C. BRAMMING.

ELECTRIC SWITCH.

APPLICATION FILED MAY 3, 1917. RENEWED JUNE 30, 1919.

1,315,204. Patented Sept. 9, 1919.

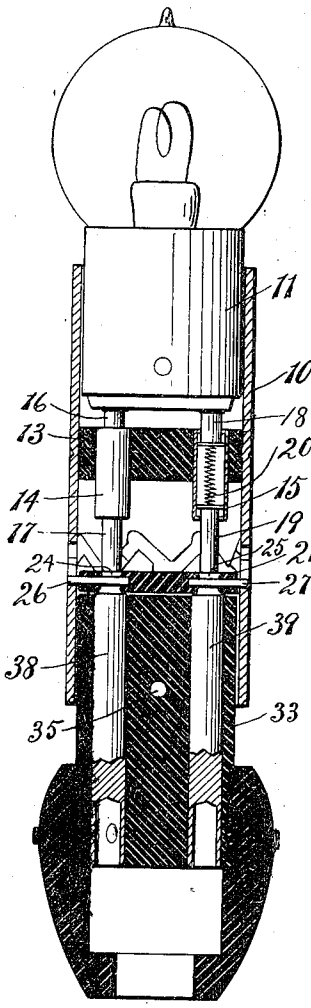

Fig. 2.

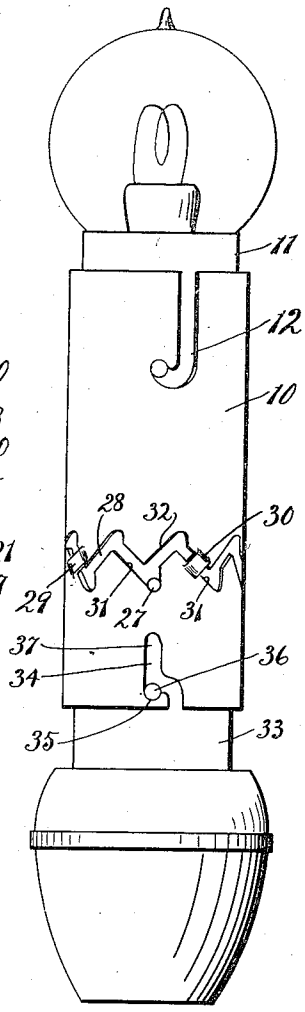

Fig. 1.

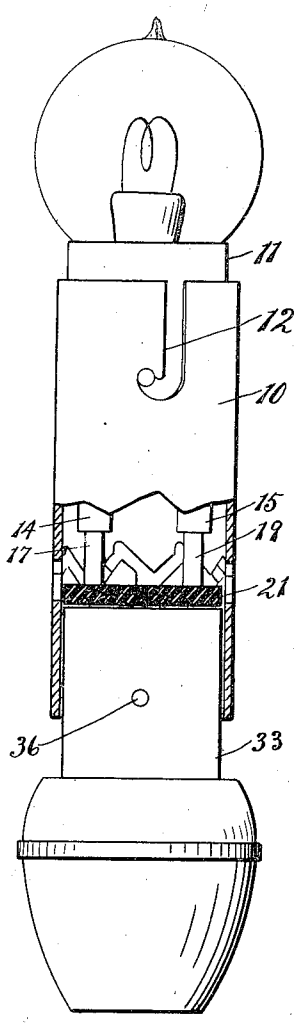

Fig. 3.

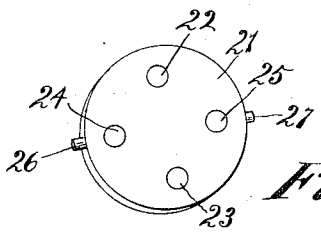

Fig. 4.

Inventor:
Carl Bramming
By Fillson & Fillson
Attys

UNITED STATES PATENT OFFICE

CARL BRAMMING, OF CHICAGO, ILLINOIS, ASSIGNOR TO ACCESSORIES MANUFACTURING CO., A CORPORATION OF ILLINOIS.

ELECTRIC SWITCH.

1,315,204. Specification of Letters Patent. Patented Sept. 9, 1919.

Application filed May 3, 1917, Serial No. 166,238. Renewed June 30, 1919. Serial No. 307,778.

To all whom it may concern:

Be it known that I, CARL BRAMMING, a citizen of the United States, and resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

The invention relates to switches for electric circuits especially adapted for use in automobile service and herein shown in connection with a lamp socket such as is used in automobile tail or other lamps.

The object of the invention is to provide, in a switch, means for opening and closing the circuit by alternate inthrusts of a plunger; and it consists in a structure such as hereinafter described and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a connector embodying the invention;

Fig. 2 is a central longitudinal section thereof showing the circuit closed;

Fig. 3 is a similar view, partly in elevation, showing the circuit open; and

Fig. 4 is an end view of the plunger.

The device is provided with a shell or casing 10, tubular in form and open at both ends, and forming at one end a socket for the reception of a plug connector 11, which may, as shown, be the base of an incandescent lamp, this plug being secured within the socket by the ordinary bayonet joint connection represented at 12. Within the casing 10 is fixed a block 13 of insulating material, through which extend a pair of stationary tubes 14, 15. From each end of each of the tubes 14 projects a plunger contact 16, 17, 18, 19, an expansion spring, as 20, being inclosed within the tube for normally holding these plungers in extended position. When the plug 11 is inserted into the socket its terminals engage one set of the plunger contacts, as 16, 18. The other set of contacts 17, 19, is constantly in engagement with the inner face of a plunger 21 formed of insulating material and carrying a plurality of conductors, here shown as four in number and designated by the numerals 22, 23, 24, 25.

The plunger 21 is provided with a pair of radially projecting studs 26, 27, which cooperate with a zigzag channel 28 formed circumferentially in the wall of the casing 10 and here shown as being cut entirely through this wall, except at certain points, as shown at 29, 30, where outwardly bowed bridge pieces are formed for holding together the two sections of the casing at opposite sides of the channel. Obviously this channel may be formed in the casing wall and the two sections of the casing held together when the channel takes the form of a slot, in any preferred manner. The edges of the channel 28 form a series of cams, as 31, 32, for guiding the studs 26, 27, to turn the plunger 21.

The plunger 21 is held in retracted position by the outward pressure against it of the plunger contacts 17, 19, the studs 26, 27, being seated at the outer angles of the channel 28, as shown in Fig. 1. When the plunger 21 is forced inwardly these studs engage inner cam edges, as 32, of the channel and are thereby guided to a pair of the inner channel apexes; pressure on the plunger being relieved, these studs engage outer cam edges of the channel, as 31, and are guided to a pair of the outer channel apexes. A complete reciprocation of the plunger, therefore, shifts its studs from one to the next adjacent pair of outer channel apexes. For the purpose of insuring this action the cam edges 31 overlap the outer ends of the cam edges 32, and in like manner the inner ends of the latter cam edges overlap the inner ends of the cam edges 31. By this arrangement a direct inthrust or outthrust of the plunger insures the engagement of the studs with the proper cam.

The conductors 22 to 25 are so positioned that at alternate complete reciprocations of the plunger 21 a pair of them engage the plunger terminals 17, 19, and are moved out of engagement therewith, thereby effecting the closing and opening of the circuit upon alternate complete strokes of the plunger.

Preferably the plunger 21 takes the form of a disk, as shown, and a push button, shown as a connector plug 33, coöperates with it, being held within the rear end of the casing 10 by a bayonet joint connection, as shown at 34, the bayonet joint slot being provided with an outer seat 35, with which the stud 36 of the connector is normally in engagement, the slot having an inward extension 37, longitudinal of the casing, to permit the reciprocation, without turning,

of the member 33. The connectors 38, 39, extending through the plug 33 are alined with the connector contacts 17, 19, so that the conductors 22 to 25 will electrically connect them.

It is obvious that if the plunger 21 were fixed to or made an integral part of the plug 33, the latter would necessarily rotate, and if so made would still be within the scope of the invention.

While the device is shown as adapted for use in connection with a two line circuit, it is equally serviceable in connection with a single line circuit, the necessary modifications being obvious to the skilled mechanic. The invention, in its broader aspects, is applicable to various forms of switches, though herein shown as incorporated into a connector.

The number of the contacts in the plate 21 depends upon the number of cams employed. If but half the number of cams shown be employed and they be given a pitch which will turn the plate through ninety degrees at each complete stroke of the plunger, but one pair of contacts will be required.

I claim as my invention—

1. In an electric switch, in combination, a suitable casing having a V-shaped cam the axis of which is parallel with the axis of the casing, a rotatable spring-retracted plunger in the casing having a contact element spaced from its axis and a stud engaging the cam, and a second contact element carried by the casing and positioned in the rotative path of the plunger contact element.

2. In an electric switch, in combination, a suitable casing, a contact element within the casing and spaced from the axis thereof and being held against rotative movement with relation thereto, a rotatable plunger within the casing and having a contact element adapted to engage the first-named contact, and cams for turning the plunger and arranged to close and open the circuit therethrough on successive complete strokes thereof.

3. In an electric switch, in combination, a tubular casing having a circumferential zigzag cam channel, a contact element within the casing and spaced from the axis thereof, and a spring-retracted rotatable plunger engaged with the cam channel and having a conductive element coöperating with the contact element and brought into and out of alinement therewith by the rotative movement of the plunger.

4. In an electric switch, in combination, a tubular casing, a block of insulating material fixed within the casing, a pair of diametrically alined spring-advanced plunger contact elements carried by the block, a rotatable plunger bearing against the plunger contacts and having conductive elements arranged to engage such contacts as the plunger turns, and a set of circumferentially arranged cams carried by the casing and adapted to turn the plunger.

5. In an electric switch, in combination, a tubular casing having a circumferentially arranged zigzag cam channel, a rotative plunger in disk form engaged with the cam channel, a non-rotative push element bearing upon the plunger, a pair of conductors extending through the disk, a pair of spring-advanced plunger contacts within the casing bearing against the disk and positioned to be engaged by the conductors carried thereby.

6. In an electric switch, in combination, a suitable casing, a contact element within the casing and spaced from the axis thereof, a rotatable plunger within the casing and having a conductor adapted to engage the contact element and being provided with a radial stud, the casing being provided with a circumferentially disposed zigzag cam slot for engaging the stud, and a spring for retracting the plunger.

CARL BRAMMING.