

Sept. 1, 1931.

C. E. LARRABEE

1,821,100

OSCILLATING ARMATURE SECONDARY CLOCK

Filed Sept. 25, 1929

2 Sheets-Sheet 1

FIG. 1.

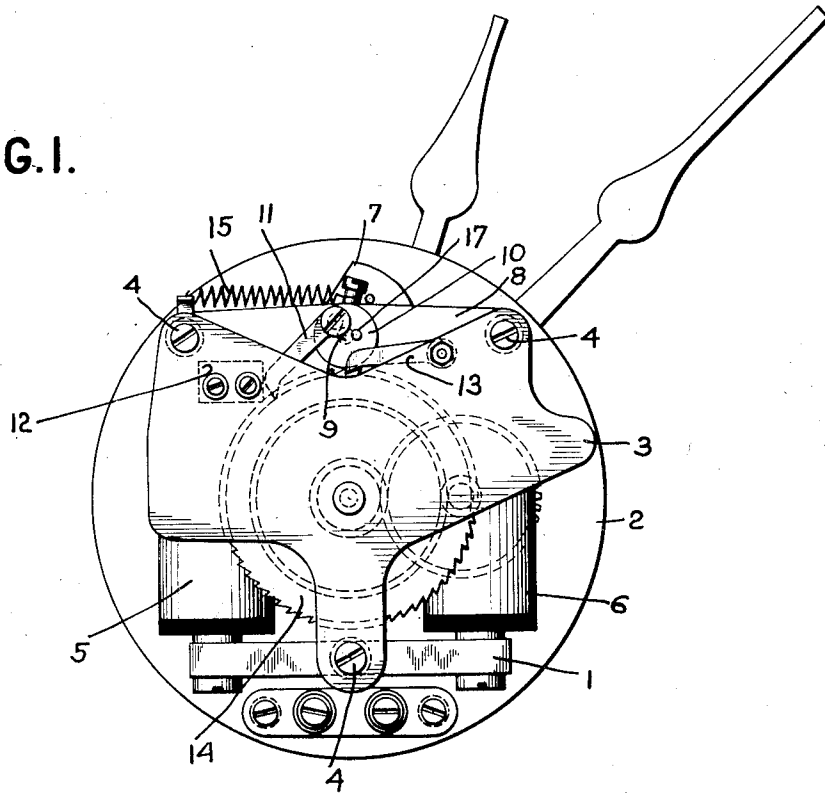
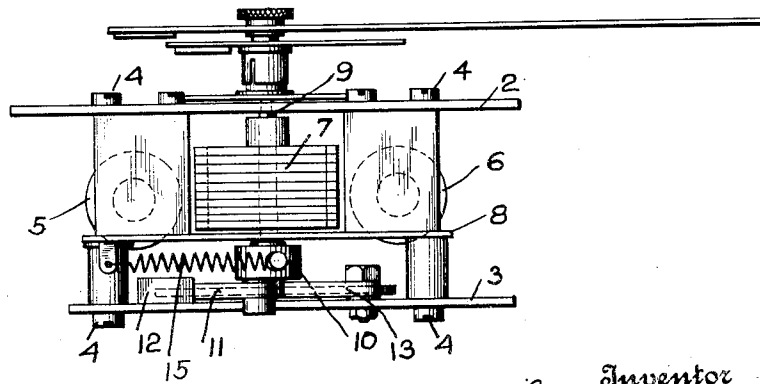


FIG. 2.



Inventor
C. E. Larrabee
By his Attorney
Wm. Wilson

Sept. 1, 1931.

C. E. LARRABEE

1,821,100

OSCILLATING ARMATURE SECONDARY CLOCK

Filed Sept. 25, 1928

2 Sheets-Sheet 2

FIG.3.

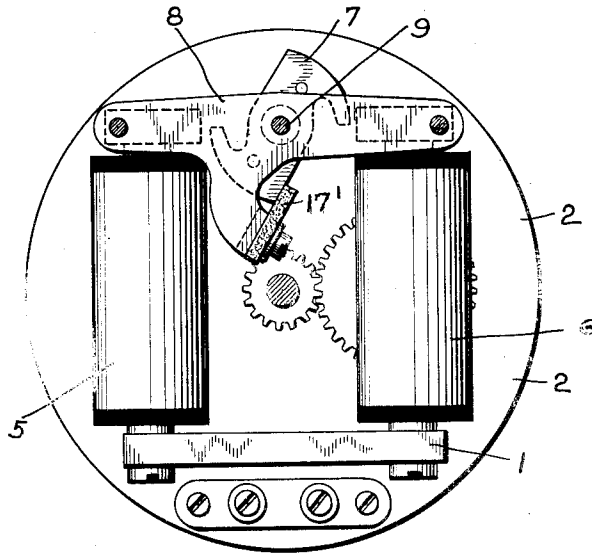


FIG.5.

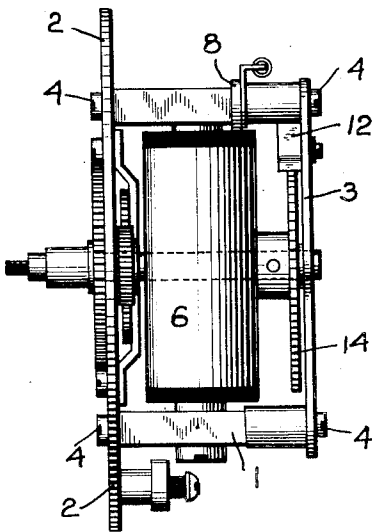
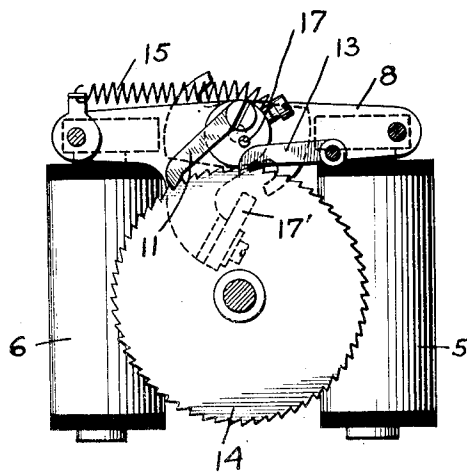


FIG.4.



Inventor
C. E. Larabee
By his Attorney
W. W. Wilson

UNITED STATES PATENT OFFICE

CLINTON E. LARRABEE, OF BINGHAMTON, NEW YORK, ASSIGNOR TO INTERNATIONAL TIME RECORDING COMPANY OF NEW YORK, OF ENDICOTT, NEW YORK, A CORPORATION OF NEW YORK

OSCILLATING ARMATURE SECONDARY CLOCK

Application filed September 25, 1928. Serial No. 308,227.

The present invention relates to an electrically operated clock and more particularly to a secondary clock such as are used in electric clock systems in which the secondary clocks are controlled by current impulses provided from a master clock.

The main object of the present invention is to provide a magnetically operated clock of extremely quiet operation.

10 A further object of the invention is to provide a shifting pawl for a ratchet wheel of the clock mechanism actuated by an oscillating armature and a retaining pawl for said ratchet wheel positively cooperating with
15 said armature.

Other objects and advantages will be hereinafter set forth in the accompanying specification and claims and shown in the drawings which show by way of illustration what
20 is now considered to be one and a preferred embodiment of the invention.

In the drawings:

Fig. 1 is a rear view of the clock mechanism.

25 Fig. 2 is a top view of the mechanism shown in Fig. 1.

Figs. 3, 4 and 5 show the magnet and its cooperation with the clock mechanism.

In the drawings reference numerals 2 and
30 3 designate the front and rear plates of the clock upon which are fastened all of the operating parts. These plates are connected with each other by cross plates and screws 4 as will be seen from the drawings. The base plate 1,
35 fastened to front plate 2, carries the magnet system consisting of two magnets 5 and 6 to which an oscillating armature 7 is coordinated. The yokes of the magnets are fastened to front plate 2 by screws 4 which also
40 carry the rear plate 3 and a third plate 8. Shaft 9 of oscillating armature 7 has its bearings in plates 8 and 2 and carries on its rear end a disk 10. Eccentrically mounted on the disk 10 is the shifting pawl 11 limited in its
45 movement by stop piece 12 fastened to rear plate 3 said shifting pawl coacting with said piece 12 to limit the rotation of the disk 10, which is biased counterclockwise by the spring 15. Said piece 12 holds pawl 11 in
50 cooperation with the ratchet wheel 14 to lock

said wheel against further rotation from other than the proper actuating means.

Pivotally mounted on the rear plate 3 is a locking pawl 13 which holds the ratchet wheel 14 constantly locked against movement
55 in a clockwise direction as viewed in Fig. 1. The ratchet wheel 14 is provided with 60 teeth and, being advanced one tooth per impulse at the rate of one impulse per minute, makes one revolution per hour. Said ratchet wheel is fixed to the main arbor which carries the minute hand. The hour hand is operated from this shaft by the usual well known set of dial works or gear train. The armature
65 7 is normally held in the position as viewed in Figs. 1 and 3 in which said armature rests against a limit piece 17' of suitable soft material to minimize any noise of impact and is held in this position under a slight tension of the spring 15. When the magnets 5 and 6
70 are energized the armature 7 is turned clockwise, as viewed in Figs. 1 and 3, bringing the axis of said armature into a position substantially parallel to the lines of magnetic flux which flows between the poles of the magnets,
75 said armature taking the position shown in Fig. 4. In taking this last mentioned position additional tension is introduced into the spring 15 and the pawl 11 is retracted to the right Fig. 4, to engage the next right hand
80 successive tooth to the one previously engaged. When the magnets are deenergized the tension of the spring 15 causes the armature 7 to be restored to its normal position (Fig. 3) and the pawl 11 is carried to the
85 left rotating the ratchet wheel 14 counterclockwise (Fig. 4) until the retaining pawl 13 engages the next succeeding ratchet tooth to prevent retrograde movement of the ratchet wheel 14 when the pawl 11 is moved to the
90 right on the next successive minute impulse. The limit piece 17' being of soft material, as described, renders the restoring stroke of the armature 7 almost noiseless.

While there has been shown and described
95 and pointed out the fundamental novel features of the invention as applied to a single modification it will be understood that various omissions and substitutions and changes in the form and details of the device illus-
100

trated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention to be limited therefore only as indicated by the scope of the following claim.

I claim:

In an electrically operated clock mechanism, a two core magnet unit, a Z-shaped armature mounted on a shaft between the cores of said unit and so disposed to be rotated into substantially parallel relationship with lines of magnetic flux when said magnet is energized free of contact with the cores of said magnet, a disk rigidly fixed to the end of said shaft, a helical spring fixed to the periphery of said disk for retracting the armature when said magnet is deenergized, a pawl for advancing the clock mechanism pivotally mounted on said disk midway between the periphery and the shaft, and a yielding stop member coacting with said armature to limit the angular displacement of said armature when retracted.

In testimony whereof I hereto affix my signature.

CLINTON E. LARRABEE.

30

35

40

45

50

55

60

65