Dec. 11, 1962 E. C. CROWTHER 3,068,445

ELECTRICAL CONNECTOR

Filed Sept. 21, 1959

Fig. 1

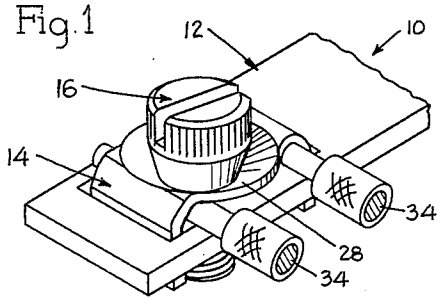
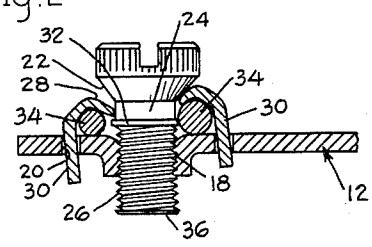


Fig. 2



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United States Patent Office 3,068,445 Patented Dec. 11, 1962

3,068,445

ELECTRICAL CONNECTOR

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Filed Sept. 21, 1959, Ser. No. 841,212
1 Claim. (Cl. 339—246)

This invention relates to an electrical connector. More specifically, it relates to an electrical connector wherein a device of the type commonly known in the art as a "bus bar" is mechanically formed so that, when used in combination with other elements, it will accept lead wires or secondary conductors and removably retain same in direct contact with the material of the bus bar.

Heretofore, metallic connectors employed for electrically connecting primary conductors of current, such as bus bars, with the secondary wire conducting means have been complex in nature. Undue resistance to the passage of electrical current between the source and the end conductor is often present in such connectors. In addition, their complexities have provided inherent problems to the persons making the initial assembly, as well as those who were called upon to utilize the connector in repair work.

It is a primary object of this invention to provide an improved electrical connector which may be partially formed from the basic conductor or bus bar. It is a further object of this invention to provide a connector which has improved electrical conductivity properties. Still another object of this invention is to provide an electrical connector which is simple in operation and economical to manufacture.

Further objects of this invention will become apparent to those skilled in the art when the specification is read in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective view of an embodiment of this invention; and

FIG. 2 is a partial sectional view taken along the longitudinal axis of the embodiment shown in FIG. 1 and illustrating the use of the connector when the secondary conducting wires accommodated in the connector are of dissimilar diameters.

Referring now to the drawings, a connector **10** includes a base **12**, a clamp **14** and a rotary threaded fastener or operator **16**. The base **12** is an electrically conductive member and can be a member of substantial cross-section of the type generally known in the trade as a bus bar.

The embodiment disclosed in FIGS. 1 and 2 provides base **12** with a threaded aperture **18**, which may take any suitable form, in the present instance a drawn cup which is internally threaded is provided to insure adequate thread engagement with the operator **16**. Spaced apart along the longitudinal axis of the base **12** on opposite sides of aperture **18** are a pair of transverse slots **20**.

Telescopically associated with threaded aperture **18** is the rotary threaded fastener or screw **16**. Screw **16** has suitable driving means such as a slot or knurls on its head and in this embodiment of the invention is provided with a conical clamping face on the under surface of said head. The shank of the screw has an unthreaded portion **24** of considerable extent adjacent the clamping surface **22** and a threaded portion **26** extending to the free extremity of the screw.

Rotatably assembled to the screw **16** is the clamp **14**. In the present instance, the clamp **14** includes a centrally apertured dished or conical central section **28** with the concave side thereof facing the conical clamping surface **22** of the screw **16**. A pair of arms **30** extend outwardly and downwardly from opposite sides of the central section **28** and are adapted to be accommodated within the slots **20**. The material from which the clamp **14** and its arms **30** are formed is preferably of a thickness substantially less than the width of the slots **20** for purposes

best set forth hereinafter. To rotatably assemble the screw **16** with clamp **14** suitable means known to the art such as an annular rib or shoulder **32** is provided at the junction of the unthreaded shank portion **24** and the threaded shank portion **26**. Shoulder **32** is greater in diameter than the aperture in the clamp **14** whereby upon retrograde movement of the screw **16** relative to the base **12**, the rib **32** comes into contact with the convex side of central portion **28** and moves the clamp **14** upwardly away from the base **12**. In the operation of this device, one or more wires **34** can be inserted in the passageway formed between the base **12**, the leg **30**, the central portion **28**, and the screw **16**.

In the event that two wires of equal diameter are not utilized the connector is adapted to compensate either for two wires of differing diameters or to the use of a single wire with the connector and bus bar. To accomplish this, the included angle of the conical clamping surface **22**, when taken in section, is less than the included angle of the conical surafce **28** whereby the clamp **14** is free to cant as best seen in FIG. 2 where wires having dissimilar diameters are utilized. The variation in thickness of the clamp material relative to the width of the slots **20** permits limited angular movement of the arm **30** within said slots **20** as shown in FIG. 2. As a safety precaution, so that the clamp **14** cannot be completely removed from the base **12**, the last thread at the free extremity of screw **16** can be distorted as indicated at **36** by peening the end of the screw or by other suitable means.

The device is extremely simple to operate since the clamp means can be jacked away from the bus bar by mere rotation of the operator or screw whereby the personnel installing the wires do not have to physically manipulate the connector in any fashion other than by rotation of the screw. The device is economical to manufacture since it can be made from stamped parts and is ideally suited for use in close, tight quarters.

While modifications or embodiments of this invention will be apparent to those skilled in the art, it is not intended that it should be limited in any fashion except by the appended claim.

I claim:

An electrical connector including a base portion formed from one end of the parent material of a bus bar, a rotary screw threaded fastener, a screw threaded aperture in said base portion for telescopically accepting said rotary screw threaded fastener, clamping means rotatably assembled with said rotary screw threaded fastener and adapted to overlie one face of said base portion, a pair of transversely extending slots in said base means positioned in spaced relation on opposite sides of said threaded aperture, said clamping means being strap-like and substantially uniform in width throughout its length and including a body portion overlying said one face of said base portion, said body having a medially apertured dished central portion with the concave side facing upwardly and the convex side facing said one face of the base portion, a pair of arms extending outwardly and thence downwardly from said dished portion and adapted to be telescopically accepted in said two slots, said rotary threaded fastener being a screw provided with a conical clamping surface under its head and an unthreaded shank portion adjacent said head, said conical clamping surface being adapted to be seated in the concave side of the dished portion when the shank is telescopically accepted within the medial aperture, said concave side having a greater apical angle than the apical angle of the conical clamping surface under the screw head, means on said screw shank in the vicinity of the unthreaded shank portion and its juncture with the threaded portion of said

shank adapted to accomplish permanent rotatable assembly of said clamping means on said screw, the aperture in said clamping means being larger in diameter than the unthreaded shank portion of said screw, said slots in said base portion being greater in lateral extent than the thickness of material in said depending arms of said clamp means whereby the introduction of wires of dissimilar diameters under the opposed outwardly extending portions of said arms will result in a canting of said clamp means to compensate for said difference in diameters, but will assure positive clamping relative to said base means, the convex side of said central dished portion extending downwardly into the clamping region to cause the convex side to impinge upon said wires to be clamped whereby said clamping means is centrally reinforced by the dished portion and said wires are forced laterally into engagement with the downwardly extending portion of said arms and said rotatable assembly of the screw to the clamp means facilitates jacking of the clamp means away from said base means upon retrograde movement of the screw

relative to said base, means adjacent the free extremity of the screw threaded portion of said screw for preventing removal of said screw from the threaded aperture in said base portion.

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