Aug. 18, 1953 E. G. GAYNOR 2,649,511

SWITCH

Filed Oct. 18, 1949 2 Sheets-Sheet 1

Fig. 1

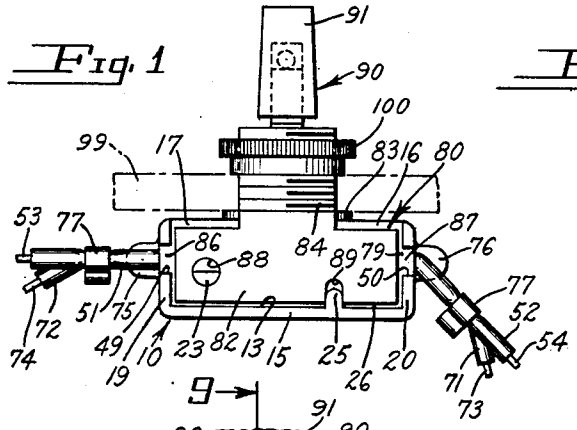


Fig. 2

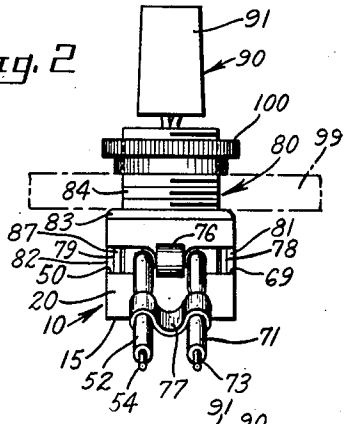


Fig. 3

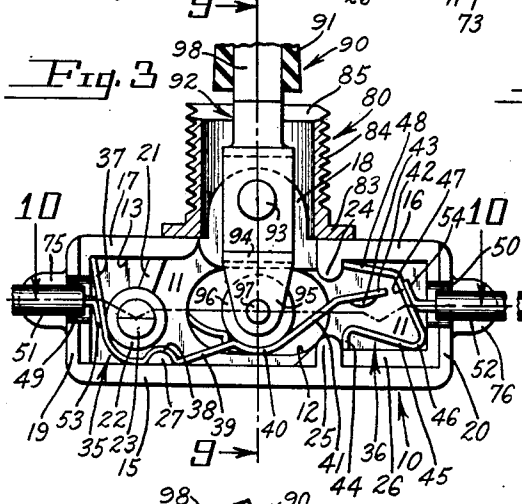


Fig. 4

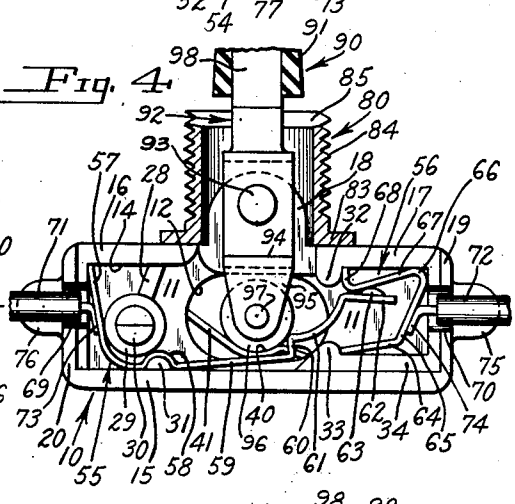


Fig. 5

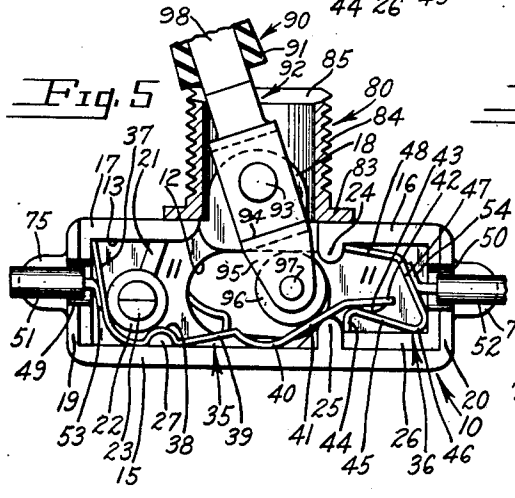
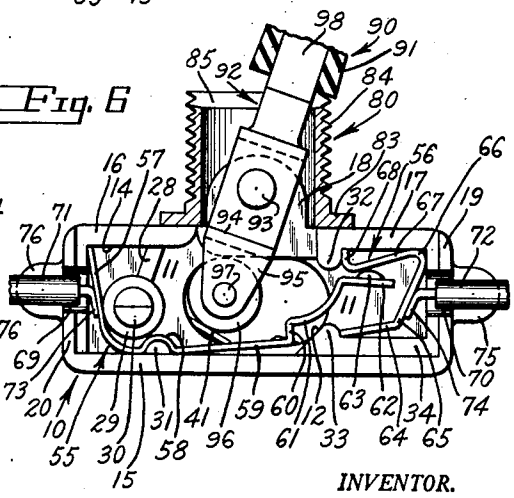


Fig. 6



INVENTOR.
EDWIN G. GAYNOR
BY
John A. Hanrahan
ATTORNEY

Aug. 18, 1953 E. G. GAYNOR 2,649,511

SWITCH

Filed Oct. 18, 1949 2 Sheets-Sheet 2

Fig. 7

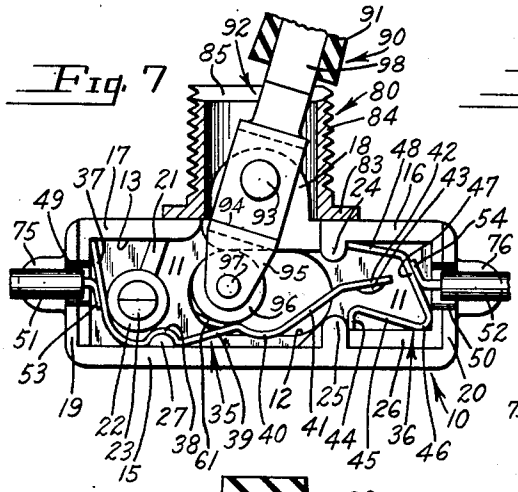


Fig. 8

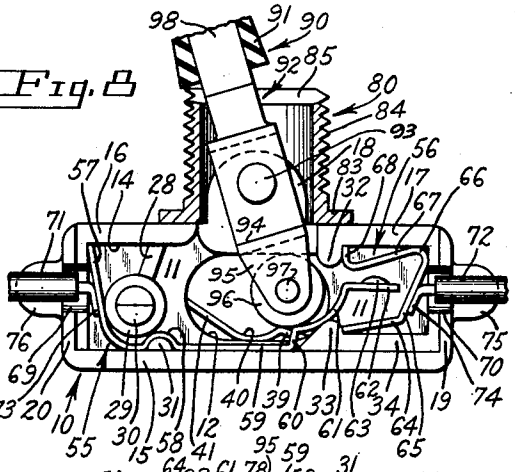


Fig. 9

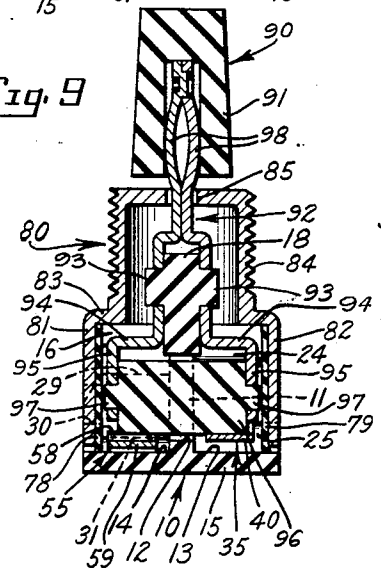
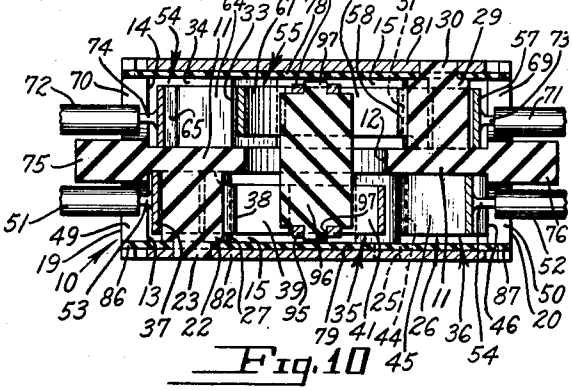


Fig. 10



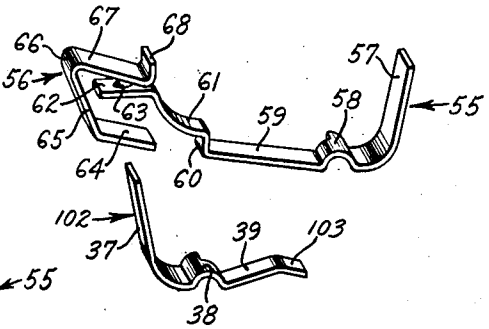


Fig. 12

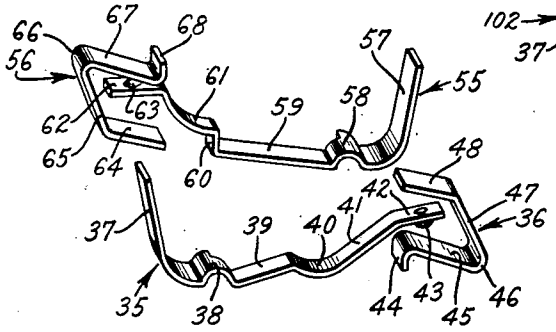


Fig. 11

INVENTOR.
EDWIN G. GAYNOR
BY John A. Hannahan
ATTORNEY

Patented Aug. 18, 1953

2,649,511

UNITED STATES PATENT OFFICE

2,649,511

SWITCH

Edwin G. Gaynor, Fairfield, Conn.

Application October 18, 1949, Serial No. 121,990

6 Claims. (Cl. 200—6)

1

This invention relates to new and useful improvements in switches and while having particular relation to a switch primarily designed for use with a fluorescent lamp, provides a switch also adapted for use with the capacitor type electric motor, for use with a two-speed motor and one in which the arrangement of contacts may be readily altered whereby the switch will be a single pole switch or double pole switch.

An object of the invention is to provide a switch of the character stated and including a single manual having three positions and so made that the manual is returned to one of said positions when moved to another of said positions and released, such return movement being occasioned by a contact of the switch.

Another object is to provide a switch of the character outlined and including a single manual having three positions including a normal or neutral position and a pair of active or circuit changing positions in one of the latter of which it is yieldingly retained when moved thereto, such retaining of the manual in the latter position being accomplished by a contact of the switch.

A more specific object is to provide a switch and contacts so constructed and related that a pair of said contacts are normally engaged and are adapted to be connected in the running circuit of a fluorescent lamp, a second pair of such contacts are normally disengaged but are adapted to be engaged to close the heating circuit of the fluorescent lamp and a manual having three positions in one of which said contacts are related as described, i. e., the contacts for a heating circuit of a fluorescent lamp are open and the contacts for the running circuit of such a lamp are closed, in another of which positions the contacts of the running circuit of the lamp are closed and the contacts of the heating circuit are closed, and in a third of which positions the contacts of the heating circuit of a fluorescent lamp are in their normal open relation and the manual is maintaining the contacts of the running circuit of the fluorescent lamp open whereby the lamp is extinguished, the contacts serving to return the manual from the second to the first of said positions when moved to such second position and released and to retain the manual in the third position when moved thereto whereby to maintain the contacts of the running circuit in open circuit relation.

Another object is to provide a switch for the purpose outlined and which is of simple construction in its insulating body and in its contacts and may be easily assembled.

2

A further object is to provide a switch including certain novel features of construction as will be pointed out.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein satisfactory embodiments of the invention are shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a side elevational view showing a switch constructed in accordance with my invention;

Fig. 2 is an end elevational view thereof;

Fig. 3 is a view looking into one side of my switch, the closure being omitted and the manual being shown in its normal position or the running position of the switch as the same relates to its use in a fluorescent lamp circuit or the circuit of a capacitor motor, the view being on a larger scale;

Fig. 4 is a view similar to Fig. 3 but looking into the opposite side of the switch;

Fig. 5 is a view similar to Fig. 3 but with the manual shifted to close the heater circuit;

Fig. 6 is a view similar to Fig. 4 but with the manual positioned as described in connection with Fig. 5, i. e., in a position closing the heater circuit of a fluorescent lamp;

Fig. 7 is a view similar to Fig. 3 but with the manual shifted to open the running circuit of a fluorescent lamp;

Fig. 8 is a view similar to Fig. 7 but looking into the opposite side of the switch;

Fig. 9 is a central vertical sectional view through the switch, the view being taken along the line 9—9 of Fig. 3;

Fig. 10 is a horizontal sectional view through the switch, the view being taken along the line 10—10 of Fig. 3;

Fig. 11 is a perspective view showing the normal relations of the contacts of the switch; and

Fig. 12 is a similar view but showing a slight modification.

Referring in detail to the drawings, my improved switch includes a body of insulating material generally designated 10. This body is disclosed as an elongated structure having centrally or midway, and extending longitudinally, a dividing wall 11 provided with a relatively large opening or hole 12. Body 10 is thus open through its opposite longitudinal sides and has recesses

13 and 14 opening through such sides and separated from one another by the dividing wall 11. Insofar as the physical structure is concerned, the body 10 in addition to the wall 11 includes a bottom wall 15, top wall portions 16 and 17, which are connected by an upstanding portion 18 of the dividing wall 11, and end walls 19 and 20, the latter being of the width of the bottom wall 15 and of slightly greater width than the top wall portions 16 and 17, for a purpose which will appear.

Within the recesses 13 and 14 the body structures are identical but are the reverse of one another. Thus, in recess 13, the body includes an integral rib-like portion 21 which terminates in a cylindrical portion 22 having a reduced diameter cylindrical portion or extension 23. All this structure is toward one end of the recess 13. Toward the other end of the recess 13 there is a depending lug 24 integrally molded with the remainder of the body and opposite said lug 24 and in opposed relation thereto a lug 25 projecting slightly above a step or thickened bottom wall portion 26 in said end of the recess. Further, on the bottom wall of the first mentioned end portion of the recess is a half-round thickened portion or lug 27 spaced slightly from the cylindrical portion 22.

The opposite recess 14 accordingly has a rib-like portion 28 depending from its top wall portion 16 and integral therewith and with the dividing wall 11. This rib-like portion 28 terminates in a cylindrical portion 29 and the outer or free end of the latter comprises a reduced diameter extension 30. Also, there is a lug 31 integral with the bottom wall 15 of the body and spaced slightly from the cylinder 29 and corresponding with the lug 27. In the opposite end of the body there is a lug 32 depending from the lower side of the top wall portion 17 and opposite said lug is another lug 33 projecting above a thickened bottom wall portion 34. Clearly, lugs 32 and 33 of recess 14 correspond with the lugs 24 and 25 of recess 13.

Within the recess 13 are a pair of contacts generally designated 35 and 36. In Fig. 11, these contacts are shown removed from the switch housing or body 10. Both contacts are preferably of spring metal and contact 35 includes an end arm 37 extending diagonally upwardly and then forwardly of this portion a hollow upwardly bowed or raised portion 38. These portions together actually comprise the mounting portion of contact 35 and the upwardly bowed portion 38 receives the lug or projection 27 and then the arm 37 is sprung between a portion of the cylinder 22 and the inner side of the adjacent end wall of the body 10. Forwardly of the bump or curved portion 38, the metal of the contact 35 inclines upwardly as at 39 and is then curved downwardly providing a hollow 40 beyond which the metal is again carried upwardly as at 41 and then bent at a slight angle providing a free end portion 42 on the under side of which is fixed a contact lug or point 43.

Contact 36 is also a single piece of metal bent somewhat into the form of a U and is located in the housing substantially as though lying on one of its side arms. Thus, contact 36 has a downwardly bent lip or end portion 44, the outer side of which is disposed against one side of the lug 25 when the contact is in place. Then the contact includes a declining arm 45 the lower end of which is bent upon itself as at 46 and then extends upwardly at an incline as at 47 and its upper end is bent into a slightly inclined portion 48, the free end of which engages against the inner side of the lug 24 of the body.

Through notches 49 and 50 in the end walls 19 and 20 of the body leads 51 and 52 are carried to the interior of the body and the wires 53 and 54 of these leads are wrapped about or soldered or otherwise connected with the arm 37 of contact 35 and the arm or portion 47 of the contact 36. As will later more fully appear, the contacts 35 and 36 are normally in open circuit relation but they are adapted to be closed momentarily to close the heating circuit of a fluorescent light or for the starting of a capacitor type of motor, etc.

In the recess 14 of the body 10 are a pair of contacts or switch elements generally designated 55 and 56 and shown separated from the housing in Fig. 11. Contact 55 is made up of a single piece of metal and comprises a mounting portion including an upwardly inclined arm 57 and forwardly of the lower end of the latter a semi-cylindrical hollow raised portion or bump 58. In the assembled switch, this portion 58 receives the lug 31 on the bottom wall 15 of the recess 14 and the arm 57 is sprung between cylinder 29 and the adjacent inner portion of the wall 20 of the housing, preferably extending to the upper corner of such wall, as in the case of the arm 37 of the element 35.

Forwardly of the raised portion or bump 58, element 55 includes a slightly upwardly inclined portion 59 and then a sharply bent portion 60 following which the element is bent to provide an arcuate portion 61 beyond which is a relatively straight free end portion 62 on its upper side carrying a contact lug or point 63. The element 56 includes a bottom arm portion 64 the free end of which engages the lug 33 on the bottom wall of recess 14 and this arm portion 64 inclines upwardly and then the stock from which the contact is formed is bent to provide an upwardly and outwardly inclining portion 65 toward the upper end of which the stock is again bent as at 66 and then extends downwardly and inwardly as at 67 and terminates in an upwardly bent lip 68. This lip engages against the inner side of the lug 32 on the top wall portion 17 of the body.

The contacts 36 and 56 are so made that their upper arms are sprung slightly toward their lower arms to get the contacts in place or to have them pass into the recesses between the upper and lower walls of the latter and then the contacts are of such dimension that their lip portions 44 and 68 are sprung against the lugs 25 and 32 and their free end portions are sprung against the lugs 24 and 33. Also, it will be noted that each of the contacts 35 and 55 includes a relatively long spring arm, the contacts being made of spring metal.

The contact or point 43 on the long spring arm of contact element 35 is located between the arms 45 and 48 of the contact 36 and the long spring arm of the contact 35 must be flexed downwardly to bring this point 43 against a portion of the contact 36 whereby to close a circuit between the contacts 35 and 36. Somewhat similarly, the end portion 63 of the contact 55 extends into or between the arms 64 and 67 of the contact 56 and contact point 63 is normally in engagement with the underside of the arm 67 of contact 56 whereby the contacts 55 and 56 are normally in closed circuit relation. Clearly, the long arm of contact 35 may be flexed to bring its contact point 43 into closed circuit relation with the arm 45 of contact 36 and just as clearly the long arm of contact 55 may be flexed to carry its contact point

63 from closed circuit relation with the arm 67 of contact 56.

Through notches 69 and 70 in the ends walls 20 and 19 of the body 10, leads 71 and 72 are carried into the respective end portions of the recess 14 and the conductors or wires 73 and 74 of such leads are soldered or otherwise connected with the contacts 55 and 56 and specifically with the arm 57 of the contact 55 and the arm 65 of the contact 56. Preferably, lugs 75 and 76 are formed integral with the end walls 20 and 19 of the body 10 and extend longitudinally therefrom to provide a separator between the notches in such end walls whereby the leads are fully separated at the walls. Preferably, these leads are lashed together as they leave the switch body as by means of the metal bridle pieces 77.

In the assembled switch, the open sides of the recesses 13 and 14 are enclosed by a saddle-like device comprising a metal structure generally designated 80. Saddle-like device or cover 80 includes side plate-like portions 81 and 82 of the proper size and shape and a connecting or bridge portion 83 and an externally threaded shell 84 electrically welded or otherwise secured to such bridge 83. In its upper closed end shell 84 is provided with a slot 85 for the passage of a manual to to be described. Relatively thin insulators 78 and 79 are located at the inner sides of the plate-like portions 81 and 82. The outer surfaces of the plate-like portions are flush with the edges of the bottom and end walls of the body.

The cover 80 is snapped into place over the insulators 78 and 79. The latter have openings and notches through which the extensions 23 and 30 of the cylindrical portions 22 and 29 may pass and through which the lugs or extensions 25 and 33 may pass. Additionally, these insulators have end extensions 86 and 87 which in the assembled switch laterally close the notches in the end walls through which the leads are carried. Then the closure 80 in its plate-like side wall portions 81 and 82 is provided with holes or perforations 88 and notches 89 for the reception of the outer ends of the reduced diameter extensions 23 and 30 of the cylinders 22 and 29 and the outer end portions of the lugs 25 and 33. Actually, the extensions or reduced diameter portions 23 and 30 snap through these holes in the side walls 80 and 81 and it will be understood that the whole structure of the closure 80 is spring metal and so resilient and once in place retains itself there against any casual displacement.

The switch of the invention is operated by a manual which in its entirety is generally designated 90. Such manual includes a handle 91, a stem portion 92 which is pivotally mounted intermediate its ends on lateral extensions 93 of the wall extension 18. Below such pivotal mounting the stem, which comprises two complemental pieces of metal, extends laterally in both directions as at 94 and then includes depending substantially parallel portions 95. Between these spaced depending portions 95 is a roller 96 of insulating material adapted for rotation about its own axis and to that end mounted by the portions 95. The roller is shown as provided with concentric end extensions 97 journaled in openings provided for their reception in the spaced depending portions 95 of the yoke.

It is clear from the drawings that the roller 96 extends through the opening 12 in the dividing wall 11 of the body 10 and thus extends into both the recesses 13 and 14. Actually, this roller overlies the long spring arms of the contacts 35 and 55.

The shank or stem 92 of the manual passes through the slot 85 in the outer end wall of the externally threaded shell 84 and is guided in its movement by the walls of such slot. Above the slot the two portions forming this stem may be bowed as at 98 (see Fig. 9) and the handle 91 will have a slot in it and will be forced over these bowed portions causing the latter to yield a bit whereby the handle is securely held and holds the complemental pieces of the manual in assembled relation. It will be understood that instead of the molded plastic handle shown, the handle may be of wood or other material and rather than a molding, may be a screw machine part or the like.

It is noted the switch of the invention includes but a single manual and for its mounting on a lamp base or the like requires the formation of but a single hole in such mounting portion. Thus, with respect to Figs. 1 and 2, a portion of a lamp base or the like is suggested by the broken lines at 99. A single hole is provided through this base to receive the neck or externally threaded shell 84 and then a nut 100 or the like having an opening therethrough of a diameter to pass over the handle 91 is threaded down onto the shell 84 clamping the base part 99 between the upper side of the switch and the lower side of the nut.

When the switch is assembled it may be used in several ways. If it is used for the control of a fluorescent lamp, then the leads 51 and 52 form part of the heating circuit of the lamp while the leads 71 and 72 form part of the running circuit. Normally, the manual 90 is positioned as shown in Figs. 1–4. Such position may also be described as the neutral position of the manual.

Assuming that it is desired to start a lamp, the manual is tilted on its pivotal mounting 93 to the position of Figs. 5 and 6. This movement of the manual causes the roller 96 of insulating material to ride up from the curved portion 40 onto the inclined arm 41 of the switch or contact element 35 whereby to flex the long arm of such element and bring its contact button 43 into circuit closing relation with the arm 45 of the contact element or switch element 36. In the case of a fluorescent lamp installation, the manual is momentarily held in this position to maintain the heating circuit of the lamp. During this time, movement of the manual has had no effect at all on the switch or contact elements 55 and 56. They remain in their normal circuit closing relationship.

Then, when the lamp has been heated, the manual is simply released and the spring arm of contact 35, because of engagement of the roller 96 with the inclined arm portion 41, acts to return the manual to its normal position. All during the time that the manual was being held in the position of Figs. 5 and 6 the spring arm of contact 35 was tending to bias the arm back to its normal position and instantly it is released such spring arms move the manual back to normal or neutral position and the spring arm itself moves into its normal position (see Fig. 3) with its contact button 43 in open circuit relation with the contact 36. Now the lamp will be operating as its running circuit continues to be established through contacts 55 and 56.

When it is desired to extinguish the lamp, the manual is rocked in the opposite direction or to the position of Figs. 7 and 8. When this occurs, the manual has no effect on the contact 35 so the latter stays in open circuit relation with the contact 36. However, as the roller 96 rides up over the sharply inclined portion 60 of the contact 55

and onto the curved portion 61 thereof, the long arm of the contact 55 is flexed downwardly carrying its contact point or button 63 from the arm 67 of contact 56. This opens the running circuit of the lamp and the lamp is extinguished.

Such circuit is kept open so there is no potential in the lamp. That is, the manual remains in the position of Figs. 7 and 8 since its roller has passed over the upper end of the sharply bent portion 66 of the contact 55 and is now disposed on the upper surface of the curved portion 61 of such contact and so there is no biasing effect to return the manual to its normal position. In fact, there is a tension or pressure on the manual from the contact 55 to retain the manual in this position of Figs. 7 and 8 with the running circuit of the lamp open.

When it is again desired to start the lamp, the manual is rocked back on its pivot 93 through its normal position to its position of Figs. 5 and 6, this being the starting position of the switch and the position in which it closes the heating circuit of the lamp. Clearly, as the manual is so rocked back, the long arm of contact 55 springs back toward normal position to bring its contact point 63 into circuit closing engagement with the arm 67 of contact 56 thereby again closing the running circuit of the lamp.

When the switch is used for the starting of a capacitor type motor, such as those used in refrigerators, washing machines, oil burners and the like, the contacts 35 and 36 of the switch are those connected with the high capacity condenser of such motor. These condensers are electrolytic to keep within volume and cost bonds and they cannot be long left in a circuit lest they heat up and are even caused to boil and perhaps burst. The present switch would be so hooked in circuit with such a motor that the starting position of the switch (Figs. 5 and 6) would cut the condenser in and when the manual was released the condenser would be cut out. This would eliminate the necessity for the centrifugal switch now commonly employed as a cutout device in such motors.

Also, the device may be used to control a two-speed motor. In such instance, both of the switches would be open when the manual was in its normal position and one would be closed when the handle was moved to the position of Figs. 5 and 6 and the other would be closed when the handle was moved to the position of Figs. 7 and 8. For such purpose, the contacts would be reversed, as viewed in Fig. 8, so as to close in this position of the manual.

Fig. 12 shows a slight modification. In that figure the contacts 55 and 56 are as previously described but the contact 36 is omitted and the contact 35 is replaced by a shorter contact which is generally designated 102 but includes the arm 37 and the raised portion or bump 38 as well as the inclined arm portion 39 of the contact 35 previously described. All of these portions are for the purpose previously described. Contact 102 has a shorter arm than the contact 35 and the former terminates in a downwardly inclined portion 103.

In this switch, the manual has no normal or neutral position exactly the same as that of the manual of the switch first described. The portion 103, when engaged by the insulating roller, causes the manual to be tilted to the position in which it is shown in Fig. 5 and tends to return it to that position after it is moved slightly therefrom and released. Then when the manual is moved to the position of Fig. 8 the free end portion comprising the portions 39 and 103 of contact 102 tend to secure it in that position by placing a tension on it and in that case the contact 55 need not be depended upon to retain the manual in a position wherein the contacts 55 and 56 are in open circuit relation.

Having thus set forth the nature of my invention, what I claim is:

1. In a switch, a body including top, bottom and end walls and open through a side, a stationary contact in one end portion of said body, said body in said end portion having lugs projecting toward one another from its top and bottom walls in spaced relation to the adjacent end wall, said stationary contact of spring metal and generally U-shaped and disposed on one of its sides with its arms sprung toward one another and with part of its connecting portion engaging said adjacent end wall and the ends of its arms abutting the respective lugs at the sides of the latter in opposing relation to said adjacent end wall, a movable contact in said body and including a portion overlapping an arm of said stationary contact, and a movable manual in said body and controlling the circuit controlling relation of the overlapping portions of said stationary and movable contacts.

2. In a switch, a body including a bottom, an end wall and one side wall, a projecting body portion rigid with and extending laterally from said side wall in spaced relation to said bottom and end walls, a lug on said bottom wall in closely spaced relation to said body portion, a movable contact comprising a spring metal strip having an anchoring end portion provided with an offset portion receiving said lug and an end portion passing under said body portion and upwardly at the rear side thereof and bearing against said adjacent end wall, said contact portion of spring metal and flexed as it passes under said body portion and yieldingly engaging said wall whereby the contact is anchored, a stationary contact in said body and having a portion in overlapping relation with a portion of said movable contact, and a manual on said body and movable to control the circuit controlling relation of the overlapping portions of said movable and stationary contacts.

3. In a switch, a body including a bottom, an end wall and one side wall, a projecting body portion rigid with and extending laterally from said side wall in spaced relation to said bottom and end walls, a lug on said bottom wall in closely spaced relation to said body portion, a movable contact comprising a spring metal strip having an anchoring end portion provided with an offset portion receiving said lug and an end portion passing under said body portion and upwardly at the rear side thereof and bearing against said adjacent end wall, said contact portion of spring metal and flexed as it passes under said body portion and yieldingly engaging said adjacent end wall whereby the contact is anchored, a stationary contact in said body and having a portion in overlapping relation with a portion of said movable contact, a manual on said body and movable to control the circuit controlling relation of the overlapping portions of said movable stationary contacts, said overlapping portion of said movable contact comprising an elongated spring arm, and said manual movable to flex said spring arm.

4. In a switch, an elongated hollow body of insulating material having a pair of parallel side-

by-side longitudinally extending recesses, a pair of contacts in each of said recesses each comprising a stationary contact and a movable contact, each said movable contact including an anchoring portion and a spring arm, said stationary contacts being mounted in the opposite ends of the respective recesses, said anchoring portions of said movable contacts being mounted in the opposite ends of the respective recesses from said stationary contacts, and said spring arms extending longitudinally in said respective recesses into vertically opposite overlapping relation with the stationary contacts therein, a manual pivoted on said body including a horizontal part disposed transversely above said respective spring arms of said movable contacts, said manual having a medial normal position and being pivotally movable in opposite directions from said normal position, the movable contact of one pair of contacts being upwardly movable into contacting relation with its stationary contact, and the movable contact of the other pair of contacts being downwardly movable into contacting relation with its stationary contact, the spring arm of said one pair of contacts including an intermediate portion, vertically opposed to said horizontal part of said manual in the normal position of the latter wherein said movable contact is in contact with its stationary contact, and a rising recessed portion at the side of said intermediate portion toward said stationary contact engageable by said horizontal part of said manual upon pivotal movement of said manual in one direction to move said movable contact into open position and to yieldably retain said manual in said moved position, and said other movable contact including a recessed portion vertically opposed to said horizontal part of said manual in the normal position of said manual to yieldably retain said manual in its normal position and to position said movable contact in open position relative to its stationary contact, and a rising biasing portion at the side of said recessed portion toward said stationary contact engageable by said horizontal part of said manual upon pivotal movement of said manual in the opposite direction from its first mentioned direction of movement to move said movable contact into contacting relation with its stationary contact and adapted upon release of said manual to bias said manual to return to its normal position under the spring action of said movable contact.

5. In a switch, an elongated hollow body of insulating material, a vertical dividing wall in said body and separating the interior thereof into a pair of parallel side-by-side longitudinally extending recesses, said dividing wall having an opening through its mid-portion with a part of said dividing wall disposed longitudinally at each side of said opening, a pair of contacts in each of said recesses each comprising a stationary contact and a movable contact, each said movable contact including an anchoring portion and a spring arm, said stationary contacts being mounted in the opposite ends of the respective recesses laterally adjacent and at opposite sides of said respective dividing wall parts, said anchoring portions of said movable contacts being mounted in the opposite ends of the respective recesses from said stationary contacts laterally adjacent and at opposite sides of said respective dividing wall parts, and said spring arms extending longitudinally in said respective recesses across said opening into vertically opposite overlapping relation with the stationary contacts therein, a manual pivoted on said dividing wall centrally above said opening including a horizontal part extending transversely through said opening above said respective spring arms of said movable contacts, said manual having a medial normal position and being pivotally movable in opposite directions from said normal position, the movable contact of one pair of contacts being upwardly movable into contacting relation with its stationary contact, and the movable contact of the other pair of contacts being downwardly movable into contacting relation with its stationary contact, the spring arm of said one pair of contacts including an intermediate portion, vertically opposed to said horizontal part of said manual in the normal position of the latter wherein said movable contact is in contact with its stationary contact, and a rising recessed portion at the side of said intermediate portion toward said stationary contact engageable by said horizontal part of said manual upon pivotal movement of said manual in one direction to move said movable contact into open position and to yieldably retain said manual in said moved position, and said other movable contact including a recessed portion vertically opposed to said horizontal part of said manual in the normal position of said manual to yieldably retain said manual in its normal position to position said movable contact in open position relative to its stationary contact, and a rising biasing portion at the side of said recessed portion toward said stationary contact engageable by said horizontal part of said manual upon pivotal movement of said manual in the opposite direction from its first mentioned direction of movement to move said movable contact into contacting relation with its stationary contact and adapted upon release of said manual to bias said manual to return to its normal position under the spring action of said movable contact.

6. In a switch, an elongated hollow body of insulating material, a vertical dividing wall in said body and separating the interior thereof into a pair of parallel side-by-side longitudinally extending recesses, said dividing wall having an opening through its mid-portion with a part of said dividing wall disposed longitudinally at each side of said opening, a pair of contacts in each of said recesses each comprising a stationary contact and a movable contact, each said movable contact including an anchoring portion and a spring arm, said stationary contacts being mounted in the opposite ends of the respective recesses laterally adjacent and at opposite sides of said respective dividing wall parts, said anchoring portions of said movable contacts being mounted in the opposite ends of the respective recesses from said stationary contacts laterally adjacent and at opposite sides of said respective dividing wall parts, and said spring arms extending longitudinally in said respective recesses across said opening into vertically opposed overlapping relation with the stationary contacts therein, a manual pivoted on said dividing wall centrally above said opening having an upwardly extending handle portion and side leg portions extending downwardly at each side of said opening, and a horizontal roller mounted in said leg portions and extending transversely through said opening above said respective spring arms of said movable contacts, said manual having a medial normal position and being pivotally movable in opposite directions from said normal position, the movable contact of one pair of contacts being

upwardly movable into contacting relation with its stationary contact, and the movable contact of the other pair of contacts being downwardly movable into contacting relation with its stationary contact, the spring arm of said one pair of contacts including an intermediate portion, vertically opposed to said roller in the normal position of said manual wherein said movable contact is in contact with its stationary contact, and a rising recessed portion at the side of said intermediate portion toward said stationary contact engageable by said roller upon pivotal movement of said manual in one direction to move said movable contact into open position and to yieldably retain said manual in said moved position, and said other movable contact including a recessed portion vertically opposed to said roller in the normal position of said manual to yieldably retain said manual in its normal position and to position said movable contact in open position relative to its stationary contact, and a rising biasing portion at the side of said recessed portion toward said stationary contact engageable by said roller upon pivotal movement of said manual in the opposite direction from its first

mentioned direction of movement to move said movable contact into contacting relation with its stationary contact and adapted upon release of said manual to bias said manual to return to its normal position under the spring action of said movable contact.

EDWIN G. GAYNOR.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,630,359	Scott	May 31, 1927
1,923,428	Engstrom	Aug. 22, 1933
1,935,498	Bentley	Nov. 14, 1933
2,085,217	Hart	June 29, 1937
2,200,981	Cook	May 14, 1940
2,233,848	Polk	Mar. 4, 1941
2,352,936	Bryant	July 4, 1944
2,377,134	Dietrich	May 29, 1945
2,428,848	Koenig et al.	Oct. 14, 1947
2,479,462	Bentley	Aug. 16, 1949
2,481,368	Tiffany	Sept. 6, 1949
2,495,266	Kruger	Jan. 24, 1950
2,503,862	Allgeyer	Apr. 11, 1950