June 23, 1942. H. HUBBELL ET AL 2,287,035

SOLDERLESS CONNECTOR

Filed Jan. 7, 1941

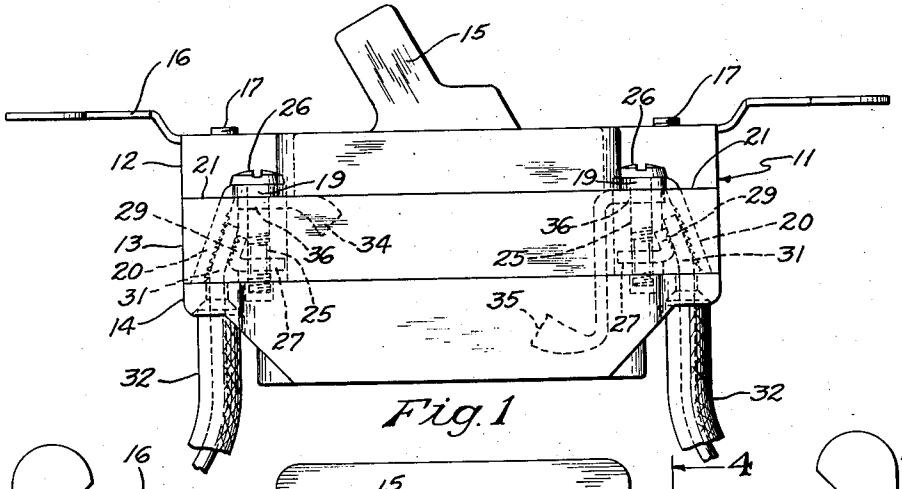


Fig. 1

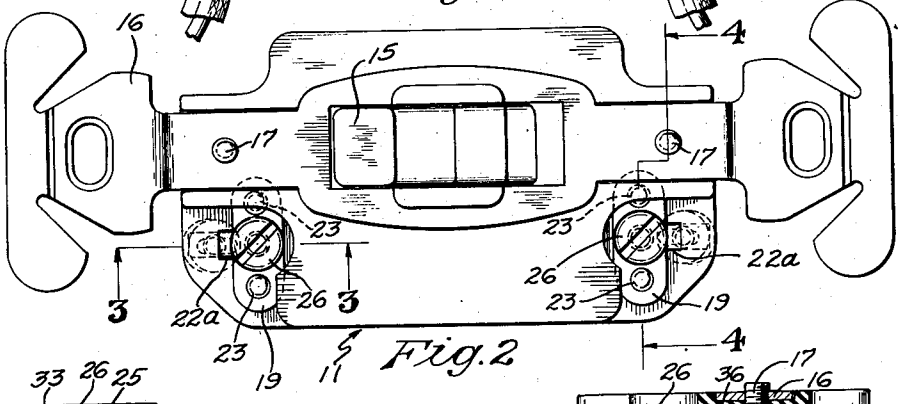


Fig. 2

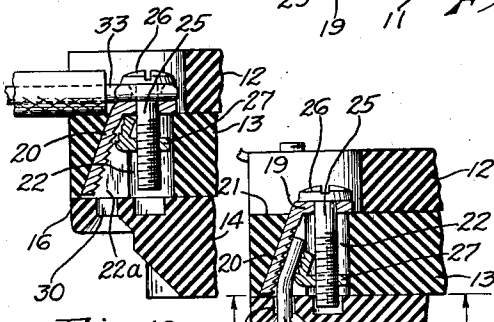


Fig. 10

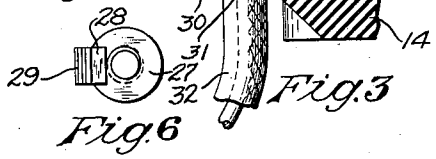


Fig. 6

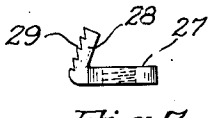


Fig. 7



Fig. 3

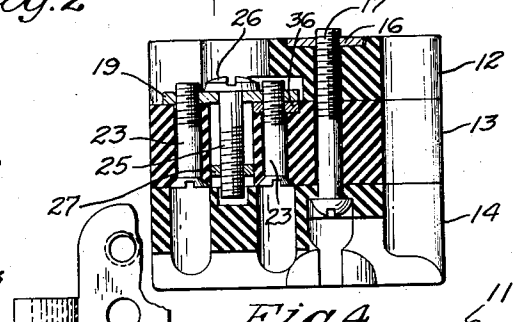


Fig. 4

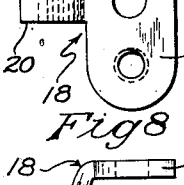


Fig. 8

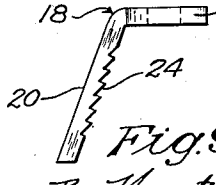


Fig. 9

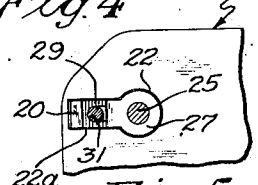


Fig. 5

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## SOLDERLESS CONNECTOR

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Application January 7, 1941, Serial No. 373,438

6 Claims. (Cl. 173—259)

This invention relates to electrical fittings, and more particularly to a solderless connector for connecting lead wires to such fittings and the electrical contacts therein.

It has for an object to provide an improved connector by means of which the lead wire may be connected without the necessity of soldering or wrapping the wire around the binding screw, but in which however the wire may be connected, if desired, in the conventional manner of wrapping it around the screw and clamping.

It is also an object of the invention to provide a construction in which the wire may be inserted from the bottom or back of the fitting and clamped or connected thereto by manipulation of the clamping device from the front.

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

In this drawing:

Fig. 1 is a side elevation of an electrical fitting with our improved connector applied thereto;

Fig. 2 is a top plan or front elevation thereof;

Fig. 3 is a detailed section substantially on line 3—3 of Fig. 2 showing the wire connected in the new way when inserted from the back;

Fig. 4 is a transverse section substantially on line 4—4 of Fig. 2;

Fig. 5 is a section substantially on line 5—5 of Fig. 3;

Fig. 6 is a top plan view of the movable clamping member;

Fig. 7 is a side view thereof;

Fig. 8 is a top plan view of the stationary member;

Fig. 9 is a side elevation thereof; and

Fig. 10 is a section similar to Fig. 3 but showing a lead wire connected in the conventional manner.

The device is shown as applied to a toggle switch comprising a body 11 of insulating material, which may be in one or more sections. The particular body shown comprises three sections 12, 13 and 14 in which the switch mechanism is mounted. No attempt has been made to illustrate any particular switch mechanism as it forms no part of the present invention. The switch is operated by the toggle handle 15 and is mounted in the usual wall outlet box by means of the bridge 16 secured to the front of the body 11 by the screws 17 passing through the sections of the body from the rear and threaded into the bridge 16. These screws therefore not only secure the sections together, but also secure the bridge to the body.

Our improved connector comprises a securing member 18 including a base 19 and a gripping portion 20. The insulating body 11 has forwardly facing shoulders 21 from each of which leads a recess 22. This member 18 is mounted with the base 19 on the shoulder 21, and may be secured thereto by any suitable means such as screws 23 passing through the body. Other securing means such as rivets anchored in the material of the body may be employed if desired. When so mounted the gripping portion 20 extends rearwardly into the recess 22 as shown, and the inner surface of this gripping portion may be roughened or provided with teeth 24 to more securely grip the lead wire. It is also preferably inclined laterally away from the binding screw 25 as shown. This mounting screw is mounted on the base 19 and passes therethrough into the recess 22 with its head 26 at the front side of the base 19 where it is exposed and accessible for operation from the front of the device.

A second clamping member 27 is threaded on the screw 25 within the recess and has a laterally extending gripping portion or finger 28 also preferably inclined relative to the screw as shown, and roughened on its outer surface or provided with teeth 29 to more effectively grip the wire. The recess 22 has a laterally extending portion 22a into which the gripping portions 20 and 28 extend and which is of substantially the width of these portions so that the sides of this portion of the recess cooperate with the portion 28 to guide it as the screw is manipulated so that clamping member 27 will not turn with the screws.

The rear section or rear wall 16 has an opening 30 therethrough leading to the section 22 and in alignment with the clamping portions 20 and 28 so that on insertion of the bared end of a lead wire 31 this opening will guide the lead wire to the proper position between the clamping portions 20 and 28 as shown in Figs. 1 and 3, and then on manipulation of the screw 25 from the front of the device the clamping member 27 is drawn forwardly in a direction longitudinally of the lead wire and effectively grips and clamps this wire between the portions 20 and 28. This action not only grips the wire firmly so that there is no danger of it becoming loose or detached but it makes a very effective electrical connection, and as the clamping member 27 moves forwardly it tends to draw the wire inwardly and bring the insulation 32 tightly up against the entrance to the opening 30. It will thus be seen that a very effective connection is made without the use of solder or requiring the wrapping of the wire around the screw. The operations are very simple ones merely requiring insertion of the wire from the back or rear of the fitting and then clamping it from the front by manipulation of the screw from the front.

This makes much easier wiring, and the connection may be made quickly. There is also some saving of wire, which is an advantage on a large job requiring a large number of fittings.

However should it be desirable to connect the wire in the conventional manner by wrapping it around the screw this can be done. This is an advantage in cases where the electrician may not be familiar with the new method of wiring from the back or where it may not be desirable to break or cut the wires in a wall box, but it is preferred that they be continued right on through without cutting. In this case the insulation may be removed from a portion of the wire without cutting the wire and then the bared portion wrapped around the screw **25** under the head and clamped in the usual manner. The use of this device for wiring in the usual manner is shown in Fig. 10. In making this connection the screw is retracted or shifted forwardly to carry its head **26** away from the base **19**. Then the exposed end of the wire **33** is wrapped around the screw under the head and then clamped against the base **19** by tightening up the screw.

The clamping device may be connected by any suitable means with the switch contacts, conventional contacts being shown at **34** and **35** having base portions **36** clamped under the base **19** by one of the screws **23** so as to give electrical connection between the connector and the contacts.

This makes a very simple and effective connector which may be easily and quickly operated to secure the wire. As indicated the wire may be connected by insertion from the back of the device and clamped by manipulation from the front. Furthermore if desired the wire may be connected in the conventional manner.

Having thus set forth the nature of our invention what we claim is:

1. In an electric fitting, a body of insulating material having a shoulder facing forwardly and a recess extending into the body from said shoulder, a securing member having a base mounted on the said shoulder and a gripping portion extending therefrom into the recess, a gripping member by the side of and adapted to cooperate with said gripping portion to grip a lead wire between them, and a binding screw mounted in said base having a head located for manipulation at the outer side of said base, and said screw being connected with said gripping member to shift it longitudinally of the wire to grip it between said members.

2. In an electric fitting, a body of insulating material having a recess therein and a shoulder at the entrance to said recess, a securing member having a base mounted on the shoulder and a gripping portion extending therefrom into the recess, means for fastening said base to the body, a binding screw mounted on said base and extending into the recess, a gripping member threaded on the screw in the recess and adapted to cooperate with said gripping portion to grip a lead wire between them, said body including a rear wall over the recess having an opening leading thereto for insertion of a lead wire between the two gripping elements, and said gripping member being operated by the screw to bind the lead against the said gripping portion.

3. In an electric fitting, a body of insulating material having a recess therein and a forwardly facing shoulder at the entrance to said recess, a securing member having a base mounted on the shoulder and a gripping portion extending into said recess, a binding screw mounted on said base and extending into the recess and having a head exposed for manipulation from the front of the body and for insertion of a lead wire from one side thereof between the head and base, a gripping member threaded on the screw in the recess and adapted to cooperate with said gripping portion on manipulation of the screw to grip between them a lead wire inserted from the back of the fitting, and said screw being capable of having its head backed away from said base portion and clamping a wire wrapped around said screw under the head against said base portion.

4. In an electric fitting, a body of insulating material having a shoulder facing forwardly and a recess leading backwardly from said shoulder, a securing member having a base mounted on said shoulder and a gripping portion extending into the recess, means for securing said base to the body, a binding screw mounted on said base portion and extending into the recess, said screw having a head exposed for operation from the front of the body, and a gripping member in the recess threaded on the screw and adapted on manipulation of the screw to cooperate with said clamping portion to clamp a lead wire inserted from the rear of the body.

5. In an electric fitting, a body of insulating material having a shoulder facing forwardly and a recess leading backwardly from said shoulder, a securing member having a base mounted on said shoulder and a gripping portion extending into the recess, a binding screw mounted on said base portion and extending into the recess, said screw having a head exposed for manipulation from the front of the body and also accessible from the side for insertion of a lead wire between the head and base to be clamped against the base, a gripping member threaded on the screw in the recess and guided by the walls of the recess against turning with the screw, said body having a back wall having an opening leading to said recess to guide a wire inserted through said opening to a position between said gripping elements, and said gripping member being operable by the screw to clamp the lead wire against the said clamping portion.

6. In an electric fitting, a body of insulating material, means for attaching a lead wire comprising a binding screw having a head exposed for manipulation from the front of the body and means for mounting the screw, said head being also accessible from the side of the body for insertion of a lead wire between the head and said means, said screw being capable of being backed away from the mounting to permit clamping of a wire wrapped around the screw under the head against said means, and clamping means to the rear of the mounting and operable by the screw to clamp a wire inserted from the back of the body.

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