April 20, 1937. G. J. MEUER 2,077,577

ELECTRIC SWITCH

Original Filed Nov. 9, 1934 2 Sheets-Sheet 1

Fig. 1

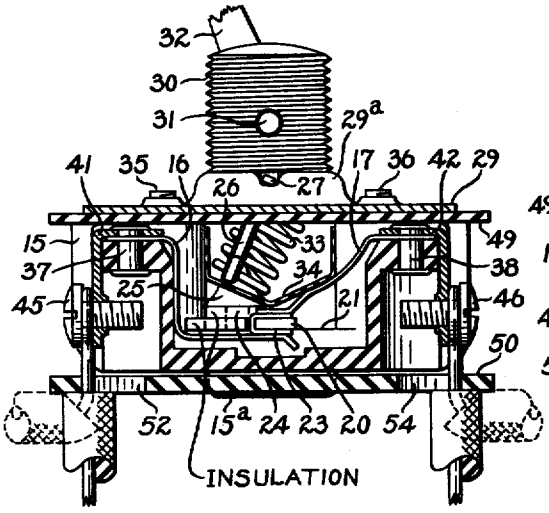


Fig. 2

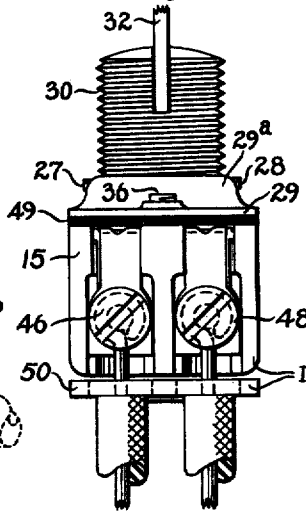


Fig. 3

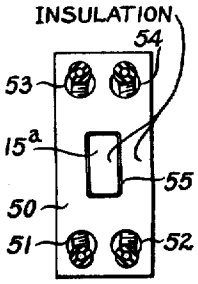


Fig. 4

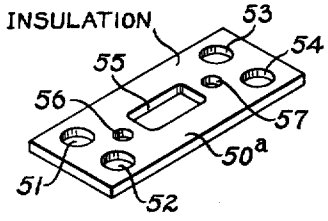


Fig. 5

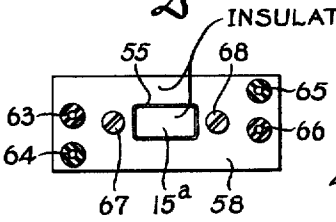


Fig. 6

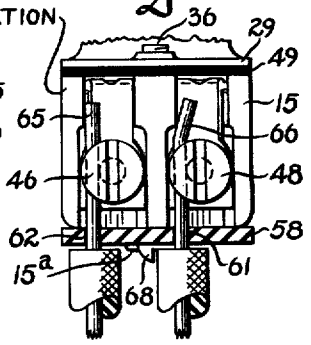


Fig. 7

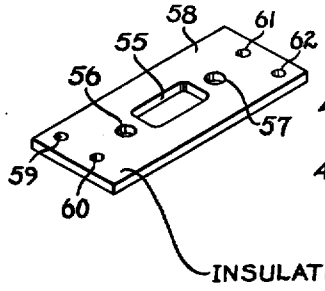
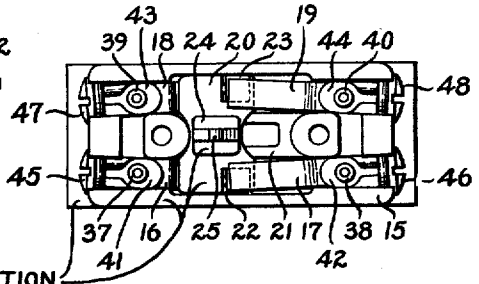


Fig. 8



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ELECTRIC SWITCH

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Fig. 9

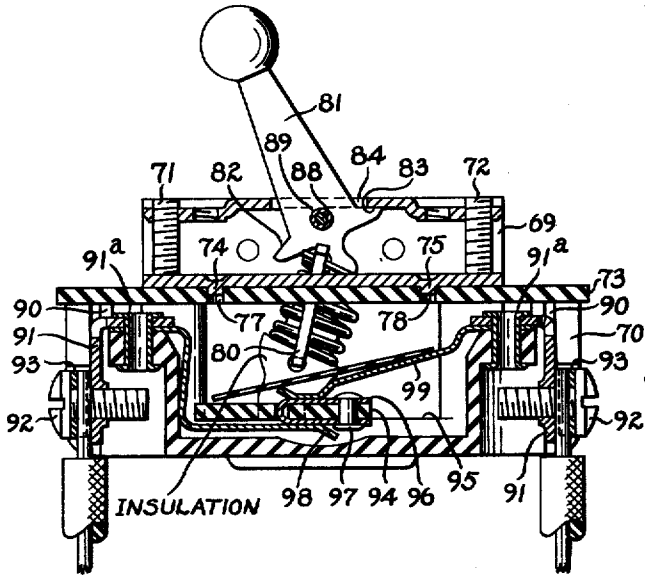


Fig. 10

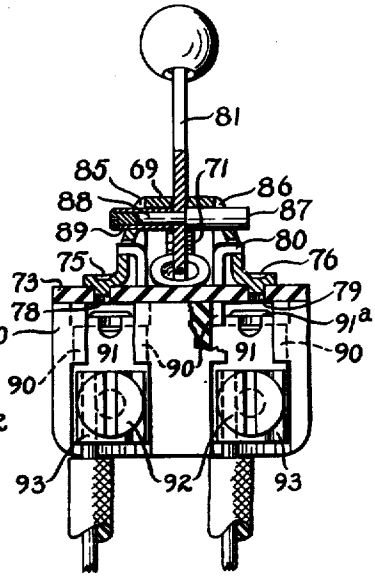
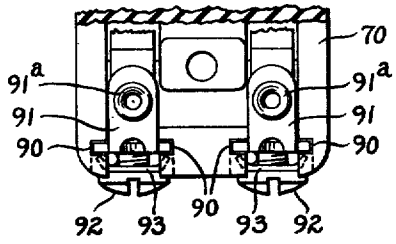


Fig. 11



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UNITED STATES PATENT OFFICE

2,077,577

ELECTRIC SWITCH

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Original application November 9, 1934, Serial No. 752,202. Divided and this application April 3, 1936, Serial No. 72,581

9 Claims. (Cl. 200—67)

This invention relates to improvements in electric switches, and the invention relates more particularly to improvements in electric snap switches of the tool-handle type.

A primary object of the invention is to provide novel means for relieving pulling strains upon the end-wiring terminals of switches of the aforementioned character.

Another and more specific object is to provide a strain relief device in the form of an attachment for switches of known construction.

Another object is to provide a novel form of pivotal support for the switch actuating lever.

Another object is to provide a novel form of mounting means for the metal top plates of switches of the aforementioned character.

Another object is to provide an electric snap switch having a novel form of connection between the contactor and its carrier.

Another object is to provide an improved form of wiring terminal clamp.

Another object is to generally improve the details of construction, assembly and operation of the parts of switches of the aforementioned character.

Other objects and advantages of the invention will hereinafter appear.

This application is a division of my copending application, Serial No. 752,202, filed November 9, 1934, for improvements in electric switches.

The accompanying drawings illustrate certain embodiments of the invention which will now be described, it being understood that the embodiments illustrated are susceptible of modification as to certain details of construction thereof without departing from the scope of the appended claims.

The snap switches herein disclosed are in general of the character described and claimed in my prior patents, No. 1,889,259, dated Nov. 29, 1933, and No. 1,977,078, dated Oct. 16 1934, to which patents reference may be had for a more detailed description of certain elements of the switch mechanism.

In the drawings, Figure 1 is a vertical sectional view of an electrical snap switch of the end-wiring type, having my improved form of wiring terminal strain-relief applied thereto.

Fig. 2 is an end view of the switch illustrated in Fig. 1.

Fig. 3 is a bottom plan view of the switch shown in Figs. 1 and 2.

Fig. 4 is a perspective view of a modified form of strain-relief plate, which may be substituted for that shown in Figs. 1, 2, and 3.

Fig. 5 is a bottom plan view of a switch like that shown in Figs. 1 and 2, but having a modified form of strain-relief plate of the character best illustrated in Figs. 6 and 7.

Fig. 6 is a fragmentary end view of a switch, with the strain-relief plate shown in section to illustrate the manner of inserting the straight bared ends of the circuit wires.

Fig. 7 is a perspective view of the strain-relief plate shown in Figs. 5 and 6.

Fig. 8 is a top plan view of a switch, with certain of the actuating elements removed, and showing a type of wiring requiring a strain-relief plate of the character illustrated in Figs. 1 to 3 or Fig. 4.

Fig. 9 is a vertical sectional view of a modified form of switch embodying certain novel details of my invention, including a novel form of strain-relief for the wiring terminal members.

Fig. 10 is a view, partly in end elevation and partly in vertical section, of the switch shown in Fig. 9, and

Fig. 11 is a fragmentary top plan view of the switch shown in Figs. 9 and 10, with the insulating and metal top plates omitted.

Referring first to Figs. 1 to 3, the numeral 15 designates an insulating base which is preferably molded from a phenol formaldehyde condensation product. Said base is recessed from its upper surface to provide a chamber in which are located two pairs of resilient contacts 16, 17 and 18, 19, the tips of which contacts are biased toward each other, as best illustrated in Fig. 1. Interposed between the respective pairs of contact tips at all times is a flat punched plate 20 of insulation, said plate being slidable over the flat upper surface 21 of a rib formed upon the bottom wall of said chamber. Plate 20 is notched at opposite side edges thereof to receive a pair of U-shaped contactors 22 and 23, the arms of each contactor being exposed on opposite sides of said plate. In one extreme position of plate 20 the contactors carried thereby are moved into bridging engagement with the respective pairs of contact tips (Figs. 1 and 8), and in the other extreme position of said plate the contactors are disengaged from said contacts.

Superimposed upon plate 20 is a relatively smaller punched plate 24 of insulation, said plates 24 and 22 having registering openings of rectangular contour to receive with a close fit the reduced lower end of a flat punched sheet metal member 25, said reduced lower end being upset over the lower surface of plate 22 to secure said parts to each other. The switch actuating

mechanism preferably comprises a wire member 26 of substantially W-form (as shown in detail in my Patent No. 1,977,078), said member being pivotally supported at 27 and 28 by the bulged portion 29a of top plate 29.

Secured to top plate 29 in a well known manner is an externally threaded yellow metal bushing 30, said bushing having alined openings formed therein to receive a pivot pin 31. Pin 31 is provided with a slightly enlarged intermediate portion (not shown) to provide for a drive fit thereof in an opening formed in the flat punched sheet metal actuating lever 32, said lever being of the desired length and having a ball or knob attached thereto with a drive fit, as indicated in the levers of Figs. 9 and 10. The upper closed end of bushing 30 is provided with a kerf to permit oscillatory movement of lever 32.

A coiled compression spring 33 is engaged at its lower end with member 26, the upper end of said spring being provided with a metal cup member to receive an abutment formed at the lower end of lever 32. A relatively thin punched insulating member 34 is interposed between the member 26 and the stationary and movable contact elements of the switch to properly insulate the latter from the former, said member 34 having a slot (not shown) formed therein to provide clearance for member 25. Also as will be apparent, the provision of insulating plate 24 insures a relatively large linear distance between the stationary and movable switch contacts and the member 25, thus increasing the current making and breaking capacity of the switch.

Top plate 29 is secured to base 15 as by means of a pair of screws the shanks of which are shown at 35 and 36, the heads of said screws being located in countersunk recesses in the bottom surface of said base, as shown in my patents aforementioned. The respective stationary contacts of the switch are attached to base 15 at the four corners of the latter and in a plane offset downwardly from the upper surface of said base, as by means of eyelets 37, 38, 39, and 40. Said eyelets also act to secure in position the horizontal portions 41, 42, 43, and 44 of the end-wiring terminal members of the switch, said members having depending vertical portions which are adapted to abut against shoulders formed on the respective ends of the base 15 to prevent inward bending of said vertical portions as an incident to tightening of the respective binding screws. Binding screws 45, 46, 47, and 48 are located adjacent to the lower ends of the vertical portions of the terminal members, and base 15 is provided with recesses to afford clearance for the shanks of said screws. A flat punched plate 49 of insulation is interposed between the upper surface of base 15 and top plate 29 to properly insulate the latter from the aforementioned wiring members.

In wiring a switch of the character herein described it is frequently necessary or desirable to employ relatively large gage solid wires of the character illustrated, whereas upon bending of said wires or upon pulling of the same (or any type of wire) endwise of base 15 an undesirable strain is placed upon the vertical portions of the wiring terminal members, with resultant liability of outward bending or distortion of the latter. To overcome this difficulty in a simple and economical manner, I provide a flat punched insulating plate 50 which is provided with a pair of relatively large substantially circular openings adjacent to each end thereof, said openings being designated by the numerals 51, 52, 53, and 54. The arrangement of said openings is preferably such that upon seating of plate 50 against the lower surface of base 15, the circularly looped ends of the wires may be inserted upwardly through the respective openings at a sufficient outward angle to clear the lower end of base 15 and the lower extremities of the terminal members. The wire ends are then positioned vertically as shown in full lines in Figs. 1 and 2 to bring the respective loops in alinement with the tapped openings in said terminal members. The aforementioned binding screws are then applied to mechanically and electrically connect the wire ends to the terminal members.

If the wire ends are bared to the proper length, the shoulders formed by the ends of the respective wire sheaths will act to restrain plate 50 against vertical displacement. In ordinary usage, however, it is desirable to provide a substantially right angled bend in each wire, as shown in dotted lines in Fig. 1. In order to prevent endwise displacement of plate 50 relatively to base 15 I prefer to provide the former with an opening 55 to accommodate a substantially rectangular projection 15a formed on the lower surface of said base. Thus upon bending of the several wires in the manner indicated in dotted lines in Fig. 1 the outer edges of the respective openings 51 to 54 will act as snubbing shoulders to prevent transmission to the terminal members of any bending or outward pulling strains upon the wires, the interlock between plate 50 and projection 15a assisting in the performance of this function. Moreover, it will be apparent that outward bending of the several wires will serve to securely clamp plate 50 against the bottom surface of base 15.

The modified form of wiring terminal strain-relief plate 50a shown in Fig. 4 is provided with the aforedescribed openings 51 to 54, inclusive, and the same is additionally provided with a pair of openings 56 and 57 which are adapated to receive the shanks of a pair of securing screws (not shown) which are relatively longer than the screws 35 and 36 aforementioned. The heads of said longer screws are adapted to engage the lower surface of plate 50 to provide for factory assembly thereof whereby the same is retained in seated position against the lower surface of base 15 independently of the circuit wires.

In Figs. 5, 6, and 7 I have shown a wiring terminal strain-relief plate 58 which is provided with openings 55, 56 and 57 like those shown in Fig. 4. However, plate 58 is provided with two pairs 59, 60, 61, and 62 of relatively small circular openings, which pairs are offset inwardly from diagonally opposite corners of the plate. Said openings are just sufficiently large to provide for upward insertion of the straight bared ends of the respective circuit wires 63, 64, 65, and 66, and said openings are so arranged as to insure positioning of the wire ends at the left-hand sides of the respective screw shanks (Fig. 6). With this arrangement the binding screws need not be entirely removed from the terminal members to permit insertion of the wire ends, whereas upon tightening of the screws the wire ends are securely clamped by the screw heads in mechanical and electrical contact with the respective terminal members.

The walls of the respective openings 59 to 62, inclusive, serve as snubbing shoulders upon bend-

ing of the several wires in the manner indicated in dotted lines in Fig. 1, whereby the downwardly extending portions of the several terminal members are relieved of outward bending strains as an incident to an outward pull upon the circuit wires. As aforeindicated, the opening 55 in plate 58 is adapted to accommodate the projection 15a on the bottom surface of base 15. It is to be understood, of course, that the shorter length screws 35 and 36 of Figs. 1 and 2 may be substituted for the screws 67 and 68 in Figs. 5 and 6, to provide for support of plate 58 solely by the circuit wires upon bending of the latter, the walls of opening 55 cooperating with projection 15a in such case to prevent displacement of plate 58 longitudinally of base 15.

The switch illustrated in Figs. 9, 10, and 11 is in general like that shown in Figs. 1 to 8. However, the switch of Figs. 9 to 11 is of such size and construction as to have a rated capacity of 10 amperes at 250 volts or 15 amperes at 125 volts, whereas the switch of Figs. 1 to 8 has a rated capacity of 5 amperes at 250 volts. It is to be understood, of course, that certain features of each of these two types of switches may be utilized in the construction of the other type of switch. For example, the top plate of inverted channel-shape and the actuating lever shown in Figs. 9 and 10 may be employed without change in conjunction with a molded base and other parts of the size shown in Figs. 1 to 8 to provide a switch of the aforementioned lower current-controlling capacity.

Certain of the parts of the switch illustrated in Figs. 9, 10, and 11 are shown and described in detail in Figs. 1 and 2 of my Patent No. 1,977,078. Thus I provide a metal top plate 69 of inverted channel-shape, which is secured to the molded insulating base 70 as by means of screws 71 and 72. A flat punched plate 73 of insulating material is interposed between the base 70 and the bottom flanges of the top plate 69.

Each of said pair of flanges is provided with a pair of downwardly extruded bosses, one pair being shown at 74 and 75 and one boss of the other pair being shown at 76; and the plate 73 is provided with recesses 77, 78, and 79 to snugly receive said bosses. Although I have shown said recesses as comprising openings extending through plate 73, it is to be understood that the recesses may be formed by locally compressing the plate without effecting penetration thereof. The arrangement just described insures against outward sliding of said flanges and consequent spreading of the substantially parallel sides of the top plate in the event of excessive tightening of screws 71 and 72. A proper pivotal support for the outwardly bent ends of the U-shaped yoke member 80 is thus provided.

The flat punched sheet metal actuating lever 81 is preferably provided with integral lugs having downwardly angled edges 82 and 83 which extend in the plane of said lever beyond the opposite ends of the slot 84 in the upper portion of top plate 69 to thereby limit the degree of oscillation of lever 81 in each direction.

As best illustrated in Fig. 10, top plate 69 is provided with a pair of alined pivot openings 85 and 86, and lever 81 is provided with a relatively smaller opening alined with said pivot openings. A pivot pin is provided with a portion 87 of relatively large diameter and a portion 88 of relatively small diameter, said pin being freely insertable endwise through the several openings in such manner that said shoulder abuts one side of lever 81, and the portion 87 has bearing engagement with opening 86. A metal tube or ferrule 89 is slidable onto the small diameter portion 88 of the pin to provide a shoulder abutting the other side of lever 81. The hollow outer end of portion 88 is upset as shown to retain all of said parts in assembled relation, it being noted that ferrule 89 has bearing engagement with opening 85.

The aforementioned upsetting operation is such that a clamping action of the inner end of the ferrule against lever 81 is effected to prevent relative movement of the lever and the pin, wherefore the pivoting action takes place solely between the pivot pin and its bearings 85 and 86. By the arrangement just described I am enabled to provide a very close and accurate fit of the pin within its bearings, and this feature, in conjunction with the fact that slot 84 is only slightly wider than the thickness of lever 81, insures against undesirable looseness or lateral wobbling of said lever.

The base 70 as shown is provided with pairs of vertical slots or grooves 90, into which pairs of grooves the vertical portions of the respective terminal members 91 are insertable downwardly prior to securement thereof by the eyelets or rivets 91a. Said terminal members 91 are of course positioned prior to insertion of the respective binding screws 92; although if desired the screws might be partly threaded into the tapped openings in the terminal members prior to attachment thereof to base 70. The walls of the aforementioned pairs of grooves 90 act to prevent inward bending of the terminal members upon tightening of the respective binding screws, and said walls likewise act to prevent outward bending or distortion of the terminal members in the event of an outward pull upon the circuit wires. If additional resistance to outward bending strains upon the terminal members is desired, one of the several types of strain relief plates of the character described in connection with Figs. 1 to 8 may of course be employed.

Where straight bared ends of the circuit wires are attached to the terminal members 91 by the binding screws, as shown in Figs. 9, 10, and 11, I prefer to employ a thin metal clamping plate 93 in conjunction with each terminal member, said plates each having the vertical edges thereof bent inwardly toward the respective terminal member to guide the circuit wire toward and retain the same adjacent to the shank of the screw, whereby proper clamping thereof by the screw head is insured. Each plate is also provided with an opening (Fig. 9) to provide clearance for the shank of its associated binding screw. As indicated in Fig. 11, the use of clamping plates 93 will facilitate proper attachment of a pair of bared wire ends to any or all of the respective terminal members, where such circuit connections are necessary or desirable.

The flat punched plate 94 of insulating material is slidable over the flat upper surface 95 of the rib formed on the bottom wall of the contact chamber. One of the U-shaped contactors carried by plate 94 is shown in section at 96 in Fig. 9; and as shown I prefer to rigidly attach the arms of each contactor to the respective sides of said plate as by means of a rivet or eyelet 97 which penetrates alined openings provided in said arms and in plate 94. One pair of lower and upper stationary contacts is designated by the numerals 98 and 99. The provision of rivets 97 additionally insures a good electrical connection

between the arms of the contactor even though the integral connecting portion thereof should be burned or worn away during use of the switch.

What I claim as new and desire to secure by Letters Patent is:

1. In an electric snap switch, in combination, a punched and stamped sheet metal top plate of substantially inverted channel-shape, said top plate having alined bearing openings formed in the opposite parallel sides thereof, said plate having a relatively narrow rectangular slot formed in the upper portion thereof, a flat punched sheet metal actuating lever insertable within said slot and restrained by the latter against movement laterally of said plate, said lever having a pivot opening formed therein, a pivot pin having a portion of relatively small diameter and a portion of relatively large diameter with a shoulder therebetween, said pin being freely insertable endwise through said bearing openings and the small diameter portion thereof being adapted to freely penetrate the pivot opening in said lever; whereby said shoulder is engaged with one side of said lever, a ferrule slidable onto said pin portion of small diameter and adapted to provide a shoulder which is engaged with the other side of said lever, said portion of relatively large diameter being adapted to engage with a snug fit one of said bearing openings and said ferrule being adapted to engage with a snug fit the other of said bearing openings, and the end of said small diameter portion being upset to retain all of said parts in assembled relation.

2. In an electric snap switch, in combination, a punched and stamped sheet metal top plate of substantially inverted channel-shape, said top plate having alined bearing openings formed in the opposite parallel sides thereof, said plate having a relatively narrow rectangular slot formed in the upper portion thereof, a flat punched sheet metal actuating lever insertable within said slot and restrained by the latter against movement laterally of said plate, said lever having a pivot opening formed therein, a pivot pin having a portion of relatively small diameter and a portion of relatively large diameter with a shoulder therebetween, said pin being freely insertable endwise through said bearing openings and the small diameter portion thereof being adapted to freely penetrate the pivot opening in said lever, whereby said shoulder is engaged with one side of said lever, a ferrule slidable onto said pin portion of small diameter and adapted to provide a shoulder which is engaged with the other side of said lever, said portion of relatively large diameter being adapted to engage with a snug fit one of said bearing openings and said ferrule being adapted to engage with a snug fit the other of said bearing openings, the end of said small diameter portion being upset to retain all of said parts in assembled relation, and said lever having integral lugs with downwardly angled edges arranged on opposite sides of said pivot opening, said lugs being respectively engageable with the inner surface of said channel member beyond opposite ends of said slot to thereby limit the degree of oscillatory movement of said lever in each direction.

3. In an electric snap switch, in combination, a molded insulating base having a recess opening to the upper surface thereof, a plurality of relatively movable contacts located within said recess, means for effecting relative movement of said contacts with a snap action, said means comprising a lever, means for pivotally supporting said lever relatively to said base, said last mentioned means comprising a punched and stamped sheet metal member of substantially inverted channel-shape, the sides of said channel member having flanges formed integrally therewith and adapted to overlie said base, a flat punched plate of insulating material interposed between said flanges and said base, a plurality of securing screws extending upwardly from said base and having threaded engagement with the upper wall of said inverted channel member, said insulating plate having recesses formed therein, and said flanges having bosses formed thereon for engagement with the walls of said recesses to positively insure against spreading of the opposite sides of said channel member upon tightening of said screws.

4. In an electric snap switch, in combination, a molded insulating base having a recess opening to the upper surface thereof, a plurality of relatively movable contacts located within said recess, means for effecting relative movement of said contacts with a snap action, said means comprising a flat punched sheet metal lever, means for pivotally supporting said lever relatively to said base, said last mentioned means comprising a punched and stamped sheet metal member of substantially inverted channel-shape, the substantially parallel sides of said channel member having flanges formed integrally therewith and adapted to overlie said base, a flat punched plate of insulating material interposed between said flanges and said base, a pair of screws extending upwardly from said base and having threaded engagement with the upper wall of said channel member, said insulating plate having a plurality of sets of relatively small recesses formed therein, said flanges each having a set of correspondingly shaped bosses formed on the lower surface thereof for engagement with the walls of said recesses to positively insure against spreading of the opposite sides of said channel member upon tightening of said screws, said member having a slot formed in the upper portion thereof to accommodate said lever, said lever and the sides of said member having alined pivot openings formed therein, a pivot pin having a portion of relatively small diameter and a portion of relatively large diameter with a shoulder therebetween, said pin being freely insertable endwise through said openings to provide for engagement of said shoulder with one side of said lever, and a ferrule slidable onto the small diameter portion of said pin into engagement with the other side of said lever, the outer end of said small diameter portion being upset to retain said ferrule in clamping engagement with said last mentioned side of said lever.

5. In an electric snap switch, in combination, a molded insulating base having a recess opening to the upper surface thereof, a plurality of stationary and movable contacts located within said recess, means for effecting movement of said movable contacts with a snap action, said means comprising a flat punched sheet metal lever, means for pivotally supporting said lever relatively to said base, said last mentioned means comprising a punched and stamped sheet metal member of substantially inverted channel-shape, said member having a slot formed in the upper portion thereof to accommodate said lever, said lever and the sides of said member having alined pivot openings formed therein, a pivot pin having a portion of relatively small diameter and a portion of relatively large diameter with a shoulder

therebetween, said pin being freely insertable endwise through said openings to provide for engagement of said shoulder with one side of said lever, a ferrule slidable onto the small diameter portion of said pin into engagement with the other side of said lever, the outer end of said small diameter portion being upset to retain said ferrule in clamping engagement with said last mentioned side of said lever, said large diameter portion of said pin and said ferrule each having a good bearing fit within the pivot openings in the sides of said metal member whereby wobbling of said lever is prevented, a plurality of wiring terminal members each having a portion thereof secured to one of said stationary contacts and to said base in a plane offset downwardly from the upper surface of the latter, said terminal members each having a portion bent downwardly at substantially right angles to the first mentioned portions thereof to lie against an end wall of said base, wiring terminal screws carried by said downwardly bent portions, a flat punched plate of insulating material underlying said base and restrained against movement relatively to the latter in a given plane, said plate having a plurality of openings formed therein to provide for upward insertion of wire ends for clamping thereof by the heads of said screws, and the walls of said openings acting as snubbing shoulders over which the wires may be bent, for the purpose set forth.

6. In an electric snap switch adapted for end wiring, in combination, a molded insulating base having a recess opening to the upper surface thereof, a plurality of sets of stationary and movable contacts located within said recess, wiring terminal members having flat portions thereof secured to the stationary contacts in a plane parallel with and spaced downwardly from the upper surface of said base, said wiring terminal members having portions thereof bent downwardly at right angles to the portions thereof aforementioned, wiring terminal screws having threaded engagement with said downwardly bent portions, said base having means associated therewith to prevent outward displacement of said downwardly bent portions in the event of an outward pull upon the latter, actuating means for said switch comprising a flat punched sheet metal lever, means for pivotally supporting said lever relatively to said base, said last mentioned means comprising a metal member of substantially inverted channel-shape, said last mentioned member having integral flanges adapted to overlie said base, a flat plate of insulating material interposed between said flanges and said base, a plurality of screws extending upwardly from said base and having threaded engagement with the upper wall of said channel member, said insulating plate and said flanges having cooperating shoulders formed thereon to positively insure against spreading of the opposite sides of said channel member upon tightening of said screws, said channel member having a slot formed in the upper wall thereof to accommodate said lever, said lever and said channel member having alined pivot openings formed therein, a pivot pin having a portion of relatively small diameter and a portion of relatively large diameter with a shoulder therebetween, said pin being insertable through said alined openings to provide for engagement of said shoulder with one side of said lever, and a metal ferrule slidable onto the small diameter portion of said pin into engagement with the other side of said lever, the outer end of said small diameter portion being upset to retain said ferrule in position.

7. In an electric snap switch adapted for end wiring, in combination, a molded insulating base having a recess opening to the upper surface thereof, a plurality of sets of stationary and movable contacts located within said recess, a plurality of wiring terminal members having flat portions secured to the respective stationary contacts and to said base in a plane offset downwardly from the upper surface of the latter, said terminal members having portions bent downwardly at substantially right angles to said flat portions thereof, said base having pairs of lateral grooves formed therein to provide for downward insertion of the side edges of said downwardly bent portions, whereby the latter are restrained against displacement in either direction out of the normal planes thereof respectively, said downwardly bent portions being formed to provide for attachment of circuit wires thereto, means for effecting movement of said movable contacts in opposite directions respectively with a snap action, said means comprising a lever, means for pivotally supporting said lever relatively to said base, said last mentioned means comprising a punched and stamped sheet metal member of substantially inverted channel-shape, said channel member having longitudinally extending flanges formed integrally therewith and adapted to overlie said base, a flat plate of insulating material interposed between said flanges and said base, a plurality of screws extending upwardly from said base and engaged with the upper wall of said channel member, said insulating plate and said flanges having cooperating shoulders formed integrally therewith to restrain the opposite sides of said channel member against spreading as an incident to tightening of said screws.

8. In an electric snap switch adapted for end wiring, in combination, a molded insulating base having a recess opening to the upper surface thereof, said base having ledges offset downwardly from the upper surface thereof, a plurality of resilient contacts having portions thereof superimposed upon the respective ledges, a corresponding number of wiring terminal members having flat portions thereof superimposed upon said ledges and rigidly secured thereto in clamping engagement with the respective contacts, said wiring terminal members having portions thereof extending downwardly at substantially right angles to said flat portions, said base having pairs of spaced downwardly extending grooves formed therein, the grooves of each pair opening toward each other to respectively receive the downwardly extending lateral edge portions of one of said terminal members, whereby said downwardly extending portions are engaged with the walls of said pairs of grooves to substantially relieve bending strains tending to move the same inwardly or outwardly with respect to said base, said downwardly extending portions having tapped openings formed therein, and binding screws the shanks of which have threaded engagement with said tapped openings, said base having recesses to accommodate the shanks of said binding screws.

9. In an electric snap switch, in combination, a molded insulating base having a recess opening to the upper surface thereof, a plurality of relatively movable contacts located within said recess, means for effecting relative movement

of said contacts with a snap action, said means comprising a lever, means for pivotally supporting said lever relatively to said base, said last mentioned means comprising a punched and stamped sheet metal member of substantially inverted channel-shape, the sides of said channel member having flanges formed integrally therewith and adapted to overlie said base, a flat punched plate of insulating material interposed between said flanges and said base, a plurality of securing members extending through said base and engaged with the upper wall of said inverted channel member, said insulating plate having shoulders formed thereon, and said flanges having shoulders formed thereon for cooperation with said first mentioned shoulders to positively insure against spreading of the opposite sides of said channel member upon tightening of said securing members.

GEORGE J. MEUER.

CERTIFICATE OF CORRECTION.

Patent No. 2,077,577. April 20, 1937.

GEORGE J. MEUER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, line 46, for the word "electrical" read electric; page 2, first column, line 7, for "yellow" read hollow; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of October, A. D. 1937.

Henry Van Arsdale

(Seal)

Acting Commissioner of Patents.

of said contacts with a snap action, said means comprising a lever, means for pivotally supporting said lever relatively to said base, said last mentioned means comprising a punched and stamped sheet metal member of substantially inverted channel-shape, the sides of said channel member having flanges formed integrally therewith and adapted to overlie said base, a flat punched plate of insulating material interposed between said flanges and said base, a plurality of securing members extending through said base and engaged with the upper wall of said inverted channel member, said insulating plate having shoulders formed thereon, and said flanges having shoulders formed thereon for cooperation with said first mentioned shoulders to positively insure against spreading of the opposite sides of said channel member upon tightening of said securing members.

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