

A. M. COATES.
ELECTRIC TIME SWITCH.
APPLICATION FILED MAR. 29, 1916.

1,229,232.

Patented June 12, 1917.
2 SHEETS—SHEET 1.

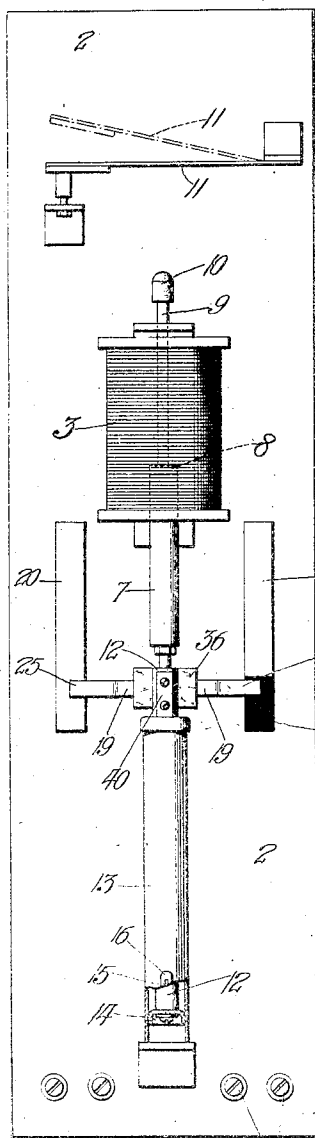


Fig. 1.

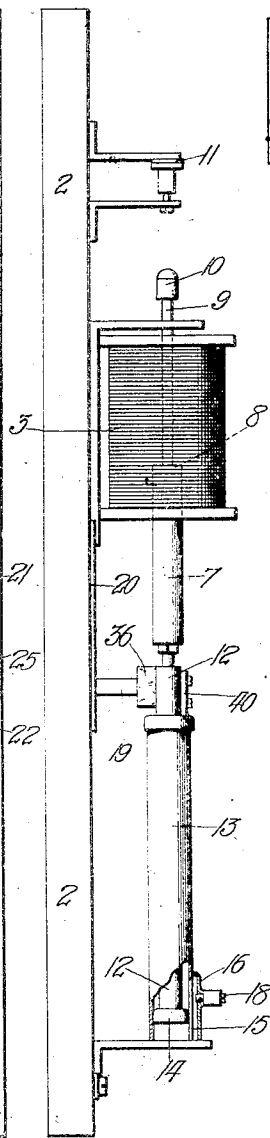


Fig. 2.

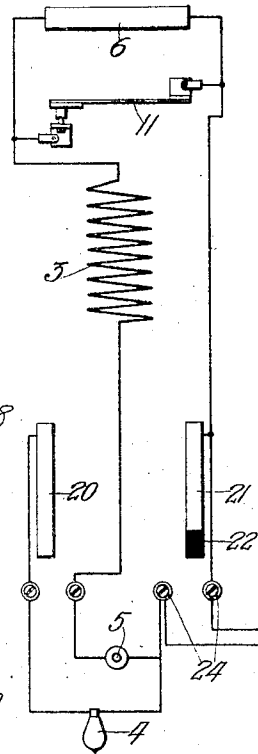


Fig. 3.



Fig. 4.

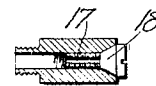


Fig. 5.

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2 SHEETS—SHEET 2.

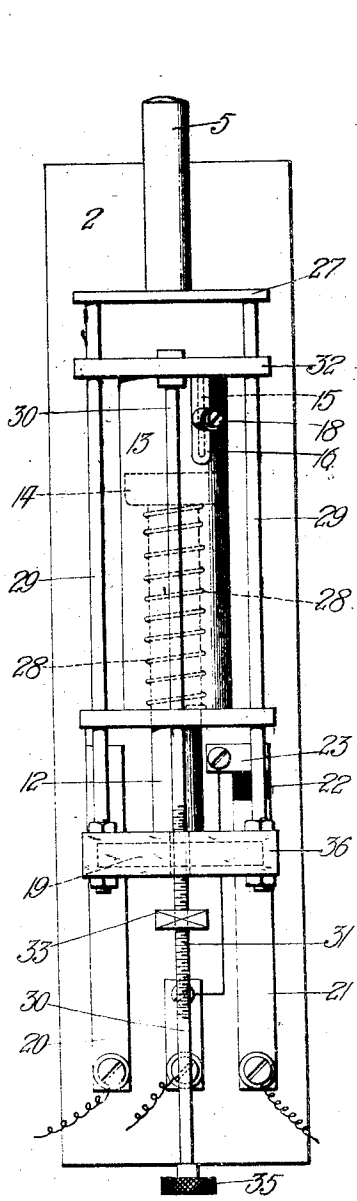


Fig. 6.

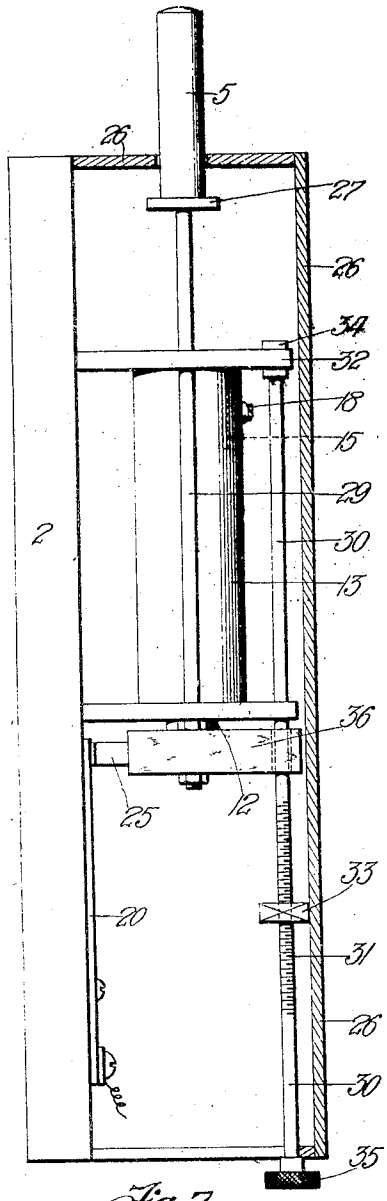


Fig. 7.

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UNITED STATES PATENT OFFICE.

ALFRED M. COATES, OF MIDDLE BRIGHTON, MELBOURNE, VICTORIA, AUSTRALIA.

ELECTRIC TIME-SWITCH.

1,229,232.

Specification of Letters Patent.

Patented June 12, 1917.

Application filed March 29, 1916. Serial No. 87,512.

To all whom it may concern:

Be it known that I, ALFRED MELBOURNE COATES, engineer, a subject of the King of Great Britain and Ireland, and a resident of the town of Middle Brighton, a division of the town of Brighton, a suburb of the city of Melbourne, in the county of Bourke, State of Victoria, Commonwealth of Australia, (whose post-office address is 25 Park street, in the said town of Middle Brighton,) have invented certain new and useful Improvements in and Connected with Electric Time-Switches, of which the following is a specification.

This invention relates to that class of switch whereby electric current is permitted to pass for consumption for a predetermined period and is then cut off by the action of the switch. The invention is particularly suitable for use while stairways, passageways and the like are being traversed, but it may be adapted for either lighting, heating or power purposes. As an example it is shown as applied to an electric lamp circuit.

Referring to the drawings which form a part of this specification.

Figure 1 is a part sectional front elevation of the invention.

Fig. 2 is a side elevation of Fig. 1.

Fig. 3 is a diagrammatic view of the wiring as used in Figs. 1 and 2.

Fig. 4 is a detail front view of a spring contact bridging piece.

Fig. 5 is an enlarged detail view of an air escape regulating screw and its appurtenances.

Fig. 6 is a front elevation of a modification with a cover removed, and

Fig. 7 is a part sectional side view of Fig. 6 the cover being shown in place.

Referring to Figs. 1, 2 and 3, this invention includes a base plate 2 supporting a solenoid 3 in circuit with a lamp 4 and a push button 5. Also carried by the base plate is a non-inductive high resistance 6.

Disposed in the solenoid is a core 7 the outer end of which is provided with a suitable buffer 8. Secured to the outer end of the said core is the inner end of a circuit breaking lift rod 9. The outer end of the lift rod is provided with an insulated head 10, adapted to engage the traveling end of a plate spring 11. The said traveling end is provided with a suitable contact the fixed end being secured to the base plate.

Secured to the inner end of the core is the upper end of a plunger rod 12. The lower end of the plunger rod passes into an air cylinder 13 and carries a cup leather or other suitable plunger 14. The lower end of the cylinder has a longitudinal opening 15 through its wall. Outside the said opening is a cover 16 covering the said opening and forming an air by-pass. Through the cover is a threaded hole to accommodate an air escape regulating screw 18 having a longitudinal groove 17 along its exterior.

To the upper end of the plunger rod and insulated therefrom as at 36 is attached a spring contact bridging piece 19 having depending legs 25. One of these legs bears against a long metallic contact strip 20 and the other against a shorter metallic contact strip 21. Beyond the short metallic strip 21 is an insulating strip 22. Beyond the insulating strip 22 may be a subsidiary contact strip 23 as shown in Fig. 6. This subsidiary strip 23 may be in circuit with any other lamp or lamps to provide either a dimming effect or additional illumination. To the upper end of the plunger rod is also attached a limit stop 40.

On reference to Fig. 3 it will be seen that 24 are the terminals to mains.

In a modification of the foregoing, as seen in Figs. 6 and 7, a casing 26 is applied to the base plate. Through it is a hole to pass the push button 5. Fixed to the base plate is an air cylinder 13. This cylinder is provided at its outer end with a longitudinal opening 15, a cover 16 and an air escape regulating screw 18 having a groove as before described.

Beyond the outer end of the cylinder is the push button 5. The push button is secured to a cross piece 27, the cross piece being attached to the outer end of connecting rods 29. The inner ends of these connecting rods are attached to an insulated cross head 36 to which is secured the spring contact bridging piece 19. To the cross head is also attached one end of a plunger rod 12 having at its other end a plunger 14. Around the plunger rod and between the plunger and the inner end of the cylinder is a coiled spring 28.

To easily regulate the duration of flow of the current from outside of the casing 26 a hole is made through the said casing to pass a rotary adjusting screw rod 30. The inner end of this rod is attached to an extension

32 on the outer end of the cylinder by collars 34. Portion of the rod is provided with a thread 31 and around it and in the path of the cross head 36 is a nut 33 incapable of turning since one of its sides bears against the inside of the casing 26. The outer end of the rod protrudes through the casing and is provided with a milled or other head 35.

The invention as shown in Figs. 1, 2 and 10 3 is operated as follows:—When the push button is actuated the current energizes the solenoid 3. The core instantly rises through the solenoid carrying with it the plunger rod 12 and the spring contact bridging piece 19. The legs 25 engage both of the metallic contact strips 20 and 21 completing the lamp circuit. As the upper end of the lift rod rises it engages the plate spring 11 and breaks the contact thereof. This throws the high resistance 6 into series with the solenoid preventing the burning of the push button contact on release. Upon releasing the push button, energization of the solenoid ceases and the plunger rod commences to descend compressing the air in the air cylinder. The speed of the descent is regulated by the speed of the escape of the air through the groove in the air escape regulating screw 18. When the plunger rod has fallen to a predetermined position and with it the iron core and bridging piece the plunger 14 reaches the opening or by-pass in the cylinder. When the trailing end of the piston has passed the inner end of the opening the confined air immediately escapes through the by-pass and causes the plunger rod 12, bridging piece and iron core to fall suddenly. The contact between the bridging piece and the metallic strips is thereby instantly broken and the lamp extinguished as the leg on the short strip suddenly leaves it and glides quickly onto the insulating strip 22. Burning is thereby prevented. If a second short metallic strip is used the leg moves from the insulating strip to the second short strip and lights a diapher or any other lamp or lamps. It will be apparent that by dividing one of the metallic strips into sections insulated from each other a number of lamps may be lighted and extinguished in succession.

Referring to Figs. 6 and 7 when the push button 5 is pressed the connecting rods 29 operate the cross head 36, the plunger rod 12, the plunger 14 and compress the coiled spring 28. When the push button is released the spring re-asserts itself and the air slowly escapes past the regulating screw 18 until the piston reaches the opening 15 when it suddenly finishes its stroke. Under ordi-

nary circumstances the duration of flow of the current is set by the position of the screw 18. If however the current is only required for a comparatively short period the head 35 of the rotary adjusting screw rod 30 is rotated. This moves the nut 33 inwardly toward the cross head 36 thereby limiting the outward travel of the cross head and the contact bridging piece 19 secured thereto. If a longer illumination is required the said head 35 of the rotary adjusting rod is rotated the required distance in the opposite direction.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In an electric time switch, an air cylinder, an air-tight flexible plunger adapted to reciprocate within the cylinder, circuit making and breaking means on the outside of said cylinder operated by said plunger, said cylinder having one end freely open to the atmosphere and provided at its opposite end with a narrow longitudinal slot having a hollow cover to form a by-pass for the air around the plunger to suddenly break the circuit to prevent burning of the circuit terminals, said cylinder being also provided at the by-pass end with an air escape screw for regulating the speed of the plunger and circuit making parts.

2. In an electric time switch, an air cylinder, a plunger within the cylinder and having a plunger rod connected thereto, a contact bridging piece carried by said plunger rod and insulated therefrom, a long contact strip and a short contact strip mounted to be engaged by the ends of the contact bridging piece, said air cylinder being provided with a by-pass and an air escape regulating screw at one end to suddenly break the contact of the bridging piece with the short contact strip to prevent burning of the terminals and regulate the speed of the plunger respectively, a solenoid, a core within the solenoid connected to the plunger rod, a lift-rod carried by said core, a spring plate, a stationary contact, a high resistance and a push button in circuit with said solenoid, said spring plate adapted to be lifted from said contact by said lift-rod to cut in said high resistance to prevent burning of the push button terminals.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

ALFRED M. COATES.

Witnesses:

Cecil M. Elestries,
Victor J. Kelson.