

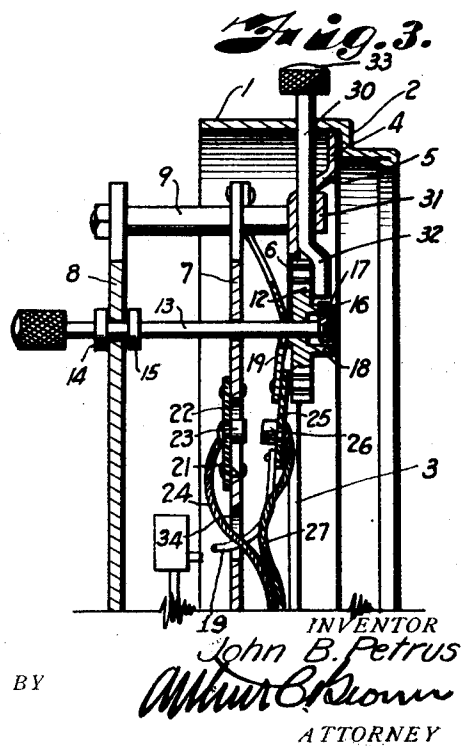
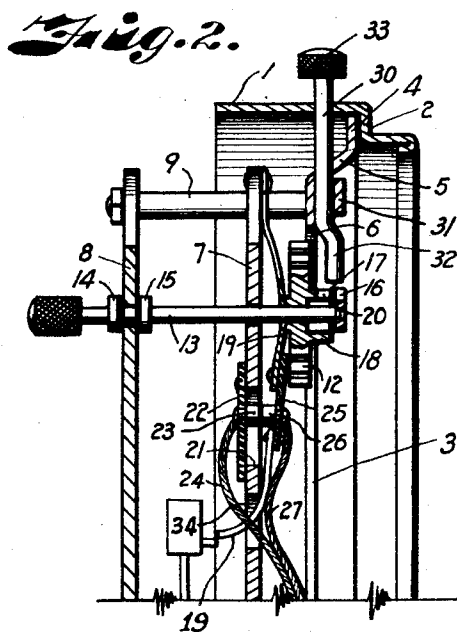
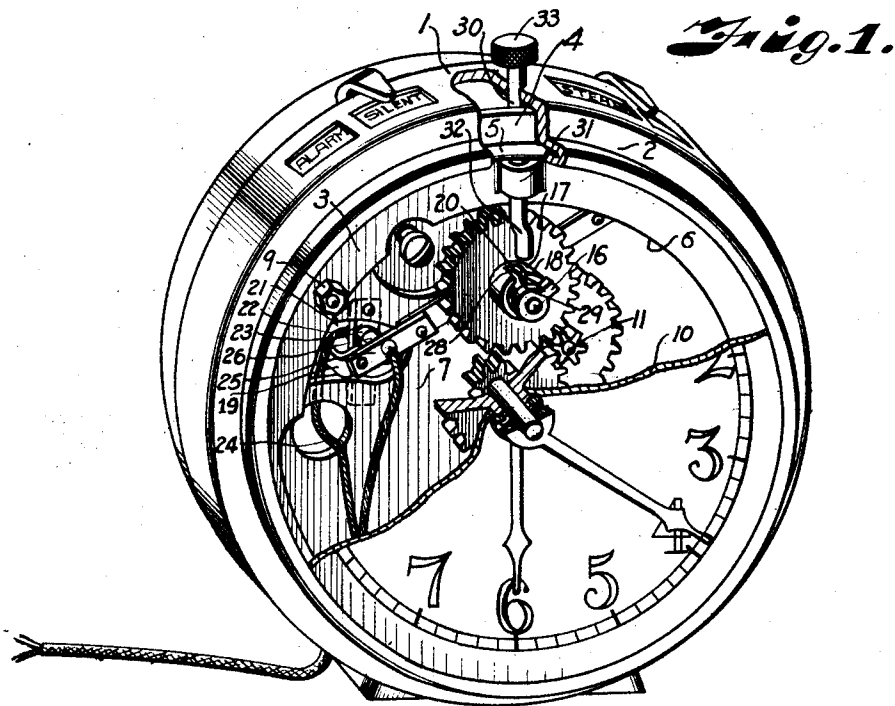
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J. B. PETRUS

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TIME SWITCH

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TIME SWITCH

Application filed January 13, 1930. Serial No. 420,415.

My invention relates to switches and more particularly to automatically operating time switches controlling an electrical circuit, and has for its principal objects to simplify and reduce the cost of clock-operated switches, and to adapt a clock for controlling the circuit whereby a radio receiving set is energized.

In an ordinary alarm clock, a spring-pressed gear driven by the clock works slides on a setting shaft at the predetermined moment for shifting a latch to release ringing mechanism, the gear being automatically retracted to relocate the latch.

Further particular objects of my invention are, therefore, to effect control of a circuit switch by the alarm controlling mechanism of a clock, to latch the alarm gear against retraction except when manipulated by the user, and to facilitate retraction of the alarm gear for resetting the timing mechanism.

In accomplishing these and other objects of the invention, I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawing wherein:

Fig. 1 is a perspective view of an alarm clock equipped with my invention, part of the walls being broken away to disclose the location of the parts within the clock casing.

Fig. 2 is a vertical section from front to back through a portion of the clock, illustrating a switch in circuit closing position.

Fig. 3 is a similar view illustrating the relation of a gear shifting member to the alarm gear, and showing the switch contacts in open circuit position.

Referring in detail to the drawing:

1 designates a circular peripheral wall of a clock casing having a front edge portion contracted to form a retaining wall 2. 3 designates a disk having a peripheral edge portion or flange 4 seated against the wall 2 and a web 5 inclined downwardly rearwardly from the flange 4. The disk is provided with

apertures such as 6 to accommodate the clock mechanism, for example the members for controlling the alarm.

Spaced disk-like plates 7 and 8 are connected with each other and with the ring 6 by bolts 9 to form a supporting frame for the clock works. A face diaphragm 10 over which the hands rotate is mounted against the flange 4.

The works include a gear train including an elongated pinion 11 meshed with a gear 12 slidable and rotatable on a setting shaft 13 to which the alarm setting hand (not shown) is keyed. The shaft protrudes through the rear plate 8 and collars 14 and 15 on the shaft engage the plates to restrain the shaft against longitudinal movement.

Keyed to the shaft 13 adjacent the front end thereof is a radially projecting rectangular lug 16 normally engaging the notched rim or edge 17 of a hub-like circular boss 18 projecting from the face of the gear 12.

A spring 19 for setting off the alarm in an ordinary alarm clock bears oppositely against the plate 7 and gear 12, and tends to shift the gear on the shaft toward the front end of the shaft, the gear being restrained by the inner-engaging lug, but being permitted to shift when a notch 20 in the boss moves into registry with the lug.

Mounted on the inner face of the plate 7 and spanning an opening 21 therein is an insulating bridge or bar 22 in which a fixed contact 23 projecting through the opening and conductively connected with a conductor 24 forming one lead of a circuit.

A portion is cut out of the spring member 19 and a strip of insulating material 25 carrying a second contact 26 is inserted in place of the portion removed. The wire 27 is connected to the contact 26 in any manner desired. The contact 26 is arranged on the insulating member 25 so as to break the contact when the alarm is tripped.

The end of the spring member 19 is at-

tached to the insulating strip 25 and has a right angle bent in it projecting through the hole 34 in the supporting plate 7, and is adapted to perform its normal function of permitting the alarm to ring at the desired time.

The clock may thus be made use of for a regular alarm clock, or as an automatic time switch to turn off an electric circuit at any desired time. The alarm feature may be used independently of the switch through the regular alarm control levers 35.

The notch 20 in the boss 18 has stop walls 28 and 29 extending perpendicularly from the face of the gear to latch the lug to the gear.

The spring tends to separate the contacts and tends to shift the gear outwardly along the shaft. The wheel is restrained however, by engagement of the lug with the end edge of the boss until the gear upon revolving brings the notch into registry with the lug, whereupon the gear may slide on the shaft under the influence of the spring and move the contact 26 away from conductive relation with the contact 23, continued revolution of the gear causing the shaft to rotate.

In order to reset the gear for closing the circuit, and to tension the spring, I provide a crank or cam comprising a pin 30 journaled in a boss 31 on the ring 6 and having a bent lower end or crank arm 32 adapted upon rotation of the pin to move toward and away from the gear and to bear against the gear for shifting the same rearwardly along the shaft against the influence of the spring.

The pin extends through the web 5 and is provided with a knurled top 33.

When the pin is operated to shift the gear, the boss moves bodily away from the lug, and the shaft may be rotated to reset the switch.

The device is particularly applicable to an electric circuit supplying energy for a radio receiving set whereby the circuit may be opened at a predetermined moment to suspend operation of the set.

In the illustrated application of the invention, the device is adapted to automatically suspend operation of a receiving set at a predetermined moment of time.

In using the device adapted for suspending operation of apparatus, namely for breaking a circuit, the pin 30 is manipulated to shift the gear against the influence of the spring and the shaft is turned to cause the indicating hand thereon to indicate the moment at which the current is to be automatically broken, the turning of the shaft for setting the hand being steps normally employed in setting the alarm of a clock.

The pin is then rotated to locate the crank at its extreme outward position and permit the gear to slide toward the end of the shaft.

The gear is temporarily restrained, however, by engagement of the lug with the end edge of the boss.

Shifting of the gear by rotation of the pin in the step just recited brings the movable contact into engagement with the fixed contact and closes the circuit.

When the clock work mechanism has operated to rotate the alarm gear over a sufficient arc to bring the notch under the lug, the spring will shift the gear toward the end of the shaft and automatically separate the contacts, thus breaking the circuit.

The works will continue to move the time indicating elements, and will continue to rotate the alarm gear but will rotate the setting shaft due to engagement of the lug in the notch of the boss, and manual manipulation of the gear shifting key is necessary to retract the spring and close the circuit.

What I claim and desire to secure by Letters Patent is:

1. A time switch for controlling a circuit comprising, in combination with a case and driving mechanism, a shaft supported by the case, a spring-pressed gear slidable and rotatable on the shaft and constantly in mesh with the driving mechanism, a lug, an arcuate boss on one face of the gear, a radial lug on the shaft adapted to engage the boss to restrain the gear against the influence of the spring, the boss having a notch provided with stop walls to receive the lug for permitting the gear to slide forwardly on the shaft, a pair of contacts supported respectively by the clock case and the gear, one of said contacts being responsive to sliding movements of the gear for controlling the circuit, and a crank mounted on the case for moving the gear against the influence of the spring.

2. A time switch for controlling a circuit comprising in combination with an alarm clock including an alarm setting shaft, an outwardly spring pressed gear slidable and rotatable on the shaft and constantly rotated by the clock works, and a lug on the shaft, a contact in the circuit fixed to the clock, a contact fixed to the gear, said gear having an arcuate boss engaged by the lug and provided with a notch to receive the lug when the gear is rotated by the clock works to register the notch with the lug to permit the gear to slide outwardly on the shaft for spacing the contacts, the ends of the notch comprising stop walls perpendicular to the face of the gear for latching the lug to the gear to prevent the lug from shifting the gear retractively on the shaft into circuit-closing position, and means for shifting the gear into circuit-closing position.

3. In a time switch for controlling a circuit, clock works including a frame, an alarm setting shaft, a gear slidable and rotatable on the shaft, an arcuate boss on one face of the gear forming a lug track, a spring tending

to move the gear toward the outer end of the shaft, a lug on the shaft engaging the boss to restrain the gear, a circuit, a contact in the circuit fixed to the frame, a contact fixed to the gear, said boss being provided with a notch to receive the lug for permitting the spring-pressed gear to slide on the shaft for spacing the contacts, and a pin journaled in the frame having a crank arm movable against the gear for shifting the same against the influence of the spring to close the circuit.

In testimony whereof I affix my signature.

JOHN B. PETRUS.

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