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W. C. ANDERSON

2,405,005

DOUBLE THROW SWITCH

Filed June 30, 1943

Fig. 3.

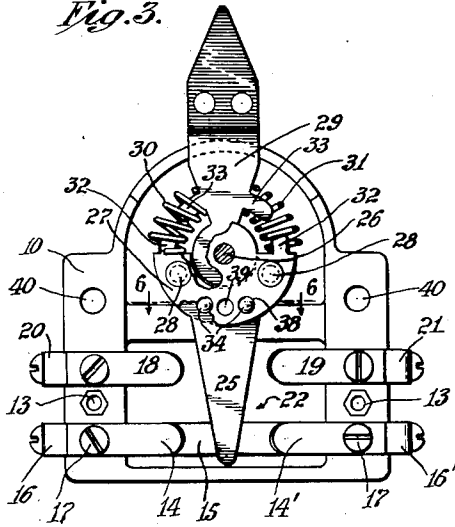


Fig. 4.

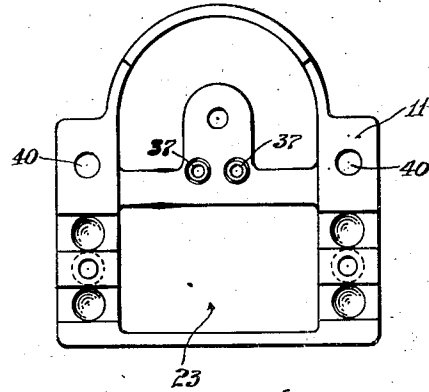


Fig. 2.

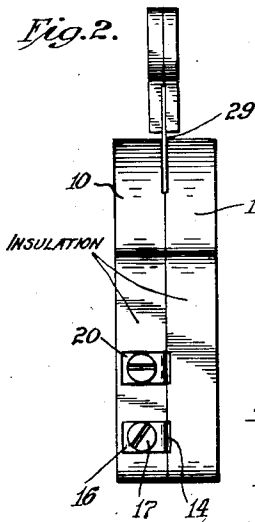


Fig. 1.

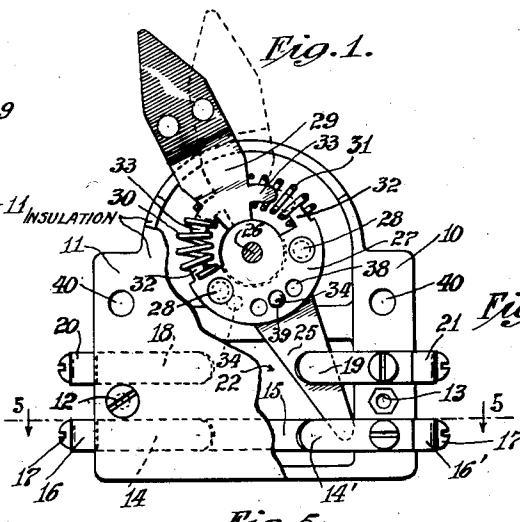


Fig. 7.

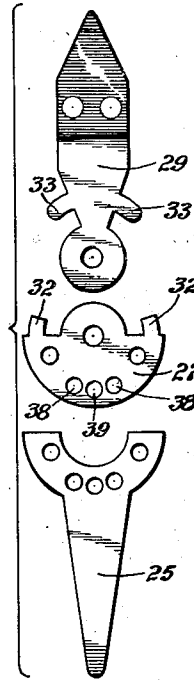


Fig. 5.

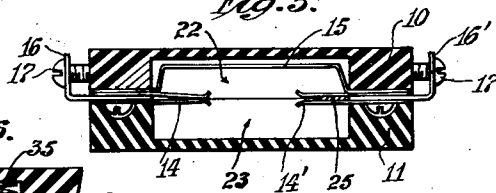
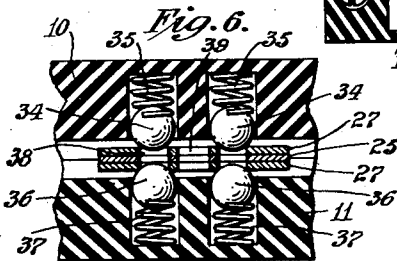


Fig. 6.



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UNITED STATES PATENT OFFICE

2,405,005

DOUBLE-THROW SWITCH

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pany, Plainville, Conn., a corporation of Con-
necticut

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4 Claims. (Cl. 200—6)

1

My invention relates to electric switches of the so-called double throw type.

One object is to provide a switch construction which is compact, simple and rugged.

Another object is to provide a switch which is easily operated and has a fairly definite central or "off" position.

In the preferred form, the housing is made of two parts of insulation having a chamber between them in which are mounted the stationary contacts and the movable switch arm member. The actuating member is hinged on the same pin as the switch member contact and two opposed springs are interposed between the actuator and the contact part of the movable switch member so as to normally hold them in alignment but permit the actuator to be tilted so as to compress one or the other spring and thus throw the contact arm from one closed circuit position to the "off" position. Spring pressed ball bearings coacting with the movable switch member serve to hold the movable switch member in its central or "off" position. They may also coact to assist in holding the switch member in each "on" position.

Fig. 1 is a side view of a switch embodying my invention, parts being broken away, and the switch being in closed circuit position.

Fig. 2 is an edge view of the switch.

Fig. 3 is a side view of one-half of the housing with attached parts.

Fig. 4 is a side view of the other half of the housing.

Fig. 5 is a horizontal sectional view on the plane of the line 5—5 of Fig. 1.

Fig. 6 is a horizontal sectional view on the plane of the line 6—6 of Fig. 3 on an enlarged scale.

Fig. 7 is an exploded view of parts of the movable switch member.

The two parts 10 and 11 of the housing are preferably of molded insulation held together by screws 12 which pass through one part into seats 13 in the other part. The stationary contacts 14, 14' are connected by a tie 15 and provided with terminals 16 and 16', respectively. Each contact may be of the split or forked type and is anchored to the housing by a rivet or screw 17. The switch contacts 18 and 19 are similarly constructed and mounted and provided with terminals 20 and 21, respectively.

The parts 10 and 11 have recesses 22 and 23 to form a chamber for the stationary contacts and the movable switch member 25 which is pivoted on the pin 26, and adapted to be moved to

2

connect adjacent stationary switch contacts. Two plates 27, 27 are secured by rivets 28 to the opposite sides of member 25 and provide the pivotal support for the member 25 on the pin 26.

The actuator lever 29 is also pivoted on pin 26. Springs 30 and 31 are interposed between the lugs 32 on plates 27 and the lugs 33 on actuator lever 29. A pair of balls 34, 34 are backed by springs 35, 35 in recesses in the housing part 10 and other balls 36, 36 are backed by springs 37, 37 in recesses in part 11. The springs press the balls against the plates 27, 27. These plates have recesses 38, 38 and 39. When the switch member 25 is in the central or "off" position, the two sets of balls are seated in the recesses 38, 38 as shown in Figs. 3 and 6 and hold the switch member quite positively although resiliently in the central or "off" position. When the switch member is in a closed circuit or "on" position, a pair of oppositely located balls will be seated in the central recess 39 and thus assist in holding the member in said "on" position.

The housing is constructed so as to be supported by fastening screws passing through the holes 40, 40.

To actuate the switch it is merely necessary to press the actuating lever to one side or the other depending upon the action desired. The ball bearings hold the switch member quite definitely in the "off" or open circuit position but yield when the actuator is tilted and one of the springs 30 or 31 is sufficiently biased to overcome the ball bearing resistance. The switch member then snaps over to the closed circuit or "on" position out of control of the actuator. In the closed circuit position, the switch member is held partly by the friction of the contacts and partly by the pressure of one pair of balls which then protrude into the center recesses 39 of the switch member. To break or open the circuit the switch actuator is tilted from one side toward the center so as to compress one of the springs 30 or 31 until it is strong enough to overcome the holding power of the switch contacts plus the spring pressed ball bearings in the center recesses 39, 39. In case the switch member should stick, the spring will be compressed until the pressure of the actuator is applied directly against the switch member or until the spring is tight. Continued pressure on the actuating lever 29 will force the switch member to start to move and as soon as the holding power of the contacts and the ball bearings, if any, is overcome, the spring, 30 or 31, whichever is compressed, will snap the switch member to the open circuit central position.

I claim:

1. In an electric switch, an insulating housing having a chamber, stationary switch contacts within the chamber having terminals outside of the housing, a switch member pivoted within the housing for coacting with the contacts, an actuator mounted on the same pivot center as the switch member and having a limited freedom of motion relative to the switch member and in the same general plane, a pair of opposed springs interposed between the actuator and the switch member and centering devices coacting with opposite sides of the switch member, within the housing chamber.

2. In an electric switch, a housing consisting of two parts of insulating material having a chamber between them, stationary switch contacts within the chamber having terminals outside of the housing, a switch member pivoted within the housing for coacting with the contacts, an actuator mounted on the same pivot center as the switch member, said switch member and said actuator having a common central plane, a pair of opposed springs interposed between the actuator and the switch member within the housing and ball bearing centering devices coacting with opposite sides of the switch member.

3. In an electric switch, a housing having recesses, a pivoted switch member having at least three spaced recesses, ball bearings in the housing recesses and spring pressed in the recesses against the switch member and adapted to fit in two of said recesses in the switch member when the switch member is in the open circuit position to resiliently hold the switch member in said open position, a pair of said ball bearings being adapted to fit in the third recess in the switch member when the switch is in the closed circuit position to assist in holding the switch member in said closed position.

4. An electric switch comprising an insulating housing, a stationary contact and a pivot pin mounted within the housing, a movable switch member having a contact and side plates hinged on said pin, said switch member having projections on opposite sides of the pivot pin, an operating member hinged on said pin and having projections on opposite sides facing the respective projections of the movable switch member, springs interposed between the respective projections and means independent of the contact parts and coacting with opposite sides of the removable switch member for resiliently holding the movable switch member in position.

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