April 3, 1934. H. A. DOUGLAS 1,953,594

CONTACT CARRIER

Filed June 13, 1932

Fig. 1

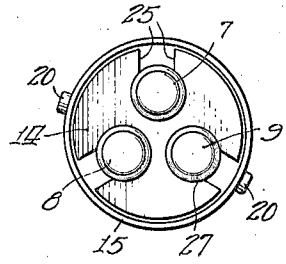


Fig. 2

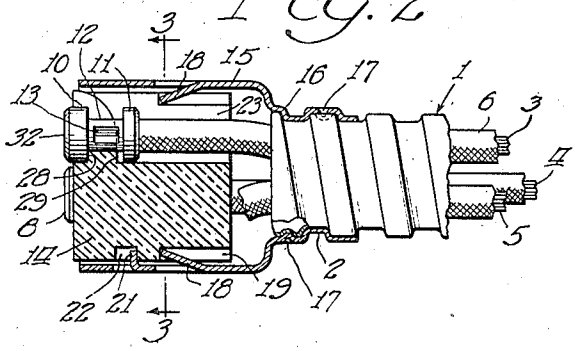


Fig. 3

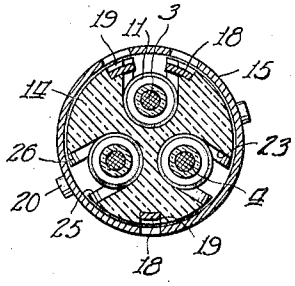


Fig. 4

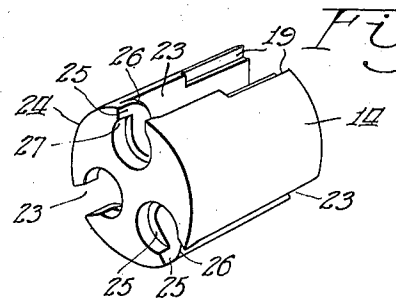


Fig. 5

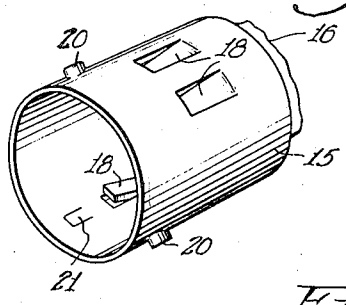


Fig. 7

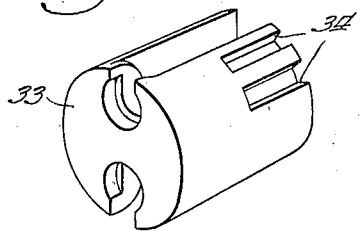
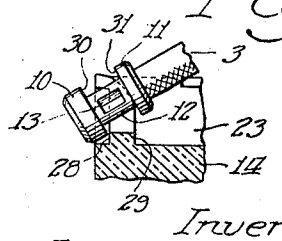


Fig. 6



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UNITED STATES PATENT OFFICE

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CONTACT CARRIER

Harry A. Douglas, Bronson, Mich.

Application June 13, 1932, Serial No. 616,843

7 Claims. (Cl. 173—328)

This invention relates to contact carriers and is an improvement upon the disclosure of my copending application, Serial No. 574,271, filed November 11, 1931.

Among other objects it aims to provide an improved insulating contact carrier having means for engaging a contact member or conductor and preventing accidental removal of the contact member or conductor from the carrier.

The invention is of particular utility as a contact carrier for the terminal plug of a conductor conduit, whereby the wires passing through the conduit may have permanently affixed to their terminations contact members which may engage the contact carrier in the form of an insulating cylindrical block carried within the plug shell, a plurality of the wires and contact members being received in grooves in the block by a rotative movement which guards against displacement of the contacts either longitudinally or transversely of the block and at the same time definitely insulates the wires and contact members transversely of the block, both from each other and from the plug shell.

A more detailed explanation will be given in conjunction with the accompanying drawing, in which—

Figure 1 is an end view of a structure embodying my invention taken from the left hand side of Figure 2;

Figure 2 is a longitudinal section of the structure of Figure 1;

Figure 3 is a cross-section taken on the line 3—3 of Figure 2;

Figure 4 is a perspective view of a contact carrier embodying my invention and employed in the embodiments of Figures 1, 2 and 3;

Figure 5 is a perspective view of a plug shell in which the carrier may be received as shown in Figures 1, 2 and 3;

Figure 6 is a fragmentary longitudinal section showing the manner of assembly of the carrier and the contact; and

Figure 7 is a perspective view of a modified form of carrier embodying my invention.

Referring in detail to the figures of the drawing, I have shown a wire enclosing conduit such as the flexible metallic conduit 1 which may be made of intermeshing helically wound members forming the internal ribs 2, of well-known construction, throughout its length. The conduit 1 provides in the usual manner an armor for one or more current conductors, in this instance the three current conductors represented by the insulated wires 3, 4 and 5 having the usual insulation 6 thereon. A metallic contact member is provided for the termination of each of the wires 3, 4 and 5 such as the contact members 7, 8 and 9 which form continuations of the conductors 3, 4 and 5, respectively.

In accordance with my present invention, each of the contact members 7, 8 and 9 embodies in this instance a metal cylinder having the annular flanged portions 10 and 11 at each end and an intermediate reduced portion 12 which may be indented as at 13 to swedge the contact member to the wire in accordance with the disclosure of my copending application, Serial No. 602,912 filed April 4, 1932. As an alternative, of course, the contact member could be soldered to the wire. The flanged portions 10 and 11 thus constitute longitudinally spaced apart shoulders on the contact.

Each of the wires, with the contact member secured to its terminal as described, is carried by the insulating carrier block 14 which may be formed of molded phenolic condensation material, for example and which, in this instance, is cylindrical to be snugly received in the metallic plug shell 15. The shell 15 may have a tail portion 16 which is internally threaded to screw upon the ribs 2 of the conductor 1. When so interconnected, the shell and conduit are secured in fixed relation by a prick punch indentation 17 in the tail 16 passing into one of the ribs 2.

The insulating carrier block 14 and shell 15 may be secured in fixed rotative relation by tongues 18 struck inwardly from the body of the shell and received in suitable grooves 19 in the insulating block, these grooves 19, however, permitting longitudinal movement of the block and shell in one direction so as to facilitate assembly. The shell 15 has the laterally extending bayonet pins 20 thereon and to insure that the block 14 shall be received in the shell 15 in but one rotative position, I have shown three of the tongues 18 and corresponding grooves 19 asymmetrically located in the block and shell. Also one of these tongues may be narrower than the other two in order to further assure correct rotative assembly of the block and shell and thus predetermine the respective positions of the contact members 7, 8 and 9 with respect to the bayonet pins 20. When the rotative position of the block and shell have been thus fixed, removal af the block longitudinally of the shell may be guarded against by another tongue 21 struck inwardly into the pocket 22 of the block.

In accordance with my present invention each of the wires 3, 4 and 5 with the contact members 7,

8 and 9 permanently secured thereto, respectively, are received within the periphery of the block 14 in such a way that accidental removal or displacement of the conductors from the block is prevented. To accomplish this result, I provide for each conductor a groove 23 running longitudinally of the block 14 and this groove is open to the periphery 24 of the block so that the conductor may be inserted laterally into the groove. If this were a direct lateral movement, however, the conductor might easily be displaced form the groove and cause a short circuit with the sheil 15 and accordingly I provide in this instance a transverse rib 25 in the groove. The rib 25 is here shown continued around the groove to form an open collar having its outer ends curved or turned on an axis transverse to the groove as at 26 thus providing an overhanging shoulder 27 and the longitudinally spaced apart shoulders 28 and 29. By a relative rotative movement of the contact member, as indicated in Figure 6, the rib 25 enters the space between the shoulders 30 and 31 formed between the reduced portion 12 of the contact and the flanged portions 10 and 11. The distance between the shoulders 30 and 31 is desirably less than the overall longitudinal extent of the rib 25 including the overhanging shoulder 27. The curved surface 26 of the rib 25 thus acts as a cam which draws the forward flanged portion 10 of the contact member under the overhanging shoulder 27, this shoulder 27 being thus disposed between the contact member and the periphery of the block secures the contact member and its connected wire within the periphery against movement laterally of the block. At the same time the longitudinally related shoulders 28 and 29 in the groove formed by the rib 25 provide abutments for the cooperating shoulders 30 and 31 of the contact member formed by the flanged portions 10 and 11 and guard against displacement or removal of the contact member and its connected wire longitudinally of the block.

The forward shoulder 28 desirably abuts the forward shoulder 30 so as to maintain the contact member projecting slightly beyond the block 14 to constitute the forward end of the contact member a contact surface as indicated at 32.

As shown in Figures 1 to 4 inclusive, the parts are adapted to include three conductors and contact members each having a contact surface 32 disposed in predetermined positions rotatively of the block 14 and each of the conductors being insulated from the other and from the shell 15.

In Figure 7 I have shown a modified form of block 33 generally similar to the block 14, but providing for the reception of two conductors instead of three. By suitable arrangement of the grooves 34 on the block 33 either the block 14 or the block 33 may be assembled with the shell 15.

Having described an embodiment of my invention, I claim:

1. The combination with an electrical conductor having longitudinally spaced apart shoulders thereon; of an insulating block; a groove in said block for receiving the conductor by a relative lateral movement of the block and conductor; shoulders in the groove for longitudinal abutment with the shoulders on the conductor; and a shoulder in the groove for abutting the conductor laterally.

2. The combination with a current conducting wire; of a contact member permanently secured to the termination of the wires, said contact member having longitudinally spaced apart shoulders thereon; an insulating block; a longitudinally directed laterally open groove in said block receiving the wire and contact by a relative rotative movement of the block and wire; and shoulders in the groove for both longitudinal and lateral abutment with the shoulders on the contact upon completion of said movement.

3. The combination with a current conducting wire; of a contact member secured to the termination of the wire, said contact member having longitudinally spaced apart shoulders thereon; an insulating block; a longitudinally directed laterally open groove in said block receiving the wire and contact within the periphery of the block by a relative lateral movement of the block and wire; longitudinally spaced apart shoulders in the groove for longitudinal abutment with the shoulders on the contact; and a shoulder overhanging one of the shoulders in the groove between the contact member and the periphery of the block for lateral abutment with the contact member upon slight relatively longitudinal movement of the block and contact member.

4. The combination with a current conducting wire; of a contact member secured to the termination of the wire, said member having flanged portions at each end and a reduced portion intermediate said flanged portions; an insulating block; a longitudinally directed groove in said block for receiving the wire and contact member within the periphery of the block; and a rib in said groove curved on an axis transverse to the groove, said rib by a relative rotative movement of the contact member entering the space between the flanged portions of the contact member to provide shoulders for abutment therewith to limit the movement of the contact member and wire longitudinally and overhanging one of the flanged portions between the contact and the periphery of the block to secure the contact member within the periphery against lateral displacement.

5. The structure of claim 4 wherein the rib overhangs the flanged portion at the forward end of the contact member and said flanged portion abuts the rib to be held in position projecting slightly beyond the insulating block to constitute a contact.

6. The structure of claim 4 wherein the rib is continued around the groove to form an open collar and wherein the rib overhangs the flanged portion at the forward end of the contact member and said flanged portion abuts the rib to be held in position projecting slightly beyond the insulating block to constitute a contact.

7. The structure of claim 4 wherein there are a plurality of longitudinally directed grooves in the insulating block receiving a plurality of parallel wires and contact members insulated transversely of the block.

HARRY A. DOUGLAS.