H. C. WILCOX.

ELECTRIC ALARM CLOCK.

APPLICATION FILED JUNE 17, 1909.

**957,397.** **Patented May 10, 1910.**

2 SHEETS—SHEET 1.

Fig. 1.

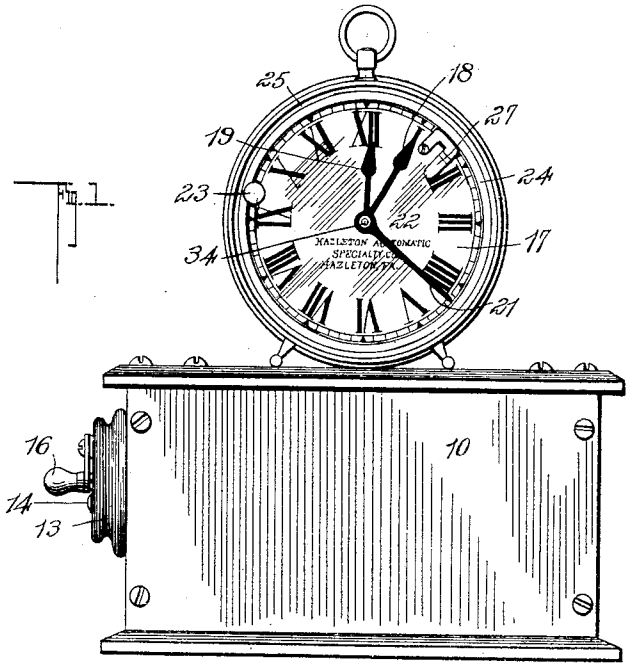



Fig. 2.

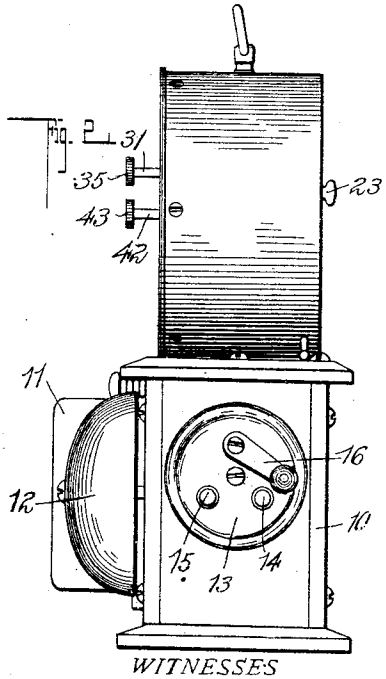
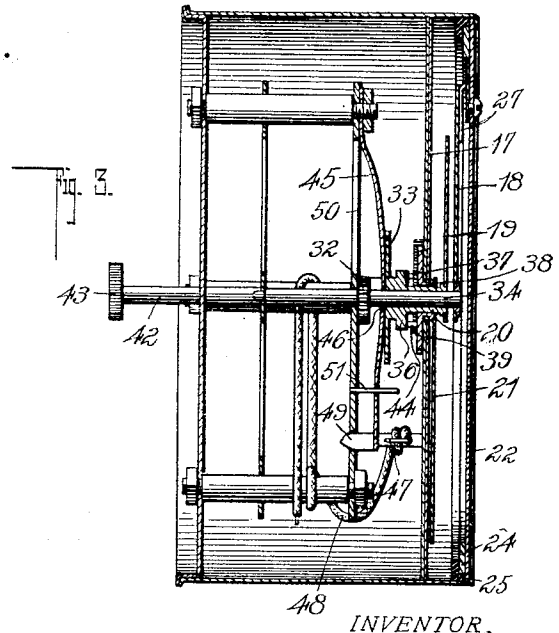



Fig. 3.




WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

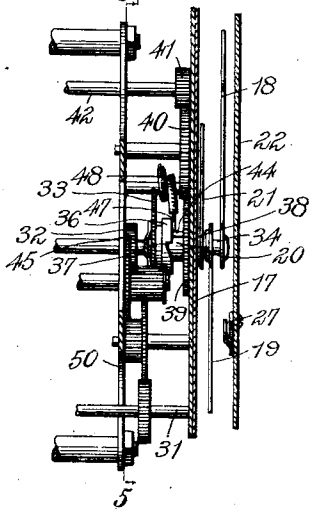



Fig. 5.

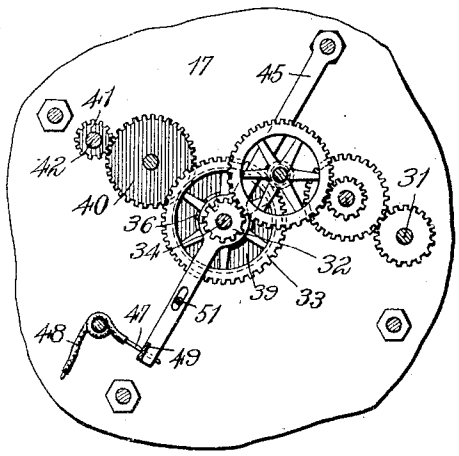
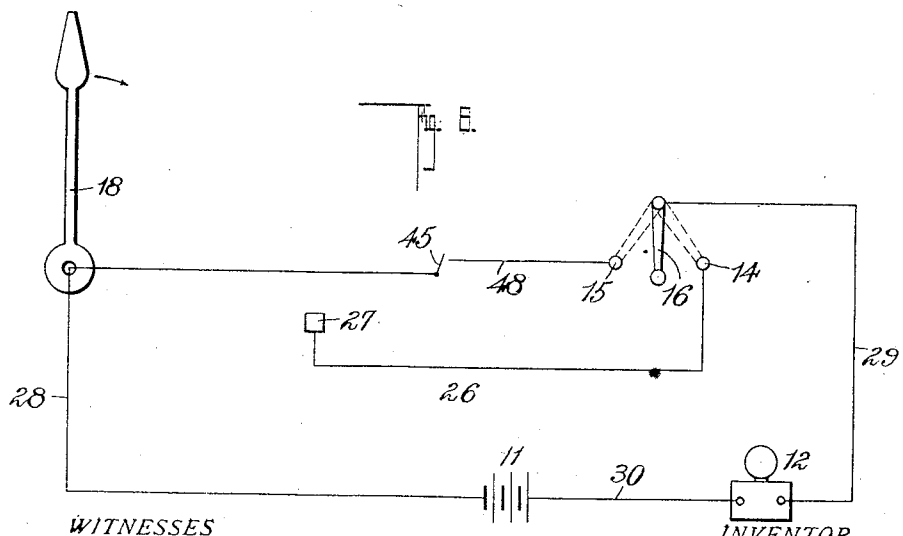



Fig. 6.

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# UNITED STATES PATENT OFFICE.

HORACE C. WILCOX, OF HAZLETON, PENNSYLVANIA.

## ELECTRIC ALARM-CLOCK.

957,397. Specification of Letters Patent. Patented May 10, 1910.

Application filed June 17, 1909. Serial No. 502,708.

*To all whom it may concern:*

Be it known that I, HORACE C. WILCOX, a citizen of the United States, residing at Hazleton, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Electric Alarm-Clocks, of which the following is a specification.

This invention relates to alarm-clocks wherein the alarm is operated at the desired time by the closing of an electric circuit, and it consists in a novel construction and arrangement of parts to be hereinafter described and claimed.

It is the primary object of the invention to provide an alarm-clock of the kind stated which can be set to sound the alarm accurately on the minute, thus rendering the clock particularly useful in certain photographic work which must be timed in order to obtain good results.

Another object is to provide a clock which may also be set to ring on the hour and half-hour, in order that it may be used as an ordinary alarm-clock.

The invention also has for its object to provide circuit controlling-means which are devoid of complicated parts to get out of order, and which can be set to sound the alarm at the exact time desired.

A further object is to provide an alarm mechanism which will not impair the accuracy of running of the clock.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of the clock. Fig. 2 is an end view. Fig. 3 is a transverse section taken through the clock in the plane of the arbors of the hands. Fig. 4 is an edge view of the parts shown in Fig. 3. Fig. 5 is a section on the line 5—5 of Fig. 4. Fig. 6 is a diagrammatic view showing the arrangement of circuits.

Referring to the drawings, 10 denotes a casing containing an electric battery 11, and carrying a bell 12 included in the circuit of the battery. On one end of the casing is mounted a switch comprising a suitable base 13, contacts 14 and 15, respectively, and a switch lever 16.

On the casing 10 is mounted a clock having an ordinary movement which has been shown removed in part, in order to make the construction and operation of the invention more clear and readily understood, the movement, except as hereinafter described, forming no part of the invention. The clock has a dial 17 on which the time is indicated in the usual manner by a minute hand 18, and an hour hand 19. On the arbor 20 of the hour hand is also mounted for independent rotation a pointer 21 indicating on the dial, and which is for a purpose to be presently made clear. The dial 17 is provided with a glass 22 behind which the hands and pointer work. The glass is held in the usual bezel, it being loose therein in order that it may be rotated by hand, it being fitted with a knob 23 for this purpose. On the dial 17 is mounted a ring 24 of metal which is insulated from the clock by a ring 25 of rubber or other insulating material. The ring 24 is electrically connected by an insulated wire 26 to the contact 14, the wire passing down through the clock and through the casing 10, and thence to the contact, to which it is connected in any suitable manner. To the inner face of the glass 22 is secured a spring tongue 27 which is in contact at one end with the ring 24, and at its free end it extends into the path of the minute hand 18 in such a manner that said hand sweeps across it lightly without being retarded, the time keeping qualities of the clock therefore not being impaired.

The clock is electrically connected to one pole of the battery 11 by an insulated wire 28 passing into the casing 10, and as the minute hand 18 is not insulated from the clock, it will be evident that when said hand makes contact with the tongue 27, the circuit will be closed and the alarm sounded, provided, of course, the switch lever 16 is on the contact 14. The circuit may be traced as follows: one pole of the battery to clock, to minute hand, to tongue 27, ring 24, wire 26 to contact 14, through switch lever 16 to a wire 29 leading to the bell 12, and from bell by a wire 30 to other pole of the battery.

The parts are set so that the alarm will be sounded at the desired time by turning the glass 22 to properly locate the tongue 27 with respect to the minute hand 18. Thus, if the alarm is to sound exactly five minutes after a certain time, the glass is rotated to bring the tongue a distance of five minute spaces of the dial 17 ahead of the minute hand. That portion of the tongue across which the minute hand sweeps has the same width as the minute spaces of the dial, and it is located in close proximity to said spaces, one of its edges extending parallel to the

graduations, which enables it to be set to sound exactly on the minute. Inasmuch as the width of the tongue is the same as the distance between the graduations, the alarm will sound a sufficient length of time, or exactly one minute, unless the switch lever 16 is swung off the contact 14.

To sound the alarm on the hour and half-hour as in an ordinary alarm-clock, the following mechanism is provided: At 31 is indicated a shaft which is for setting the clock, it being geared to the hour and minute hands by a train of gears connected to pinions 32 and 33. The pinion 32 is on the arbor 34 of the minute hand, and the pinion 33 is on the arbor 20 of the hour hand, with which it may be formed integral. The shaft 31 is mounted for rotation in the clock casing, and it projects from the back thereof, the projecting end being fitted with a knob 35 for rotating it and thus setting the clock.

The arbor 20 is tubular, and the arbor 34 works therein. On the arbor 20 is a disk 36 having in one of its faces a notch 37. This disk may be formed integral with the arbor. The pointer 21 has a tubular arbor 38 which is mounted for independent rotation on the arbor 20. On the arbor 38 is mounted, or formed integral therewith, a pinion 39, which is geared by an intermediate pinion 40 to a pinion 41 on a shaft 42 which is provided for setting the pointer 21. This shaft is mounted for rotation in the clock casing, and it projects from the back thereof, the projecting end being fitted with a knob 43 for rotating it.

The pinion 39 carries a projecting pin 44 which rides over the notched face of the disk 36. The arbor 20 is slidable endwise on the arbor 34, and the disk and pin are held in engagement with each other by a spring 45 made fast at one end to one of the posts of the clock casing, said spring being engageable intermediate its ends with the pinion 33. There is an aperture 46 in the spring through which the arbor 34 loosely passes, so that its movement is not disturbed or retarded by the spring.

The free end of the spring 45 is opposite the bared end 47 of a piece of insulated wire 48 leading to the contact 15. Inasmuch as the spring is electrically connected to the clock casing, it will be evident that the electric circuit is closed when the spring comes in contact with the part 47, provided the switch lever is on the contact 15, the clock casing being connected to one pole of the battery 11 as already described. The circuit may be traced as follows: one pole of battery to spring 45, wire 48 to contact 15, switch lever 16 to wire 29, bell 12, and through wire 30 to other pole of battery.

Contact at the predetermined time between the spring 45 and the part 47 is made as follows: The pin 44, by its engagement with the disk 36, holds the spring normally out of contact with the part 47, so that the circuit is broken. However, when the notch reaches the pin, the arbor is moved endwise by the pressure of the spring against the pinion 33. The spring is thus released and it moves with the arbor and swings into contact with the part 47, thus closing the circuit, and causing the alarm to be sounded. The extent of this movement of the arbor 20 is equal to the depth of the notch, and this is sufficient to bring the spring into contact with the part 47. As the disk 36 continues to rotate, the pin gradually backs out of the notch, whereby the arbor 20 is caused to move in the opposite direction, and disengage the spring, thus breaking the circuit. The length of the notch governs the length of time the circuit remains closed. That end of the notch out of which the pin backs is made inclined so that no binding will take place. At the free end of the spring 45 is a lateral bend 49 which extends into an opening made in the adjacent supporting plate 50 of the clock movement. On said plate is also mounted a pin 51 which extends into an opening in the spring. The function of these parts is to guide the spring in its movement to and from the part 47.

It will be evident from the foregoing, that to set the alarm for the desired time all that is required to be done, is to set the pointer 21 on the hour or half-hour when the alarm is to be sounded. This places the pin 44 in such a position relative to the notch 37, that the latter will reach the pin at the time to which the pointer was set, and the circuit is then closed in the manner already described.

By the structure herein described, the alarm will be accurately sounded on the minute, thus rendering the clock especially useful in certain photographic work which requires to be timed in order to obtain good results. After the alarm has been set, the workman may devote his time and mind to some other duties without fear of having the work which is being timed spoiled by forgetting the exact time the process is to be stopped. The clock may also be used in connection with various time-controlled devices, and also employed as an ordinary alarm-clock. The parts constituting the mechanism are arranged in a simple manner, and are devoid of complications, and therefore not liable to get out of order.

I claim:

1. The combination with a clock including its minute hand, dial and glass, the latter being rotatably mounted; of an electric circuit connected at one end to the minute hand of the clock, a signal device in the circuit, a ring mounted on the dial, and insulated from the clock, said ring being connected to the

other end of the circuit, and a contact carried by the glass in the path of the minute hand, and engageable thereby, said contact being electrically connected to the ring, and adjustable with respect to the graduations of the dial by rotation of the glass.

2. In a clock alarm, the combination of an hour hand having an arbor which is mounted for endwise movement, a disk on said arbor having a notched face, a pointer indicating on the clock dial, a tubular arbor for the pointer mounted for independent rotary movement on the hour hand arbor, a pinion on the pointer arbor, a pin carried by the pinion, and extending into contact with the notched face of the disk, a spring pressing on the hour hand arbor, and tending to move the same endwise when the pin enters the notch of the disk, said spring moving with the arbor, and having an aperture through which the minute hand arbor loosely passes, an electric circuit including a signal device, one end of the circuit being connected to the spring, a contact connected to the other end of the circuit, said contact being in the path of the spring and engageable thereby when the aforesaid movement of the spring takes place, and a setting device for the pointer geared to the aforesaid pinion.

3. The combination with a clock including its hands, dial and glass, the latter being rotatably mounted; of an electric circuit connected at one end to one of the hands of the clock, a device in the circuit actuated by the closing thereof, a ring mounted on the dial, and insulated from the clock, said ring being connected to the other end of the circuit, and a contact carried by the glass in the path of the aforesaid hand, and engageable thereby, said contact being electrically connected to the ring, and adjustable with respect to the graduations of the dial by rotation of the glass.

In testimony whereof I affix my signature in presence of two witnesses.

HORACE C. WILCOX.

Witnesses:
HENRY PIPPERT,
R. R. MONTELIUS.