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2,622,119

CLAMPLESS BOTTOM WIRING FOR ELECTRICAL DEVICES

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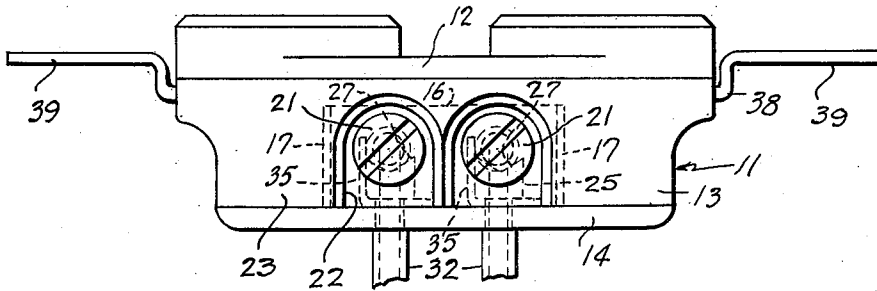


Fig. 1.

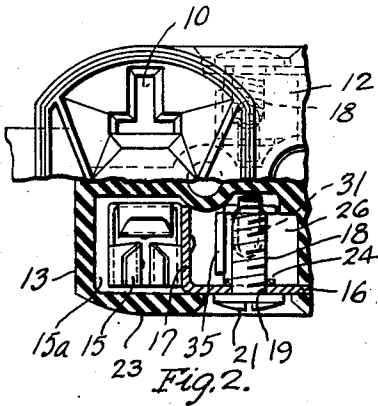


Fig. 2.

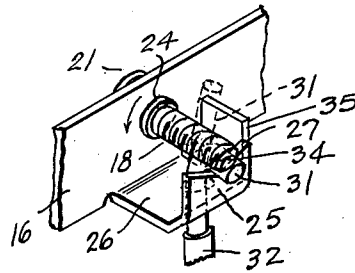


Fig. 4.

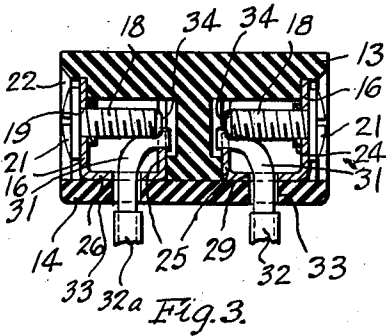


Fig. 3.

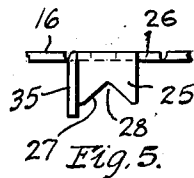


Fig. 5.

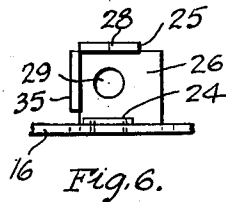


Fig. 6.

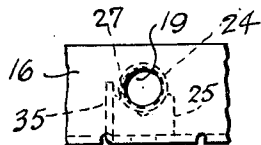


Fig. 7.

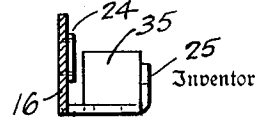


Fig. 8.

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UNITED STATES PATENT OFFICE

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CLAMPLESS BOTTOM WIRING FOR
ELECTRICAL DEVICES

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6 Claims. (Cl. 173-259)

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This invention relates to devices for connecting conductor wires to outlet receptacles, switches and other electrical elements, and an object is to provide an improved wire clamping device adapted for general use with such elements.

Heretofore in connecting lead wires to outlet receptacles, for example, it has been customary for the electrician to bend the stripped end of each wire to form a loop for embracing the binding post screw and then secure the looped end under the head of the screw. Such an operation is not only time consuming, but the resulting connection is not always entirely satisfactory. If the electrician is careless or hurried, the bent loop may not be properly shaped or sized to be secured correctly under the head of the binding screw, or the wire conductor may be of such heavy gauge that the loop cannot be readily formed. In either case the wire is not engaged and held by the binding screw as securely as is normally required.

A further object is to eliminate this operation by the electrician and to provide an improved device for connecting conductor wires to electric fixtures, switches and the like constructed and arranged to electrically and mechanically connect a conductor wire without requiring any preliminary bending or looping of the stripped conductor.

A further object is to provide an improved device for connecting lead wires to outlet receptacles by back or bottom wiring without clamping the leads around the binding post screws.

A further object is to provide an improved wire clamping device for use with outlet receptacles and the like, so constructed as to provide an efficient electrical connection as well as a strong mechanical grip merely by inserting the stripped end of a conductor into the device and then screwing up on the associated 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 elevation of a duplex electrical outlet receptacle having a wire connecting device constructed in accordance with one embodiment of the invention;

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Fig. 2 is a part plan, part horizontal section, of one end of the receptacle shown in Fig. 1;

Fig. 3 is a vertical transverse section through the lower portion of the receptacle shown in Figs. 1 and 2;

Fig. 4 is a perspective view showing certain details of the illustrated wire clamp;

Figs. 5, 6 and 7 are views illustrating a detail of the clamping device, and

Fig. 8 is a similar view partly in section of the same detail.

The illustrated embodiment of the invention is shown in connection with an outlet receptacle 11, although the invention is equally adapted to other types of electrical devices. As illustrated, the receptacle 11 is formed of top and bottom sections 12, 13, respectively, of insulating material and a bottom insulating cover plate 14. Spring contacts 15 are mounted in chambers 15a in the bottom section 13 to engage the blades of attachment plug caps inserted in the slots 10 in the front wall. The illustrated duplex receptacle includes two sets of such contacts and slots.

Each contact 15 at each end of the receptacle 11 is connected to a device for securing a conductor lead thereto. As illustrated, a current conducting plate 16 is provided on each side of the receptacle 11 and has an inturned flange 17 at each end riveted or otherwise connected electrically and mechanically to the corresponding contacts 15 on the same side of the receptacle at each end thereof. Binding screws 18 are threaded through threaded openings 19 in the plate 16 and have slotted screw heads 21 positioned in recesses 22 formed in the face 23 of the bottom section 13 of insulating material. Each threaded opening 19 may be reinforced with a threaded collar 24 formed on or secured to the inner face of the plate 16, if desired.

In order to connect a lead wire to a given contact 15 without any preliminary shaping or bending, plate 16 has a plate or flange 25 spaced from the plate 16 and connected to it by a transverse connecting plate 26 bent laterally from this plate at the lower edge thereof. The spaced plates 16 and 25 are in planes substantially parallel to each other, and the plate 25 is so formed as to provide a wire clamping edge 27 on a level slightly below that of the screw opening 19. As shown in Figs. 4 and 5, the clamping edge 27 is notched, preferably with a V-shaped notch 28, to adapt it to clamp conductor wires of different gauge, as hereafter explained.

The transverse connecting plate 26 which is shown as located at the back or bottom of the receptacle 11 has an opening 29 through which the stripped end 31 of a conductor lead or wire 32 can be inserted, the insulating bottom cover 14 having a corresponding opening 33 concentric with the opening 29 for this purpose. Assuming the binding screw 18 is retracted so as not to extend across the axis of the opening 29, when the stripped end 31 of a conductor 32 is inserted through the aligned openings 29, 33, it will be located opposite the end 34 of the retracted clamping or binding screw 18. By then screwing the latter inwardly the end 34 of the screw, which is relatively blunt, engages the side of the stripped end of the conductor and bends the conductor toward the wall 25 of the angle plate and into engagement with the clamping edge 27 thereof, the V-shaped notch 28 accommodating wires of different gauge. The threads of the screw bite or cut into the wire to increase the grip on the wire and provide a better electrical connection. In order to prevent the rotation of the screw, as it is threaded into the clamp and engages the wire, from causing the wire to be displaced laterally to the side and thus prevented from being properly bent to engage the V notch, the angle plate 16 is formed with a third or guide wall 35 which is so positioned adjacent the wire as, if necessary, to engage the wire on the side toward which rotation of the screw 18 would tend to displace it, to thereby prevent such displacement and guide the wire into the clamping notch under the advancing movement of the binding screw 18.

In operation, no preliminary looping or shaping of the conductor lead 32 is required, the end 31 thereof merely being stripped of insulation and inserted through the aligned openings 29, 33 to position it between the blunt end 34 of the retracted screw 18 and the clamping edge 27, as indicated in dotted lines Fig. 4. Subsequent screwing in of the screw bends the stripped conductor end 31 into engagement with and clamps it against the edge 27, the V notch 28 accommodating the clamp to different diameters of wire.

In the illustrated outlet receptacle 11, the two receptacle contacts 25 at an end of the receptacle will be connected to separate wires 32 and 32a, as best shown in Fig. 3, forming the two sides of the circuit. A mounting bridge 38 extends longitudinally of the receptacle 11 and has ears 39 for securing the receptacle to any suitable supporting surface.

The invention can be variously modified and adapted within the scope of the appended claims.

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

1. An electric fixture having a body of insulating material formed with a recess opening at the back and side of said body, an electric contact in said body, a wire clamp electrically connected to said contact member mounted in said recess and including an angle plate having one wall at the back of said recess and formed with an opening adapted to receive the stripped end of a conductor wire, a second wall at substantially right angles to the first wall and located at one side of said recess, and a third wall substantially parallel to the second wall and located on the opposite side of said opening from this wall so that the opening is located between the second and third walls, said third wall being provided with a wire clamping edge, and a binding screw

threaded through said second wall above the first wall to engage one side of the stripped end of a conductor wire projecting into said recess through said opening to bend said wire laterally and clamp it against said clamping edge.

2. An electric fixture having a body of insulating material formed with a recess opening at the back and side of said body, an electric contact in said body, a wire clamp electrically connected to said contact member mounted in said recess and including an angle plate having one wall at the back of said recess and formed with an opening adapted to receive the stripped end of a conductor wire, a second wall at substantially right angles to the first wall and located at one side of said recess, and a third wall at substantially right angles to the first wall and located on the opposite side of the opening from the second wall, said third wall having a wire receiving V-shaped notch in the edge thereof opposite said second wall, and a binding screw threaded through said second wall above the first wall to engage one side of the stripped end of a conductor wire projecting into said recess through said opening to bend said wire laterally and clamp it in engagement with said V-notch.

3. An electric fixture having a body of insulating material formed with a recess opening at the back and side of said body, an electric contact in said body, a wire clamp electrically connected to said contact member mounted in said recess and including an angle plate having one wall at the back of said recess and formed with an opening adapted to receive the stripped end of a conductor wire, a second wall at substantially right angles to the first wall and located at one side of said recess, and a third wall forming a wire clamping edge, located at the opposite side of said opening from the second wall, a binding screw threaded through said second wall above the first wall to engage one side of the stripped end of a conductor wire projecting into said recess through said opening to bend said wire in a direction longitudinally of the screw and clamp it against said clamping edge, and a guide wall located at one side of the screw to prevent lateral displacement of said wire when engaged by said screw whereby to guide the bent end of said wire against said clamping edge.

4. An electric fixture having a body of insulating material formed with a recess opening at the back and side of said body, an electric contact in said body, a wire clamp electrically connected to said contact member mounted in said recess and including an angle plate having one wall at the back of said recess and formed with an opening adapted to receive the stripped end of a conductor wire, a second wall extending at an angle to the first wall and located at one side of said recess, and a third wall formed with a wire clamping edge located at the opposite side of said opening from the second wall, and a binding screw threaded through said second wall above the first wall to engage one side of the stripped end of a conductor wire projecting into said recess through said opening to bend said wire in a direction longitudinally of the screw and clamp it against said clamping edge, and a guard member located at one side of the screw for guiding the stripped end of said wire into engagement with said clamping edge as it is bent by operation of said screw.

5. The combination in an electrical device having an electrical contact, of means for connecting a wire to said contact comprising spaced sub-

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stantially parallel plates electrically connected to said contact, one of said plates having a clamping edge, means for positioning a conductor wire between said plates with its axis substantially parallel to the planes of said plates comprising a third plate extending between and connecting the first two plates and provided with an opening for the conductor wire leading to the space between said plates, and a clamping screw threaded through the second of said plates into said space for movement transverse to said wire to engage one side of and bend said wire toward said clamping edge and clamp the bent portion against said edge.

6. The combination in an electrical device having an electrical contact, of means for connecting a wire to said contact comprising spaced substantially parallel plates electrically connected to said contact, one of said plates having a clamping edge positioned substantially opposite a threaded opening in the other plate, a third plate extending between and connecting the first plates provided with an opening leading to the space

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between said plates for positioning a conductor wire between said plates with its axis substantially parallel to the planes of said plates, and a clamping member comprising a binding screw threaded through said threaded opening into said space for movement toward and from said clamping edge to engage one side of and bend said wire toward said clamping edge and then clamp the bent portion of the wire against said edge.

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