A. J. TIZLEY.

ELECTRIC SWITCH.

APPLICATION FILED MAY 31, 1919.

1,434,972. Patented Nov. 7, 1922.

Fig. 1.

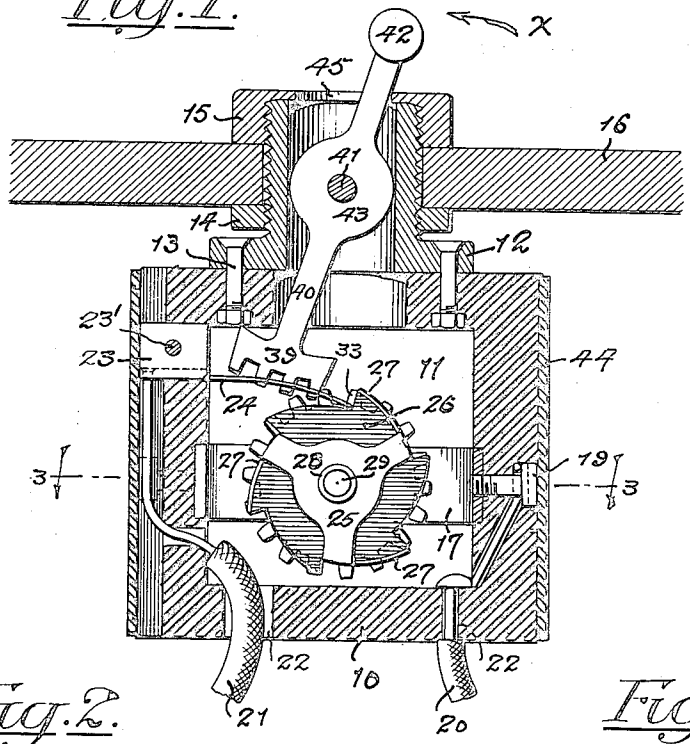


Fig. 2.

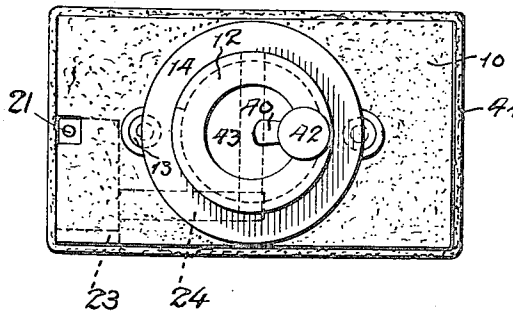


Fig. 3.

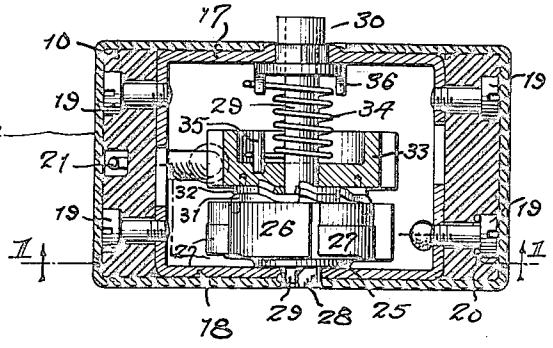
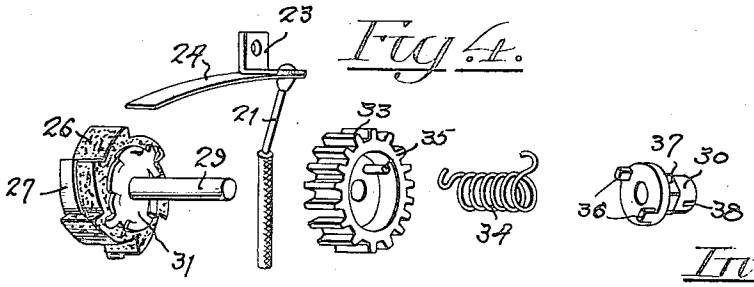


Fig. 4.



Inventor
ARTHUR J. TIZLEY
by his Attorneys,
Norman and Norman

Patented Nov. 7, 1922. 1,434,972

UNITED STATES PATENT OFFICE.

ARTHUR JAMES TIZLEY, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE BRYANT ELECTRIC COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

ELECTRIC SWITCH.

Application filed May 31, 1919. Serial No. 301,040.

To all whom it may concern:

Be it known that I, ARTHUR J. TIZLEY, a citizen of the United States of America, residing at New York city, borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

My invention relates to electric switches, and particularly to hand-operated switches, the direct object of my invention being to provide an efficient and inexpensive switch for controlling local lamp circuits, although it may be readily adapted to other uses.

In the accompanying drawings—

Fig. 1 is a vertical section on line 1—1 of Fig. 3 through a switch in which my invention is embodied in one form, and drawn to an enlarged scale;

Fig. 2 is a plan thereof;

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

Fig. 4 is a detached perspective of certain switch elements.

While the present switch is readily adapted to various installations, I have here shown it as of canopy type. The insulating body 10 comprises a rectangular block of insulating material, centrally apertured to form the switch chamber 11. A thimble 12, secured by screw bolts 13, projects from one side of the block 10 and is externally threaded to receive the clamping nuts 14 and 15, by means of which the switch is mounted on its support 16, here indicated as a canopy wall.

Supporting standards 17 and 18 for the switch mechanism span the chamber 11 at opposite sides thereof, and are secured in position by means of screws 19. The lead wires 20 and 21 may be brought into the switch chamber in any suitable way, as for example through apertures 22 and 23 formed in one side of the base 10. One of the wires, viz. 20, is electrically connected to the standard 18, for example, by securing its bared end beneath the head of one of the securing screws 19 for the standard. The other lead wire 21 is secured in any suitable way to the base 23 of the spring terminal 24. A screw bolt 23′ secures the base plate 23 to the insulating body 10. It will be observed that as here shown the switch is of the single pole type.

The circuit between the spring terminal 24 and the standard 18 is completed or broken by the rotary switch piece 25 carried by the ratchet wheel 26 of insulating material, and having contact arms 27 overlying alternate ratchet teeth, while its hub 28 is journaled in the standard 18. The ratchet wheel 26 is positioned in the same plane as the spring terminal 24, which rides over the periphery thereof, and thus contacts with the wings 27 of the contact piece 25 on alternate partial rotations of the ratchet wheel 26. The latter is journaled on the spindle 29, one end of which has its bearing in the hub 28, while its opposite end has its bearing in a thimble 30 mounted in the standard 17.

To effect the step by step rotation of the ratchet wheel 26, I provide it with a ratchet plate 31 and cooperating with a second ratchet plate 32 carried by a pinion 33 mounted on the spindle 29. A switch spring 34 is coiled on the spindle 29, and one end thereof engages the pin 35 secured to the pinion 33, while its other end is engaged by one or the other of the studs 36 projecting from the inner face of the thimble 30. The tension of the spring is adjusted in any suitable way, as for instance by displacing the thimble 30 inward against the action of the spring 34 until its squared area 37 clears its seat in the standard 17, whereupon it may be rotated to increase or decrease the torsion of the spring, after which the thimble is permitted to return to its seat by the expansion of the spring. A slot 38 cut in the outer end of the thimble 30 facilitates its rotation by means of a screw driver.

Meshing with the pinion 33 is a gear segment 39 formed at the inner end of the operating lever 40, pivoted on a cross pin 41 in the thimble 12, and projecting beyond the latter a sufficient distance to permit ready operation thereof by means of its thumb piece 42. The lever is preferably enlarged at 43 within the thimble to form a hub which excludes dirt and dust from the interior of the switch.

An insulating sheath 44 of paper or fiber slipped over or wrapped around the block 10 completely closes the switch chamber 11 and forms a protective housing therefor.

The operation is readily understood. When the switch is shifted from the "off" position, illustrated in Fig. 1, to the "on" position, the spring terminal 24 is brought into engagement with one of the wings 27 of the contact piece 25 by pushing the thumb

piece 42 of the lever 40 to the left in the direction of the arrow X. This motion of the lever causes the segment 39 to actuate the pinion 33, thereby rotating the wheel 26 by reason of the inter-engagement of the juxtaposed ratchet plates 31 and 32. The extent of rotation is limited by the throw of the lever, which in turn is limited by the aperture 45 in the clamping nut 15. This throw is sufficient to rotate the ratchet wheel 26 through an arc of such extent that the drop of the free end of the spring terminal 24 over the edge of the succeeding peripheral tooth of the ratchet wheel is insured, but is so limited that the terminal will not overrun said succeeding tooth. Upon release of the lever by the operator, the torsion spring 34, which has been further tensioned by the rotation of the pinion 33, returns the latter and the lever to their original positions, the pinion being halted while the spring is still under tension by reason of its engagement with the segment 29. This return movement tends also to return the ratchet wheel, but the latter is halted by the engagement of the free end of the terminal 24 against the base of the tooth which it has just left. The switch is now "on" and current flows from the standard 18 through the hub 28 and the contact piece 25 to the wing 27 thereof, and thence through the spring terminal 24 to the terminal plate 23, to which the other wire 21 is connected. Obviously the switch is thrown into the "off" position by the next movement of the ratchet wheel 26 when the switch lever 40 is again actuated.

While I have here shown the contact piece 25 provided with three contact wings 27, the number of the latter may be as many as desired, it being premised always that they overlie alternate teeth of the ratchet wheel 26. Similarly, while I have shown the gear 23 as a full pinion, it is obvious that only a portion of its toothed periphery is operative, and that it may accordingly be substituted by a gear segment substantially corresponding in extent to the segment 39 of the switch lever. I prefer, however, to provide a construction in which the ratchet plate 32 is supported firmly throughout its entire area. It is further obvious that instead of using independent ratchet plates 31 and 32 the adjacent faces of the pinion 33 and wheel 26 may be suitably shaped to afford a cooperating ratchet engagement.

Various other modifications will readily occur to those skilled in the art which do not depart from what I claim as my invention.

I claim—

1. An electric switch device comprising a rotary carrier of insulating material having a ratchet periphery, a commutator mounted on one side of said carrier and having contact wings angled over spaced ratchet teeth of said carrier, a current carrying plate against which said commutator bears, a gear operated ratchet connection for driving said carrier, together with a switch contact riding the ratchet periphery of the carrier, substantially as and for the purpose set forth.

2. An electric switch device comprising a rotary carrier of insulating material having a ratchet periphery, a commutator mounted on one side of said carrier and having contact wings angled over spaced ratchet teeth of said carrier, a current carrying plate in which said commutator is journalled, a gear operated ratchet connection for driving said carrier, together with a switch contact riding the ratchet periphery of the carrier, substantially as and for the purpose set forth.

3. An electric switch comprising a current carrying frame member, a spindle journalled in said frame member, a rotary carrier of insulating material mounted on said spindle and having a ratchet shaped periphery, a commutator mounted on said carrier and engaged between the latter and the frame member, contact wings for said commutator angled over spaced peripheral teeth of said carrier, a switch contact riding said teeth, a ratchet element on the face of said carrier opposite that of the commutator, an oscillating gear member mounted on the spindle, a ratchet element associated therewith and cooperating with the ratchet element on said rotary carrier, an oscillating manually operated gear member meshing with said gear on the switch spindle, and spring means for returning said gear members to initial position for operation.

4. In an electric switch, an insulating block pierced to afford a switch chamber, frame members spanning the opening so formed therein, a spindle journalled in said frame members, a switch mechanism mounted on said spindle and comprising a gear, in combination with a switch operating lever, a member mounted on said insulating body and on which said lever is pivoted, said switch body being apertured to permit the entry of the switch lever into the switch chamber, and a gear segment on said lever meshing with the gear on the spindle to afford an operating connection to the switch mechanism.

5. In an electric switch, an insulating block pierced to afford a switch chamber, frame members spanning said opening, a switch mechanism mounted between said frame members, an operating member projecting from one side of said insulating block and passing through an aperture therein, together with a sleeve of insulating material surrounding the insulating body and forming a closure for the opposite ends of the switch chamber.

6. An electric switch comprising a spindle

mounted in fixed position, an insulating carrier rotating on the axis of said spindle and having a ratchet periphery, a commutator having contact wings overlying spaced peripheral teeth on said carrier, means establishing spanning electrical connection with said commutator, a contact brush riding the periphery of said carrier and serving as a pawl to prevent reverse rotation thereof, a gear operated ratchet connection for rotating said carrier in one direction and a manually operated oscillating lever having a gear segment meshing with the ratchet operated gear to drive the latter on the oscillation of the lever.

In testimony whereof I have signed my name to this specification.

ARTHUR JAMES TIZLEY.