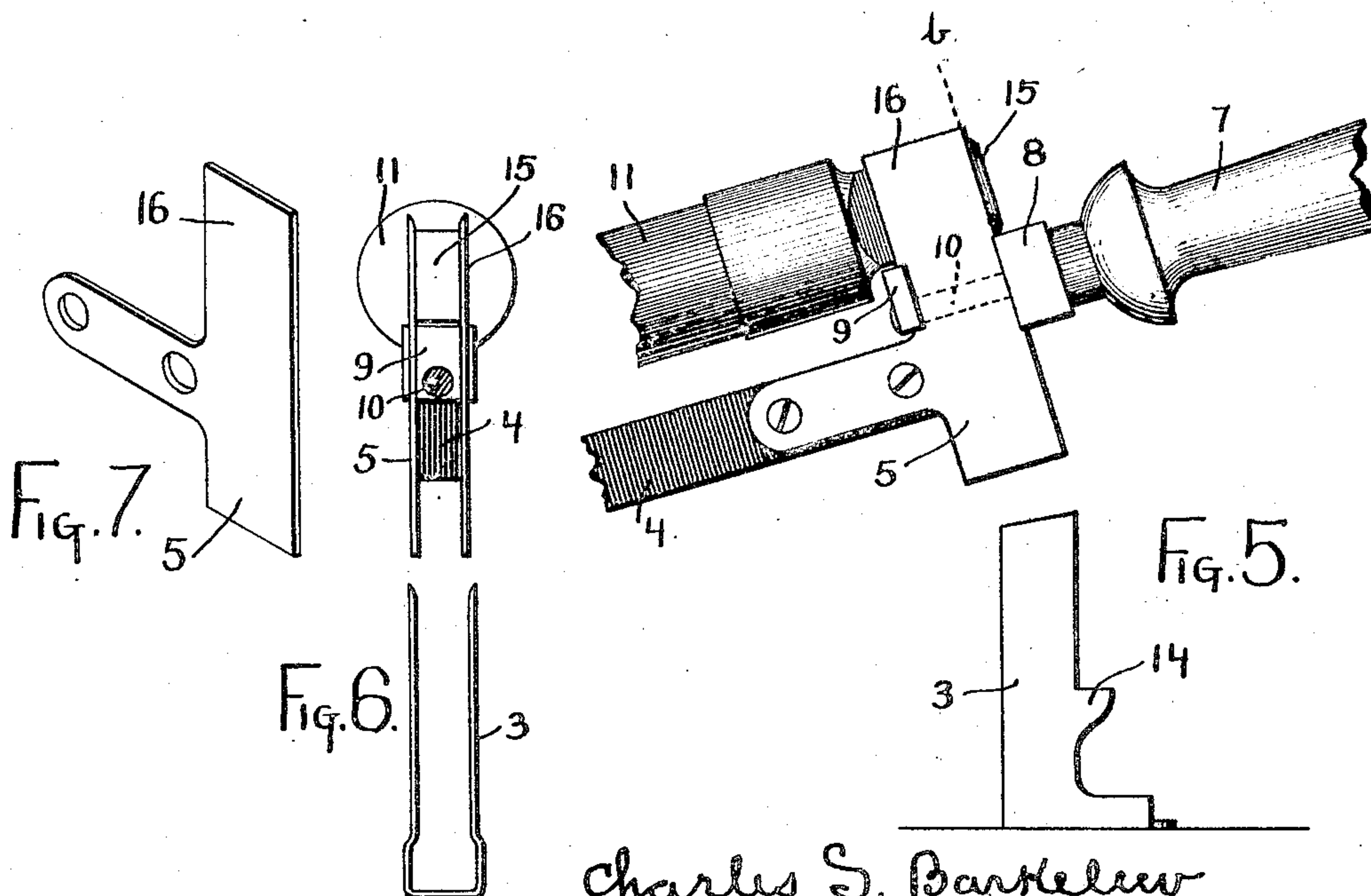
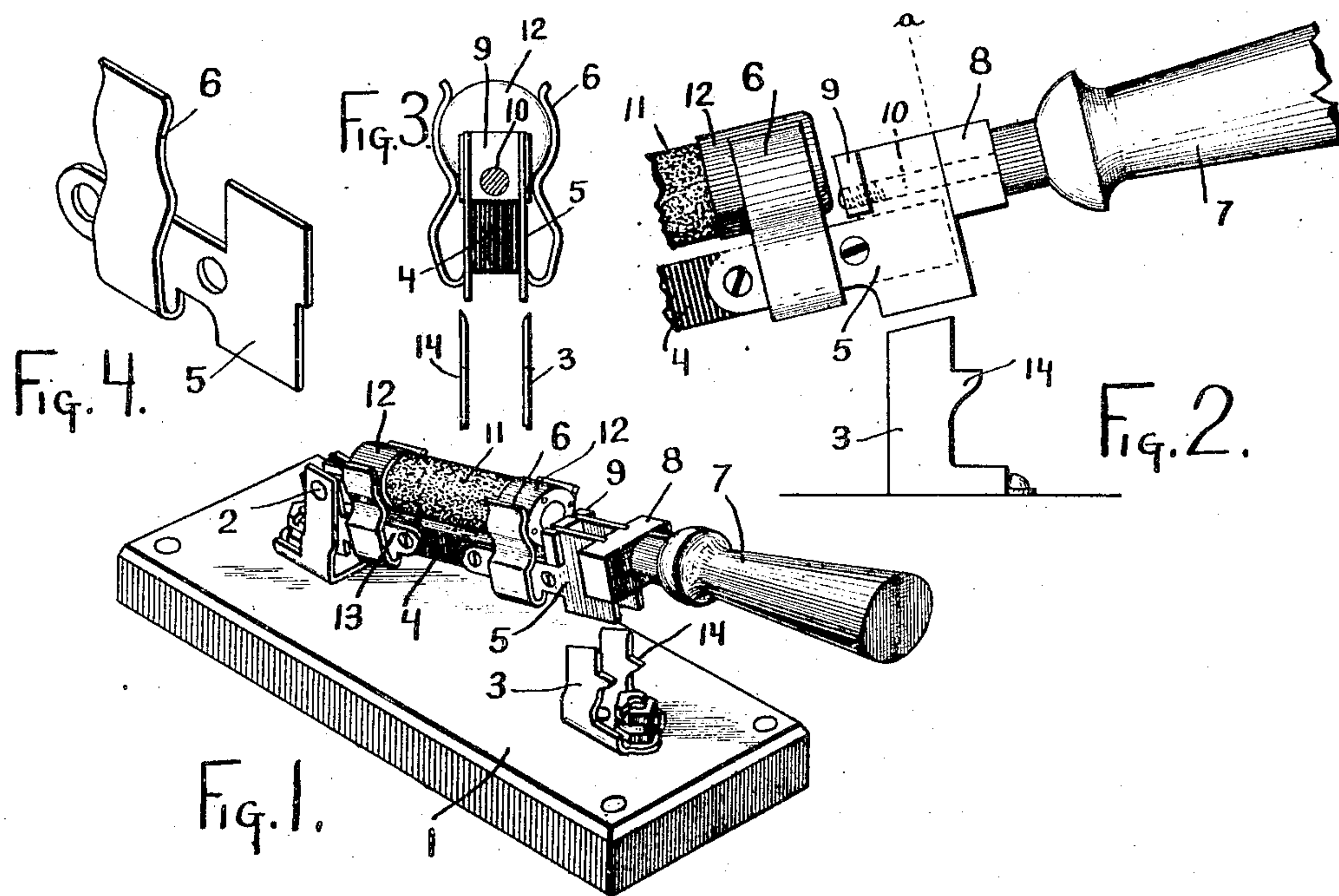


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C. S. BARKELEW.
ELECTRIC SWITCH.

APPLICATION FILED NOV. 11, 1904.



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ELECTRIC SWITCH.

No. 822,237.

Specification of Letters Patent.

Patented June 5, 1903.

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To all whom it may concern:

Be it known that I, CHARLES S. BARKELEW, a citizen of the United States, residing at Middletown, Butler county, Ohio, (post-office address Middletown, Ohio,) have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

This invention, pertaining to electric switches, will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a perspective view of a construction exemplifying my invention; Fig. 2, a side elevation of a portion of the same; Fig. 3, a vertical section in the plane of line *a* of Fig. 2; Fig. 4, a perspective view of one of the moving contact-plates; Fig. 5, a side elevation of a portion of the structure in modified form; Fig. 6, a vertical section of the modified structure in the plane of line *b* of Fig. 5, and Fig. 7 a perspective view of one of the contact-plates of the modified structure.

In modern practice with fuse-provided switches there are two general forms of fuses of standard employment, understood as being underwriters' standard fuses. In both cases the body of the fuse is generally cylindrical, with metallic caps at the ends. In one form, designed for comparatively light service, the contacts with the fuse are made directly with the periphery of the metal caps, while in the form for heavier service the fuse has flat-sided metallic shanks projecting from its ends, the receiving contact members engaging against the flat sides of these shanks.

In my improved switch the current controlled by the switch goes through a separable fuse, and I illustrate my invention as adapted for either form of standard fuse above referred to. For primary illustration I select the first type of fuse—that is, the one in which the receiving members engaged the periphery of the circular caps of the fuse, secondary illustration being made of a modified form of the switch adapted for the other type of fuse-terminal.

In the drawings, excluding for the present Figs. 5, 6, and 7, 1 indicates the base of the switch; 2, a hinge member secured thereto and adapted to have one of the circuit-terminals connected with it; 3, a contact member secured to the base and adapted to have the other circuit-terminal connected with it,

this contact member consisting of two blades disposed parallel with each other and projecting from the face of the base; 4, a bar of insulating material, as vulcanite, having its heel end connected in a pivotal manner with the hinge member 2; 5, a pair of contact-plates firmly secured to the opposite faces of the free end of bar 4, parallel with each other and at such distance apart that they will enter snugly between the two blades of the contact member 3; 6, arms integrally formed with the contact-plates 5 and projecting upwardly therefrom and having concave inner surfaces, these arms extending downwardly from the edges of the contact-plates and then curving outwardly and upwardly, whereby the arms are given greater length and corresponding elasticity; 7, a handle, preferably of insulating material, connected with the free end of bar 4; 8, a heel-block for the handle, the same being notched over the outer edges of contact-plates 5; 9, a nut-block notched over the rear edges of the contact-plates 5; 10, a stud carried by the handle and projecting through heel-plate 8 and between contact-plates 5 and screwing into nut-plate 9, whereby the handle is firmly secured to the bar through the medium of the contact-plates; 11, the fuse, of generally cylindrical form and disposed parallel with bar 4; 12, the metallic caps on the ends of the fuse, the cap at the outer end of the fuse engaging and being grasped by the upper portion of the arm 6 of the contact-plates, while the cap at the inner end of the fuse engages similar arms formed on metallic hinge-pieces connecting bar 4 with hinge member 2, the contact between the peripheries of the metallic caps of the fuse and the concave inner surfaces of the arms completing the connection from the hinge member 2 through the fuse to the contact-plates 5 and when the switch is closed to contact member 3, and 13 the metallic pieces just referred to as connecting the heel of the bar 4 with the hinge member of the base and having arms to clip the inner cap of the fuse.

The operation and performance of the switch will be obvious. It will be observed that when the switch is closed the contact-plates 5, with their arms, provide integral jointless metallic connections between the contact-surfaces of contact member 3 and the contact-surface of the fuse. The arms 6

and also the arms or connecting-pieces 13 are resilient enough to permit the lateral insertion and displacement of the fuse, the arms spreading considerably as the fuse is inserted 5 and then by the action of their resiliency contracting upon and gripping the metallic caps of the fuse and establishing contacts of sufficient perfection to be satisfactory for currents up to the strength for which fuses of 10 this type have been deemed suitable.

It is manifest that the entrance of the fuse into the clips formed by the arms necessitates a considerable displacement of the arms outwardly, the perfection of the contacts between 15 the arms and the fuse-caps being of course dependent upon the recovering power of the arms. It is this displacing strain that has caused in some quarters the condemnation of this type of fuse and fuse-clips for currents of 20 considerable strength, and the flat-shank type of fuse-terminal has been approved for the heavier currents by reason of its not involving the outward displacement and recovery of the clips while the fuse is being positioned.

25 In Figs. 5, 6, and 7 I illustrate my switch with its contact-plates modified to suit the flat-faced-shank type of fuse. The construction differs from that just described only in that the arms 6, which were in the previous 30 case provided with concave inner faces and arranged for a considerable degree of lateral displacement, are in the present case projected straight up from the contact-plates and present their inner surfaces parallel with each 35 other in position to snugly engage the flat faces of the flat-sided fuse-shank when the fuse is inserted. In the drawings illustrating the modification the modified form of arms is indicated at 16, the flat-faced fuse-shank being illustrated at 15. In this construction it 40 is to be observed that the blades of the contact member 3 are at liberty to extend when the switch is closed, even up to the top of the arms which grip the fuse-shanks, thus getting 45 the benefit of an extended area of contact. In the construction adapted for gripping the round cap of the fuse the contact member 3 could of course extend as far up on the contact-plates 5 as desired or as consistent with 50 the height of the contact-plates 5; but the contact effected by the contact member 3 could not in such case be at the same outward point on the bar with the clips which engage the fuse. The construction illustrated 55 in Fig. 5 for the flat-faced fuse-shank permits the switch-lever being shortened or of the fuse being lengthened, in view of the fact that the contact of contact member 3 can be at the same point outwardly on the lever as 60 the contact of the arms with the fuse-shank.

In either of the forms illustrated when the switch is closed the heel-block 8, forming a rigid projection from the front edge of the contact-plates of the lever, comes down upon

stops 14, projecting from the outer edges of 65 the blades of contact member 3, thus limiting the closing motion of the switch without imposing stopping duties upon any contact-blade edges.

In blade-switches generally destructive 70 sparking takes place at the shearing edges of the contact members, and by "shearing edges" I mean those edges first meeting and last leaving each other as the switches are closed and opened. The disintegration of 75 these shearing edges brings about a loss of dimension and unfits them for satisfactory employment as limiting-stops. In my improved construction I utilize the metal of a contact member as a stop, but I avoid the defects re- 80 ferred to.

While I have illustrated my improved construction as embodied in a switch whose movable member is operated by means of a handle 85 on a bar pivoted to a base, the invention is obviously applicable to switch constructions in which no handle is provided upon either of the two members of the pivoted couple.

It is to be observed that while the upper 90 arms of the contact-plates 5 are rendered resilient enough for the performance of their work in properly grasping the fuse-terminal other portions of them are rigidly seated against the side faces of the bar 4, so that the bar rigidly meets the side thrust due to the 95 collapsing pressure of the contact member 3 when the switch is closed. It is to be further noted that the contact-plates 5 serve a multiple office in clipping the fuse, in making contact with the member 3, in connecting the 100 fuse with the bar 4, and in connecting the handle with the bar.

I claim as my invention—

1. In a fuse-carrier for an electric switch, the combination, substantially as set forth, 105 of a bar, a pair of contact-plates rigidly secured to the opposite faces of each end of the bar, each contact-plate having a surface adapted for rubbing engagement with a co-operating contact member and having an in- 110 tegrally-formed flexible resilient arm adapting the pair of contact members to grasp the metallic terminal of the fuse, a handle disposed in general prolongation of one end of said bar, a stud carried by said handle and 115 projecting between the two contact-plates at the handle end of the bar, a heel-block disposed upon said stud between the handle and the outer extremities of said contact-blocks, and a nut-block having screwed engagement 120 with the inner extremity of said stud, portions of said contact-plates being clamped edgewise between said heel-block and nut-block by the action of said stud.

2. In a fuse-carrier for an electric switch 125 the combination, substantially as set forth, of a bar, a pair of contact-plates rigidly secured to the opposite faces of each end of the

bar, each contact-plate having a surface adapted for rubbing engagement with a cooperating contact member and having an integrally-formed resilient arm adapting the pair of contact members to grasp the metallic terminal of the fuse, a handle disposed in general prolongation of one end of said bar, a stud carried by said handle and projecting between the two contact-plates at the handle end of the bar, a heel-block disposed upon said stud between the handle and the outer extremities of said contact-blocks, and a nut-block having screwed engagement with the inner extremity of said stud, portions of said contact-plates being clamped edgewise between said heel-block and nut-block by the action of said stud, said heel-block and nut-block having notched engagement with the edges of said contact-plates.

3. In a fuse-carrier for electric switches, the combination, substantially as set forth, of a bar, a contact-plate rigidly secured against each side of one end of said bar and having surfaces adapted for rubbing contact with a cooperating contact member, each of said plates having an integrally-formed resilient arm adapting the bar to grasp the metallic terminal of the fuse, said resilient arms being disposed a distance inwardly of the end of said bar, a nut-bar and a heel-bar clamping edgewise upon portions of said contact-plates outwardly beyond said resilient arms, a handle projecting outwardly from said heel-bar, and a stud carried by the handle and projecting through the heel-bar and between the contact-plates and screwing into the nut-bar.

4. In a fuse-carrier for electric switches, the combination, substantially as set forth, of a bar, a contact-plate rigidly secured against each side at each end of said bar, each of said plates having a surface adapted for rubbing contact with cooperating contact members and each plate having an integrally-formed, recurved resilient arm adapting the pair of plates at each end of the bar to clasp the metallic terminal of a fuse, a pivot engaging one pair of said contact-plates and having its axis at right angles to said bar, and a handle secured to the other pair of said contact-plates by means of bars slotted to engage the edges of members of said plates and extending in general prolongation of the bar.

5. In an electric switch, the combination of a movable member having a contact-plate and a grooved handle-supporting member secured thereto, and a fixed contact member having a flat blade formed with a projecting shoulder adapted to be engaged

by said handle-supporting member for the purpose of limiting the throw of the switch.

6. In an electric switch, a contact-plate formed of sheet metal, having a member provided with apertures for securing said plate to a switch-bar, a widened portion adapted to engage a stationary contact member and having an upwardly-projecting part adapted to be engaged by a handle-attaching member, and a flexible clip for engaging a fuse-terminal, consisting of a strip integral with said plate, projecting from one edge thereof and bent backward and upward so that it projects above the opposite edge of said plate, thereby providing a free spring action.

7. In a fuse-carrier for electric switches, the combination of a bar of insulating material and two contact-plates, one secured to each side of one end of said bar and each having a portion adapted to engage a stationary contact, lying against the end of said bar, an upwardly-extending portion clear of said bar and adapted for the attachment of a handle, and a flexible clip projecting from said plate at a lower edge and curved back and upward and provided with a concave curve near its extremity, the clips of the two adjacent plates referred to serving by means of the said concave curved portions to engage the terminal of a fuse.

8. In a fuse-carrier for electric switches, the combination of an insulating-bar, contact members at one end thereof comprising a plate on each side of said bar, each plate having a portion adapted to engage a stationary contact member and another portion bent into the form of a recurved spring-clip to contact with the terminal portion of a fuse, a similar upwardly-projecting portion on each of said plates, standing clear of said bar, a handle provided with a screw, and two blocks each confronting the opposite edges of said upwardly-projecting portion of said plates and provided with grooves engaging the edges of said plate portions.

9. A movable contact member for fuse-carriers, composed of a single piece of sheet metal, having a part adapted to be secured to a switch-bar, a widened portion adapted to engage a stationary contact member and also adapted either to be pivotally secured thereto or to receive clamping members for securing a handle to said movable contact member, and a flexible part for engaging a fuse-terminal.

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