

J. THOMPSON.

TIME SWITCH.

APPLICATION FILED JULY 17, 1911.

1,021,436.

Patented Mar. 26, 1912.

3 SHEETS-SHEET 1.

Fig-1-

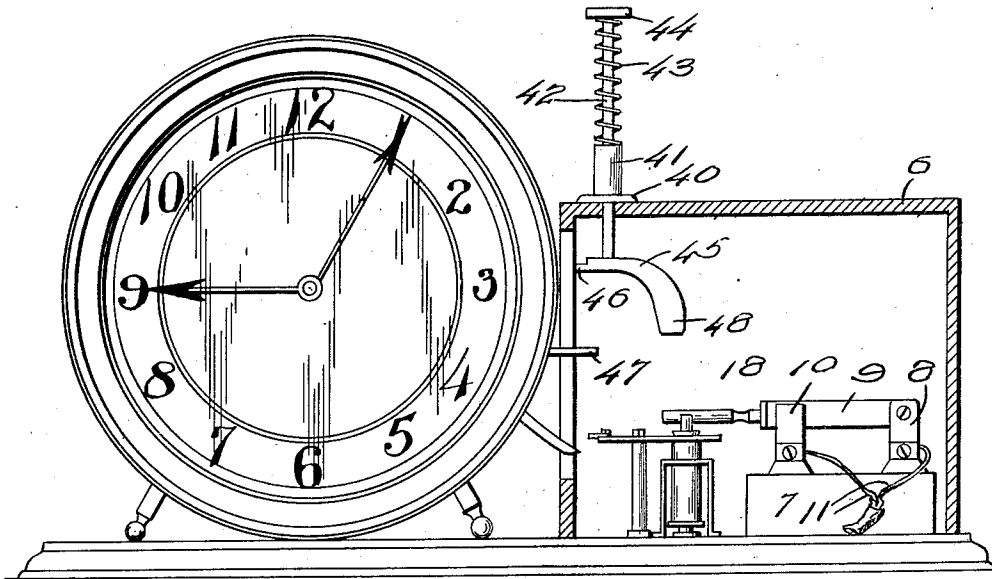
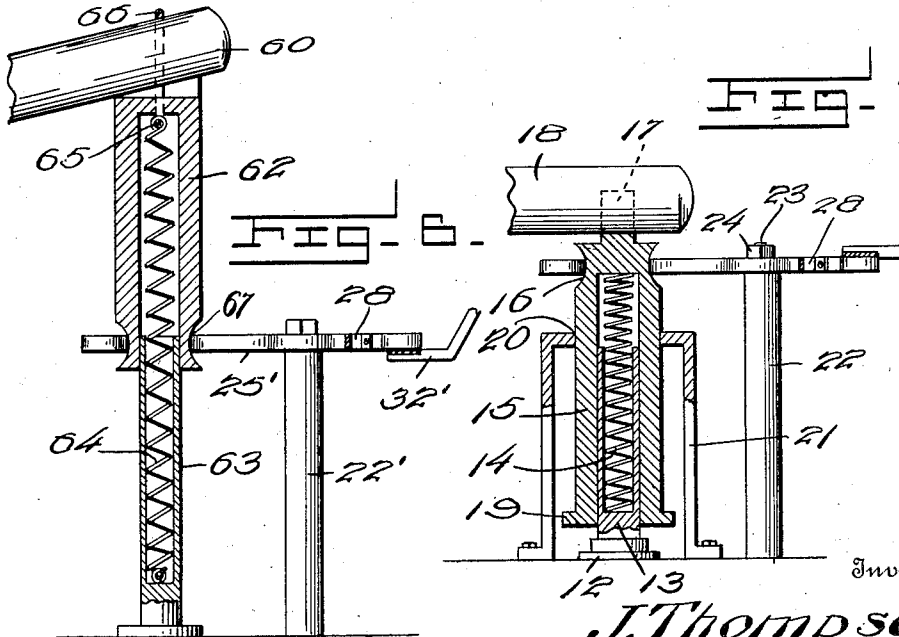


Fig-7



Inventor

J. Thompson,

By Harry Ellis Chandler

Attorney

Witnesses

R. H. Thompson

W. H. Parsons

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3 SHEETS—SHEET 2.

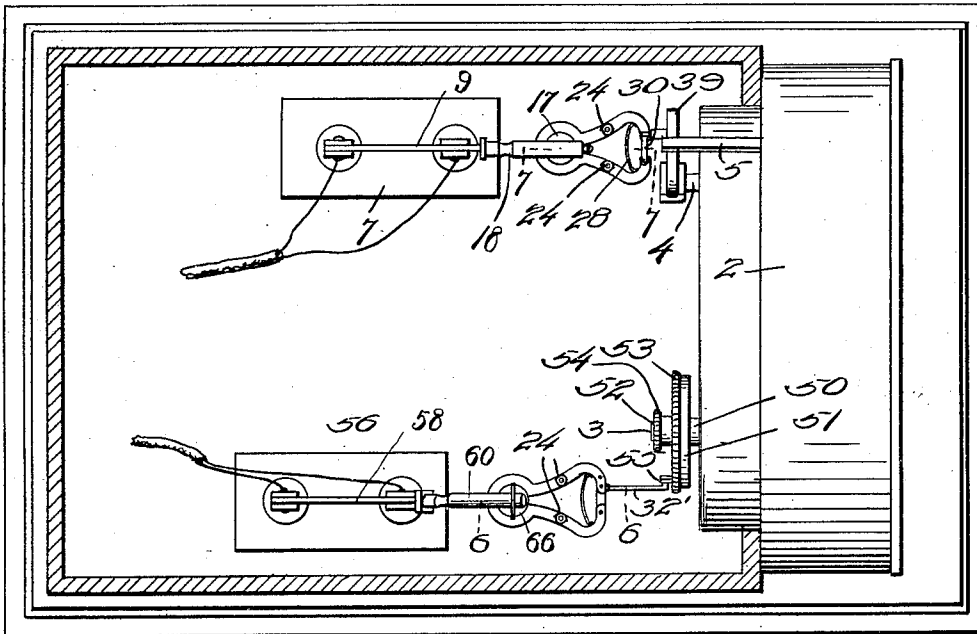
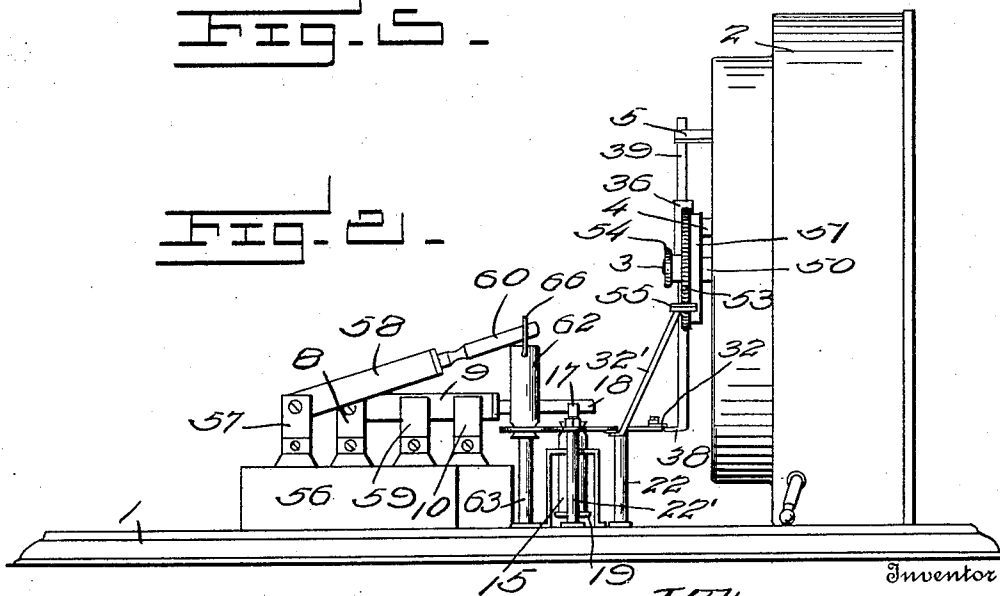


Fig. 5.



Witnesses
C. Cunningham
Edw. Parsons

Inventor
J. Thompson,

By *Harry Ellis Chase*
Attorney

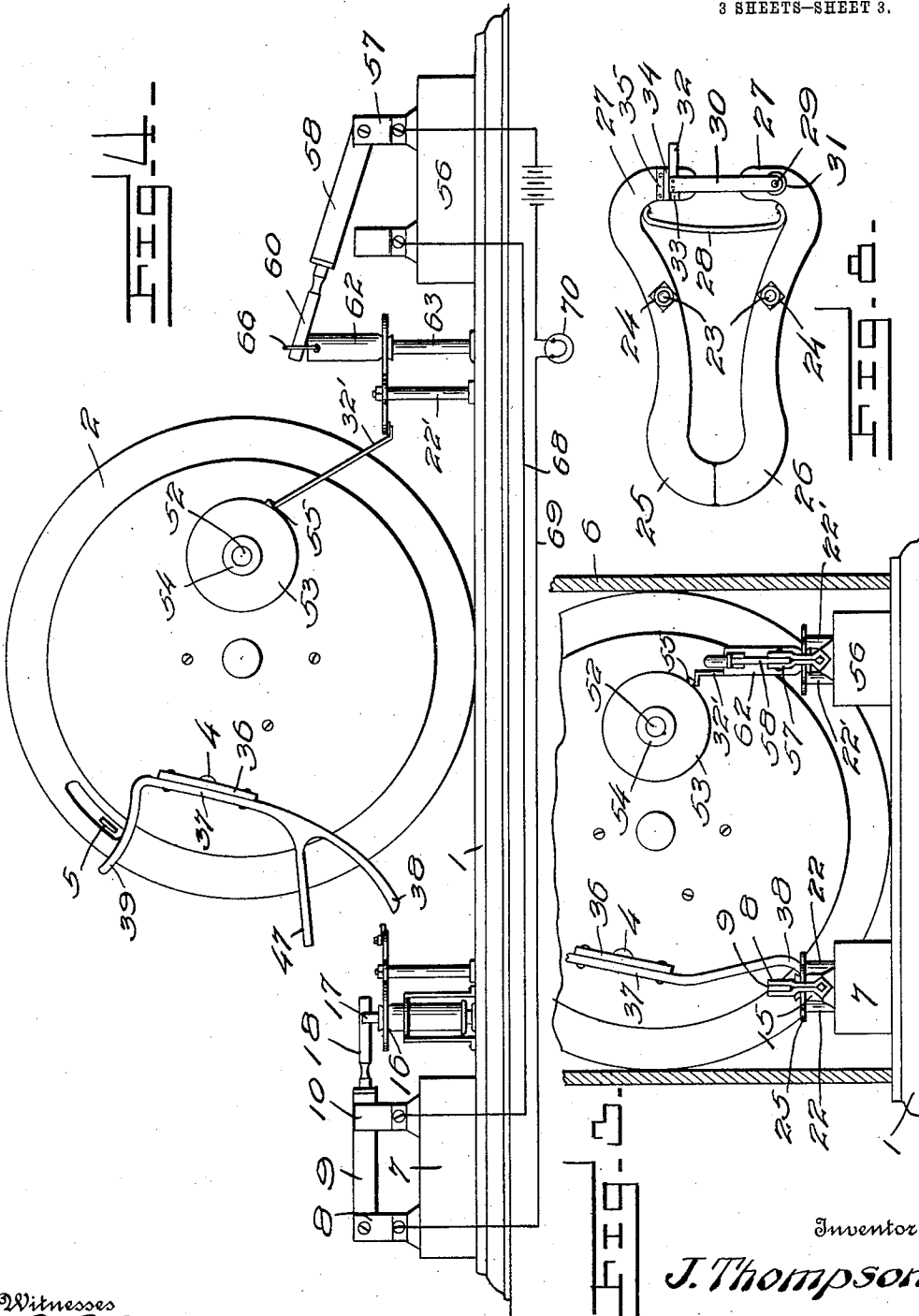
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Witnesses
R. H. Thompson
Chas. Parsons

Inventor
J. Thompson,
By *Navy Ellis Chandler*
Attorney

UNITED STATES PATENT OFFICE.

JAMES THOMPSON, OF GREENSBURG, PENNSYLVANIA.

TIME-SWITCH.

1,021,436.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Application filed July 17, 1911. Serial No. 639,003.

To all whom it may concern:

Be it known that I, JAMES THOMPSON, a citizen of the United States, residing at Greensburg, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Time-Switches, of which the following is a specification.

My invention relates to improvements in electric switches, and has for its leading object the provision of an improved form of time controlled electric switch particularly adapted for use in controlling the switching on and off of electric lights in store display windows or other like positions.

The further object of my invention is the provision of improved attachments which may be readily secured to the winding keys of an ordinary alarm clock and which will serve to satisfactorily control my improved spring operated electric switches and will serve to switch on or to shut off said current at any desired time.

Another object of my invention is the provision in connection with my improved automatic opening switch and operating mechanism therefor carried by the alarm winding key of the alarm clock, of improved means for simultaneously closing the switch and resetting the controlling mechanism carried by the winding key for the alarm, which resetting mechanism will serve to rewind the alarm, whereby the said alarm will be kept wound at all times without the necessitating of access to the alarm winding key for independently winding the same.

Other objects and advantages of my improved time switch will be readily apparent by reference to the following description taken in connection with the accompanying drawings and it will be understood that I may make any modifications in the specific structure shown and described within the scope of my claims without departing from or exceeding the spirit of the invention.

Figure 1 represents a front view of one form of my invention, comprising merely an automatically opening switch for shutting off the current. Fig. 2 represents a side elevation of my complete mechanism for operating both automatically opening and automatically closing the switches at any predetermined time. Fig. 3 represents a rear view of the alarm clock and parts carried thereby as shown in Fig. 2. Fig. 4 rep-

resents a semidiagrammatic view of my complete mechanism, the two switches being illustrated as disposed at the sides of the clock in order that the method of operation of my mechanism may be more readily understood, although in the actual construction as shown in Fig. 2 the switches and controlling mechanism therefor are disposed behind the clock. Fig. 5 represents a top plan view of my complete mechanism, the inclosing casing therefor being shown in section. Fig. 6 represents a vertical sectional view on the line 6—6 of Fig. 5. Fig. 7 represents a similar sectional view on the line 7—7 of Fig. 5, and Fig. 8 represents an enlarged detailed view of the locking clasps of my device.

In the drawings, in which similar characters of reference are employed throughout to denote corresponding parts, the numeral 1 designates the base board of my invention on which is suitably secured the ordinary alarm clock 2 having the main spring winding arbor 3 and the winding arbor 4 for winding the spring of the alarm controlling mechanism, said clock having projecting from the rear thereof the end of the lever 5 for shutting off the operation of the alarm when desired. Suitably secured on the base board 1 adjacent the said alarm clock 2 is the inclosing casing 6 for protecting the various parts of my improved switches and controlling means therefor.

Mounted on the base 1 is the block 7 of suitable insulation material, while rising from the said block are the plates 8 between which is pivoted the movable knife switch member 9 adapted to connect the plates 8 with the second pair of plates 10 rising from the block 7, the terminals of the connecting wires 11 being suitably connected to the plates 8 and 10 respectively. Secured to the base 1 adjacent the said insulated block 7 is the basal flange 12 of the tubular post 13 which has coiled therewithin the helical spring 14 projecting upward above the top of the post. Slidably mounted upon the said post and having the upper end of the spring 14 secured thereto is the sleeve 15 having a peripheral groove 16 formed near the upper end thereof and terminating in the furcations 17 adapted to span the handle 18 of the blade switch 9. Said sleeve 15 has a basal flange 19 of size to limit the upward movement of the sleeve in the aper-

ture 20 of the guide member 21 which is secured to the base, the sleeve being forced upward by the spring 14.

By reference to the drawings, it will be
5 observed that when the sleeve 15 is in upwardly pressed position it carries upward the handle 18 until the blade switch 9 is out of engagement with the contact plates 10 and thus serves to break the circuit. To normally lock the sleeve in depressed position
10 with the spring 14 compressed to allow said switch 9 to be closed, I secure to the base 1 adjacent the post 13 the pair of upstanding posts 22 having the reduced upper ends 23 on which the clasp members of my invention
15 are rotatably held by the nut 24. Said clasps have their outer ends so bent as to form curved portions 25 and 26, the same being adapted to fit into the peripheral
20 groove 16 formed in the upper portion of the sleeve 15. The inner ends of the clasps are similarly formed to produce portions 27. A blade spring 28 is provided and is of sufficient strength to normally hold the curved
25 portions 25 and 26 in contacting relation, said spring having its opposite ends secured adjacent the curved portions 27. To hold the portions 27 in their proper positions a screw 29 is secured to one of the portions to
30 which is connected one end of the resilient strip 30, said strip being held raised above one of the portions 27 by the washer 31. The strip 30 has secured to its free end a transversely disposed locking bar 32 adapted
35 to engage in the groove 33 formed in the plate 34, said plate being secured to one of the curved portions 27, as clearly shown in Fig. 8. The plate 34 is formed with a beveled portion 35 which causes the bar 32 to
40 ride upward into the groove as the two curved portions 27 of the clasps are forced apart.

In the use of my device, I press the handle 18 downward to close the switch, said
45 downward movement of the handle 18 forcing the sleeve 15 downward against the expansive force of the spring thereof, and as the sleeve is forced downward the curved portions 25 of the clasp will pass into the
50 peripheral groove 26, the spring 28 causing this movement of the clasps. As the clasps are so shifted the locking bar 32 will drop into the groove 33 and will secure the same in said position to prevent upward movement
55 of the sleeve 15 when the handle 18 is released. The bar 32 projects beyond the end of the clasps, and to release the said bar and permit the force of the spring 14 to cause the sleeve to move upward, I secure to
60 the winding key 36 for winding the spring of the alarm mechanism the plate 37 having a rounded end 38 adapted to engage the projecting end of the bar 32 as the key is revolved upon the operation of the alarm,
65 the engagement of said end 38 raising the

bar 32 to unlock the clasp and permit the spring 14 to force the sleeve 15 and thus the handle 18 of the blade switch upward to break the circuit and shut off the light controlled by the said switch.

Inasmuch as the winding key 36 will not turn to unwind until the alarm starts to operate and since it is not necessary for the key to make a complete turn to unlock the clasps there is no reason for the said winding key to continue to revolve until the alarm spring is entirely unwound. To stop said revolution of the key, I form on the plate 37 the curved end or abutment portion 39 which is adapted to contact with the alarm shut-off lever 5 as the key 36 is turned and to shift the said lever to shut off the alarm after the key has made a partial revolution and has sufficiently moved to unlock the bar 32.

To enable me to readily return the various parts into position to reset the switch and controlling mechanism therefor, I secure to the top of the casing 6 the basal flange 40 of the sleeve 41 which has slidably engaged therein the rod 42 pressed upward by the spring 43 bearing at one end against the base of the sleeve 41 and at the other end bearing against the handle knob 44 of the said rod 42. Said rod 42 extends downward through the sleeve into the interior of the casing 6, and has secured to its lower end the cross piece 45 which is formed with a reduced portion 46 adapted to engage the arm 47 of the plate 37 and is further formed with an enlarged portion 48 adapted to engage the switch handle 18. As the knob 44 and rod 42 are pressed downward, the engagement of the portion 46 with the arm 47 with the plate 37 will press said arm 47 downward to reversely turn or wind the winding key 36 and move the plate 37 out of engagement with the controlling lever 5 of the alarm and also depress the portion 38 of said plate until the same is out of engagement with the bar 32. In the meantime the end 48 bearing against the handle 18 will force the handle 18 and the sleeve 15 downward into position where the parts may be again locked to cause the switch to remain in closed position until the alarm mechanism again operates.

It will be understood that the mechanism heretofore described is adapted only for use in opening a switch to shut off an electric current, but it is sometimes desirable to shut off one set of lights or cut off certain currents while throwing on a second current either simultaneously or at a predetermined time, and to effect this result, I have provided improved mechanism adapted to be operated by the unwinding rotation of the winding key for the main spring of the alarm clock. To attain this, I screw onto the threaded end of the winding arbor

the internally threaded sleeve 50 having on its outer end the knurled head or disk 51 and having projecting centrally therefrom the threaded lug 52. Rotatably engaged on the said lug 52 is a washer or disk 53 clamped in adjusted rotated position by the thumb nut 54 engaged on the outer portion of the lug 52. Said washer 53 has secured to one side thereof the controlling finger 55 which projects rearwardly from the clock. Secured on the base plate 1 rearwardly of the clock is a second insulation block 56 having rising therefrom the plates 57 to which is pivoted the knife blade switch member 58 adapted to close the circuit between the plates 57 and the second plates 59. Said knife switch member 58 has secured to its end the handle 60 which rests upon the upper end of the plunger sleeve 62 which is slidably engaged on the post 63 rising from the base. A spring 64 is coiled within the post 63 and has one end secured to the base and the other extending upward and secured to the pin 65 which extends transversely of the plunger sleeve at the upper end thereof. Said pin 65 has its ends projecting from the sleeve 62 and has secured to said projecting ends the ends of the loop 66 which passes around the handle 60 of the switch, whereby said handle is mounted to move with the plunger sleeve 62.

Rising from the base 1 adjacent the tubular post 63 are a pair of posts 22' similar in all respects to the post 22, said post 22' bearing clasps 25' similar in construction to the clasps 25 carried by the post 22 but being inverted to cause the locking member 32' thereof and the spring and engaging recess for the said locking member to be disposed on the under side of the clasps. Said clasps are adapted to be engaged in the peripheral groove 67 in the bottom of the plunger sleeve to lock said sleeve in raised position against the tension of the spring 64.

The type of clock which I prefer to use in connection with my improved switch throwing mechanism is so geared that the winding arbor thereof will rotate once in four hours as the clock runs. This rotation will carry with it the disk 53 clamped on the lug 52 and will thus rotate the finger 55 of said washer disk. To regulate the time at which my switch will close to throw on the electric current, it is merely necessary to calculate the position at which to clamp the finger 55 relative to the locking bar 32' of the clasp, said locking bar projecting into the path of movement of the finger 55, whereby as the handle and finger 55 rotate, they will depress the locking bar 32' to allow the clasps to fly apart and disengage the plunger sleeve when the spring 64 will serve to draw the plunger sleeve downward to close the switch.

From the foregoing description taken in

connection with the accompanying drawings, the construction and operation of my improved time controlled switches will be readily apparent and it will be seen that I have provided an extremely simple and efficient mechanism having practically no parts to get out of order and which will serve to satisfactorily either shut off the electric current or to close a circuit thereof at a predetermined time and which will consequently particularly commend itself to storekeepers desiring to have their windows lighted for a certain period of time and yet not desiring to turn the current for the light on until dark and desiring to have the current cut off after the hours when people are passing said windows. The utility of my device lying in the fact that by connection with the main spring winding arbor the current may be turned on several hours after 6 o'clock, the normal closing time of the store, while by the setting of the alarm the said current may be later shut off at 12 o'clock for example or any other desired hour. In the diagrammatic view I have illustrated the wiring for this purpose, showing the wire 68 connecting the contact plates 10 and 59 and the wires 69 leading from the contact plate 57 to the electric lights 70, the current being shut off and the circuit broken when either of the said switches are open, whereby the light will not be lighted until the switch 58 is closed upon the rotation of the winding arbor while the circuit will be again broken when the alarm mechanism turns to release the switch 9.

I claim:—

1. The combination with an electric switch, of a spring shifted plunger engaging the switch for controlling the same, clasps for locking the plunger in desired position against the tension of the spring, said clasps including a locking bar, and means carried by one of the winding arbors of a clock for moving the locking bar, said bar acting to lock the clasps in their operative position to operate said clasps to release the plunger and to allow the spring to shift the plunger to operate the switch.

2. The combination with a clock having rotating winding arbors, of a knife blade switch mounted adjacent one of said winding arbors, a spring pressed plunger for controlling the operation of the switch, clasps for locking the plunger in position to stretch its springs, means for securing the clasps in locking position, and an operating finger carried by the winding arbor for unlocking the clasps to permit the spring to shift the plunger and switch.

3. The combination with the alarm arbor of an alarm clock, of a plate secured thereto and having an end adapted to shut off the alarm upon partial rotation of the arbor, a

spring operated switch mounted adjacent the clock, means for holding the switch in position against the force of the controlling spring, and a finger formed on the plate carried by the winding arbor for disengaging said means to allow the spring to operate the switch.

4. The combination with the winding arbor of an alarm clock, of a sleeve engaged on the arbor, a washer adjustably secured on the sleeve and having an outwardly projecting finger, a normally open switch disposed adjacent said winding arbor, a spring pressed plunger for closing the switch, and clasps for locking the plunger, said clasps including a locking bar therefor for holding the switch in open position against the tension of the spring, said locking bar being disposed in the path of movement of the finger and the rotation of the winding arbor causing the finger to engage the bar to release the switch and allow the spring to close the same.

5. The combination with a base, of a knife blade switch mounted thereon, a spring pressed plunger for operating the switch, clasps for engaging the plunger, means for locking the clasps to hold the plunger against the force of its spring, an alarm clock disposed adjacent the switch and having a lever for shutting off the alarm, a plate secured on the winding arbor of the alarm and having a finger for engaging the locking means of the clasp to unlock the clasps to permit the plunger to be shifted by its springs to operate the switch, a finger on the plate for engaging the alarm controlling lever to shut off the alarm after the clasps have been unlocked, an arm projecting from the plate, a casing inclosing the switch, and a rod slid-

ably engaged in the casing and having a portion for engaging the arm of the plate and a second portion for engaging the switch to close the switch and force the plate arm downward to partially rotate and rewind the winding arbor of the alarm and disengage the ends of the plate from the alarm controlling lever and from the clasps locking means.

6. The combination with a base, of a switch mounted thereon, a tubular post rising from the base adjacent the switch, a helical spring mounted within the post, and a plunger sleeve slidably engaged on the post and having one end of the spring secured thereto, supporting posts rising adjacent the tubular post, said supporting posts each having a clasp mounted thereon formed with a portion curving around the plunger sleeve, said sleeve having a peripheral groove formed near one end thereof to receive the curved portions of the clasps, a spring for pressing the clasps into said groove, means for locking the clasps in the groove to hold the plunger sleeve against the force of the spring secured thereto, connections between the plunger sleeve and switch for operating the switch upon releasing of the sleeve, a clock mounted adjacent the parts, and means shifted by the rotation of one of the winding arbors of the clock for unlocking the clasps to allow the spring to shift the plunger and switch.

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

JAMES THOMPSON.

Witnesses:

JOHN A. GEORGE,
H. A. MURRAY.