. As the display disk 16 revolves, the display 17 thereon is alternately hidden by the painted portion of crystal 18, is exposed to view through the transparent sector thereof, and, hence, the train has the appearance of going through a tunnel when it passes from view and of going past a railway station when exposed to view. Since the disk on which the train is painted is transparent, the train appears to be self-propelled. The track for the train may be painted on the back ground plate 13 or on the revolving disk 16 since the track is a circle and appears stationary in any event.

In the example shown, the display disk 16 revolves counterclockwise. I have found it feasible to revolve disk 16 at a rate of four revolutions per second in timed relation with the clock. While no particular rate of rotation is important, it is generally desirable to make it an even fraction of a second so as to give the effect of vigorous motion and also be able conveniently to use the display disk for short interval timing purposes. One may also tell at a glance if the clock is stopped or running.

Fig. 3 illustrates the drive train for the display clock of Figs. 1 and 2. In such drive, 19 represents an electric clock motor preferably of the self-starting synchronous variety. Between its rotor, not seen, and its terminal pinion 20 is a casing 21 containing suitable speed-reducing gearing. Pinion 20 meshes with a gear 22 on shaft 15 to which the display disk 16 is secured. Such gearing will be selected to drive disk 16 at the desired rate and in the desired direction of rotation.

The minute-hand shaft 23, which is hollow and concentric with shaft 15, is driven from the motor 19 through a slip friction clutch at 24, gear 24 comprising a portion of such clutch, and gears 25, 26, 27, 28, 29, 22, and 20. Such gearing will, of course, be selected to drive the minute hand at one revolution per hour in a clockwise direction. The hollow hour-hand shaft 30, concentric with the minute-hand shaft, is driven from the latter through the usual back gear train rep-

resented by gears 31, 32, 33, and 34. The friction clutch 24 permits the hands to be set through the setting shaft represented at 35 and a pinion 36 thereon which may be meshed with gear 33 when a setting operation is called for. With such drive arrangement, the display disk 16 will be driven continuously when the clock is running.

In some cases, an intermittent motion of the display disk may be desired. In such cases, I may substitute for the pinion 20, Fig. 3, a pinion 37, Fig. 4, having some of its teeth missing, meshing with gear 38 to take the place of gear 22, Fig. 3.

The terminal speed of the motor pinion will be somewhat faster with the intermittent motion arrangement and such changes as may be necessary will be made in the gearing to the clock hands to advance them at a time-keeping rate. If the clock hands are also driven through the lost motion device, their motion will also be intermittent but it will not be noticeable or objectionable so long as the intermittent motion does not interfere with the timing accuracy of the driving motor.

In Figs. 5, 6, and 7, 39 represents the second-hand shaft of an ordinary synchronous motor-driven clock. I have not shown the remainder of the clock-driving mechanism since no change is required therein from that which is customarily used. Such second-hand shaft is concentric with the hollow hour and minute-hand shafts as is the shaft 15 of Fig. 3. The second-hand shaft 39 has a driving dog 40 secured thereto, which dog may comprise the second-hand of the clock. The outer end of the shaft 39 supports a light-weight display disk 41, which is free to turn on shaft 39 but which has a driving pin 42 extending from the rear of its hub member 43 so as to be engaged by dog 40. Disk 41 is made of or has its central portion made of transparent material so that, when in front of the clock dial as shown in Figs. 6 and 7, the clock dial and hands may be seen therethrough. Disk 41 has its center of gravity to one side of its axis of rotation. This may be caused by an off-center weight attached to its back side or by an extra thickness of material on one side of its center. In any event, when free to do so, disk 41 may rotate freely on shaft 39, oscillate like a pendulum, and finally come to rest with its heavy side downward.

The outer annular portion of this display disk 41 has painted thereon any suitable display material, such as advertising matter, and the stationary covering bezel or crystal 18 may be painted to correspond. In the example shown, the glass bezel is painted the same as in Figs. 1 and 2 with a transparent sector uppermost. In the example shown, the display 41 is arranged for advertising high grade merchandise such as shoes. Its outer annular display section may be opaque or transparent and, if transparent, additional display material may be painted on the stationary background as in Figs. 1 and 2. As illustrated, the display disk 41 has painted on the half shown uppermost in Fig. 6, the words "High Grade" separated by the picture of a truck. The other half, shown uppermost in Fig. 7, illustrates footwear and the word "Merchandise".

The position of the display disk 41 in Fig. 7 is that which it will assume due to gravity when free to rotate to that position. When the clock is running, dog 40 will engage drive pin 42 and rotate disk 41 from the position shown in Fig. 7 to that shown in Fig. 6. This will be a relatively slow steady motion in a clockwise direction requiring one-half minute if, as assumed, shaft 39 is the second-hand shaft of an ordinary clock. The truck shown on this disk will thus have the appearance of being driven slowly up a high grade. When the disk 41 reaches the position shown in Fig. 6 with its weighted part uppermost corresponding to the position of the truck displayed thereon, it will very shortly become overbalanced and start to rotate more rapidly in a clockwise direction due to gravity, its driving pin 42 moving away from dog 40. Its motion will be accentuated until it returns through the position shown in Fig. 7 and then it will oscillate like a pendulum, finally coming to rest in the position shown in Fig. 7. It will then remain at rest a short while, perhaps one-fourth of a minute, until dog 40 catches up with drive pin 42 and the cycle of motion just described will be repeated. Thus, we have a variety of different motion-display conditions varying from a condition of standstill to a slow forward movement, a rapid forward movement, and a varying oscillatory movement.

The simulation of the action of a truck slowly climbing up a high grade and its acceleration on a down grade emphasizes the advertising words "High Grade". During the oscillatory movement which immediately follows, the different goods, footwear in this instance, pictured on the disk bob up and down and are alternately hidden and displayed to view.

This attractive advertising device is made possible without any change in the ordinary clock mechanism simply by adding the display disk to the second-hand shaft as described and providing a suitable clock bezel 18. The movable display disk also times the minutes like a second hand and shows from a distance whether or not the clock is in operation.

The examples given of my motion-display mechanism and the nature of the display are intended to be illustrative. A variety of modifications will readily occur to those skilled in the art. For example, the scheme shown in Fig. 1 may be combined with that shown in Fig. 6 by simply extending the fast-moving shaft 15, adding a second motion-display disk which is free to turn thereon, and employing the lost motion driving connection shown in Fig. 5 between the two display disks. Contrasting and changing color schemes may readily be had by painting different portions of a rotary disk in different colors or a section thereof a different color from the background, and leaving a transparent sector in the rotary disk. An additional display disk may be secured to and may rotate with the hour or the minute-hand shaft or with both to obtain changes in the background effect. Changes in the color or intensity of lighting effect of the display may be readily obtained by providing a lamp for general illumination of the display and clock dials as indicated at 45, Fig. 1, arranged to reflect its light downward through a translucent color screen 46, Fig. 2, about the outer edge of the revolving display disk 16. The color screen 46 may vary in color and in degree of transparency from point to point about the disk and thus, as it revolves with the display disk, the color of light and light intensity on the display will vary.

In accordance with the provisions of the patent

statutes, I have described the principle of operation of my invention together with the apparatus which I now consider to represent the best embodiment thereof but I desire to have it understood that the apparatus shown is only illustrative and that the invention may be carried out by other means.

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

1. In combination with a clock having an electric driving motor, a clock-operating mechanism driven by such motor, a clock dial, a display disk rotatively mounted at the center of and in front of the clock dial and having a central viewing window through which the clock dial may be seen and an annular display portion surrounding such window, means for driving said display disk from said motor so as to give the disk a rotary cycle of movement in timed relation to said clock at not less than one revolution per minute, and a stationary crystal for said clock spaced from and covering the front of said display disk, said crystal having transparent sections through which the clock dial and display disk may be seen.

2. In combination with a clock, a synchronous electric motor for driving said clock, a clock dial, minute and hour hands driven by said motor over said dial, hollow shafts on which said pointers are mounted, a shaft extending through said hollow shafts and supporting a display disk in front of said dial, said last mentioned shaft being driven by said motor in timed relation with said clock but at a much faster rate than the minute hand, said display disk having a central window through which the clock dial may be seen and an annular display portion surrounding said clock dial and on which display features are inscribed, a stationary glass crystal spaced from and covering the display disk and having a central transparent portion through which the clock dial may be seen, and a sector-shaped transparent portion through which is exposed a sector of the annular display portion of the display disk.

3. In combination with a clock, an electric motor for driving said clock, a stationary plate having a clock dial at its center and an annular portion surrounding said dial serving as a background for a display, a disk rotatively mounted at the center of said clock dial and spaced therefrom and covering the front of said stationary plate, means for driving said disk from said motor so as to give it a cycle of movement in timed relation with said clock at not less than one revolution per minute, said disk being made of transparent material and having display features inscribed on an annular portion thereof opposite the annular background portion of said plate, and a stationary glass crystal spaced from and covering the front of said disk through which the clock dial and display features of said disk and background plate may be seen as said disk is rotated.

4. In combination, a clock, an electric motor for driving said clock, a clock dial, hour and minute hands driven by said motor over said dial, a display disk rotatively mounted at the center of and in front of said clock dial, said disk having a central window through which the clock dial and hands may be seen and an annular portion surrounding said dial on which display features are inscribed, a lost motion driving connection between said motor and display disk through which said disk is driven so as to give the disk a cycle of intermittent rotary movement in timed relation with said clock and at an average rate of not less than one revolution per minute, and a crystal spaced from and covering the front of said display disk, said crystal having a central transparent portion through which the clock dial may be seen and a sector-shaped transparent portion through which the annular portion of said display disk may be seen as said disk revolves.

5. In combination with a clock, an electric motor for driving said clock, a clock dial therefor, a display disk rotatively mounted at the center of said dial and in front thereof, means for driving said display disk from said motor at an average rate of not less than one revolution per minute, said disk having a window in its central portion through which the clock dial may be seen and an annular portion surrounding said clock dial on which display features are inscribed, a stationary glass covering for the front of said clock through which the clock dial and display disk may be seen, a lamp secured adjacent the edge of said display disk for illuminating the display disk and clock dial, and a screen rotated with said display disk for varying the character of such illumination as said display disk revolves.

6. In combination with a clock, an electric driving motor therefor, a clock dial, hour and minute hands driven by said motor over said dial, a shaft concentric with the center of said dial driven by said motor at a rate of not less than one revolution per minute, a display disk rotatively mounted on said shaft in front of said dial, said disk having a central window section through which the clock dial may be seen and an annular section surrounding said clock dial on which display features are inscribed, and a lost motion driving connection between said shaft and display disk, said display disk having its center of gravity on one side of its axis of rotation whereby, due to such lost motion driving connection, it is rotated at the same rate as said shaft for a portion of a revolution, rotates faster than said shaft due to gravity for another portion of a revolution, and then has an oscillatory rotary movement.

7. In combination with a clock including an electric motor for driving said clock and a clock dial, a transparent display disk rotatively mounted in front of said clock dial and having an annular portion extending beyond and surrounding said dial, a glass crystal covering said dial and display disk having a transparent central window for displaying said clock dial and a transparent sector through which a section of the annular portion of said display disk may be seen, and means connecting said display disk in driving relation with said motor such that, when the clock is in operation, said display disk has a cycle of rotation in timed relation with said clock and at an average rate of not less than one revolution per minute, said display disk having a picture on its annular portion which, due to the transparency of said disk, has the appearance of being self-propelled when said disk is rotated and the picture is moved past the transparent sector of said covering crystal.

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