

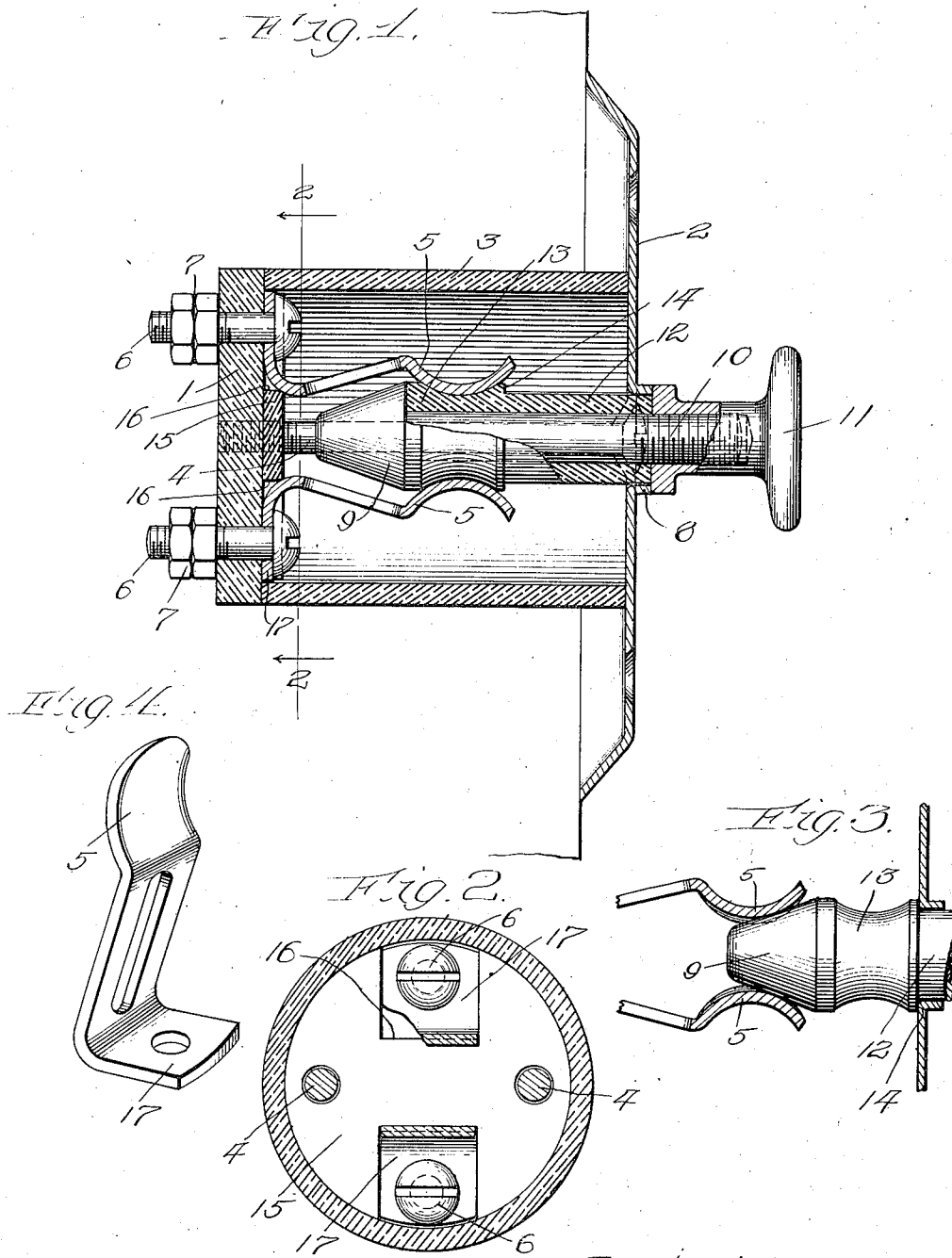
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J. O. EIS ET AL

ELECTRIC SWITCH

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ELECTRIC SWITCH.

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To all whom it may concern:

Be it known that we, JULIUS O. EIS and EDWARD J. KNAUFF, both citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in an Electric Switch; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to electric switches of the type in which the current is turned on and off by reciprocating a longitudinally slidable plunger. Generally speaking, our invention aims to provide a simple and inexpensive switch construction of this class in which the resiliency of a pair of contacts will also operate for holding the plunger in either its "on" or its "off" position, and to provide simple and effective means for mounting the contacts to hold the latter in their proper positions. Furthermore, my invention aims to provide a simple means for holding the circuit-closing part of the plunger in firm engagement with the contacts when the plunger is in its "on" position, and to provide a simple and effective construction for such a plunger. In one of its commercial objects, our invention is particularly adapted for use in connection with low voltage circuits, such as the ignition circuits of automobiles; hence it is shown in an embodiment for this purpose in the accompanying drawings and in the following specification, from both of which further objects of our invention will also be apparent. In the drawings, Fig. 1 is a central and longitudinal section through a switch embodying our invention, showing the plunger in its "off" position.

Fig. 2 is a transverse section through the same switch, taken along the correspondingly numbered line of Fig. 1 and with the base portions of one of the contacts broken away to show the shape of the opening in the insulating washer.

Fig. 3 is a fragmentary section similar to Fig. 1, but showing the plunger in its "on" position.

Fig. 4 is a perspective view of one of the spring contacts.

In the embodiment of the drawings, the switch of our invention has a casing con-

sisting of a base 1 in the form of an insulating disc, a front plate 2 substantially parallel to the base 1, and a cylindrical shell 3. This shell is interposed between the said base and front plate, and is clamped between them by screws 4, which screws have their beads in engagement with the front plate and are threaded into the base 1. Mounted on the base 1 are a pair of contact members 5 disposed symmetrically with respect to the axis of the casing and each fastened to the base 1 by a bolt 6, which bolt also carries an extra nut 7 to permit of clamping one of the current supply wires between this extra nut and the nut which clamps the nut to the base of the switch. The front plate 2 of the switch has a central perforation, and desirably has the metal adjacent to this perforation drawn into a tubular extension or collar 8 so as to afford a cylindrical guide for the plunger member. This plunger member desirably consists of a cylindrical stem having a substantially frusto-conical head 9, and a shank 10 connecting this head with a knob 11. This knob is disposed outside the casing of the switch and is secured to the stem 10 by any suitable means. Surrounding the portion of the shank 10 between the knob 11 and the head 9 is an insulating sleeve, comprising a stem 12 (which slidably fits the tubular extension 8 of the front plate) and a concaved portion 13 adapted to be engaged simultaneously by the curved fingers of the contacts 5. The insulating sleeve also has a shoulder formation 14 directed towards the front plate 2 and adapted to engage this front plate while the contact fingers are in forcible engagement with the metal tip 9 of the plunger, as shown in Fig. 3.

With the parts thus arranged, it will be obvious from Fig. 1 that when the plunger has been slid inward by pressing on the knob, the contact fingers 5 will both bear on the grooved portion of the insulating sleeve, so that they will be electrically disconnected while the engagement of the curved tips of these contacts with the grooved part of the sleeve will prevent the plunger from slipping in either direction. Upon pulling the knob 11 away from the front plate 2, the enlarged portion of the sleeve adjacent to the head 9 will cause the contacts to separate, so that there will be a snap action to the movement of the plunger. However,

this movement will be stopped by the engagement of the shoulder 14 with the rear face of the front plate before the contact fingers reach the positions at which they would be normally at rest, so that these fingers will still be somewhat forcibly separated by engagement with the head 9, thereby insuring a good electrical connection from one contact to the other.

10 As a simple method of mounting the contact members, we desirably fasten each to the base 1 by a single bolt 6 and keep it from rotating by employing an auxiliary insulating member consisting of a disk 15 disposed close to the base 1 and held in position by engagement with the bends of the contact members. For this purpose, we desirably provide the washer 15 with a pair of recesses 16 as shown in Fig. 2, and also provide the same with a pair of bores through which the bolts 4 can freely extend. Each of the said recesses is desirably of a width closely fitting the sides of the base part 17 of each of the contact members, but is of such limited depth towards the center of the washer 15 that the bend in the adjacent contact member will overhang an edge of the middle portion of the washer. In other words, the two opposed recesses are spaced somewhat further apart than the bends connecting the bases of the two contact members with the finger portions of the latter. Consequently, when the switch is assembled, both the bolts 6 and the screws 4 will keep the washer 15 from rotating upon the base, while the engagement of the overhanging bends of the contact fingers with the washer will press the latter tightly against the base of the switch. Then, since the sides of the base portions 17 of the contact members closely fit the sides of the recesses 16, these sides will prevent the contact members from rotating about the bolts 6. The contact parts will therefore be held continuously in their desired positions without requiring complicated fastening arrangements.

50 However, while we have shown the switch of our invention in an embodiment in which the bases 17 of the contact members have straight sides and the recesses 16 in the locking washer are substantially square in shape, we do not wish to be limited to these or other details of the construction and ar-

55 rangement here disclosed, it being obvious that the same might be varied in many ways without departing from the spirit of the appended claims.

We claim as our invention:

1. In a switch, a base plate, a pair of contact members, fastening means for attaching the members at one end to the base plate, and a removable insulating member having cut-outs to interlock with the attached ends of the contact members to hold the latter against turning on their fastening means, said contact members overhanging the removable member and resiliently exerting pressure thereon to secure the same on the base plate.

2. In a switch, a front plate, a base plate, a shell between the plates, a washer seated on the base plate and having a pair of cut-outs therein, bolts extending through the washer to prevent rotation thereof and secured to the front and rear plates to hold the same against the shell, a pair of contact members having parts seated on and secured to the base plate and received in the cut-outs of the washer and having parts engaged with the walls defined by the cut-outs to prevent turning of the members, said contact members having inward bends which extend over and engage the inner walls of the cut-outs to press against the washer and hold same against the base plate, and a reciprocal plunger for engaging the contact members.

3. In combination with a shell, a pair of approximately L-shaped contacts having one end secured to an end of the shell and disposed in spaced opposed relation, a washer having a pair of cut-outs to conformably receive said ends of the contacts and to engage and hold same against turning about the securing means thereof, said contacts having parts which overhang and bear against the inner adjacent end walls of the cut-outs so as to hold the washer frictionally in place against said end of the shell, and a reciprocal plunger for engaging the opposite ends of the contacts.

Signed at Chicago, Illinois, November 14th, 1919.

JULIUS O. EIS.
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