Aug. 20, 1929. G. H. HART 1,724,930

DOOR LOCK CONTROLLED SWITCH MECHANISM

Filed Nov. 14, 1927

Fig. 1.

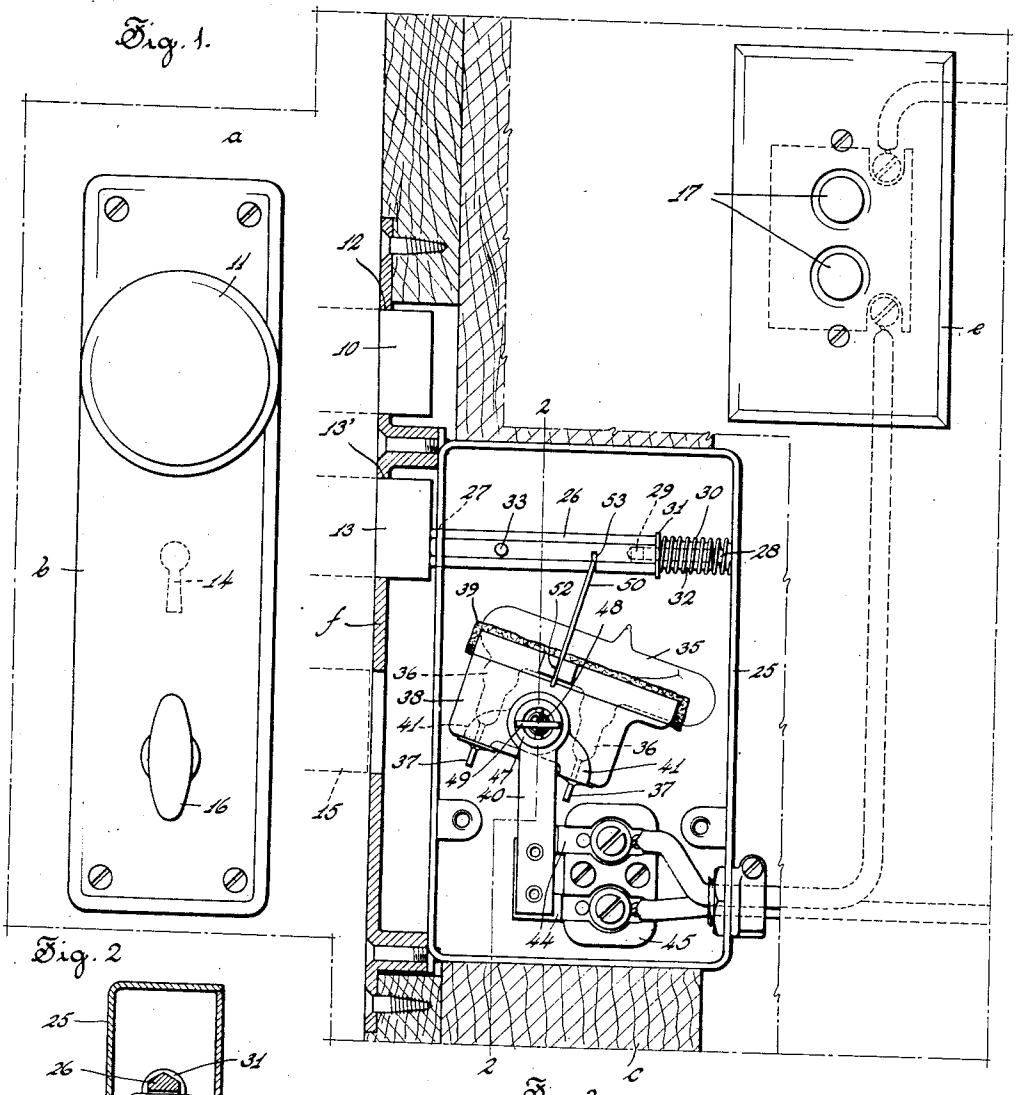



Fig. 2

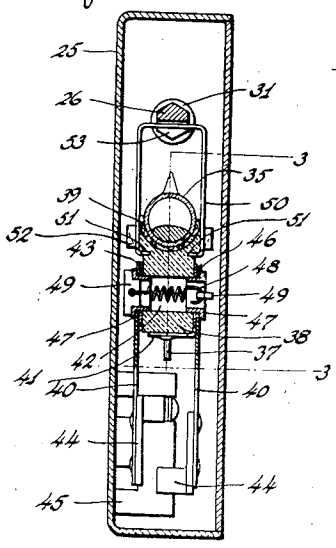
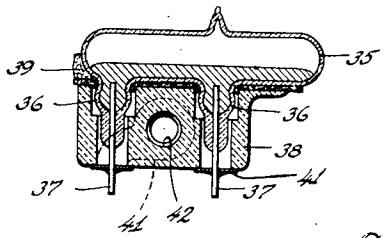



Fig. 3.




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Patented Aug. 20, 1929. 1,724,930

# UNITED STATES PATENT OFFICE.

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## DOOR-LOCK-CONTROLLED SWITCH MECHANISM.

Application filed November 14, 1927. Serial No. 232,966.

This invention relates to an arrangement whereby the lights, for instance, of a room in a hotel, are automatically thrown off in the event that they have been on when the hotel guest closes the door of the room and locks the same from the outside.

The aim of the invention is to provide an improved arrangement of this sort having various features of novelty and advantage, and is particularly characterized by its extreme simplicity in construction, its economy in manufacture, the ease and convenience with which it may be installed and wired, and by its durability.

A further aim of the invention is to provide, in a switch mechanism of this sort, a resilient connection between the mercury switch and the reciprocating member which is actuated by the bolt so that excessive shocks imparted to the reciprocating member will not be transmitted to the mercury switch, thus eliminating the danger of injuring or breaking the latter.

A further aim of the invention is to provide an improved and simplified arrangement for mounting the mercury switch.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings, wherein is shown one of the many embodiments which the present invention may take:

Figure 1 is a view showing, more or less diagrammatically, an installation in which my improvements are incorporated, the door-lock controlled switch mechanism being illustrated in "off" position;

Fig. 2 is a vertical sectional view taken substantially on line 2—2 of Fig. 1; and

Fig. 3 is a sectional view through the mercury switch, this view being taken substantially on line 3—3 of Fig. 2.

Referring to the drawings in detail, *a* denotes, generally, a door carrying a lock *b* which is shown diagrammatically, as the particular construction thereof forms no part of the present invention. *c* designates generally the door frame or casing secured to a wall on which is mounted a switch *e* by means of which the lights of the room may be manually thrown "on" or "off" at will. Secured to the door frame is a strike plate *f*.

In the present illustrative disclosure, the lock *b* is provided with a catch 10 which may be operated by a knob 11 in the usual manner. This catch is adapted to engage in an opening 12 in the strike plate. The lock is further provided with a bolt 13 which is adapted to be thrown from the outside of the door in any suitable manner as, for instance, by means of a key which may be inserted through a key hole 14 shown in dotted lines in Fig. 1. It may be assumed that this view is being taken from the inside of the door when the latter is in closed position. The lock mechanism, by means of which the bolt is thrown, is not shown as this may be of any suitable construction. The lock may be further provided with a bolt 15 which may be thrown from the inside of the door by means of a key or knob, a knob 16 being illustrated in the drawings. The switch *e* may be of any suitable type. It is here shown to be what is termed as a "flush switch", the same having push buttons 17 as is usual in switches of this sort.

In accordance with the present invention, I provide in series with the flush plate *e*, a mercury switch which is controlled by the bolt 13. The mercury switch is located in a box or casing 25 suitably secured to the strike plate *f* and positioned in a recess provided in the door casing behind the strike plate. The door-lock controlled switch mechanism has a reciprocating member or plunger 26 mounted for longitudinal movement in alignment with the strike plate opening 13′ which is adapted to receive the lock bolt 13. By preference, this plunger 26 is polygonal in cross section and its outer end slidably fits in a correspondingly shaped hole 27 provided in the outer wall of the casing. The inner or rear end of the plunger is guided by a stud or rod 28 riveted or otherwise secured to the rear wall of the casing. The forward end of this rod fits in a recess or bore 29 in the rear end of the plunger. The plunger is normally urged outwardly by a spring 30 coiled about a stud 28 and interposed between the inner wall of the casing and a collar 31 abutting against the rear end of the plunger 26. The

collar may be carried by a sleeve 32 provided on the rear end of the plunger 26. The extent of outward movement of the plunger 26 is limited by a stop or pin 33.

Pivoted within the box or casing 25 is a mercury switch comprising a tube 35 having a pair of depending legs or wells 36 into which extend terminals 37. The tube 35 is mounted on a pivoted support 38 of insulating material, there being, by preference, a cushioning element, such as a piece of felt 39, between the support and the tube. The mercury tube is so supported and electrically connected that flexible leads leading to the electrodes or terminals of the tube are eliminated, such flexible leads being objectionable for many reasons. To this end, the mercury tube support is pivoted on conductors 40 and contacts 41 are provided on, and are movable with, the support for connecting the terminals 37 to the conductors 40. The contact members 41 are preferably formed of sheet metal and are respectively connected to the lower ends of the terminals and then are led upwardly to opposite sides of the support. The support has a transverse opening 42 and each contact has an opening 43 aligned with the opening 42. The conductors 40 are preferably formed of spring metal and are respectively connected to contact posts 44 carried by an insulating block 45 located adjacent the lower end of the casing 25. The conductors 40 are provided adjacent their upper ends with aligned openings 46 which register with the openings 42 and 43 when the mercury switch is in place. For the purpose of pivotally supporting the mercury switch on the conductors 40 there is provided a pair of flanged sleeves 47 which respectively project through the openings 42, 43 and 46 and into the opposite ends of the opening 42. For the purpose of holding these pivot sleeves in place and also insuring a good electrical engagement between the conductors 40 and the contact members 41, the sleeves are normally thrown towards each other by a spring 48, the opposite ends of which are anchored to cross pieces 49 of insulating material. With this arrangement, it will be seen that the use of flexible leads is avoided, the structure is greatly simplified and the parts may be readily assembled and disassembled.

The mercury switch is connected to, so as to be operated by, the plunger 26 by a resilient or flexible member 50 which, in the present instance, is formed of wire. The wire is bent into a generally rectangular or U-shape. The lower ends of the arms are bent in towards each other and engaged in aligned recesses 51 in the support. In order to prevent the member 50 from turning with respect to the support, the arms of the connection engage in grooves 52 provided on the side walls of the support. The upper end of the wire engages in a vertical slot or notch 53 provided in the under side of the plunger 26.

The operation of my improved arrangement will be readily understood from the foregoing description taken in connection with the accompanying drawings. In the event that the lights of the room are on when the guest closes the door and locks the same from the outside, the bolt 13 moves the plunger 26 to the position shown in Fig. 1 with the result that the mercury within the tube 35 flows to the lower end thereof, thus breaking contact between the terminals 37. The lights will remain off until the bolt is withdrawn. When the guest returns to the room and unlocks the door, the member 26 will advance under the influence of the spring 30 with the result that the mercury switch will be thrown on and the lights which were left on when the guest left the room, will again be automatically thrown on. It is of advantage to provide a resilient connection between the plunger 26 and the mercury switch in order to prevent excessive shocks imparted to the member 26 from being transmitted to the mercury switch.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. In combination, a door-lock having a bolt, a mercury switch, a member adapted to be actuated by said bolt, and a resilient connection between said member and switch whereby excessive shocks imparted to said member will not be transmitted to said mercury switch.

2. In combination, a door-lock having a bolt, a fixed box, a mercury switch pivoted therein, a reciprocating member carried by said box and adapted to be actuated by said bolt, and a resilient connection between said switch and member whereby excessive shocks imparted to said member will not be transmitted to said mercury switch.

3. In combination, a door-lock having a bolt, a pivoted mercury switch, a plunger adapted to be actuated by said bolt to throw said switch into "off" position, a spring normally urging said plunger forwardly and said switch into "on" position, and a resili-

ent wire between said plunger and switch said wire being connected to so as to move with said plunger throughout its strokes.

4. In combination, a door-lock having a bolt, a pivoted carrier, a mercury switch on said carrier, a reciprocating plunger adapted to be retracted by said bolt and having a notch, means normally urging said plunger forwardly, and a connection between said carrier and plunger comprising a spring wire fixed to said carrier and having sliding movement in said notch.

5. In a switch mechanism, a pair of resilient conductors having aligned openings adjacent their free ends, a mercury tube support between said conductors and having an opening in alignment with the openings therein, a mercury tube carried by said support and having electrodes, contacts carried by said support respectively connected to said electrodes and respectively contacting with said conductors, and means extending through said openings for urging said conductors against said contacts.

6. In a switch mechanism, a pair of resilient conductors formed of strip metal and having aligned openings adjacent their free ends, a mercury tube support pivoted therebetween and having a through opening in alignment with the openings thereof, a mercury tube carried by said support and having electrodes, contacts carried by said support respectively connected to said electrodes and respectively contacting with said conductors, a spring extending through said openings, and cross pieces of insulating material to which the ends of said spring are connected.

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