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TIMER SWITCH PLATE FOR TOGGLE SWITCHES

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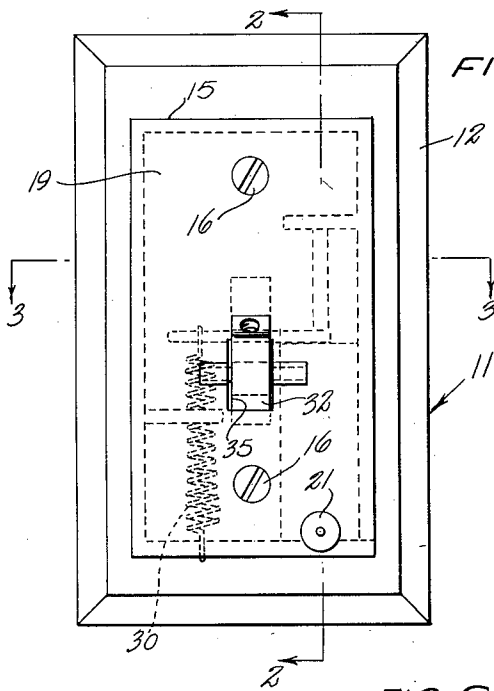


FIG. 1.

FIG. 2.

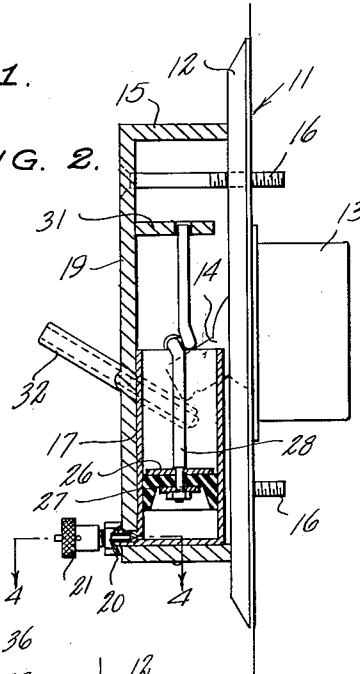


FIG. 6.

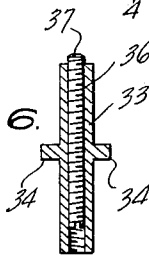


FIG. 5.

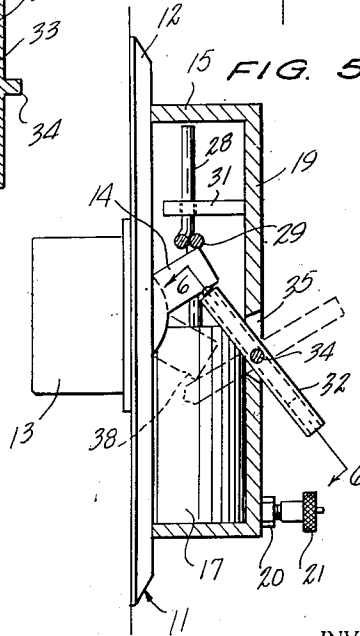
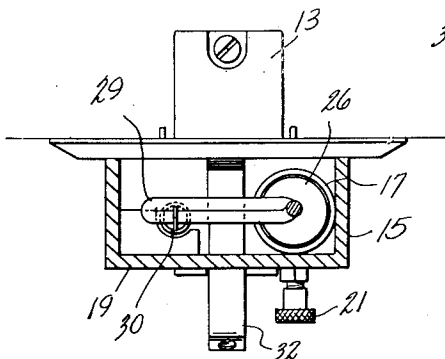
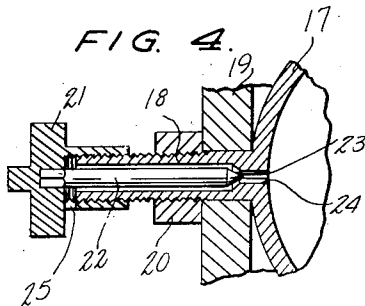


FIG. 3.

FIG. 4.



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TIMER SWITCH PLATE FOR TOGGLE SWITCHES

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2 Claims. (Cl. 200—34)

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This invention relates to improvements in switches, and more particularly to an attachment for a wall switch adapted to provide delayed action for the switch.

A main object of the invention is to provide a novel and improved delay device for use with a conventional wall switch of the toggle type, said delay device being simple in construction, being easy to install, and involving only a few parts.

A further object of the invention is to provide an improved attachment for use with a conventional electrical wall switch of the toggle type, said attachment being adapted to provide a delayed action for the toggle switch, the attachment being inexpensive to manufacture, being sturdy in construction, being compact in size, being neat in appearance, and being applicable for use with existing wall switches.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a front elevational view of a wall switch provided with an improved time-delay device constructed in accordance with the present invention;

Figure 2 is a vertical cross-sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a horizontal cross-sectional view taken on the line 3—3 of Figure 1;

Figure 4 is an enlarged cross-sectional detail view taken on the line 4—4 of Figure 2;

Figure 5 is a vertical cross-sectional view similar to Figure 2, but showing the toggle switch in position immediately prior to initiation of a delay period thereof;

Figure 6 is an enlarged cross-sectional view taken on the line 6—6 of Figure 5.

Referring to the drawings, 11 designates a conventional wall switch of the toggle type, said switch including the switch plate 12, the switch body 13 and the rotatable toggle lever 14. When the lever 14 is in its lowered position, as shown in Figure 2, the switch 13 is open, and when said toggle lever 14 is in its raised position, shown in Figure 5, the switch 13 is closed.

Designated at 15 is a rectangular housing which is secured to the switch plate 12 in overlying relationship to the toggle lever 14 by means of respective bolts 16, 16, which are arranged to extend through the usual bolt openings of switch plate 12 and to threadedly engage the usual securing lugs associated with the switch body 13. Designated at 17 is a cylinder which is secured in the lower portion of the housing 15, and which

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is open at its top end. Designated at 18 is a laterally extending conduit which communicates with the lower end of the cylinder 17 and which extends through the front wall 19 of the housing 15. As shown in Figure 4, a fastening nut 20 is threadedly engaged on the conduit 18, the nut 20 being tightened into engagement with wall 19, thereby rigidly securing cylinder 17 in the bore portion of housing 15. Threaded on the end of the conduit 18 is a cap 21 to which is rigidly secured the axially extending needle valve 22 having a tapered tip 23 which extends into a reduced lower portion 24 formed in the conduit 18 at the portion thereof which communicates with the cylinder 17. The cap 21 is formed with an air escape opening 25 through which air from cylinder 17 may exhaust to the atmosphere after passing through the restriction defined between tip 23 and reduced bore portion 24. The rate of escape of air from the cylinder 17 may be regulated by adjusting the position of cap 21 on the threaded conduit 18, whereby the tip 23 is adjusted with relation to the reduced bore 24.

Designated at 26 is a piston which is slidably mounted inside the cylinder 17 and which includes the inwardly facing elastic cup member 27 of rubber or similar material which sealingly and slidably engages the inside wall surface of cylinder 17. The intermediate portion of the piston rod, as shown at 28, is formed with a horizontally extending, integral arm 29 which is connected to the bottom wall of housing 19 by a coil spring 30, whereby the piston 26 is biased downwardly in the cylinder 17. The top end of the piston rod extends slidably through a horizontal projection 31 secured in the upper portion of housing 18 and serving as a guide means for the piston rod 28, guiding said piston rod for vertical movement along the axis of cylinder 17.

As shown in Figures 3 and 5, the arm 29 overlies the top surface portion of the toggle lever 14 and exerts downward force thereon, due to the action of the spring 30. In the absence of any other means limiting rotation of the toggle lever 14, the spring 30 is of sufficient strength to move the toggle lever 14 into the lowered position thereof shown in Figure 2, namely, the position wherein the switch 13 is open.

Pivoted to the front wall 19 of housing 15 is an operating lever 32, said lever comprising an outer sleeve 33 formed with the opposed pivot lugs 34, 34 which are rotatably received in the side walls of a vertical slot 35 formed in the front wall 19 of housing 15. As shown in Figure 6, the lugs 34, 34 are formed at the intermediate portion

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of the sleeve 33, whereby a substantial portion of the operating lever 32 projects inside the housing 15. The sleeve 33 is internally threaded, and threadedly engaged within the sleeve is the adjustable abutment screw 36 whose forward end may be adjusted to engage the lower surface of the toggle lever 14. As shown in Figure 6, the tip of the screw 36 is rounded, as indicated at 37, and the toggle lever 14 is preferably formed with a recess adjacent its end in which the rounded tip 37 of screw 36 may lockingly engage when the toggle lever 15 has been elevated to the position of Figure 5. As shown in Figure 5, the operating lever 32 is substantially at right angles to the toggle lever 15 when the lever is elevated, and is substantially in a dead center position relative to the toggle lever, whereby said toggle lever will be locked against downward rotation. When the switch is off, the operating lever 32 assumes the dotted line position of Figure 5 relative to toggle lever 15 also shown in dotted view, and when the switch is to be closed, the outer end of the operating lever 32 is depressed manually, whereby the inner end of the operating lever engages beneath the toggle lever 15 and elevates said toggle lever to the full line position of Figure 5, in which position the tip 37 of screw 36 engages in the recess, indicated at 38, which is provided in the bottom surface of the toggle lever 15. When it is desired to open the switch 13, the outer end of the operating lever 32 is manually elevated, releasing the toggle lever 15, and allowing the spring 38 to move said toggle lever downwardly to the position of Figure 2. However, when the toggle lever 15 is rotated to the position of Figure 5, said toggle lever exerts an upward force on the arm 29 which moves the piston 26 upwardly in the cylinder 17, said piston being readily movable upwardly because of the yieldability of the elastic cup element 27. When the cup member 27 is moved upwardly air flows into the cylinder 17 past the yieldable periphery of the cup member and is trapped in the lower portion of the cylinder. When the toggle lever 15 is released by rotating the operating lever 32 counterclockwise from the full line position thereof shown in Figure 5, the downward rotation of toggle lever 15 is delayed for a period of time required for the air trapped in cylinder 17 to escape from the cylinder through the discharge opening 25 of the needle valve cap 21. After the required time for the trapped air to escape from cylinder 17, the spring 38 forces the toggle lever 15 downwardly to the full line position thereof shown in Figure 2, causing the switch 13 to open.

It will be therefore apparent that a time delay is provided in the opening of the switch 13, said time delay being adjustable by adjusting the position of the needle valve 22 relative to the restricted bore portion 24.

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While a specific embodiment of an improved time delay device for wall switches has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. A timing attachment for a wall switch of the toggle type comprising a housing adapted to be secured to a switch plate over the toggle lever of the switch, a cylinder in said housing, said cylinder having a restricted air escape aperture in its end portion, a piston slidably positioned in said cylinder, an arm secured to said piston and being arranged to engage said toggle lever, spring means biasing said piston inwardly, said arm being arranged to rotate said toggle lever in one direction responsive to inward movement of said piston in said cylinder, and an operating lever pivoted to the front wall of said housing, being drivingly engageable with said toggle lever to rotate the toggle lever in the opposite direction, and being arranged to lockingly engage said toggle lever when said toggle lever has been rotated through its operating angle.

2. A timing attachment for a wall switch of the toggle type comprising a housing adapted to be secured to a switch plate over the toggle lever of the switch, a cylinder in said housing, said cylinder having a restricted air escape aperture in its end portion, a needle valve adjustably mounted in said aperture, a piston slidably positioned in said cylinder, an inwardly facing elastic cup member secured to said piston and engaging the inside wall surface of said cylinder, an arm secured to said piston and being arranged to engage said toggle lever, spring means biasing said piston inwardly, said arm being arranged to rotate said toggle lever in one direction responsive to inward movement of said piston in said cylinder, and an operating lever pivoted to the front wall of said housing, being drivingly engageable with said toggle lever to rotate said toggle lever in the opposite direction, and being arranged to lockingly engage said toggle lever when said toggle lever has been rotated through its operating angle.

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