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MEANS FOR ATTACHING A WIRE TO A BINDING PLATE

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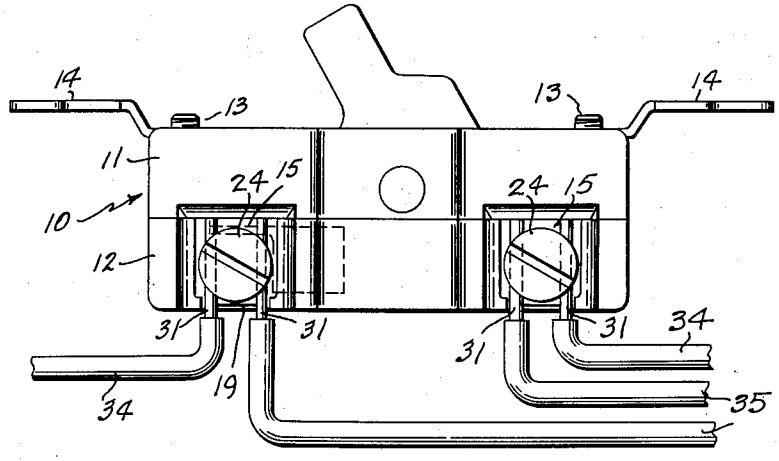

Fig. 1.

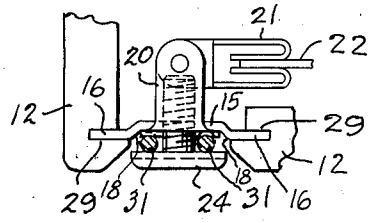

Fig. 4.

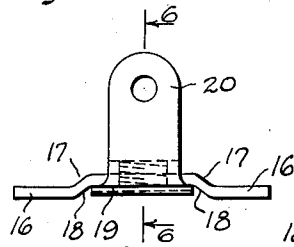

Fig. 5.

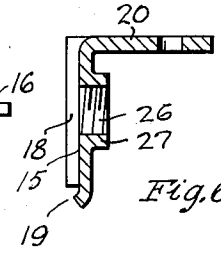

Fig. 6.

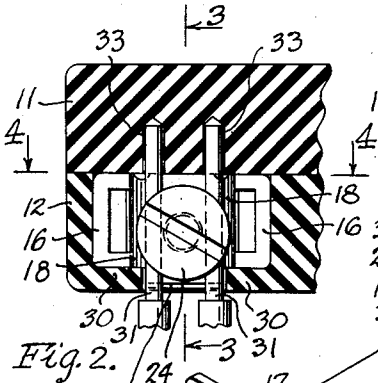

Fig. 2.

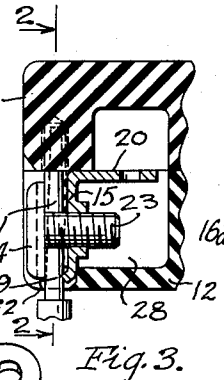

Fig. 3.

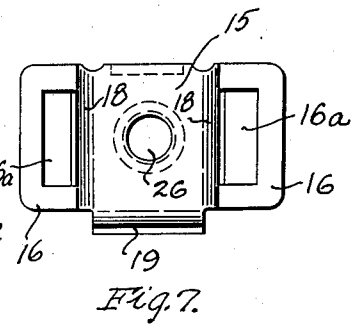

Fig. 7.

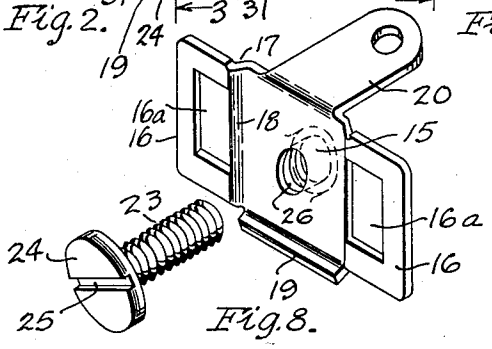

Fig. 8.

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MEANS FOR ATTACHING A WIRE TO A BINDING PLATE

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5 Claims. (Cl. 339—95)

This invention relates to electrical wiring devices, and particularly to means for attaching a wire to a binding plate connected with a contact in the wiring device.

It is an object of the invention to provide an improved and simplified means for attaching a conductor wire to a binding plate.

It is also an object to provide a means for connecting a conductor wire to a binding plate whereby an improved electrical and gripping connection is secured.

A further object is to provide an improved means for fastening a conductor wire to a binding plate, in which it is not necessary to wrap the wire around the binding screw, and also in which either one or two wires may be secured to the plate by the same binding screw.

With the foregoing and other objects in view, I have devised the construction illustrated in the accompanying drawing forming a part of this specification. It is, however, to be understood the invention is not limited to the specific details of construction and arrangement shown, but may embody various changes and modifications within the scope of the invention.

In this drawing:

Fig. 1 is a side view of an electric wiring device in which this invention is applied, the particular device shown beng an electric switch;

Fig. 2 is a detail section on a larger scale taken substantially on line 2—2 of Fig. 3;

Fig. 3 is a section taken at right angles to Fig. 2 substantially on line 3—3 of Fig. 2;

Fig. 4 is a section substantially on line 4—4 of Fig. 2 which is also a plan view looking down on a portion of the inner or rear section of the body of the device;

Fig. 5 is a plan view of the binding plate with the binding screw removed;

Fig. 6 is a section thereof substantially on line 6—6 of Fig. 5;

Fig. 7 is a front view looking toward the bottom of Fig. 5, and

Fig. 8 is a perspective view of the plate and the binding screw.

The electrical wiring device shown is a toggle switch, but this means for attaching a wire to a binding plate is used in other electric wiring devices such, for example, as outlet receptacles and the like.

The device shown comprises a body member 10 of insulating material comprising two sections in the form of a forward section 11 and a rear section 12 placed side by side and secured together by suitable screws 13 passing through these members, and also used to secure to the front side of the member 11 a yoke 14 for mounting the device in a wall outlet box (not shown), in which it is connected to the house wiring system.

This improved binding plate and means for connecting a wire to the plate comprises a formed plate of uniform thickness having an intermediate portion 15 and opposite end portions 16 which are offset rearwardly from the intermediate portion 15 as shown at 17, forming inclined

transverse shoulders 18, and at its lower longitudinal edge it is provided with an offset sharp edge 19, preferably formed by bending this edge outwardly to an inclined position as shown in Figs. 3, 6 and 8, thus locating the sharp edge 19 a short distance forwardly or outwardly of the outer surface of the intermediate portion 15. The end portions may have openings punched out as shown at 16a to reduce the metal. At the upper edge the plate is provided with a rearwardly extending lug or other extension 20 to which may be secured a stationary contact in the wiring device such, for example, as the spring contacts 21 arranged side by side between which may pass the movable contact blade 22 of the switch. There is also mounted in the plate a binding screw 23 having a head 24 on the outer side of the plate provided with a slot 25 for operation by a screw driver, and this screw passes through an opening 26 in the plate. It is preferably secured to the plate by tapping or threading this opening, although it could be secured by a nut on the screw at the inner side thereof. To secure greater length of thread in the plate a short sleeve or tubular boss 27 could be drawn on the rear side thereof.

For mounting the plate in the wiring device the inner or rear member 12 is provided with a recess 28 opening through the top wall, rear wall and side wall of this member, and it is provided on the opposite sides of this recess with inwardly facing channels 29 adapted to receive the free outer end edges of the end portions 16 of the plate by sliding them downwardly into these channels from the top wall of the member 12, these channels being closed at their lower ends by the walls 30, which limit this movement. This positions the plate and the binding screw, as indicated in Figs. 2, 3 and 4, so that the bared ends 31 of either one or two conductor wires may be inserted between the head of the screw and the outer face of the intermediate portion of the plate through the opening 32 through the back wall of the member 12 leading to the recess 28, and this also positions the contact 21 in the body. The rear wall of the forward member 11 is also provided with a pair of sockets 33 in substantial alignment with the inclined shoulders 18 to receive the inner ends of conductor wires 31 and help position them in proper relation to plate 15, the shoulders 18 and the binding screw 23. The shoulders 18 help to guide the wires to these positions and prevent the wires from shifting outwardly out of position upon tightening of the binding screw.

In Figs. 3 and 4 the binding screw and the wire are shown in full lines just before final tightening of the screw, the head of the screw being accessible for operation from one side of the body member. In this position the wires extend across the sharp edge 19 and under the head of the screw. As can best be seen in Fig. 3, a portion of the periphery of screw head 24 overlies the sharp edge 19. As a result of the size, shape and disposition of the screw head relative to the binding plate, on tightening the screw to its final position, the wires are pressed against the sharp edge 19 so that this edge sinks slightly into the wires and the wires are bent over this edge so as to be clamped against the surface of the intermediate portion 15 of the plate, as indicated in dotted lines. Thus, in fastening the wires to the plate all that is necessary is to insert the bared ends of one or more of the wires into position between the plate and the head of the screw, with their inward movement limited by the bottoms of the sockets 33, and then tighten up the screw to clamp them in this position. The sharp edge 19 in combination with the clamping action of the head of the screw provides an effective electrical connection between the lead wires and the plate and a good tight grip to prevent pulling of the wires from the plate.

It will be seen that this single screw can be used for securing either one or two lead wires to the same plate, and the same type of connection may be used for securing the wires to all of the contacts in the electric fixture or wiring device, Fig. 1 showing two of these plates for contacts which may be simultaneously bridged by the movable switch contact 22 to control one side of the circuit, similar contacts and connections (not shown) being used for the other side of the circuit. Also, as two wires may be connected to the same plate, these connections can be used for connecting through wires through the wall box in the house wiring system at the same time as providing the connections to the contacts in the device. Thus, for example, the wires 34 may be used to supply current to the contacts in the device, while the wires 35 may be used to carry through to the next box.

It will be seen from the above that this provides a simple and effective means for quickly and effectively connecting the lead wires to the wiring device without the necessity of wrapping the wires about the shank of the screw, which is especially important if the wires are relatively large or heavy gauge, it requiring merely the insertion of the bared ends of the wires into position between the plate and the head of the screw, and then tightening up the screw, which action presses the wires against the sharp edge 19 and also clamps them against the face of the plate; furthermore, that the inclined shoulders 18 formed by offsetting the opposite end portions of the plate provide guiding and positioning means to assist and insure the wires are in proper position, and also to retain the wires against shifting outwardly away from this position during tightening of the screw. It will also be understood that lead wires may be attached, detached or re-attached simply by loosening or tightening the binding screw and inserting or removing the lead wires.

Having thus set forth the nature of my invention, I claim:

1. In an electric wiring device, a body of insulating material provided with a recess extending through one side and the back wall thereof, said body provided with channels facing the recess on opposite sides thereof, a binding plate for an electrical contact in the body having opposite end edges seated in the channels and provided with an intermediate opening, said plate provided with an outwardly offset sharp edged rib along one side edge of the plate, the opposite end portions of the plate being offset outwardly providing inclined shoulders on opposite sides of the opening, said body provided with sockets in the bottom wall of the recess in substantial alignment with said shoulders to receive the free ends of lead wires and position these wires along one side of the shoulders over the sharp edge, and a binding screw in the opening provided with a head on the outer side of the plate adapted to clamp the wires to the plate and over said sharp edge.

2. An electric wiring device including a body member of insulating material comprising front and rear connected sections, the rear section provided with a recess opening through a side and the rear wall and provided with channels extending rearwardly from the front wall of this section and facing the recess on opposite sides thereof, a binding plate for an electrical contact in the body including opposite end edges seated in said channels and an outwardly offset sharp edged rib along the rear side edge, a binding screw in the plate provided with a head on the outer side of the plate adapted to clamp a lead wire to the plate and over said sharp edge, and the front section of the body provided with a socket in alignment with the recess arranged to receive the free end of the wire and position it in clamping position at the outer side of the plate.

3. The wiring device of claim 2 in which at least one end portion of the plate is offset outwardly between its free end edge and the screw providing an inclined transverse shoulder in substantial alignment with said socket to position the lead wire on the plate and hold it against being shifted laterally out of position under clamping action of the screw head.

4. In an electric wiring device, a body member of insulating material provided with a recess extending through one side wall thereof, said body provided with channels facing the recess in opposite side walls of said recess, a binding plate for an electrical contact in the body having opposite free end edges seated in said channels and provided with a tapped opening, the opposite end portions of the plate offset forwardly from the central portion with the connections between the end portions and the central portion providing inclined shoulders extending across the plate on opposite sides of the tapped opening, said plate provided with a sharp edged rib along one longitudinal edge of the central portion with its sharp edge located forwardly of this portion between the inclined shoulders, said shoulders each adapted to position a lead wire in clamping position over said sharp edge and prevent it from shifting laterally toward the adjacent end of the plate, and a binding screw in said tapped opening provided with a head on the outer side of the plate of a size and in position to clamp a lead wire located along one of said shoulders against the plate and over said sharp edge.

5. A wire attaching means for an electric wiring device comprising: a formed plate of uniform thickness having an intermediate portion and opposite end portions offset forwardly from the intermediate portion with the connections between the end portions and intermediate portion providing spaced inclined shoulders extending across the plate; said plate provided with a threaded opening in its intermediate portion between said shoulders and a forwardly offset sharp edge extending along one edge of said intermediate portion between said shoulders; and a binding screw adjustably mounted in said opening and having a head disposed on the forward side of said plate which is of a size and shape and disposed so as to have a portion of its periphery overlie said sharp edge whereby said head is arranged to clamp a pair of lead wires to the face of said plate over said sharp edge in positions longitudinally of and adjacent said shoulders and with said sharp edge sunk into said lead wires.

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