March 30, 1926. 1,578,485

S. H. TODD

ELECTRIC SWITCH

Filed May 6, 1922

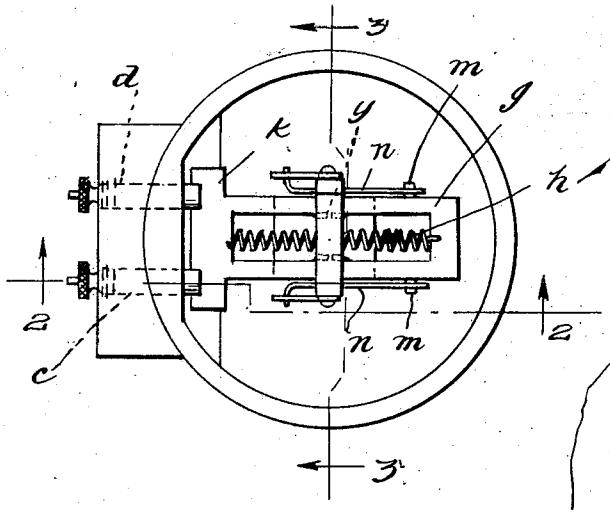


Fig. 1

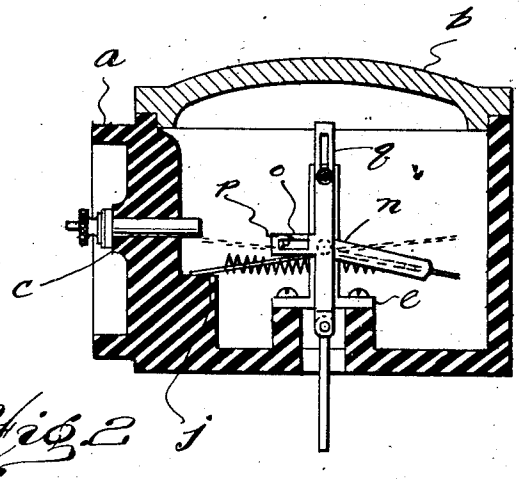


Fig. 2

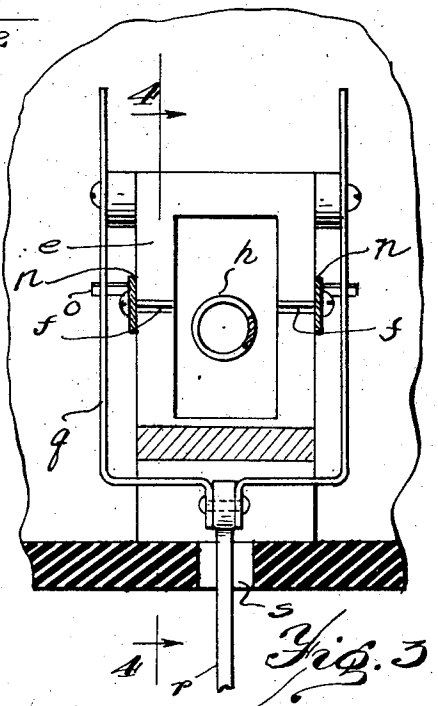


Fig. 3

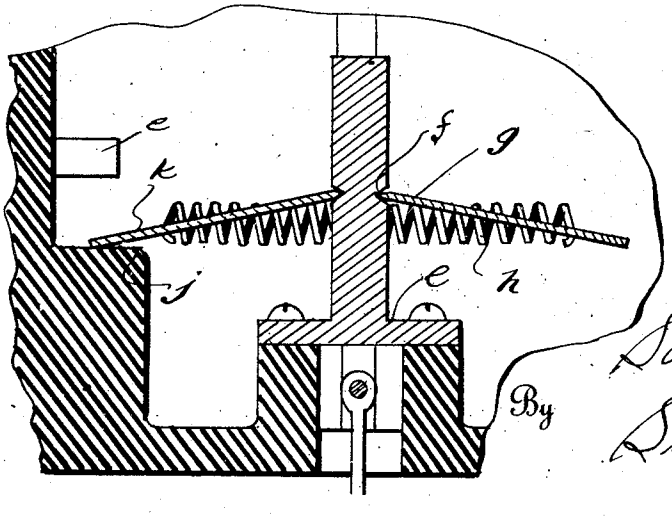


Fig. 4

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UNITED STATES PATENT OFFICE.

SAMUEL H. TODD, OF HIGHLAND PARK, MICHIGAN.

ELECTRIC SWITCH.

Application filed May 6, 1922. Serial No. 558,854.

To all whom it may concern:

Be it known that SAMUEL H. TODD, a citizen of the United States, residing at Highland Park, in the county of Wayne and State of Michigan, has invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

This invention relates to electric switches and especially to an electric switch which can be operated by a thermostat. It is the object of the invention to provide a switch which can be operated by a small amount of movement and which when moved a small initial distance will complete the movement by energy stored during the initial movement. By using this stored energy a quick snappy final movement of the switch is had.

Another feature of this switch is that on the breaking of the connections the initial movement of the switch parts does not lift the bridging member during the initial movement, but only, when the parts have reached the point where the stored energy is drawn upon, is the switch broken. This, therefore, permits the switch to snap open with a thermostat as an actuator which obviously moves very slow. A slow opening or closing of the switch results in objectionable arcing of the current.

The switch is simple in construction, cheap to manufacture and effective in giving a snapping action, both in opening and closing the switch member. This will be described more in detail in the drawings following.

In the drawings:

Fig. 1 is a plan view of the switch.

Fig. 2 is a vertical section on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is a section on the line 4—4 of Fig. 3.

a designates a housing made of bakelite, hard rubber or other insulating material. This is provided with a cap or lid *b*. A pair of terminals *c* and *d* run through the housing. In the center of the housing is a pair of upstanding lugs on which is secured by screws a standard *e*. This standard is in the form of a yoke or an inverted U. In each side of the leg of the yoke is a deep groove *f*, adapted to take the knife edge of the U-arms *g* and *k*. Each U-arm is provided with a pair of extensions *y* that fit to the inside of the standards so as to hold the U-arm against lateral movement. A tractile spring *h* is fastened to the connecting bar portion of each U-arm. The upward movement of the U-arms connected by the spring is limited by the two contacts *c* and *d*. The downward movement by the shoulder *j* and the housing.

One of these U-arms constitutes an electric bridge from contact to contact, namely the arm *k*. The other U-arm *g* has no electric functions, but it does play an important part in doing the initiatory work of the switch in storing energy or permitting the active or bridging arm to rest until energy sufficient for a quick snappy breaking or closing action is provided. This is a very important factor in switch operation as it eliminates arcing, due to a slow closure such as normally procured by the movement of a thermostat.

This snappy action is procured by the arrangement of the parts. These two arms are in some respects similar to toggle arms, in that they pass from one side to another of a straight line position. The toggle arm switch is, of course, old, but this new switch of mine differs from the toggle arm arrangement in that the toggle arms are tied together at the center so that they must move together. In my construction I have a pair of pivoted arms arranged to pass a straight line or dead center position, like toggle arms, which gives them the snappy action permitted by putting a spring under strain, but there is this distinguishing feature, that the arms are tied together by only a tractile spring so that in initiating the movement in either direction only the arm *g* is moved until a straight line position is achieved and crossed, whereupon the spring acts upon the other bridge arm to snap it open or closed.

The arm *g* is provided with laterally projecting lugs *m* which engage through a slot in the levers *n* pivoted to the uprights of the standard. The end of one of these levers is bent around to form a lug *o* which passes though the slot *p* in the slide *q*. This slide is in the form of a yoke as appears by Fig. 3 so as to provide actuation for levers *n* on both sides of the arm. A draw bar *r* is fastened to the bottom of the yoke and passes through the opening *s* in the bottom of the switch

housing. This may be connected with a thermostat which is not shown, or any other source of movement.

Fig. 4 demonstrates quite nicely why the bridging arm *k* does not move when the arm *g* moves, in its initial movement. The spring *h* being on the underside of the straight line position will simply draw the switch arm *k* against the shoulder *j* until the straight line position of the two arms is crossed. At this point the spring *h* is put under its greatest tension and has considerable energy stored, hence immediately the straight line position is crossed it snaps the switch arm *r* up against the contacts *c* with a quick snappy action that avoids arcing.

What I claim is:

1. In an electric switch, the combination of a standard, a pair of arms pivoted to swing on opposite sides of the standard, a spring between the two arms for resisting movement of the arms from one side to the other of a straight line position, a pair of contacts engaged by one arm, and a yoke-like slide slidably secured on the standard and a pair of levers connecting the yoke-like member with the other arm to actuate the same.

2. In an electric switch, the combination of a standard, a pair of arms, pivoted to swing on opposite sides of the standard, a spring between the two swinging arms for resisting the movement of the arms from one side to the other of a straight line position, a pair of contacts engaged by one swinging arm, a yoke member having each arm slidably secured to the standard, and a pair of links each secured at one end to an arm of said yoke member and at the other end to the other swinging arm to actuate the same.

3. In an electric switch, the combination of a standard, a pair of arms pivoted to swing on opposite sides of the standard, a spring between the two swinging arms for resisting the movement of the arms from one side to the other of a straight line position, a member slidably secured to the standard and having a relatively small movement, a lever secured at one end to the slidable member and at the other end to one swinging arm to impart a greater relative movement to said swinging arm than would be possible by direct connection of said slidable member with said swinging arm.

In testimony whereof I affix my signature.

SAMUEL H. TODD.