April 5, 1949. R. M. HEINTZ 2,466,312

TRANSPARENT DISK CLOCK

Filed Jan. 26, 1945 2 Sheets-Sheet 1

Fig. 1.

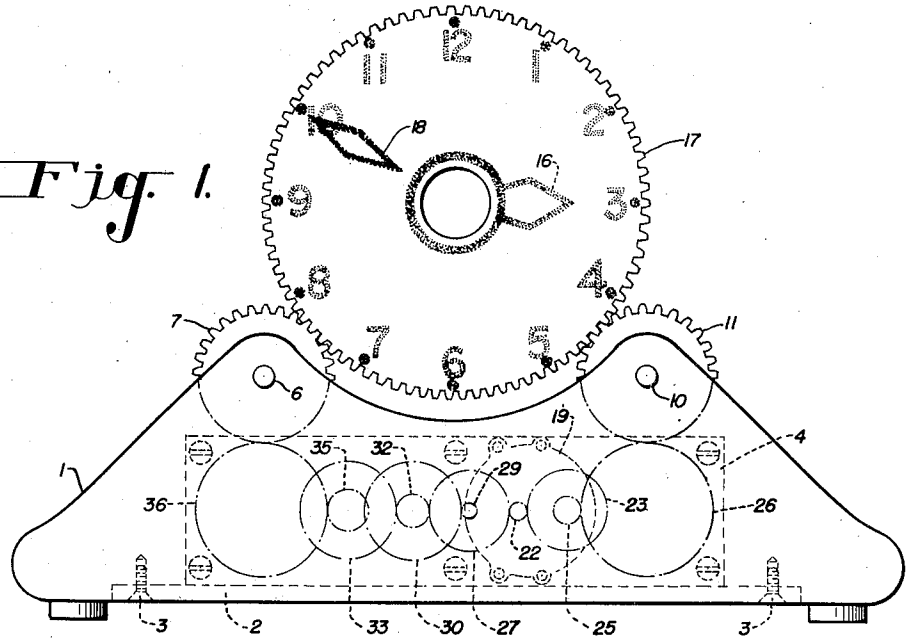

Fig. 2.

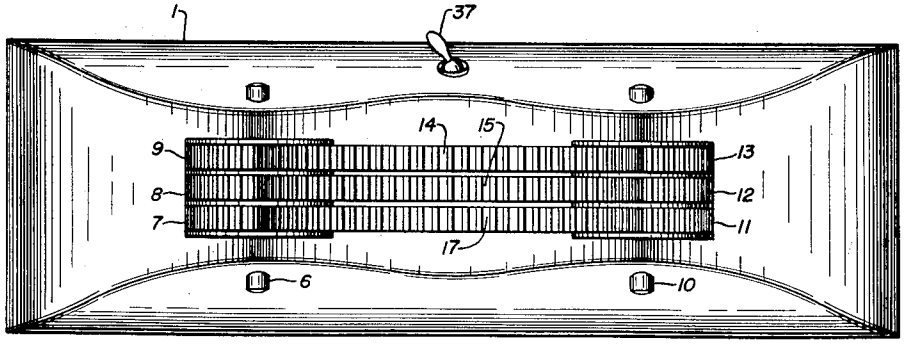

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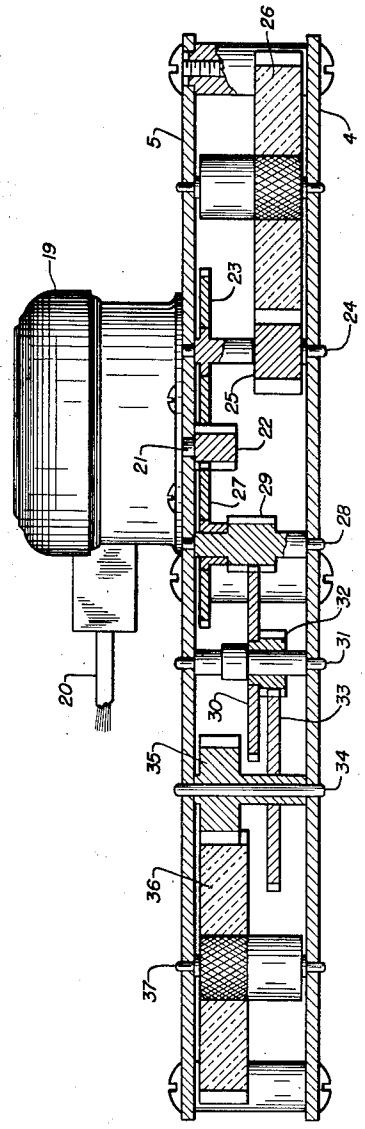
Fig. 3.



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UNITED STATES PATENT OFFICE

2,466,312

TRANSPARENT DISK CLOCK

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Application January 29, 1945, Serial No. 575,077

1 Claim. (Cl. 58—2)

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This invention relates in general to clocks and more particularly to electric clocks and has for one of its primary objects to provide an improved self-contained clockwork mechanism and an electric motor, the driving mechanism comprising two gear trains, one to drive a minute disc and the other an hour disc, the minute and hour discs to be of transparent material and of the same size and containing merely a minute and an hour hand respectively while the clock indicia are contained on a third transparent equal sized disc, the three discs to be removably placed to rest on gears extending outwardly from the clockwork casing with one driving gear for the hour disc, one for the minute disc and two freely mounted idler gears for supporting the indicia disc.

With the foregoing and other objects in view the invention resides in the combination of parts and in the details of construction hereinafter set forth in the following specification and appended claim, certain embodiments thereof being illustrated in the accompanying drawings in which:

Figure 1 is a view in front elevation of the clock including the discs and the clockwork casing, the clockwork gear trains being shown in dotted lines;

Figure 2 is a top plan view of the clock with the discs in mesh with the exteriorly extending gears; and

Figure 3 is a view in cross section of the electric motor casing and the gear trains.

Referring more particularly to the drawings, the casing 1 has a bottom lid 2 removably secured by screw bolts 3 for containing the clock work mechanism anchored to the two plates 4 and 5. Mounted to rotate about a pin 6 extending through the casing are three parallel spaced gears 7, 8 and 9 and about a similar pin 10 are rotatably mounted three parallel spaced gears 11, 12 and 13.

Gears 9 and 13 are both freely rotatable about pins 6 and 10 and are disassociated from the clockwork gear train. Removably placed to rest on gears 9 and 13 is a peripherally toothed transparent disc 14 which teeth mesh with gears 13 and 9 and which is provided with the hour indicia of a clock. In front of disc 14 is another peripherally toothed disc 15 removably placed to rest with its peripheral teeth meshing with gears 8 and 12. The disc 15 carries an hour hand 16. Gear 12 is a freely rotating gear but gear 8 is driven by the clockwork gear train. In front of disc 15 is another transparent disc 17 carrying

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a minute hand 18 and peripherally toothed to mesh with gears 7 and 11 as the disc 17 is removably placed to rest on gears 7 and 11. Gear 7 is freely rotatably mounted on pin 6 but gear 11 is driven by the clockwork gear train.

The prime mover for the clockwork mechanism may be electric and may comprise an electric motor in a housing 19 connected by an electric lead 20 to the usual electric outlet. This electric motor has a driving shaft 21 carrying a gear 22 that has 12 teeth. Gear 22 makes one revolution per minute and its 12 teeth which mesh with a larger ring gear 23 carried by a free stud shaft 24. Gear 23 has 60 teeth and is rotated 12 teeth or 1/5 revolution per minute. Stud shaft 24 rigidly carries a smaller ring gear 25 that has ten teeth which mesh with a larger ring gear 26 having forty teeth. Gear 25 makes 1/5 revolution or two teeth per minute and gear 26 makes 1/20 revolution or two teeth per minute. Gear 26 meshes with ring gear 11 which, having forty teeth, rotates 1/20 revolution, or two teeth per minute. Gear 11 meshes with the geared minute disc 17 to rotate the latter in a clockwise direction. Disc 17 has one hundred and twenty teeth and is rotated by gear 11 at a rate of 1/60 revolution or two teeth per minute, or 2° out of 360° per one revolution of the motor shaft 21.

The gear 22 carried by the motor shaft 21 also meshes with a larger gear 27 having sixty teeth and freely carried by a shaft 28. Rigid with shaft 28 is a smaller gear 29 having twelve teeth which meshes with a larger gear 30 having seventy-two teeth and freely carried by a shaft 31. Rigid with shaft 31 is a smaller gear 32 having twenty-four teeth and meshing with a larger gear 33 having seventy-two teeth and freely mounted on a shaft 34. Rigid with shaft 34 is a smaller gear 35 having fifteen teeth and meshing with a larger gear 36 freely carried by a shaft 37. Gear 36 has forty teeth and meshes with gear 8 having ten teeth and meshing with the teeth of the hour disc 15 carrying the hour hand 16 in a clockwise direction 1/12 of the speed of rotation of the minute hand disc 17.

In other words, the hour disc 15, having one hundred and twenty teeth rotates in one hour 1/12 revolution, or ten teeth, or 30° out of 360°. Gear 8, having ten teeth rotates 1/4 revolution or ten teeth per hour. Gear 36, having forty teeth, rotates 1/4 revolution or ten teeth per hour. Gear 35, having fifteen teeth, rotates 2/3 revolution or ten teeth per hour. Gear 33 has seventy-two teeth and rotates 2/3 revolution or forty-eight teeth per hour. Gear 32 has twenty-four teeth

and rotates two revolutions or forty-eight teeth per hour. Gear **30** has seventy-two teeth and rotates two revolutions or one hundred forty-four teeth per hour. Gear **29** has twelve teeth and rotates twelve revolutions or one hundred forty-four per hour. Gear **27** has sixty teeth and rotates twelve revolutions or seven hundred and twenty teeth per hour as gear **22** on the motor shaft rotates seven hundred and twenty teeth or sixty times per hour, or one revolution per minute, to carry the hour hand **16** in a clockwise direction at a rate of $\frac{1}{12}$ that of the speed of rotation of the minute hand disc **17**. The numeral **37** represents a light switch lever for turning on and off a suitable source of electrical illumination for the three clock discs.

From the foregoing it will be seen that there has been provided a clock having a unitary self-contained electrically driven clockwork gear train mechanism easily accessible for inspection and repair. Moreover, the clock face and the minute and hour discs are readily removable from and replaceable on the driving gear train of the clockwork mechanism without any disturbance to the clockwork mechanism.

I claim:

In combination in a clock, a casing, a clockwork mechanism therein and including a driving shaft, a pair of driving gears extending externally of said casing, a peripherally toothed transparent

disc carrying minute hand indicia and removably placed to rest upon and in mesh with one of said driving gears, a second peripherally toothed transparent disc spaced from and parallel with said first disc and carrying hour hand indicia and meshing with and driven by said other driving gear, a pair of laterally spaced idler gears extending externally of said casing and meshing with and supporting said hour hand disc and said minute hand disc, a third peripherally toothed transparent disc having indicia constituting a clock dial and spaced from and parallel with the other two discs and meshing with said idler gears, gear trains driven by said driving shaft to drive the driving gear for driving said minute hand disc at a twelve to one ratio to said hour hand disc.

RALPH M. HEINTZ.

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