

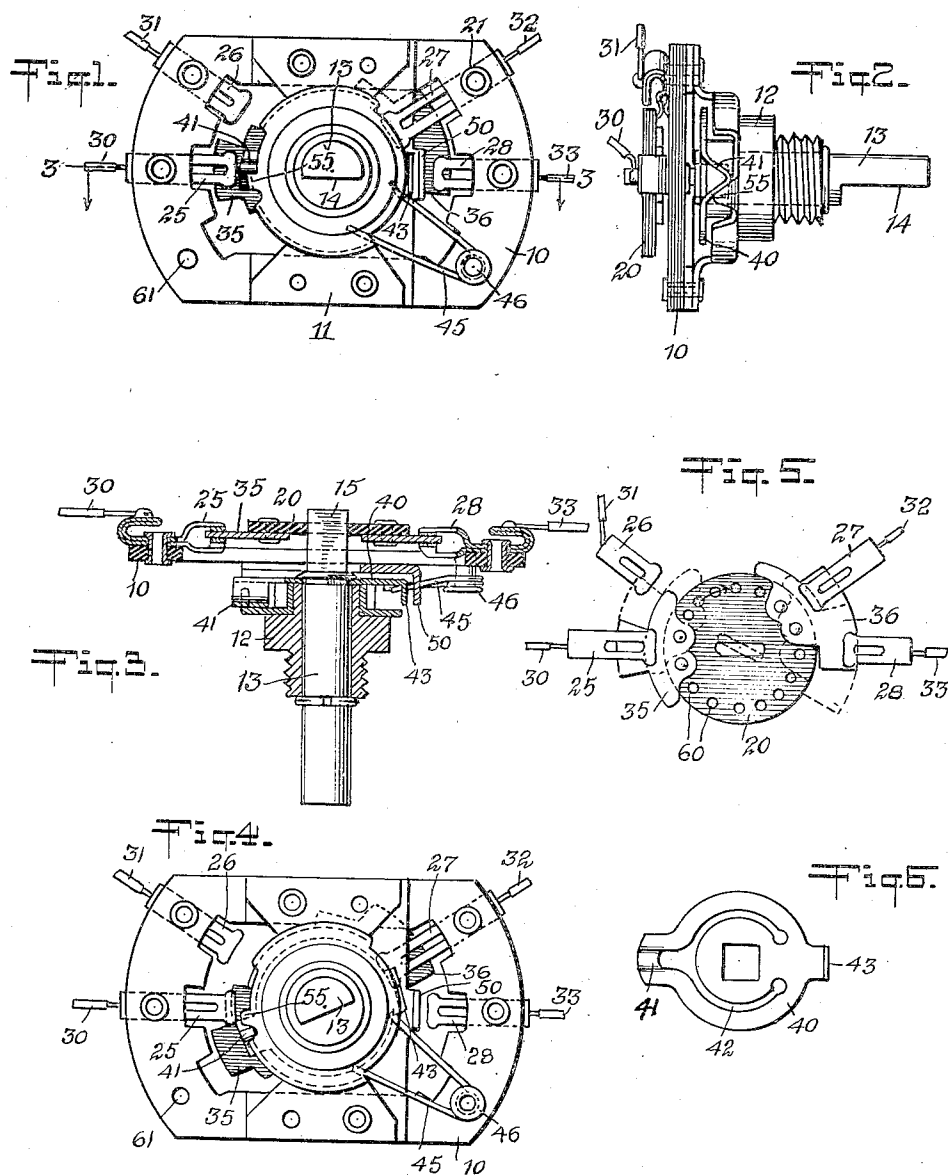
Oct. 26, 1948.

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2,452,507

SNAP-ACTION FLUORESCENT LIGHT SWITCH

Filed Aug. 1, 1947



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UNITED STATES PATENT OFFICE

2,452,507

SNAP-ACTION FLUORESCENT LIGHT SWITCH

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Application August 1, 1947, Serial No. 765,344

4 Claims. (Cl. 200—6)

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This invention relates to instantaneous snap-action fluorescent light switches.

The principal object of this invention is the provision of a switch of the character described which has three positions; the "off" position, the "on" position, and the starting or booster position. These positions are arranged in the order given when the switch is operated in clockwise direction. The "off" and "on" positions are locked positions, but the starting position is occupied against the action of a tension member and only so long as the person operating the switch holds it in that position. Release of the switch in its starting position automatically causes it to revert to its "on" position. It is this automatic action and the mechanism by which this action takes place that constitutes the principal object of this invention.

Another object of this invention is the provision of a fluorescent light switch of the character described which is simple to make, assemble and operate.

A preferred embodiment of this invention is shown in the accompanying drawing in which—

Fig. 1 is a plan view thereof with the operating knob removed therefrom, the switch being shown in "on" position;

Fig. 2 is a side view thereof;

Fig. 3 is a sectional view on the line 3—3 of Fig. 1;

Fig. 4 is a plan view similar to that of Fig. 1 showing the switch in "off" position;

Fig. 5 is a plan view of the movable contact members showing in full lines the position occupied by said contact members when the switch is in "on" position and showing in dotted lines the position these contact members occupy when the switch is in its starting position; and

Fig. 6 is a plan view of the locking or stop member which locks the switch either in its "off" or "on" position and which coacts with a tension member to automatically shift the switch from its starting position to its "on" position when the switch is released.

The switch under discussion is provided with a base plate 10 which is made of insulating material such as a plastic. Mounted on said base plate by means of a bracket 11 is a housing 12 which contains the actuating shaft 13. It will be noted that at its upper or exposed end shaft 13 is provided with a flat portion 14. It will be understood that any conventional knob may be mounted on this exposed end of the shaft and conventional means may be used to engage the flat portion of said shaft to provide integral move-

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ment of the knob with the shaft. The lower or inner end of shaft 13 is provided with a reduced portion 15 which is flat on two sides. This portion functions in the manner of a key. It engages a slotted disc 20, which, like plate 10, is made of insulating material. When the shaft 13 is caused to engage in angular movement a corresponding movement of the disc 20 is effected.

It will be noted that affixed to the base plate 10, as by rivets 21, are contact members 25, 26, 27 and 28, respectively. Conductors 30, 31, 32 and 33 are affixed, respectively, to said contact members. It will be understood that these four contact members are permanently fixed in the positions which they are shown in the drawing to occupy. Movable contact members 35 and 36 are affixed to the disc 20, also by means of rivets or by any other conventional means. Reference to Fig. 3 will show that contact members 25 and 28 are bifurcated, that is at their contact ends they comprise a pair of opposing fingers which are adapted to receive the movable contact members 35 and 36 between them. Contact members 25 and 28 are adapted, therefore, to engage the movable contact members 35 and 36 on both sides thereof, to wit, both on the top and on the bottom. And what has been said of contacts 25 and 28 is equally true of contacts 26 and 27. When the shaft 13 is caused to turn, corresponding movement of the slotted disc 20 causes movement of the movable contact members 35 and 36 relative to the fixed contact members 25 to 28 inclusive.

Bracket 11 serves the function, above mentioned, of supporting the housing for the stud shaft 13. It also performs an additional function, namely, that of limiting the rotary movement of said stud shaft. Affixed to the stud shaft is a spring type of stop member 40 which is shown in detail in Fig. 6. There is no relative movement between the stud shaft and the tension stop 40 except insofar as the contact end 41 of said tension stop member is concerned. This contact portion is separated from the main body of the stop member by means of a virtually circular slot or cut-out 42. It is by reason of this cut-out that the contact portion 41 is adapted to flex relative to the main body of said tension stop member. At the opposite end of said tension stop member is a raised portion or flange 43 which is engaged by a tension member 45, said tension member being mounted on a pin 46 which is affixed to the base plate 10. The tension member 45 is coiled intermediate its ends around pin 46 and its two free ends are positioned to engage

the bracket 12 and the flange 43 of the stop member 40. Plate 11 also has a flanged portion 50 which engages one of the free ends of spring 45.

When the switch, as will hereinafter appear, is in any position other than the starting or boosting position, the spring does not act upon the flange 43 of the stop member 40. It acts upon said flange and hence upon the stop member only when the switch is brought into its starting position. When the switch is in this position and it is released by the operator, the spring will act upon it to return it to its normal "on" position. The bracket 12 and the flange 50 on the plate 11 prevent the spring from engaging the flange 43 of the stop member 40 when the switch is either in its open or its closed position. The housing 12 is also provided with a tooth 55 which engages the contact portion 41 of the stop member 40. This will be apparent from an examination of Fig. 2. It will there be seen that the contact portion 41 has a raised piece which itself constitutes a tooth. When the two teeth, that is the one on the stop member 40 and the one on the bracket 12 engage each other, the position of the stop member becomes fixed relative to the base. When the contact portion 41 is on one side of the tooth portion 55, the switch is in its "off" position. When it is on the opposite side of said toothed portion, the switch is in its closed position. And when the contact member 41 is moved completely out of engagement with the toothed portion 55, the switch is in its starting position. Movement of the contact portion 41 against and across the toothed portion 55 may be effected by reason of the flexible character of the structure supporting said contact portion 41. The stop member 40, of which contact portion 41 is a part, is made preferably of spring material and this fact, together with the fact that contact portion 41 is separated by slot 42 from the main body of the stop member 40, endows said contact portion 41 with the ability to flex out of and into engagement with the two sides of the toothed portion 55.

Reference to Fig. 5 will disclose the fact that holes 60 are formed circumferentially of disc 20. It is through these holes that rivets are passed to fasten the contact members 35 and 36 to said disc. It will be appreciated from the fact that only two holes are needed for each of these contact members, that said contact members may be secured to said disc 20 in a great many different positions relative to each other and to the disc proper. It is possible, therefore, by fixing these contact members to the disc at predetermined points thereon to arrange for different relationships between said contact members and the fixed contacts 25 to 28, respectively. It will also be noted in Fig. 5 that the contact members 35 and 36 are provided with irregular shapes and that the contacts 25 and 27 are longer than the contacts 26 and 28. It is apparent from these two facts that varying relationships between the contact members 35 and 36 on the one hand and 25 to 28 on the other hand, may be provided for by changing the shapes of said contact members 35 and 36 and the lengths of said contact members 25 to 28 inclusive.

Reference to Fig. 4 will show that the base plate 10 is provided with a plurality of holes 61. It is through these holes that the rivets which affix the contact members 25 to 28 inclusive to the base plate, extend. There is at least one more hole than is required for the arrangement of the switch under discussion. It will be un-

derstood that more than one additional hole may also be provided, depending upon the requirements of the case at hand. Since there are more holes than are required, it will be appreciated that the contacts 25 to 28 inclusive may be made to occupy positions other than those which are shown in the drawing. In other words, they may be made to occupy different positions relative to each other and relative to the contact members 35 and 36. This, too, makes for different switching arrangements.

And finally it will be understood from the fact that there are more holes 60 than are needed for contact members 35 and 36 and more holes 61 that are needed for the contact members 25 to 28 inclusive, that additional contact members may be affixed both to the disc 20 and to the base plate 10. In other words, the structure above described is susceptible of the following variations: A greater or a lesser number of contact members may be affixed to the disc 20; a greater or a lesser number of contact members may be affixed to the base plate 10; the positions of the contact members on the disc 20 may be changed at will; the positions of the contact members on the base plate 10 may be changed at will; the shape of the contact members on the disc 20 may be changed; and the lengths of the contact members on the base plate 10 may also be changed. These variations adapt the switch under discussion to virtually unlimited combinations.

Referring specifically to the switch as it is shown in the drawing, its operation may be described as follows, the assumption being that the switch is in its "off" position as shown in Fig. 4.

It will be noted that when the switch is in this position, contact is made between contact members 25 and 35 and between contact members 27 and 36. The stud shaft 13 is now turned in clockwise direction as far as it will go. This brings the disc 20 and its contact members 35 and 36 to the dotted line position of Fig. 5. In this position engagement is between contact members 25 and 26 on the one hand and contact member 35 on the other; and between contact members 27 and 28 on the one hand and contact member 36 on the other. The starting or boosting impulse is now sent through the starting circuit. At the appropriate time shaft 13 is released and spring 45 acting upon flange 43 causes shaft 13 as well as disc 20 to move in counterclockwise direction until contact portion 41 engages tooth 55 and thereby brings said shaft and said disc to a halt. The position of the switch is now shown by the full lines in Fig. 4. Contact is shown to be made between contact members 25 and 26 on the one hand and 35 on the other hand and also between contact members 28 and 36. The switch is now in its "on" position. To turn the switch to its "off" position as shown in Fig. 4, the shaft 13 is turned in counter-clockwise direction until contact portion 41 is brought to the other side of tooth 55.

It will be apparent from the foregoing that a highly versatile and effective switch has been provided which is susceptible of many combinations. It will also be apparent that what has been shown in the drawing and described in the specification is but a preferred form of this invention, and that modifications may be incorporated therein within the spirit of the invention. An illustration of how the switch shown in the drawing may be changed without departing from the principles of the invention may be found in

changing the number of contact members from the number shown in the drawing to a larger or smaller number. This change would of course enable the switch to be used for purposes other than in connection with fluorescent light bulbs.

I claim:

1. A snap-action switch comprising a base plate having a plurality of contact members affixed thereto, a movably mounted plate having a plurality of additional contact members affixed thereto positioned, when the movable plate is rotated, to engage the first-mentioned contact members in predetermined order, a rotatably mounted support for said movable plate, a spring member connected to said rotatably mounted support, said spring member having a raised portion at one end and a tooth-shaped portion at the opposite end, a stop member connected to the base plate positioned for engagement with said toothed portion, a tension member mounted on said base plate positioned for engagement with said raised portion, said tension member acting to urge said spring member and with it the movable plate, the plate support and the contact members on said movable plate, to move in counter-clockwise direction from a predetermined point until brought to a halt by the stop member which engages the toothed portion on said spring member, further movement in a counter-clockwise direction of said spring member being effected by manually moving it in counter-clockwise direction and causing its toothed portion to slide over the stop member on the base plate.

2. A snap-action switch comprising a base plate having a plurality of holes, a plurality of contact members fastened to said base plate at selected points thereon determined by the positions of said holes, a rotatably mounted plate containing a plurality of circumferentially arranged holes, a plurality of contact members affixed to said rotatable plate in selected positions thereon determined by the locations of the holes in said rotatable plate, said rotatable plate being positioned to enable the contact members thereon to engage

the contact members on the base plate, a tension member, means connecting said tension member to said rotatable plate whereby said plate is urged by said tension member to turn in counter-clockwise direction, stop members which prevent the rotatable plate from moving in response to the action of the tension member thereon when said rotatable plate reaches a predetermined point, the engagement between said stop members being sufficiently yielding to enable further movement of said rotatable plate beyond the stop position by manually operating said rotatable plate and causing it to move beyond said stop position.

3. A snap-action switch in accordance with claim 2 in which the contact members on the base plate are of different sizes and the contact members on the rotatable plate are of different shapes, whereby predetermined relationships between the base plate contact members and the rotatable plate contact members are achieved.

4. A snap-action switch in accordance with claim 2 in which the connecting means between the tension member and the rotatable plate comprises a stud shaft keyed to said rotatable plate and a spring member affixed to said stud shaft, said spring member having a raised portion at one end which engages the tension member, said spring member having a toothed portion at the other end which constitutes one of the stop members by which the rotatable plate is brought to a stop at a predetermined point.

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