June 30, 1936. T. A. PURVIS 2,045,798

COMBINED ALARM CLOCK AND LIGHT

Filed March 23, 1935

Fig. 1

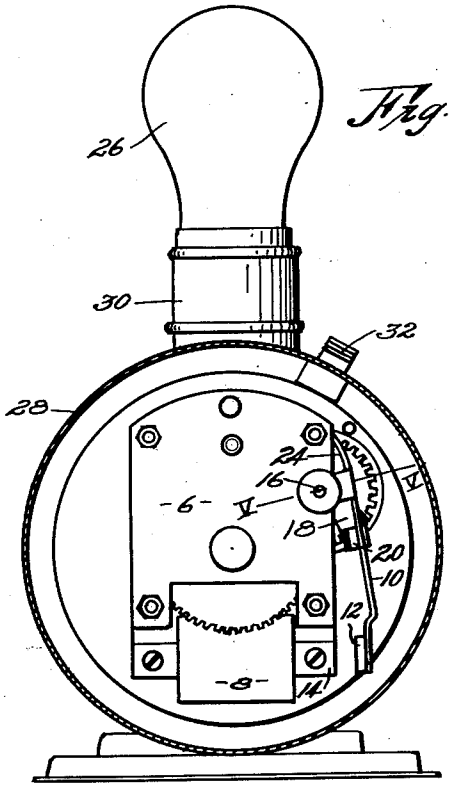


Fig. 2

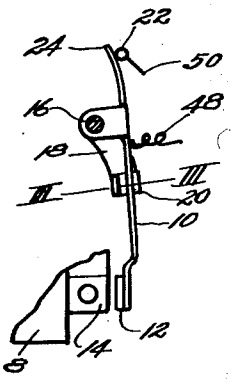


Fig. 3.



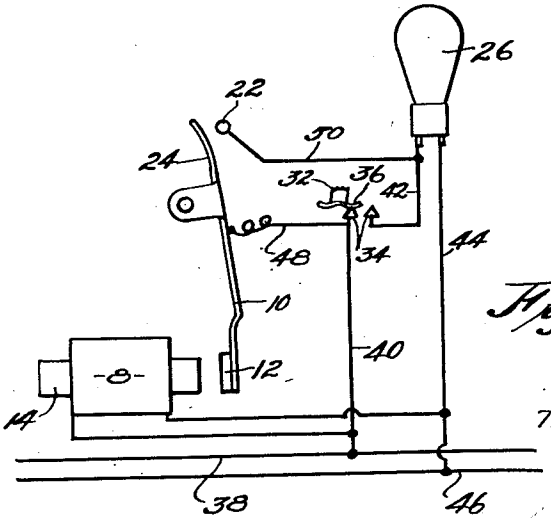


Fig. 4

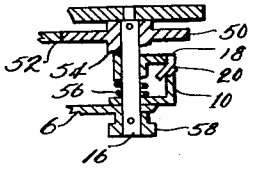


Fig. 5.

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COMBINED ALARM CLOCK AND LIGHT

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4 Claims. (Cl. 58—19)

This invention relates to combination alarm clock and light mechanism and the primary object of the invention is to provide such a device so that when the alarm is released, a light will automatically glow and remain in such condition until a manually controlled switch on the casing of the clockwork is opened to break the circuit to the lamp which was closed by another switch when the alarm mechanism was released.

Another important aim of this invention is the provision of a combined alarm clock and light, which has as a part thereof, unique electrical circuits having appropriate switches for effecting the flow of current to the electric lamp; one of said switches being manually operable so that the lamp might be caused to glow irrespective of the position of the clockwork or the other switch that is opened and closed thereby.

A yet further object of this invention is the provision of a clock and light device of the aforementioned character that includes means operable by the alarm release of the clockwork irrespective of the nature of the clockwork in so far as the method of actuating the mechanism of the clockwork is concerned.

Another object of this invention is to provide novel switch mechanism which is associated with the vibrator arm, of electrically operated clockwork, which mechanism is of such a nature that the vibrator arm is operated by the coil of the clockwork as the switch is closed and without affecting its efficiency.

It is well known in this art that alarm clocks have been provided with various types of lights, but in most cases the circuits involved have not permitted using the lamp irrespective of the position of the switch that is actuated by the alarm mechanism. In cases where the alarm mechanism did actuate a switch the means whereby such was accomplished has usually been involved, complicated, expensive and very hard to maintain in order.

This invention contemplates overcoming the objections of the types of alarm clocks now obtainable and also aims to provide unique structure whereby an electrically operated clockwork might be easily provided with a lamp which is caused to glow when the alarm is released.

With these objects in mind, one form of the invention will be explained by referring to the accompanying drawing, wherein:

Figure 1 is a sectional view through a combined alarm clock and light made to embody this invention.

Fig. 2 is a detailed, fragmentary view of the switch mechanism and associated parts of the clockwork.

Fig. 3 is a fragmentary, detailed, sectional view taken on line III—III of Fig. 2,

Fig. 4 is a wiring diagram illustrating the circuits employed in the clock, and

Fig. 5 is a fragmentary, detailed, sectional view showing the releasing mechanism taken on line V—V of Fig. 1.

In the instance shown, the device has the well known electrically operated clockwork 6, which usually embodies a synchronous motor that is operated by alternating electric current and other parts that are well known in the art, but which do not form a part of this invention in so far as the alarm signal is concerned. This clockwork has a coil 8 that is always energized and which always maintains an attraction for the free end of a vibrator arm 10. This arm 10 has a head 12 thereon and the core 14 of the coil 8 attracts this free end of arm 10 as soon as the distance between the two is diminished to a point where the magnetic attraction is great enough to pull the arm toward the end of core 14. Vibrator arm 10 is of a resilient material and is mounted upon pintle 16. A pivotally mounted lever 18 has an inclined face 20 formed thereon which rides against arm 10 so that the latter is set a predetermined distance from coil 8. This distance, obviously, must be great enough so that the core 14 will not normally pull the head 12 toward it when the alarm is in an inoperative position.

As the clockwork operates, lever 18 is moved axially by the usual alarm let-off mechanism and arm 10 is allowed to slowly approach core 14 due to the cam action of cam 20 on arm 10 and when the magnetic attraction is great enough, vibrator arm 10 commences to vibrate and set up the alarm. The let-off mechanism which allows arm 10 to approach core 14 where the latter may act upon it is detailed in Fig. 5 and comprises gear 50, pinned to shaft 16 and in mesh with a gear 52 of the clockwork. A cam face 54 is formed on the hub of gear 50 and lever 18 which is slidable upon shaft 16, has a portion thereof bearing against cam face 54. A spring 56 urges lever 18 against cam face 54 and as gear 50 is turned, lever 18 and its inclined face 20 will move away from arm 10 to allow it to rotate about the axis of shaft 16 upon which it is mounted in response to the pull of coil and core 8 and 14 respectively. The relative position of cam face 54 and lever 18 may be manually set by manipulating knob 58. As the clock-

work, including gear 52 continues to run, gear 50 will turn and, obviously, at a predetermined time arm 10 will be slowly allowed to approach core 14 so that vibrating action may start. Usually the vibrator arm 10 is quickly released so as to have its free end moved toward core 14 at the time set for the alarm and in so doing, arm 10 moves about pintle 16 as an axis so that the switch mechanism may be closed at that instant.

This switch mechanism includes pin 22 which forms the fixed contact member of the switch that is engaged by finger 24 when vibrator arm 10 is released for the purpose of sounding the alarm. This finger 24 is flexible and is in longitudinal extension of arm 10. Its flexibility and position is such as to allow arm 10 to vibrate to its fullest extent without breaking the contact made by bringing together pin 22 and finger 24. The lamp 26 is mounted upon casing 28 which houses the clockwork and a suitable socket 30 may be employed to receive lamp 26. Another switch 32, having contacts 34 which are bridged by member 36, is carried by case 28 and it is this switch that may be manually operated to light lamp 26 regardless of the position of the clockwork and the alarm mechanism.

Very simple circuits may be used in embodying this invention in the clock. The two switches hereinbefore mentioned are in the lamp circuit and operate independently of each other as will be more fully understood after a description of the wiring diagram illustrated in Fig. 4.

Assuming that the alarm is set and that particular switch which is operated by the alarm open and it is desired to cause lamp 26 to glow, switch 32 will be closed by bridging contact points 34 with member 36. The lamp will then receive energy through a circuit traced as follows: from one wire 38 of the supply line through wire 40, closed switch 32, wire 42, lamp 26, wire 44 to the other wire 46 of the supply line.

Assuming that switch 32 is open and the alarm is set, the circuit will be broken not only by switch 32, but by the open switch that is actuated by the alarm mechanism. When the alarm mechaanism is released, vibrator arm 10 will be drawn toward core 14 of coil 8 and finger 24 will contact pin 22. With these two contact members drawn together the closed circuit which provides energy to the lamp may be traced as follows: Wire 38, wire 40, wire 48, arm 10, flexible finger 24, pin 22, wire 50, wire 42, lamp 26, wire 44, to wire 46. This circuit will be maintained closed so long as vibrator arm 10 is attracted by coil 8 and its core. This coil 8 is always energized and is shown in diagrammatical figure as being in constant connection with supply wires 38 and 46.

In most instances, spring-operated clockwork employs a vibrating clapper arm which moves in precisely the same manner as arm 10 and where this alarm signal in the form of an electrically operated lamp or the like is used in such types of clocks, the switch, comprising the flexible contact finger 24 and fixed contact pin 22, should be of the same character as that herein described. The location and character of finger 24 should be such as to permit vibration of arm 10 without breaking the electrical contact after it has once been made at the time of releasing the alarm mechanism.

It is understood that any number of slight modifications with respect to specific structure might be made without departing from the spirit of the invention or scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In combination with an electrically operated clockwork having a case, an electromagnet, a pivotally mounted vibrator arm operable thereby, and means releasable by the clockwork at a predetermined selected time for holding said arm against operation by the electromagnet, of an electric lamp mounted on the case, and an electric circuit for the lamp having a switch therein maintained in a closed condition by the vibrator arm as the latter is being operated by the electromagnet of the clockwork, said vibrator arm having its pivotal point intermediate its ends and serving as one contact point of said switch.

2. In combination with an electrically operated clockwork having a case, an electromagnet, a pivotally mounted vibrator arm operable thereby, and means releasable by the clockwork at a predetermined selected time for holding said arm against operation by the electromagnet, of an electric lamp mounted on the case, and an electric circuit for the lamp having a switch therein closable by the vibrator arm as the latter is being operated by the electromagnet of the clockwork, said switch comprising a fixed contact member and a flexible finger movable thereagainst by the movement of said vibrator arm about its pivotal mounting when the latter is operated by the electromagnet of the clockwork, said electromagnet being of sufficient strength to maintain the said flexible finger under tension against the fixed contact member as the arm is vibrating.

3. In combination with an electrically operated clockwork having a case, an electromagnet, a vibrator arm fulcrumed adjacent one end operable thereby, and means releasable by the clockwork at a predetermined selected time for holding said arm against operation by the electromagnet, of an electric lamp mounted on the case, and an electric circuit for the lamp having a switch therein closable by the vibrator arm as the latter is being operated by the electromagnet of the clockwork, said switch comprising a fixed contact member and a flexible finger in longitudinal continuation of the vibrator arm movable thereagainst by the said vibrator arm when the latter is operated by the electromagnet of the clockwork about the fulcrum, the said flexible finger being held against the said fixed contact member with sufficient force by the electromagnet as to allow the vibrator arm to vibrate without breaking the circuit at the said switch.

4. In an alarm clock of the character described having an electromagnetically operated vibrator arm pivotally mounted for adjustable setting with respect to proximity to the electromagnet, a flexible contact finger integral with the arm extending longitudinally of the said arm on the opposite side of the pivotal point of the arm, a fixed contact member engageable by the said contact finger when the electromagnet is operating the vibrator arm, and an electric circuit having a lamp therein and closable by the contacting of said finger and fixed contact member, said flexible finger being in constant contact with the contact member as the electromagnet is operating the vibrator arm.

THOMAS ANDREW PURVIS.