Feb. 2, 1954 W. C. TREGONING 2,668,204

SWITCH

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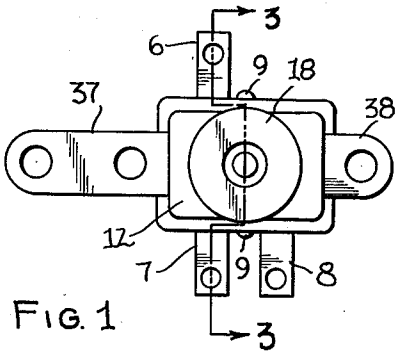


FIG. 1

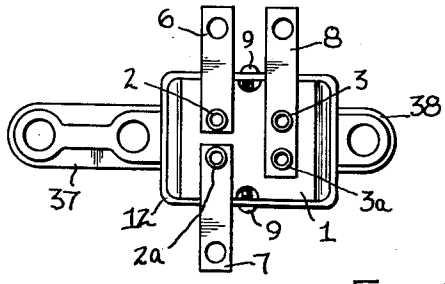


FIG. 2

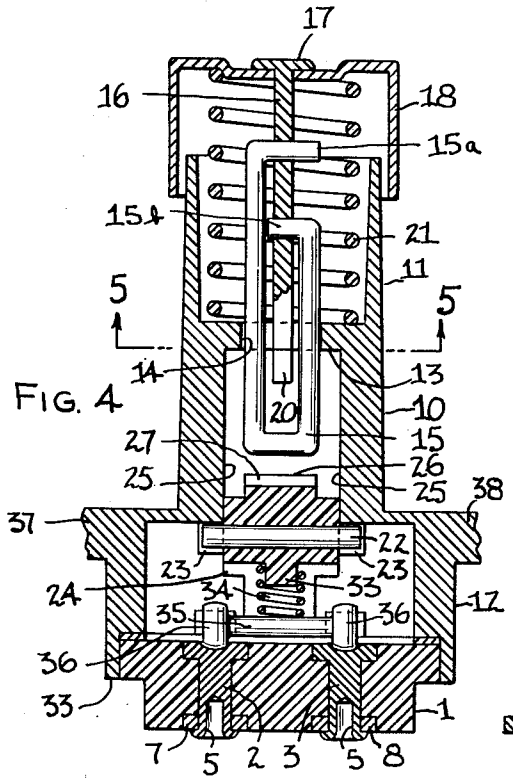


FIG. 4

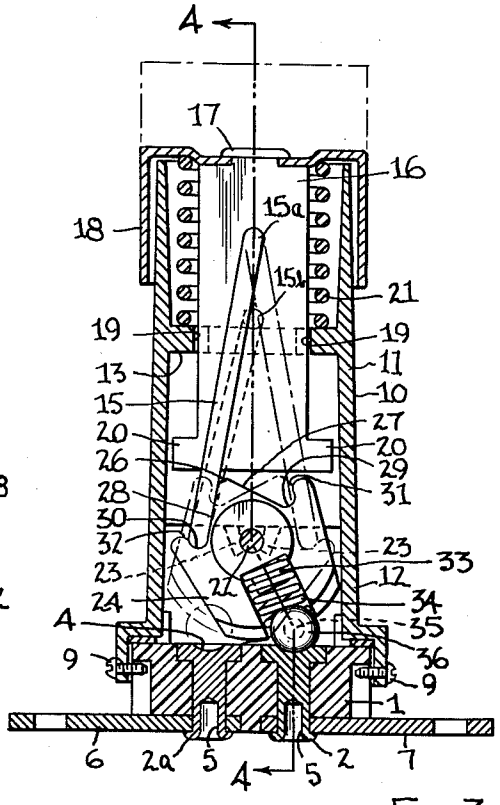


FIG. 3

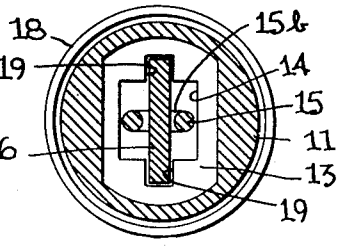


FIG. 5

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SWITCH

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4 Claims. (Cl. 200—68)

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This invention relates, as indicated, to switches, but has reference more particularly to that type of switch known as an automobile dimmer switch.

A primary object of the invention is to provide a switch of the character described, which has a highly desirable snap action, thereby insuring positive and quick action of the switch at all times.

Another object of the invention is to provide a switch of the character described, which is extremely simple in construction, which is housed in a manner insuring against entry of moisture of foreign matter into the switch, thereby avoiding corrosion of metallic parts, which is free from constructional features which might cause sticking or binding of parts, which is highly efficient in operation, and in which the necessity for lubrication, bearings, etc. is obviated.

A further object of the invention is to provide a switch of the character described, which is characterized by the use of a plunger having the ability to restore itself automatically to a desired central vertical position, ready for operation or use in the operation of the switch.

Other objects and advantages of my invention will be apparent during the course of the following description. In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Fig. 1 is a top plan view of the dimmer switch;

Fig. 2 is a bottom plan view of the dimmer switch;

Fig. 3 is a cross-sectional view, taken on the line 3—3 of Fig. 1;

Fig. 4 is a cross-sectional view, taken on the line 4—4 of Fig. 3, and

Fig. 5 is a transverse cross-sectional view, taken on the line 5—5 of Fig. 4.

Referring more particularly to the drawings, the switch will be seen to comprise a terminal base 1, of insulating material, and having embedded therein, spaced pairs of rivets 2 and 3 and 2a and 3a the first pair constituting contacts for bright filaments and the other pair constituting contacts for the dim filaments respectively of the headlights of an automotive vehicle.

The rivets 2 and 3 and 2a and 3a are provided in the upper ends or heads thereof with spherical recesses 4, and the lower ends of the rivet stems are hollowed out, as at 5 so as to enable these ends to be riveted into engagement with terminal plates 6, 7 and 8 (Fig. 2), whereby these plates are rigidly secured to the base 1.

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The plates 6 and 7 are adapted for connection to the light beam circuit, while the plate 8 is adapted for connection to the battery of the automobile.

Removably secured to the base 1, as by means of screw 9, is a housing, generally designated 10, and formed as a die casting. The housing 10 comprises an upper, generally cylindrical portion 11, and a generally rectangular or box-like base portion 12. The portion 11 of the housing has a transverse web or flange 13, defining a rectangular opening 14, in which a G-shaped plunger 15, formed of wire, has vertical reciprocal movement.

The plunger 15 is supported by a push bar 16, which is riveted, as at 17, to an inverted cup-like member 18, which is slidable on the upper end of the housing portion 11. The bar 16 is in the form of a flat plate, which is guided, in its vertical movement by slots 19 in opposite sides of the opening 14, and has flanges 20 at its lower end, which abut the web 13 to thereby determine the uppermost limit of movement of the bar 16. A compression coil spring 21 is interposed between the web 13 and base of the member 18, this spring serving to normally maintain the push bar 16, and accordingly, the plunger 15, in their uppermost positions.

A rocker pin 22 is disposed within the portion 12 of the housing and has its ends mounted between pairs of ears 23 formed integrally with the housing. A rocker, formed of electrical insulating material, 24, is mounted for pivotal movement about the pin 22, and is restrained against movement axially of the pin by reason of the confinement of the sides of the rocker between the inner walls 25 of the portion 11 of the housing, as best shown in Fig. 4.

The rocker 24 is molded to provide a central apex or ridge 26 and oppositely inclined sides 27 and 28, which terminate at their respective lower ends in recesses or grooves 29 and 30, the other walls 31 and 32 of which constitute abutments for a purpose to be presently described.

The rocker 24 is also provided with a central depending boss 33 which provides an anchor for one end of a compression coil spring 34, the other end of which bears against a contactor bar 35, provided at its end with spherical contactors 36, which are spaced to correspond with the spacing of the plates 7 and 8.

The switch housing is also provided with ears 37 and 38, whereby the switch may be secured to the floorboard of the automobile.

The operation of the dimmer switch will now be briefly described.

It will be assumed that the parts are normally in the position shown in Fig. 4, and that the rocker **24** is in the position shown in broken lines in Fig. 3. In this position, the contactors **36** are disposed in the recesses **4** of the rivets **2***a* and **3***a*, closing the circuit to the bright filaments of the headlights. The rocker **24** is maintained in this position due to the pressure of the spring **34** against the rocker and contactor bar **35**, and the fact that the contactors **36** are located in the recesses **4** of the rivets, which aid in preventing the rocker from being accidentally displaced.

When it is desirable to dim the headlights, the driver of the automobile will merely press his foot, usually his left foot, on the member **18**, thereby depressing this member and compressing the spring **21**. This causes the bar **16** to be pushed downwardly, forcing the plunger **15** against the surface **28** of the rocker. The plunger slides downwardly along the surface **28** until it enters the recess **30** and strikes the abutment **32**. After the plunger abuts the abutment **32**, continued downward movement of the plunger to the position shown in Fig. 3, causes the rocker **24** to rock about the pin **22** to the position shown in solid lines in Fig. 3, in which position, the contractors **36** enter the recesses **4** in the rivets **2** and **3**, closing the circuit to the dim filaments of the headlights. The foot is then released from the element **18**, permitting the spring **21** to return the element **18**, as well as the parts **15** and **16** to their normal position, as shown in Fig. 4. The rocker **24** is maintained in the position shown in solid lines in Fig. 3 due to the pressure of the spring **34** against the rocker and contactor bar **35**, and the fact that the contactors **36** are located in the recesses **4** of the rivets, which aid in preventing the rocker from being accidentally displaced.

When it is desired to again energize the bright filaments, the member **18** is again depressed, but this time the plunger engages the surface **27** of the rocker, with the result that the rocker is again moved to the position shown in broken lines in Fig. 3.

The movement of the rocker **24** from one position to the other is accompanied by a snap action, due principally to the expansion and contraction of the spring **34** and the engagement of the contactors **36** in recesses in the rivets **2** and **3** and **2***a* and **3***a*. This snap action insures positive and quick action of the switch, and the switch generally is free from constructional features which would cause sticking or binding of any parts thereof.

The manner in which the parts are housed or enclosed insures against entry of moisture or foreign matter into the switch and avoids corrosion or rusting of the metallic parts.

Moreover, due to the simplicity of construction and efficient operation, the necessity for lubrication, bearings, etc., is obviated.

Another important feature is the manner in which the plunger **15** is mounted on the push bar **16**. By providing an end **15***a* on the plunger **15** which extends transversely through the bar **16**, the plunger is permitted to have a pivotal movement relatively to the bar, so as to accommodate its position to the movement of the rocker **24**. This pivotal movement is however, accomplished against a resistance caused by the fact that the plunger also has an end **15***b* which extends transversely through the bar **16** at a point below and in spaced relation to the end **15***a*. This resistance causes the plunger to be resiliently distorted, as indicated in Fig. 3, and the tendency of the plunger to restore itself to normal condition, following such distortion, serves to aid in restoring the plunger to its normal position, which, if viewed in Fig. 3, would be a vertical position.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In a switch of the character described, a terminal base, a housing secured to said base, a rocker mounted for pivotal movement in said housing, a contactor bar below said rocker, spring means interposed between said rocker and contactor bar, and means for causing rocking movement of said rocker between predetermined positions, said last-named means comprising an inverted cup-like member mounted on said housing, a push bar secured to said member, and a plunger secured to and depending from said bar, said plunger having an inturned end portion journalled in said push bar and a second inturned end portion journalled in said push bar at a point spaced vertically from the journalling of said first-named end portion.

2. A switch, as defined in claim 1, in which said plunger is made of resilient material and normally lies in a single plane common to the axes of said end portions, but is distortable to permit distortion of a portion of the plunger from said plane.

3. In a switch of the character described, a terminal base, a housing secured to said base, a rocker mounted for pivotal movement in said housing, a contactor bar below said rocker, spring means interposed between said rocker and contactor bar, and means for causing rocking movement of said rocker between predetermined positions, said last-named means comprising a push bar mounted for reciprocal movement in said housing, and a plunger secured to and depending from said bar, said plunger having an inturned end portion journalled in said push bar and a second inturned end portion journalled in said push bar at a point spaced vertically from the journalling of said first-named end portion.

4. A switch, as defined in claim 3, in which said plunger is made of resilient material and normally lies in a single plane common to the axes of said end portions, but is distortable to permit distortion of a portion of the plunger from said plane.

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