

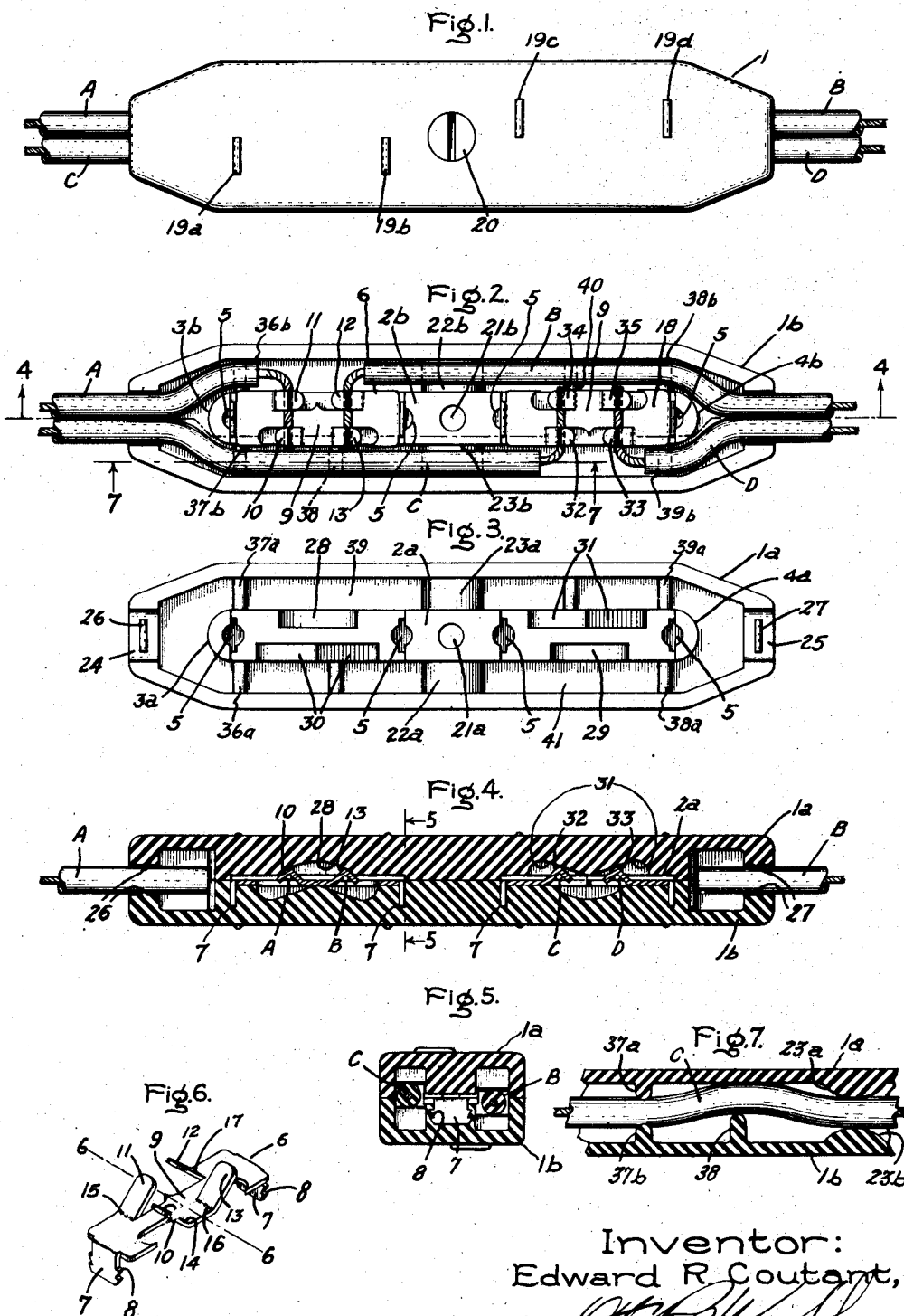
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TWO WIRE ELECTRICAL CONNECTOR

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TWO WIRE ELECTRICAL CONNECTOR

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This invention relates to an electrical connector, and more particularly to a connector of the type known as a "through connector" for joining electric wires.

It is an object of this invention to provide a convenient and effective connector for electric wire or cable splicing which is simple in construction and of low manufacturing cost.

The above and other objects of the invention and the manner of carrying out the same will be understood from a consideration of the following description and the accompanying drawing wherein:

Fig. 1 is a plan view of the assembled unit with wires secured therein;

Fig. 2 is a plan view with wires secured and the top half of the housing removed;

Fig. 3 is an elevation of one of the two identical housing halves showing the internal structure;

Fig. 4 is a longitudinal section of the assembled unit taken on line 4-4 of Fig. 2;

Fig. 5 is a cross-section taken on line 5-5 of Fig. 4;

Fig. 6 is a perspective of one of the identical wire connecting elements; and Fig. 7 is a longitudinal section of a portion of the assembled unit taken on line 7-7 of Fig. 2.

This invention in general covers a wire connector comprising one or more connecting elements and a housing for the same.

Referring to Fig. 1, I have provided a shallow, elongated hollow housing 1 of suitable insulating material formed of two identical halves, as shown in Figs. 2 and 3, which I shall call 1a and 1b. Each half of the housing 1 has recesses and projections which will be fully described later in conjunction with their functions.

The housing half 1a has a projection 2a, which, as shown in Fig. 3, is centrally located, runs longitudinally in the housing, has straight longitudinal sides, rounded ends 3a and 4a, and keyhole recesses 5.

In housing half 1b, I have provided an identical projection 2b similarly located and having rounded ends 3b and 4b and keyhole recesses 5 spaced to receive the mounting ends of two identical wire connecting elements 6 and 18. The wire connecting element 6 is shown in detail in Fig. 6. It comprises a sheet metal strip, the ends 7 of which are bent at right angles and formed with teeth 8. The main body 9 of the connecting element 6 has two pairs of adjacent tongues 10 and 11, and 12 and 13. The tongues of each pair project from the surface of the strip

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and are lanced out of the strip along opposite sides thereof and face in opposite directions. The adjacent tongues 10 and 11 of the body 9 are bent upwardly clockwise and counterclockwise respectively, forming bends 14 and 15. The adjacent tongues 12 and 13 of the body 9 are likewise bent upwardly clockwise and counterclockwise respectively, forming bends 17 and 16. The tongues 10, 11, 12 and 13 are so lanced from the body 9 that the bends 16 and 14 are equidistant from the transverse center line 6-6 of the body 9, as are the bends 17 and 15. However, the bends 17 and 15 are at a greater distance from this center line than are the bends 16 and 14. The reason for this will be explained later. An identical wire connector 18 which appears in Fig. 2 is also provided.

These two identical wire connecting elements 6 and 18 are mounted on projection 2b of housing 1b as shown in Fig. 2, the recesses 5 in housing half 1b being spaced to receive the mounting ends 7 of the wire connecting elements 6 and 18. The mounting ends 7 are forced into the recesses 5 so that the teeth 8 grip the inner surfaces of the recesses and secure the connecting elements in position as shown in Fig. 5. Recesses 5 in the other half 1a of the housing are not used.

The housing half 1b is now ready to receive the wires A, B, C, and D, which are to be connected, as shown in Fig. 2. To facilitate the operation of removing the insulation from the wire ends, I have provided a gauge on the outer surface of the housing halves 1a and 1b. This gauge is in the form of four projections 19a, 19b, 19c, and 19d. In preparing the wires, the distance of projections 19a from the left end of the housing serves as a guide for the cutting and skinning of wire A. The distance of projection 19b from the right end of the housing serves as a guide for the cutting and skinning of wire B, etc.

Now having the ends of the wires prepared, they are then bent at a right angle to lie under the tongues as shown in Fig. 2. The end of wire A is placed under tongues 10 and 11 of element 6. The end of wire B is placed under tongues 12 and 13. Wires C and D are similarly connected to the other wire connecting element 18. The tongues are then bent down over the wire ends (or such a bend may be performed in the tongues during manufacture) to hold each stripped wire end between the under surface of the tongues and body 9 of the wire connecting element as shown in Figs. 2 and 4. As so secured, a longitudinal pull on one of the wires will cause a wedging action on each side of the end of

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the wire under the tongues which will increase with increasing strain on the wire.

Having the wires in place in the lower half 1b of the housing 1, the upper half 1a is secured to the lower half by means of a bolt 20 or the like passing through apertures 21a and 21b in the housing halves 1a and 1b and secured by a nut or other suitable means.

It will be noted in Fig. 2 that the wires A and C entering from the left divide at the rounded end 3b of the projection 2b and lie positioned on either side of that projection. Similarly, the wires B and D entering from the right divide at the rounded end 4b of the projection 2b and lie positioned on either side of that projection. Thus, the projections 2a and 2b of the housing halves 1a and 1b, when secured together, serve to separate and position the incoming wires A, B, C, and D.

My connector is provided with a number of strain relief features. Figs. 2 and 3 show arched end recesses 24 and 25 at both ends of the molded halves 1a and 1b. In the recesses 24 transverse projections 23 grip the insulation of the pair of wires AC, and in the recesses 25 projections 27 grip the pair of wires BD when the two housing halves are assembled. At the end of the housing adjacent recess 24 projections 36a and 37a in housing half 1a cooperate with projections 36b and 37b in housing half 1b to grip the insulation of wires A and C; and, likewise, at the end of the housing adjacent recess 25 similarly disposed projections 38a and 38b, and 39a and 39b, serve to grip the insulation of wires B and D respectively. Thus strain relief is provided within the housing of all four wires A, B, C, and D.

I have also provided additional strain relief for the longer wires B and C. Projections 22a and 22b in the moulded halves 1a and 1b grip the insulation of wire B when the upper half 1a of the housing is secured over the wires and projections 23a and 23b in the molded halves 1a and 1b grip the insulation of wire C in the same manner. As shown in Figs. 2 and 3 and more particularly in Fig. 7 a projection 38 approximately midway between projections 37b and 23b in the housing half 1b, which projection is higher than either in the latter projections, forces wire C into recess 39 of housing half 1a when the two housing halves are assembled thus putting a bend in wire C which provides further strain relief for that wire. Similarly, projection 40 located between projections 22b and 38b in housing half 1b acts in a similar manner on wire B forcing it into recess 41 of housing half 1a. Thus in addition to the strain relief provided at and adjacent to the ends of the housing 1 for all four wires, additional strain relief is provided within the housing for each of the longer wires B and C.

As shown in Figs. 3 and 4, I have also provided arch-shaped recesses 28 and 29 in the projections 2a and 2b of the housing halves 1a and 1b. In addition, there are recesses 30 and 31 which in longitudinal section are half heart shaped. The function of these recesses is best explained by reference to Fig. 4 wherein it will be seen that the curved surface of the recess 28 presses against the tongues 10 and 13, providing better electrical contact and aiding in securing the wires A and B under those tongues. The surface of recess 31 presses against tongues 32 and 33 to provide the same effect for wires C and D. Recess 30 serves a similar function with respect to tongues 11 and 12, and recess 29 with respect to tongues 34 and 35.

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It will be noted that the recesses 28 and 29 are shaped differently from recesses 30 and 31. The reason for this is that the arched recesses 28 and 29 are respectively used in conjunction with tongues 10 and 13 of wire connecting element 6 and the similarly disposed tongues 34 and 35 of connecting element 18. The arched surfaces of recesses 28 and 29 not only bear down upon those tongues but also press inwardly on the ends of the tongues and toward the transverse center line 6-6 to keep the tongue ends bent as shown in Fig. 4 and thus to better secure a wire which may be placed under them.

On the other hand, the recesses 30 and 31 are used in conjunction with tongues 11 and 12, and 32 and 33 respectively, and are shaped as shown in Fig. 4, not only to provide a downward force on those tongues, but also to press outwardly with respect to transverse center line 6-6 so as to keep the ends of those tongues bent down as shown in Fig. 4, and thus better to secure a wire which may be placed under them.

As an example of size, a wire connector as shown in Fig. 1 and described herein used with #14 or #18 wire preferably has housing halves each about 2 3/4" long by 5/8" wide, by 1 1/8" deep; that is, approximately one-half the size shown in the drawing.

From the above, it may be seen that I have provided a small, compact, wire connector employing in addition to a screw and nut, only two different parts readily manufactured at low cost. The molded housing not only provides strain relief for longitudinal strain on the wires, but also serves to insure good electrical contact between the wire connecting elements and the stripped ends of the wires. Further, by arrangement of the tongues of the wire connectors as described, my connector exerts increasing wedging action on the ends of the wires with increasing strain on the wires as an aid in preventing separation of the wires from the connecting elements.

Although the foregoing description is necessarily of a detailed character, in order to completely set forth the invention, it is to be understood that the specific terminology is not intended to be restrictive or confining, and it is to be further understood that various re-arrangements of parts and modification of structural detail may be resorted to without departing from the scope or spirit of the invention herein claimed.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electric wire connector including a shallow elongated hollow housing formed of recessed upper and lower halves of insulation material and having an opening at both ends, each adapted to receive a pair of wires having bared ends, each half of said housing having elongated projections in said recesses centrally located and longitudinally disposed therein dividing each housing half into two parallel longitudinally disposed recesses, one on each side of said projection; adapted to accommodate in each longitudinal recess two wires, one from each of said pairs of wires, a pair of metallic connecting elements mounted upon and secured to said projection in said lower housing half, each adjacent to an opposite end thereof, each of said connecting elements being adapted for securing thereto the two wires to be positioned in one of said longitudinal recesses, and each of said elements comprising a metal strip having two pairs of tongues longitudinally lanced along opposite edges, one

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pair of tongues being adjacent said one longitudinal recess which is associated with that connecting element and being inwardly directed with respect to said openings and toward each other, the other pair of tongues being adjacent the other of said recesses being outwardly directed with respect to said openings and away from each other, and said pairs of tongues being positioned adjacent each other transversely in said housing, whereby the bared ends of each of said pairs of wires to be accommodated in a particular one of said longitudinal recesses may be bent at right angles to the longitudinal axis of said housing to be inserted each between particular transversely adjacent tongues of its associated connecting element and the body of said element to be electrically connected thereby and secured thereto.

2. An electric wire connector according to claim 1, provided with recesses in said projection of the upper housing half, said recesses having an inclined surface positioned opposite said tongues and adapted to bear upon said tongues and keep the ends of said tongues bent toward the lower housing half and over a bared wire end which may be secured thereunder, whereby electrical contact and a secure mechanical connection resistant to a longitudinal tension on said

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wires is made between said bared wire end and said wire connecting element, and recesses in said projection of the lower housing half, said recesses having an inclined surface positioned opposite said tongues adapted to accommodate the tongue ends when said ends are forced toward the lower housing half, and means for securing said housing halves together.

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