Dec. 21, 1937. W. A. HEINRICH 2,102,896

ELECTRICAL CONNECTER

Filed May 4, 1934

Fig. 1.

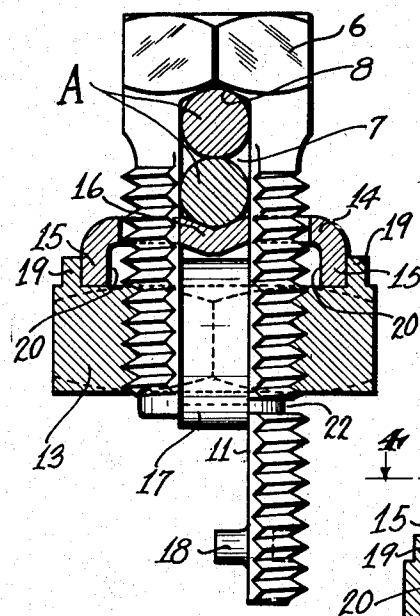



Fig. 2.

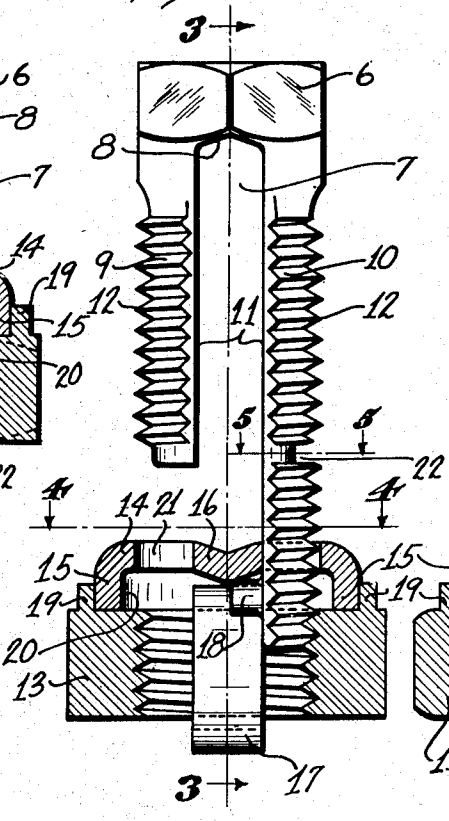



Fig. 3.

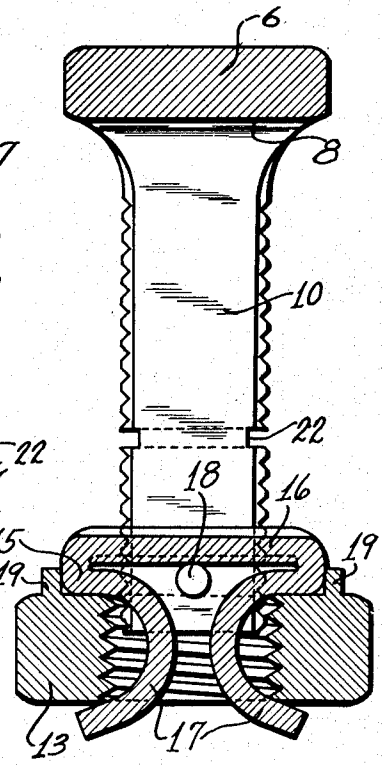



Fig. 4.

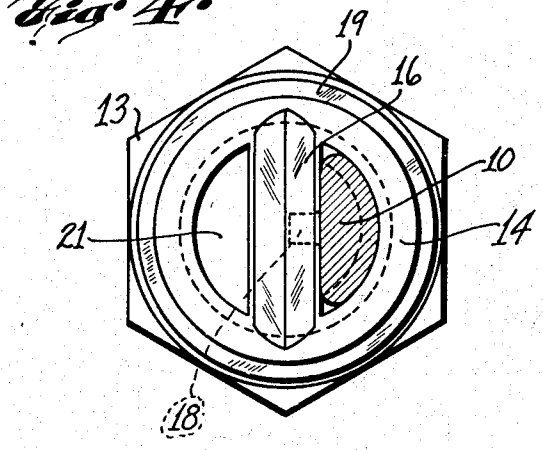
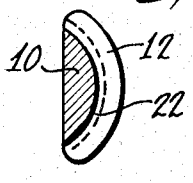



Fig. 5.




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## ELECTRICAL CONNECTER

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Application May 4, 1934, Serial No. 723,813

3 Claims. (Cl. 173—263)

This invention relates to electrical connecters, and more particularly to an improved connecter of split-bolt and nut type.

When applying electrical connecters of heretofore prevailing construction, the lineman was required to use both hands. Such connecters embody a bolt and a nut, and under ordinary conditions it is necessary that the nut be entirely removed from the threaded shank of the bolt prior to application of the device to an overhead or other line preparatory to making a connection. Accordingly when applying such devices it is customary for the lineman to manipulate the bolt portion with one hand, and the nut portion with the other, at least until proper threaded engagement is effected between these parts. When tapping a main, or feeder conductor, a connecter which may be applied thereto with the use of only one hand is highly desirable, since it leaves the other hand free to hold the tap, or lead-off wire.

An object of this invention is to provide an improved connecter having a minimum of individual parts all of which are inseparably connected together, and which connecter requires the use of but a single hand during the installation thereof.

More specifically an object of this invention is to provide a connecter of split-bolt and nut type which is adapted for lateral application to a pair or more of wires, while the nut remains in threaded engagement with the bolt.

A further object of the invention lies in the provision of a longitudinally slotted connecter bolt having threaded shanks of unequal length, the prolonged portion of the longer shank serving to carry the nut during the operation of positioning the device on a pair or more of conductors, and the provision of improved means for maintaining the nut in threaded engagement with the prolonged shank portion during such operation.

Other objects are directed toward unifying the connecter parts and facilitating the insulating of the device.

Other objects and advantages will hereafter appear. In the drawing, Fig. 1 is a side elevation of a presently preferred embodiment of the invention, shown in operative engagement with a pair of wires which appear in section; Fig. 2 is a side elevation of the device of Fig. 1, the parts of the device being shown disposed in positions preparatory to application; Fig. 3 is a sectional elevation taken at line 3—3 of Fig. 2; Fig. 4 is a sectional view taken at line 4—4 of Fig. 2, and Fig. 5 is a sectional view taken at line 5—5 of Fig. 2.

Referring now by characters of reference to the drawing, 6 designates the head portion of a bolt, the shank of which is provided with a longitudinal slot 7 terminating in a transverse groove or wire seat 8, at the under side of the bolt head. The slot 7 divides the bolt into laterally spaced shank portions 9 and 10 having flat parallel inner faces 11 and threaded outer surfaces 12. The shank portion 10 is of greater length than portion 9, as best appears from Figs. 1 and 2.

Threadedly engaging the bolt shank is a nut 13, which may be of hexagonal variety, such nut serving to clamp together a pair or more of conductors A, shown as extending transversely through the shank slot 7. The nut 13 carries a washer, or spacer element which, in the present example, embodies an annular rim 14, the outer margin 15 of which is turned at an angle to the plane of the rim whereby such marginal portion is adapted to bear edge-wise upon in the upper face of the nut, spacing the washer body away from the face of the nut. Extending diametrally across the rim 14 and transversely through the bolt slot is a bridge portion 16, of width equal to the width of the bolt slot. Such bridge portion is preferably grooved to seat a conductor. The washer element is provided with fingers 17 connected to the rim margin 15 near the ends of the bridge portion 16. Initially, these fingers project radially inwardly, (such portions of the fingers seating on the face of the nut as appears from Fig. 3), thence curve downwardly through the bore of the nut and terminate at the outer face of the nut. With the bridge portion 16, the fingers 17 serve to maintain the shanks 9 and 10 in normal spaced relation, preventing the shanks from collapsing, and thereby releasing the nut, when the latter element is drawn up tightly on the shank portions. In addition to the foregoing purpose the fingers maintain the nut and washer in permanently assembled relation, yet permit full rotation of the nut relative to the washer.

Disassociation of the washer element and bolt is prevented by a projection 18 on the inner face of the shank portion 10, the projection being adapted to engage the bridge 16 (Fig. 2), and thereby to limit the downward or withdrawal movement of the washer on the bolt. Since the washer and nut are held together by means of the fingers 17, removal of the nut 13 is likewise prevented. It will thus appear that the device is devoid of separable parts. In lieu of the boss or stud 18 for precluding removal of the washer,

and hence the nut, from the shank portion 10, the same result may be accomplished by providing a projection, or by distorting the threads, at the outer end of the shank portion. In such modifications, (not shown) the washer element would play no direct part in maintaining the nut and bolt in permanently assembled relation. The means illustrated, however, are preferred, since the nut, when in full open position relative to the bolt, (Fig. 2), is not required to be threadedly engaged for its entire length by the shank portion, as would be required by the modified arrangement. Accordingly, the length of the shank portion 10 may be kept to a minimum. More specifically, the nut-limiting expedient shown, as compared to the alternative methods, enables shortening of the shank portion 10 by a substantial fraction of the length of the nut.

In order to render the device a practical, so-called one-hand connecter, means are provided which serve to maintain the nut in threaded engagement with the extended or prolonged section of the shank portion 10 when the nut is free of the shank portion 9. Such means may appear in various forms and in the present example attain the desired result by preventing any substantial play, or lateral movement of the washer relative to the nut. This may be accomplished by the provision of an annular, upstanding flange 19 on the nut which is adapted snugly to receive the marginal, or skirt portion 15 of the washer. The shank portions 9 and 10 are adapted to fit the segmental openings 21, (Fig. 4), in the washer element with a minimum of play. Accordingly, when the nut and washer assembly is located on the prolongation of shank portion 10, the washer element serves to prevent lateral movement of the nut relative to the shank section, which would otherwise result in disengagement of the nut and shank threads. When the nut and washer assembly is carried by the single shank portion, it will appear that any substantial lateral play in the nut, even though insufficient to permit of total disengagement of the nut and shank threads, may allow the nut to assume an angular position relative to the axis of the bolt shank. Under such circumstances improper threaded engagement with the opposite shank portion will subsequently result, causing unintended locking of the nut on the shank. This undesirable condition is obviated in the present device.

In connecting a pair or more of wires with the device of my invention, the nut is threaded down on to the prolonged shank section to provide a sufficient opening between the end of shank portion 9 and the upper face of the washer, for the entrance of wires as best appears in Fig. 2. The wires may be inserted laterally through such opening. The nut is then turned up on the shank until the wires are tightly clamped between the bridge portion 16 of the washer and the grooved under surface of the bolt head, as shown in Fig. 1.

It will appear that the nut remains in threaded engagement with the bolt shank at all times. By grasping the nut, the device may be positioned on an overhead electric line and the nut turned up on the bolt, using but one hand for these operations, the line serving to hold the bolt portion of the device against rotation as the nut is being turned. The other hand of the lineman will be free for other purposes, such as, for example, the manipulation of a tap, or lead-off conductor.

In order to facilitate insulating, as by wrapping the device with insulating tape after a conection has been effected, the prolonged shank portion is adapted to be readily broken off, a groove 22 being formed in the shank portion 10 at a point opposite the end of shank 9, for the purpose of weakening the shank 10 at such point.

The invention has been described and illustrated with reference to a presently prefererd embodiment thereof. It is understood however that various modifications and alterations in the device herein shown may be effected without departing from the spirit and scope of the invention, which is defined by the following claims.

I claim:

1. In an electrical connecter, a body member including paired laterally spaced shanks, one of said shanks having a threaded continuation extending beyond the end of the other shank, a nut on said shanks, a washer carried by said nut, said washer having a diametral bridge overlying one end face of said nut, and paired fingers extending through the bore of said nut adapted to maintain said nut and washer in assembled relation, means on said nut for maintaining said nut and washer in coaxial relation, and means on said continuation, cooperable with said bridge for preventing removal of said nut and washer assembly from said body member.

2. In an electrical connecter, a bolt having a longitudinal slot in its shank, forming paired, laterally spaced portions adapted threadedly to receive a nut, a threaded continuation connected to one of said portions by a neck of reduced sectional area, a nut adapted for threaded association with said continuation, and with said paired shank portions, an arcuate shoulder on said nut, a washer maintained by said shoulder in concentric position relative to the nut, said washer having a diametral bridge extending transversely through said shank slot and paired fingers projecting into the bore of said nut adapted to maintain the nut and washer in assembled relation, and a projection on said continuation adapted to engage said bridge whereby to prevent removal of said nut and washer assembly from said body member.

3. In an electrical connecter, a body member including a pair of laterally spaced, screw-threaded shanks arranged with the screw-threads of each shank in continuation of the screw-threads of the other shank, one of said shanks having a screw-threaded continuation extended beyond the end of the other shank, a nut on said shanks, said nut being in screwthreaded engagement with both of said shanks when the connecter is in the wire-clamping position, said shank continuation being adapted to support the nut when said nut is free from the other shank, a washer associated with said nut in assembled relation, said washer having a diametral bridge portion which contacts with said shank continuation when the nut and washer assembly is supported thereby, means for maintaining said nut and washer in assembled relation, and means carried by said shank continuation and adapted to engage the diametral bridge portion of said washer for preventing removal of the assembled nut and washer from said body portion.

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