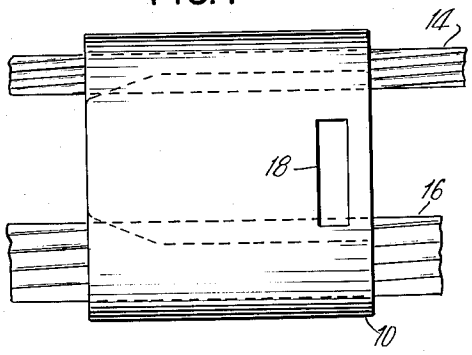
Nov. 20, 1962 I. F. MATTHYSSE ETAL 3,065,449

CONNECTOR

Filed April 30, 1958

FIG. 1



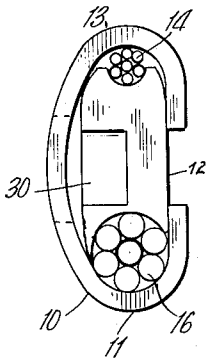


FIG. 2

FIG. 3

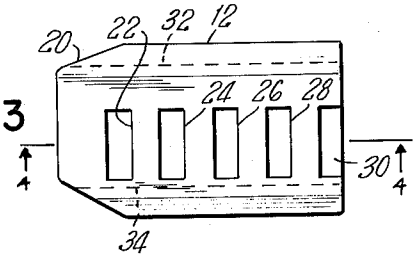


FIG. 4

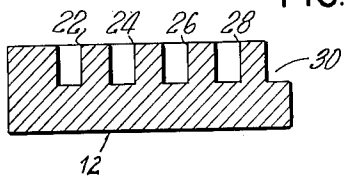


FIG. 5

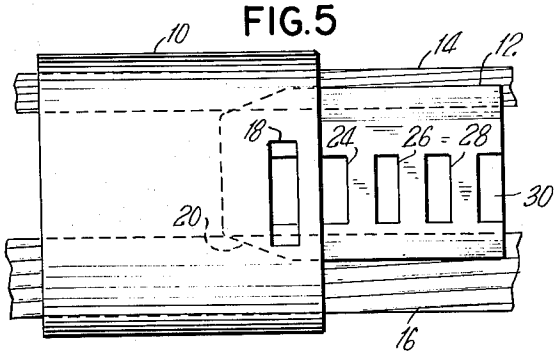


FIG. 7

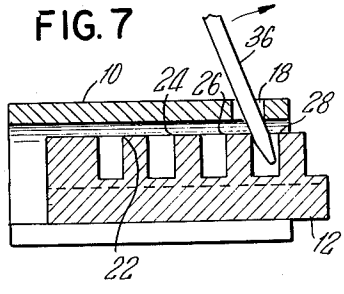
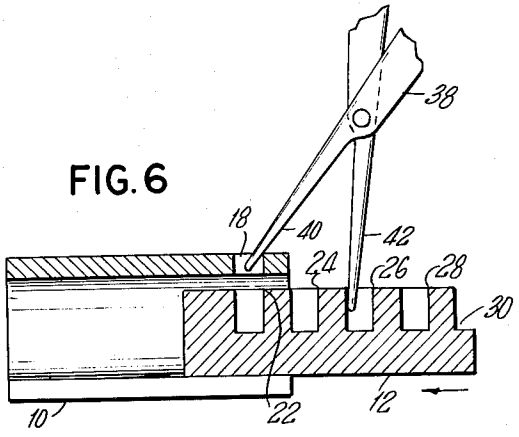


FIG. 6



INVENTORS.
IRVING F. MATTHYSSE
EDWARD S. RAILA
BY
Ernest Fanwick
ATTORNEY

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3,065,449

CONNECTOR

Irving F. Matthysse, Stamford, and Edward S. Raila, Norwalk, Conn., assignors to Burndy Corporation, a corporation of New York

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1 Claim. (Cl. 339—247)

This invention relates to connectors, and more particularly, to electrical connectors of the solderless type in which two or more lines or conductors are mechanically and electrically joined.

This invention eliminates the need for screws, bolts, wedges or compression tools in assembling the connection. Such devices employed by the prior art connectors have proven to be unsatisfactory due to their mechanical instability or inconvenience of their application.

The prior art discloses a connector having a clamping member including a base portion and two side portions adapted to receive a pair of conductors therebetween and an insert having parallel sides which is adapted to be guided along and between the conductors so that when forced into final position, it presses the conductors against the side portions of the clamping member.

While this connector eliminated the need for solder, bolts and wedges, it has never been widely adopted because in order to obtain the necessary clamping force, this prior art connector required that the insert be forced into the clamping member. No means were provided to assist in the forcing of this insert into position.

The connector of my invention utilizes a connector frame having resilient characteristics and having a pair of side walls extending from a base. A pair of conductors are disposed between the side walls and an insert member is positioned between the conductors by applying a force between the outer surface of the clamping member and a cooperating discontinuity on the face of the insert. This force may be applied with any of the usual tools, such as pliers or screwdrivers, and the forces applied cause the insert to move into its intended location between the conductors, clamping the conductors against the side walls of the clamping member.

One of the objects of my invention, therefore, is to provide a solderless connector adapted to joining a plurality of lines together without the use of special tools or special joining members.

Another object of my invention is to provide a connector in which an insert member is forced between a pair of conductors to tightly clamp the conductors to the side walls of a clamping member by applying successively a force between the clamping member and longitudinally positioned cooperating discontinuities on the insert member.

Still another object of my invention is to provide a connector which has an opening against which a force may be asserted to move an insert member into position within the connector.

These and other objects and features of my invention will become more apparent from reading the description below in conjunction with the drawing in which:

FIG. 1 is a plan view of a connector of my invention attached to a pair of conductors;

FIG. 2 is an end view of the connector shown in FIG. 1;

FIG. 3 is a plan view of the insert member for use in my invention;

FIG. 4 is a sectional view taken along the lines 4—4 of FIG. 3;

FIG. 5 is a plan view of the connector of my invention prior to installation;

FIG. 6 is a sectional view of the connector of my invention being installed with the use of a pair of pliers; and

FIG. 7 is a sectional view of the connector of my invention being installed with the aid of a screwdriver.

Referring to FIGS. 1–4 of the drawing, a connector in accordance with the principles of my invention is herein shown comprising a clamping member **10** of a generally flattened U-shaped configuration but having a slightly arcuate base from which a pair of semi-circular arms or side walls **11** and **13** extend. The side walls **11** and **13** are adapted to receive conductors **14** and **16** therebetween. The clamping member **10** is composed of a conductive metal having resilient characteristics so that when the arms **11** and **13** are distorted, they have a tendency to return to their original shape and position. One such metal which I have found satisfactory for use in the clamping member of my invention is TN245 alloy sold by Aluminum Company of America as described on page 817 in the Metals Handbook of the American Society for Metals, 1948 edition.

Associated with the clamping member **10** is an insert element **12**. The insert element **12** may, if desired, have a slightly tapered front edge **20** leading back to parallel sides. The parallel sides may be channeled and be arcuate in shape so that the conductors **14** and **16** are seated properly between the side walls of insert **12** and the arms **11** and **13** of the clamping member. The insert **12** has a series of discontinuities **22**, **24**, **26**, **28** and **30** on its surface. These discontinuities may either be depressions or elevations on the base surface.

In use, one of the conductors **14** and **16**, which may be of different sizes if so desired, may be a run and the other a tap, and they are located within the nest formed by the arms **11** and **13** of the channels of the clamping member **10**. The small end **20** of the connector insert member **12** is inserted between the cables and slipped along their length. The clamping member **10** and the width of the insert **12** is so designed that when the cable and insert member are inserted between the arms **11** and **13**, they cause the arms to be forced open, and because of their resiliency and their tendency to return to their original configuration, they tightly clamp the conductors **14** and **16** against the insert **12**. Alternately, of course, the insert element **12** may be formed in the shape of a wedge and tapered along its entire length. Such a configuration would not place an even clamping force along the entire length of the connector but is satisfactory in many uses.

In order to slip the insert member **12** between the conductors **14** and **16**, the clamping member **10** may be provided with a discontinuity **18** in its outer surface. This discontinuity may take the form of an elevation, a depression or a hole in the surface. If the discontinuity **18** comprises an elevation or a hole, a pair of pliers **38** may apply a force from its jaw members **40** and **42** between one wall of the discontinuity **18** and one wall of the discontinuities **22**, **24**, **26**, **28** and **30** of the insert member **12**. It is apparent that the jaw **42**, when it is closed, may be reopened and moved to the next discontinuity of the insert member, thus causing progressive movement of the insert between the conductors.

Alternately, as shown in FIG. 7, when the discontinuity in the clamping member **10** comprises a hole, a screwdriver **36** may be inserted into the hole and use one wall thereof as a fulcrum for a lever which, when rotated clockwise, forces the insert member **12** to the left or into clamping position.

It is, of course, obvious that the insert member **12** may have a single discontinuity and the clamping member have a plurality of holes therein so that the screwdriver may be inserted in the first hole of the clamping member and force the discontinuity of the insert member **12** along the

longitudinal axis of the clamping member until the screwdriver can be inserted into the next successive hole and continue the successive positioning of the insert member.

We have thus described our invention, but we desire it understood that it is not confined to the particular forms or uses shown and described, the same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of our invention, and, therefore, we claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claim, and by means of which, objects of our invention are attained and new results accomplished, as it is obvious that the particular embodiments herein shown and described are only some of the many that can be employed to attain these objects and accomplish these results.

We claim:

A connector for a plurality of elongated conductors comprising: a clamping member of generally flattened U-shaped configuration having an arcuate base, composed of a conductive resilient metal and including a pair of semi-circular side walls; an elongated nonresilient insert adapted for rectilinear disposition into said clamping member between said side walls to resiliently grip said elongated conductors between said insert and said semi-circular side walls; means to receive the application of a force couple including a discontinuity on the outer surface of said clamping member providing a first force couple bearing surface and a plurality of discontinuities on a surface of said insert, each providing a second force couple bearing surface opposed to said first surface; said insert member including sides which are parallel for at least a part of their length and form a wedge for at least a part of the length of said insert member, said wedge portion including at least one of said discontinuities to permit said insert to be manually inserted into said clamping member to align, for said force couple receiving cooperation, said clamping member discontinuity and at least said insert discontinuity included on said wedge portion.

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