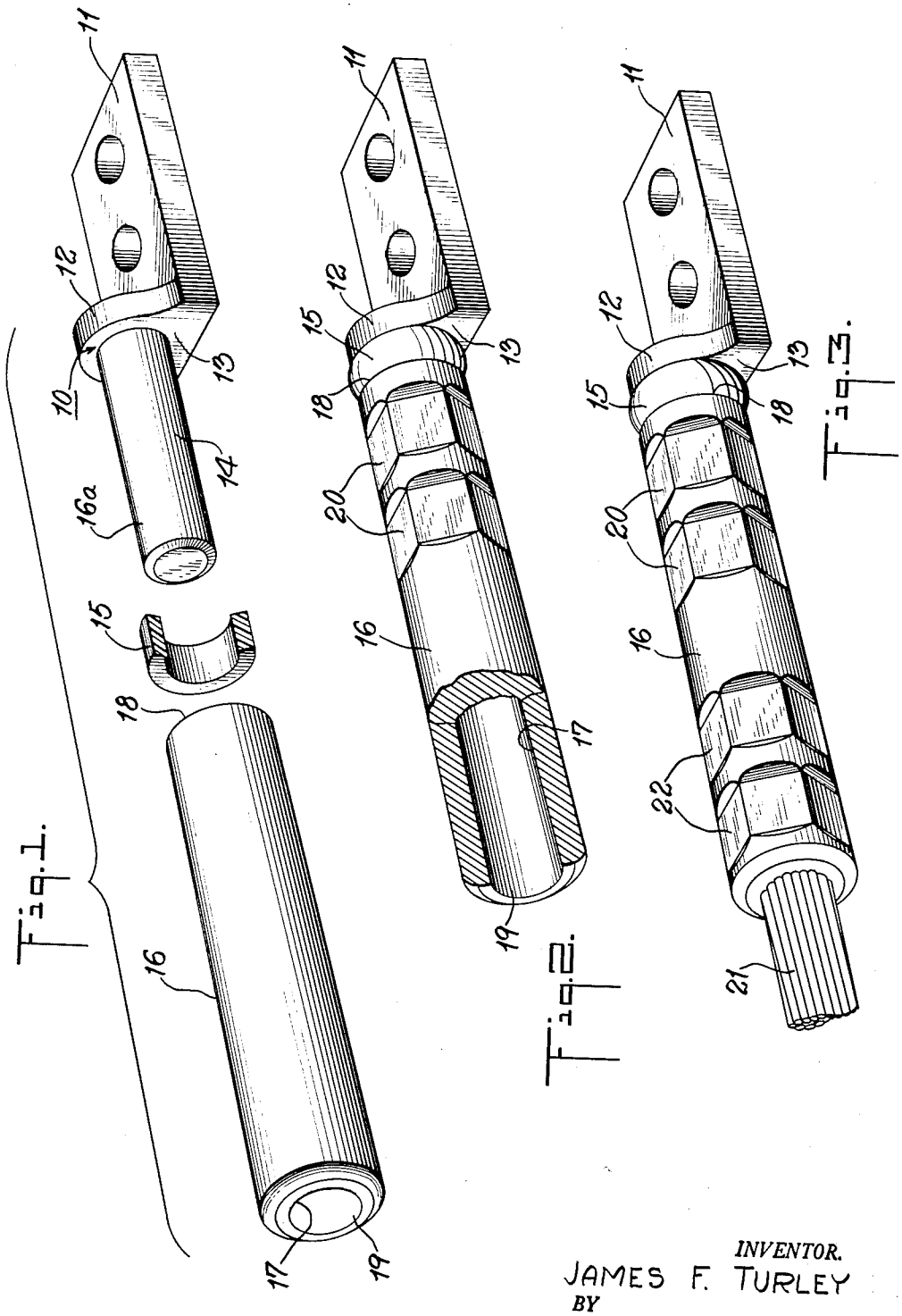
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COPPER ALUMINUM CONNECTOR

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COPPER ALUMINUM CONNECTOR

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The invention relates to connectors of the type where conductors of dissimilar metals are mechanically and electrically connected.

As is well known in this art such connectors are very apt to deteriorate, particularly at the joint between the metals, due to electrolytic reactions between the dissimilar metals when exposed to the atmosphere.

Attempts have been made in the art of securing together conductors of dissimilar metals to provide means for defeating access of air to the joint therebetween. Such sealing performed in situ must be done carefully in order to attain the proper sealing effect and at the same time to attain the desired mechanical and electrical connection between the conductors.

The primary object of the invention is to provide a prefabricated fitting as a factory produced article of manufacture and wherein the conductors are assembled accurately in preset relation with the seal therebetween already in proper sealing position.

Another object of the invention is to provide a fitting in which the dissimilar conductors with a sealing connection therebetween, all completely assembled as a unit, is also provided with means whereby either or both conductors may be secured to another conductor.

Various other objects and advantages of the invention will be in part obvious from an inspection of the accompanying drawings and in part will be more fully set forth in the following particular description of one form of connector embodying the invention, and the invention also consists in certain new and novel features of construction and combination of parts hereinafter set forth and claimed.

In the accompanying drawings:

Fig. 1 is an exploded view of the component parts of a preferred embodiment of the invention;

Fig. 2 is a showing in perspective of the parts of Fig. 1 assembled to form an article of manufacture constituting a preferred embodiment of the invention; and

Fig. 3 is a similar view of the article assembled with a cable forming a continuation of the sleeve.

In the drawing and referring first to Fig. 1, there is disclosed a one-piece conductor **10**. The conductor **10** considered as a whole constitutes one of the two conductors of dissimilar metals which make up the novel fitting herein featured.

In the form illustrated the conductor **10** is formed of copper and comprises a perforated tang portion **11** provided at one end with an upstanding flange **12**, the outer face **13** of which forms a flat-faced stop. Projecting from the flange is a solid metal stud **14** extending lengthwise and rigidly from the tang and centered on the stop. The root end of the stud is integral with the flange **12** and the exposed stop face **13** forms an annular shoulder extending in a plane at right angles to the axis of the stud.

A gasket **15** of ring-like form has a freely sliding fit on the stud and has its opposing sides flat and parallel to each other with one side fashioned to have a snug fit

with the stop face **13** when pressed manually into engagement therewith.

The gasket is formed of an insulating material preferably of a rubber-like material and capable of being compressed at least axially. In the instant case the gasket is formed of a plastic material, for instance, neoprene.

The stud is dimensioned lengthwise to have a length materially longer than the thickness of the gasket to provide an outer end portion **16a** which projects beyond the gasket in the complete assembly.

A tubular sleeve **16** of malleable metal has a bore **17** extending axially therethrough and is dimensioned to have a freely sliding fit on the end portion **16a** of the stud. The sleeve is formed of aluminum and the sleeve per se or the sleeve with an extension therefrom as a cable of the same material, as hereinafter described, constitutes the coacting conductor of dissimilar metal which makes up the fitting of dissimilar metals herein featured. The sleeve has a flat end face **18** extending in a plane at right angles to its axis and designed to have a snug engagement with the adjacent flat face of the gasket as the sleeve is forced manually into engagement with the gasket.

The sleeve in the device illustrated has a length substantially twice that of the end portion of the stud beyond the gasket, so that the outer end of its bore provides a hollow cable-forming socket **19**.

In forming the fitting at the factory the gasket is slid on the stud until it bears on the stop, and the sleeve is slid on the stud until it bears on the gasket. The end portion of the sleeve which encircles the stud is then deformed by indentations **20**, of which two are shown in Figs. 2 and 3. In this way the sleeve at the end nearest the gasket is permanently crimped onto the stud in such way that air is extruded from the joint formed between the stud and the sleeve at its inner end.

Another action takes place by virtue of the crimping operation. The metal at the crimped end of the sleeve as it is compressed tends to spread axially. As it spreads towards the gasket it squeezes the gasket between the stop face **13** and the adjacent end of the sleeve. This has the effect of forming the gasket as an air and gas seal to prevent moist air and deleterious gases from reaching the joint formed by the aluminum sleeve and the copper stud. In this way electrolytic action at the joint is eliminated more or less completely.

It is understood that while it is within the scope of the disclosure to form the indentations **20** by any conventional crimping tool, the illustrated disclosure being factory made has its indentations formed mechanically by squeezing the tube between power operated dies, in this case to form the indentations **20** of hexagonal form.

While the stud is shown solid, it is obviously possible to have it as a hollow tube and it need not even be rigid. It is simply necessary that the stud be provided with a stop between which and the adjacent end of the sleeve a compressible seal may be squeezed.

While the disclosure has been described thus far as if the sleeve alone is the aluminum element of the assembly, it is possible to provide the aluminum element as made up of the sleeve plus a separate extension such as the cable **21**, which may be secured to the sleeve following any suitable fastening means.

In the device illustrated an end of the cable **21** is inserted into the socket **19** preferably with its inner end in slightly spaced relation to the end of the stud. The outer end of the sleeve **16** is then deformed into a firm electric bonding engagement with the cable by indentations **22**, as was done to form the indentations **20**. In this

way the sleeve is permanently secured to the cable in such way that pull-apart possibility is eliminated.

The crimping at 22 tends to displace any residual air from the bore of the sleeve and acts subsequently to defeat entrance of environmental air or gases into the bore from the outer end of the assembly, so that in effect both ends of the sleeve are sealed.

While the invention has been described particularly with reference to aluminum and copper as the dissimilar metals, it is understood that the invention is equally applicable to any two metals which are apt to develop an electrolytic action between the same in the presence of environmental air or other gases.

As the article disclosed in Fig. 2 is factory produced it is marketed in the form illustrated and with the gasket set with that degree of squeeze pressure which has been determined by the manufacturer as being exactly right to obtain the optimum results, particularly in so far as defeating air and gas leakage to the metal joint is concerned. It is thus possible for even the unskilled operator to attach a cable to the fitting thus prepared simply by following conventional practices in securing a sleeve to a cable.

I claim:

1. A permanently fabricated new article of manufacture, comprising in combination, a connector lug of highly conductive metal having a flat, rectangular tang portion provided with an end wall normal thereto, a cylindrical stud integral with said end wall and extending in a direction opposite said tang portion, a resilient annular gasket fitted on said stud in abutting engagement with said end wall, and a compression sleeve of ductile conductive metal having an outer diameter substantially equal to that of said gasket and a length greater than that of said stud, partly telescoped on said stud with one end face thereof in abutting engagement with said gasket, said compression sleeve being crimped annularly adjacent its gasket abutting end face and in a region surrounding the free end portion of said stud to permanently secure said sleeve thereon whereby the telescoped portion of said sleeve is substantially elongated axially and said gasket thereby compressed into sealing engagement with said end wall and the abutting end face of said sleeve, the remaining portion of said sleeve being adapted to receive a cable end portion therein with said remaining sleeve portion crimped annularly thereon.

2. A permanently fabricated new article of manufacture, comprising in combination, a copper connector lug having a flat, rectangular tang portion with an end flange normal thereto, a solid cylindrical stud integral with said flange and extending in a direction opposite said tang portion in a plane laterally offset therefrom, a resilient annular gasket fitted on said stud in abutting engagement with said end flange, and an aluminum compression sleeve having an outer diameter substantially equal to that of said gasket and a length twice that of said stud partly telescoped on said stud with one end face thereof in abutting engagement with said gasket, said sleeve being crimped annularly adjacent its gasket abutting end face and in a region surrounding the free end portion of said stud to permanently secure said sleeve thereon whereby the telescoped portion of said sleeve is substantially elongated axially and said gasket thereby compressed into sealing engagement with said end flange and the abutting end face of said sleeve, the remaining portion of said sleeve being adapted to receive a cable end portion therein with said remaining sleeve portion crimped annularly thereon.

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