Jan. 12, 1932. R. A. MILLERMASTER ET AL 1,840,520

ELECTRICAL FITTING

Filed March 21, 1930

Fig. 1

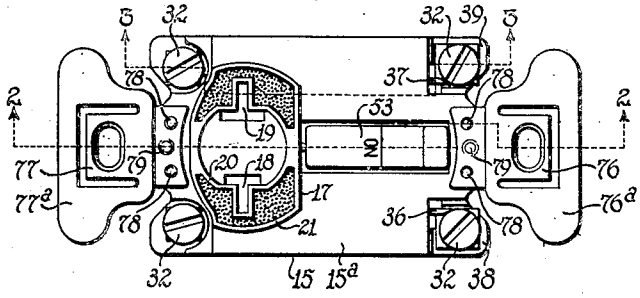


Fig. 2

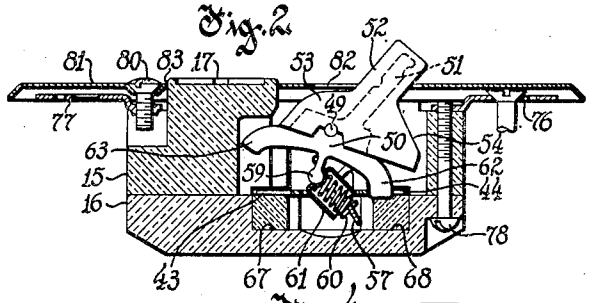


Fig. 3

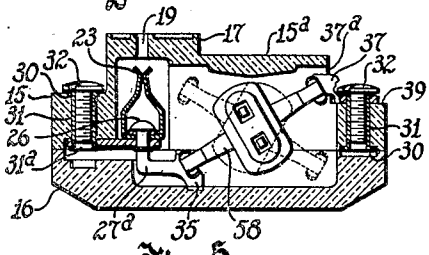


Fig. 4

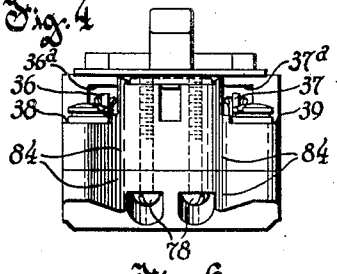


Fig. 5

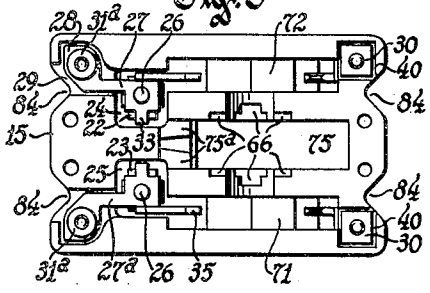


Fig. 6

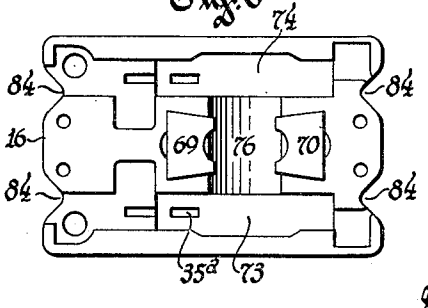


Fig. 10

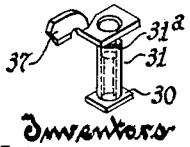


Fig. 7

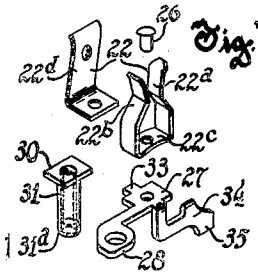


Fig. 8

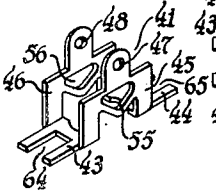
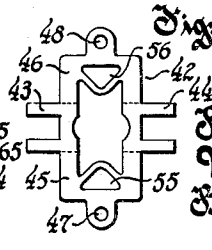


Fig. 9



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Patented Jan. 12, 1932 1,840,520

UNITED STATES PATENT OFFICE

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ELECTRICAL FITTING

Application filed March 21, 1930. Serial No. 437,757.

This invention relates to improvements in electrical fittings, and more particularly to improvements in a combined switch and attachment plug receptacle.

An object is to improve and simplify the details of construction and assembly of the parts of devices of the aforementioned character.

Another object is to provide a combination switch and receptacle of the enclosed type whereby the receptacle contacts and switch mechanism are adequately protected from dust and other foreign matter.

Another object is to provide a novel form of two-part molded insulating base for supporting and enclosing the receptacle contacts and the switch mechanism.

Another object is to provide novel means for attaching and supporting the receptacle contacts and switch contacts with respect to the two-part insulating base.

Other objects and advantages of the invention will hereinafter appear.

The accompanying drawings illustrate an embodiment of the invention which will now be described, it being understood that the invention is susceptible of embodiment in other forms within the scope of the appended claims.

In the drawings, Figure 1 is a top plan view of a combined switch and attachment plug receptacle constructed in accordance with our invention.

Fig. 2 is a vertical sectional view on the broken line 2—2 of Fig. 1, with a metal face plate shown in position.

Fig. 3 is a vertical sectional view on the broken line 3—3 of Fig. 1.

Fig. 4 is an end view of the device.

Fig. 5 is a bottom plan view of the top member of the divided or two-part insulating and enclosing casing,—the switch frame and the parts carried thereby being omitted.

Fig. 6 is a top plan view of the bottom member of the casing.

Fig. 7 is a perspective view, in separated relation, of certain of the combined receptacle and switch contact parts together with the wiring terminal and supporting means therefor.

Fig. 8 is a perspective view of the switch frame.

Fig. 9 is a plan view of the frame punching, and

Fig. 10 is a perspective view of another of the switch contacts and the combined attaching and terminal means therefor.

Referring to the drawings, the numeral 15 designates the top section of the molded insulating and enclosing casing and 16 designates the bottom section of said casing. Section 15 is provided with a flat upper face 15^a, and projecting upwardly a short distance beyond said face is a flat boss 17 of the contour best illustrated in Fig. 1.

Boss 17 is pierced to provide the usual T-slots or guide openings 18 and 19 for the jack blades of an attachment plug (not shown),—a guide ring or flange 20 being formed around said openings to facilitate insertion of the jack blades therewithin. Boss 17 is also preferably provided with a peripheral flange 21,—the areas between flanges 20 and 21 being slightly depressed and stippled or otherwise decorated.

Slots 18 and 19 provide access to the triple-spring receptacle contacts 22 and 23 located within recesses 24 and 25 which extend upwardly from the bottom face of section 15. One set of triple-spring contacts 22 is shown in detail in Fig. 7,—said set comprising a strip metal punching bent to provide two upstanding spring arms 22^a, 22^b bent inwardly toward each other, thence extending upwardly, having the respective ends thereof bent outwardly from each other. The intermediate perforated portion 22^c is initially bowed upwardly, as shown, and superimposed upon said bowed portion is the perforated foot portion of the third spring contact 22^d. A rivet 26 is adapted to penetrate the aforementioned perforations and the registering perforation in a punched sheet metal supporting element 27;—said rivet when tightly upset against the lower face of element 27 being adapted to cause flattering of the bowed portion 22^c whereby the arms 22^a, 22^b are brought toward each other in the manner illustrated in Fig. 3.

Element 27 is provided at one end with a

perforated enlargement 28 which is adapted to lie within a correspondingly shaped shallow recess 29 in the lower face of section 15. Seated within a correspondingly shaped recess in one corner of section 15 (but offset downwardly from the flat face 15ª thereof) is the angular head 30 of an internally threaded metal eyelet 31,—the shank of which penetrates a registering passage in section 15 and the lower end wall 31ª of which is of reduced thickness to facilitate spinning or upsetting thereof against the lower surface of portion 28, as best illustrated in Fig. 3. The usual binding screws 32 are adapted for threaded engagement with said eyelets.

Element 27 is preferably provided with a projection 33 to insure proper positioning thereof with respect to recess 24. Also formed integrally with element 27 and bent downwardy at a right angle therefrom is a switch contact portion 34,—said contact portion having a short extension 35 to be engaged by the bottom and side walls of a shallow recess 35ª within the section 16 of the casing. While the aforementioned eyelet provides for rigidly attaching element 27 to section 15 it will be apparent that engagement of extension 35 by bottom section 16 of the casing insures a more rigid support for the assembled parts and guards against accidental misalinement of said parts when the device is in use. It will be noted that the elements 27 and 27ª are formed from identical blanks,—the switch contact portions thereof being merely bent in reverse directions to provide right and left hand assemblies.

The right and left hand switch contacts 36 and 37 extend inwardly beneath the flat surface 15ª of section 15 from downwardly offset ledges 38 and 39,—the clearance passages for said contacts being best illustrated at 36ª and 37ª in Fig. 4. Contacts 36 and 37 are bent upwardly at right angles from flat base portions thereof (see Fig. 10) which engage shoulders upon the respective ledges 38 and 39 to insure proper positioning or alinement of said contacts.

Contacts 36 and 37 are rigidly secured to section 15 by means of eyelets 31, the angular heads 30 of which are seated in correspondingly shaped shallow recesses 40 in the bottom face of section 15,—the upper ends of said eyelets being spun or riveted over the respective base portions of said contacts, as shown at the right hand side of Fig. 3.

The switch mechanism is preferably of the general character described and claimed in the patent of Ralph A. Millermaster, No. 1,796,854, dated March 17, 1931. More particularly, said mechanism comprises a frame 41 which may be formed from a punched sheet metal blank of the shape illustrated at 42 in Fig. 9. Said frame is provided with base or foot portions 43 and 44 and parallel upstanding arms 45 and 46 the reduced upper ends of which are respectively provided with registering perforations 47 and 48 which act as bearings for the pivot pin 49 (Fig. 2). Upon the pin 49 is pivotally mounted a punched sheet metal actuating lever 50 of the form shown partly in full lines and partly in dotted lines in Fig. 2. The projecting upper end 51 of said lever is preferably so arranged as to extend at the angle illustrated in Fig. 2 in one extreme position thereof and to extend vertically upward when in its other extreme position. In this manner unobstructed insertion or removal of a plug with respect to the receptacle is permitted irrespective of the on or off positioning of the switch. As shown the end 51 of the lever has molded thereabout a suitable insulating block 52, the lower enlarged portions 53 and 54 of which may be provided with suitable legends to indicate the position of the movable contacts of the switch.

Located below the perforations 47, 48 are a pair of relatively large openings 55 and 56 of substantially inverted triangle shape which act as bearings for the punched sheet metal contact carrier 57 which has secured thereto but insulated therefrom the respective pairs of resilient bridging contactors,—one pair of such contactors being shown at 58 in Fig. 3. Interposed between the lower end 59 of lever 50 and an abutment upon the carrier 57 is a coiled compression spring 60, said spring being preferably enclosed by the cup-shaped and slotted metal member 61. The manner of assembling the movable switch parts with respect to the frame is described in detail in the aforementioned Millermaster patent. Also as in said Millermaster patent the lever 50 is provided on opposite sides of its pivotal center with arms 62 and 63, which, prior to assembly of the switch within the casing, are adapted to abut against the end walls of slots or notches 64 and 65 in the foot portions 43 and 44 of the frame to limit oscillatory movement of said lever.

However, as will be noted, the switch frame with its assembled parts is adapted to fit snugly within a correspondingly shaped recess 66 formed in the bottom face of section 15, so that the bottom or foot portions 43 and 44 of the frame lie substantially flush with said bottom face of section 15. The bottom section 16 of the casing is, moreover, provided with a pair of spaced dove-tail recesses 67 and 68 within which a pair of correspondingly shaped soft rubber blocks or pads 69 and 70 are adapted to fit, with the upper surfaces of the latter normally projecting slightly above the upper surface of section 16. It will thus be apparent that when the two sections 15 and 16 are brought tightly together the pads 69 and 70 will press against the foot portions 43 and 44 of the frame and thus

clamp the latter in proper position within the top section 15 of the casing. Similarly said pads will thereupon act as yieldable or resilient stops or cushions to limit oscillatory movements of lever 50, and the opposed side edges of said blocks will act as resilient stops to limit oscillatory movements of carrier 57.

The sections 15 and 16 are provided on opposite longitudinal sides thereof with recesses 71, 72 and 73, 74 respectively, to provide proper clearance for the oscillatory contactors of the switch,—the intermediate recesses 75 and 76 in the respective sections being likewise adapted to provide ample clearance for the actuating lever 50, contact carrier 57 and other movable elements of the switch.

As best shown in Figs. 2 and 3 the switch frame not only has its parallel sides in engagement with the walls of recess 66, but one of the foot portions 43 or 44 is adapted to rest upon the shallow ledge or recess 75^a formed in the lower face of section 15.

The sections 15 and 16 are preferably firmly secured to each other and to suitable supporting lugs or ears 76 and 77 as by means of a pair of screws 78 at each end of the casing. Tapped openings 79 are provided in said lugs for cooperation with the usual attaching screws 80 of a face plate or cover 81 formed of metal or other suitable material. Face plate 81 is provided with punched out perforations or openings 82 and 83 to accommodate the actuating lever 51, 52 and the boss or projection 17 of the receptacle. The lugs 76, 77 may be provided with the usual plaster engaging enlargements 76^a, 77^a if desired.

As best illustrated in Figs. 1, 4, 5 and 6 the respective sections 15 and 16 are preferably provided with vertically extending end wire grooves 84, thus facilitating wiring of the device and positioning thereof within an outlet box of minimum size.

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

1. A combined switch and attachment plug receptacle, comprising a molded insulating block recessed from the lower face thereof to accommodate a switch frame and the mechanism carried thereby, said block being also recessed to accommodate a plurality of receptacle contacts, said receptacle contacts having combined supporting and terminal elements rigidly secured to said block, stationary switch contacts electrically connected to the respective supporting and terminal elements, and a molded insulating member underlying said switch frame and arranged to clamp the latter in assembled relation to said block.

2. A combined switch and attachment plug receptacle, comprising a molded insulating block recessed from the lower face thereof to accommodate a switch frame and the mechanism carried thereby, said block being also recessed to accommodate a plurality of receptacle contacts, said receptacle contacts having conductive supporting elements rigidly attached to said block, stationary switch contacts formed integrally with said supporting elements, and a molded insulating member adapted to cover the lower face of said block, said insulating member being recessed to accommodate said stationary contacts and portions of said switch mechanism, said member also having portions in clamping engagement with said switch frame to retain the latter in assembled relation to said block.

3. A combined switch and attachment plug receptacle, comprising a molded insulating block recessed from the lower face thereof to accommodate a switch frame and the mechanism carried thereby, said block being also recessed to accommodate a plurality of receptacle contacts, said receptacle contacts having conductive supporting elements rigidly attached to said block, stationary switch contacts formed integrally with said supporting elements, a molded insulating member adapted to cover the lower face of said block, said insulating member being recessed to accommodate said stationary contacts and portions of said switch mechanism, said member also having portions in clamping engagement with said switch frame to retain the latter in assembled relation to said block, the upper face of said block being pierced to accommodate a switch actuating element, and said upper face being also pierced to afford access to said receptacle contacts.

4. A combination switch and receptacle of the enclosed type, comprising a molded insulating top member recessed from its bottom face to accommodate the switch mechanism and a plurality of sets of resilient receptacle contacts, supporting elements for said receptacle contacts having switch contacts formed integrally therewith, other contacts for said switch, internally threaded eyelets attached to said supporting elements and said switch contacts to rigidly secure the same to said insulating member, said eyelets being exposed at the four corners of the upper face of said insulating member for cooperation with the usual binding screws, and a bottom cover member having supporting engagement with certain of said switch contacts, said bottom member also having means to yieldably retain said switch mechanism within the recess in said top member.

5. An electric snap switch comprising, in combination, a molded insulating block recessed from the bottom face thereof, a sheet metal switch frame of substantially U-shape seated within said recess in a relation substantially flush with the bottom face of said block, a bottom cover member for said block, and a plurality of soft rubber members carried by said cover member and in clamping

engagement with portions of said frame to yieldably retain the latter within said recess.

6. An electric snap switch comprising, in combination, a molded insulating block recessed from the bottom face thereof, a sheet metal switch frame of substantially U-shape seated within said recess in a relation substantially flush with the bottom face of said block, a bottom cover member for said block, a plurality of soft rubber members carried by said cover member and in clamping engagement with portions of said frame to yieldably retain the latter within said recess, a punched sheet metal contact carrier pivotally supported by said frame, and a plurality of resilient contactors rigidly attached to said carrier but insulated therefrom, said block and said cover member being recessed to provide clearance for said carrier and said contactors during oscillation thereof from one extreme position to the other.

7. An electric snap switch comprising, in combination, a molded insulating block recessed from the bottom face thereof, a sheet metal switch frame of substantially U-shape seated within said recess in a relation substantially flush with the bottom face of said block, a bottom cover member for said block, a plurality of soft rubber members carried by said cover member and in clamping engagement with portions of said frame to yieldably retain the latter within said recess, a punched sheet metal contact carrier pivotally supported by said frame, a plurality of resilient contactors rigidly attached to said carrier but insulated therefrom, said block and said cover member being recessed to provide clearance for said carrier and said contactors during oscillation thereof from one extreme position to the other, an actuating lever pivotally supported by said frame above said carrier, and extensions on said lever on each side of the center of oscillation of the latter, said extensions and said carrier being engageable with the respective rubber members to cushion the movements thereof to opposite extreme positions.

8. In a snap switch adapted for flush mounting, in combination, a punched and stamped sheet metal frame of substantially U-shape in cross section, a molded insulating and enclosing base having a recess to accommodate said switch frame, said base being divided horizontally in the plane of the bottom surface of said frame, and the lower portion of said base having soft rubber inserts in clamping engagement with portions of said frame to yieldably retain the latter within said recess.

9. In a snap switch adapted for flush mounting, in combination, a punched and stamped sheet metal frame of substantially U-shape in cross section, a molded insulating and enclosing base having a recess to accommodate said switch frame, said base being divided horizontally in the plane of the bottom surface of said frame, the lower portion of said base having soft rubber inserts in clamping engagement with portions of said frame to yieldably retain the latter within said recess, a plurality of resilient contactors pivotally supported by said frame but insulated therefrom, an actuating lever pivotally supported by said frame and projecting upwardly through an opening in said base, and spring means controlled by said lever for effecting snap movement of said contactors from one extreme position to the other, said lever having integral arms engageable with said rubber inserts to cushion movements of the former to opposite extreme positions respectively.

10. In a device of the character described, in combination, a punched sheet metal member having a stationary switch contact element formed integrally therewith and bent downwardly therefrom at substantially a right angle thereto, a molded insulating block recessed on its bottom face to accommodate said member, a metal eyelet penetrating registering openings in said block and said member and having one end upset over the latter, said eyelet being internally threaded at its other end, a binding screw having cooperative engagement with said thread, and a plurality of resilient receptacle contacts formed of strip metal and rigidly secured to said sheet metal member at a point between said switch contact element and said metal eyelet.

11. In a device of the character described, in combination, a punched sheet metal member having a stationary switch contact element formed integrally therewith and bent downwardly therefrom at substantially a right angle thereto, a molded insulating block recessed on its bottom face to accommodate said member, a metal eyelet penetrating registering openings in said block and said member and having one end upset over the latter, said eyelet being internally threaded at its other end, a binding screw having cooperative engagement with said thread, a plurality of resilient receptacle contacts formed of strip metal and rigidly secured to said sheet metal member at a point between said switch contact element and said metal eyelet, and a second insulating block engageable with said switch contact element to act as additional supporting and alining means therefor.

12. In a device of the character described, in combination, a punched sheet metal conducting element, a tubular wiring terminal member rigidly attached to said element to secure the latter to a suitable support, triple-spring plug receptacle contacts superimposed upon said element and riveted thereto, two of said contacts being formed integrally with each other and having the upper flared ends thereof initially spaced apart, and

in intermediate upwardly bowed portion to be flattened by the riveting operation whereby said flared ends are brought toward each other for proper cooperation with a plug jack.

In witness whereof, we have hereunto subscribed our names.

RALPH A. MILLERMASTER.
WILLIAM C. TREGONING.