Jan. 8, 1929. 1,697,954

J. M. GRIBBIE

ELECTRICAL CONNECTER

Filed Oct. 10, 1925

Fig. 1.

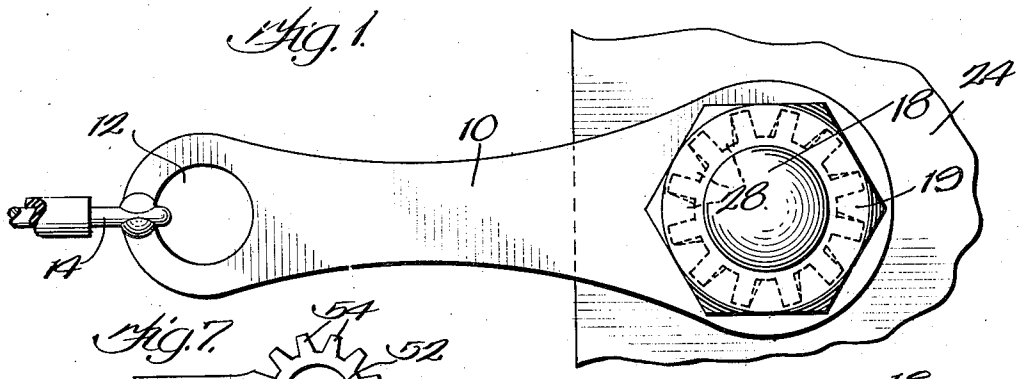


Fig. 7.

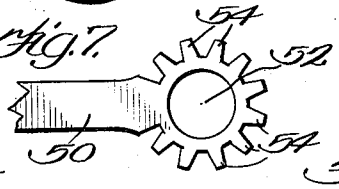


Fig. 2.

Fig. 5.

Fig. 3.

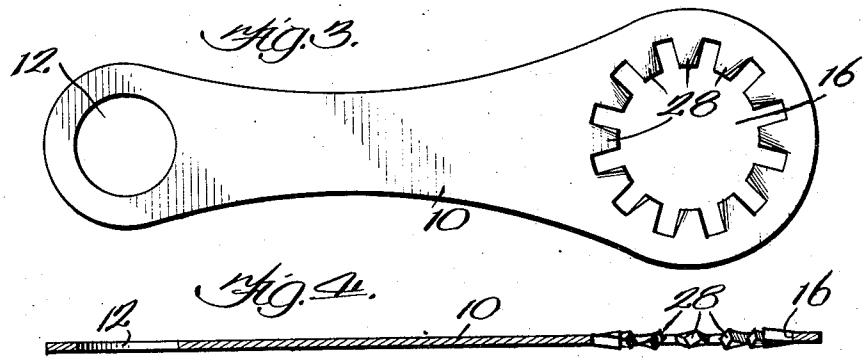
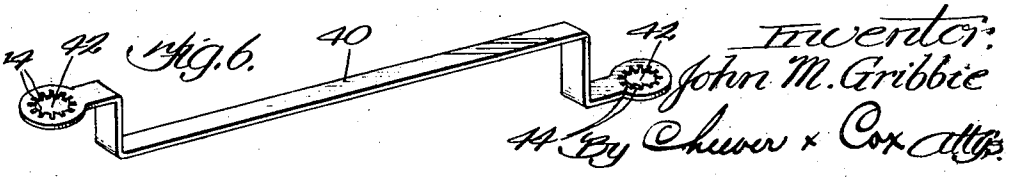


Fig. 4.

Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN M. GRIBBIE, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO SHAKEPROOF LOCK WASHER COMPANY, INCORPORATED, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

ELECTRICAL CONNECTER.

Application filed October 10, 1925. Serial No. 61,677.

My invention relates to electrical connecters including especially connecter lugs for radio and other forms of electrical apparatus. One object of the invention is to provide a device of this character, which will prevent the accidental backing off or loosening of the binding screw or nut with which it is associated. Another object is to provide means for improving the electrical contact between the connecter and the conducting element or elements with which it is to cooperate.

I obtain these objects by the construction illustrated in the accompanying drawings in which—

Figure 1 is an assembly face view showing one form of connecter attached at one end to a conductor and at the other to a binding post.

Figure 2 is an edge view of the parts shown in Figure 1.

Figure 3 is a face view, and Figure 4 is a longitudinal section view of the form of connecter illustrated in Figures 1 and 2.

Figure 5 is an edge view of the same type of connecter showing the same in the form of a soldering lug and showing it attached to a binding post by means of a screw instead of by means of a bolt and nut as in Figures 1 and 2.

Figure 6 is a perspective view of a double-ended connecter illustrating a form which may be used to special advantage in radio apparatus.

Figure 7 is a fragmentary view of the modified form of connecter in which the teeth extend radially outward instead of radially inward.

Like numerals denote like parts throughout the several views.

Referring first to the form of connecter shown in Figures 1, 2, 3 and 4, the device has a body 10 having at one end an aperture 12 to facilitate electric connection with an external conductor 14. At the other end is an aperture 16 for accommodating a bolt 18 or like object. In the illustrated case the bolt is provided with an ordinary nut 19. In the particular form used for explanatory purposes the stud or bolt is employed for connecting the connecter to an external conductor 20. For this purpose it has a body 22 which is shouldered to engage a supporting element 24. This latter may be an insulating panel or any other appropriate construction. The body 22 is transversely apertured to receive the end of conductor 20 and is longitudinally apertured and internally screw-threaded to take the threaded shank of a set screw 26. The set screw cooperates with its associated parts to make the electric connection between conductor 20 and the screw or stud 18.

The connecter may have internal or external teeth. In Figures 1 to 4 inclusive the teeth extend radially inward toward the aperture 16. They are indicated by the reference numeral 28. They are preferably of resilient materials such as steel, and are warped in the manner indicated. This warping serves at least two functions. It prevents the accidental loosening or backing off of the binding nut 19. Inasmuch as they are warped or slightly twisted they present corners to the nut and to the coacting element 24 and are highly efficient in preventing the parts from accidentally becoming loosened. The teeth also tend to dig into the metal when the nut is tightened, and this of course improves the electric contact between the nut and the connecter.

In Figure 5 I have shown a modification in which the connecter 30 is in the form of a soldering lug, being provided at one end with a socket 32 for receiving an external conductor 34. At the other end the particular connecter illustrated has internal warped teeth as previously described. In Figure 5 the connecter is shown in association with a socketed binding post 36, which is internally threaded for the reception of a binding screw 38. It will be evident that it is immaterial whether the connecter is associated with a bolt and nut as in Figures 1 and 2, or with a binding screw 38 as shown in Figure 5.

In Figure 6 I have illustrated a connecter in a form well adapted for use in radio sets. In this form the connecter is double-ended. It has a body 40 consisting of a flat strip of resilient conductive material as before. At each end, however, it has an aperture 42 for the reception of a binding screw or bolt. In the form illustrated the locking and contacting teeth 44 extend radially inward as in the other forms hereinabove described.

In Figure 7 I have shown a modified form in which the body 50 of the connecter has an aperture 52 for the reception of a binding screw or bolt, but the teeth 54 instead of extending radially inward extend radially outward. These teeth are warped as in the forms previously described and operate upon the same principle.

In practice, when a connecter is assembled with the parts with which it is to coact, in the manner illustrated in Figures 1 and 2, the nut 19 when it is tightened stresses the teeth to a greater or lesser extent by pressing down upon them. This tends to flatten them and at the same time tends to force their corners into close contact with the nut and the element 24 or whatever other element is resisting the compressive strain. The result is that a negative rotation of the nut is resisted. Apparently this is partly because the corners of the teeth tend to dig into the metal, and partly because the teeth slant in such direction, due to their warping, that the negative rotation of the nut would tend to roll the teeth on their own axes in such manner as to bring the engaged corners further from the plane of the connecter. This tends to force the corners into the surfaces of the coacting parts. Apparently a sort of toggle or cam action is induced which increases the pressure between the engaged elements. The digging in of the metal also improves the electric contact. The effect is the same whether the teeth extend radially inward or extend radially outward, although where other considerations are equal it is usually preferable to employ the form in which the teeth extend radially inward, for with such construction a smaller area of metal is required for a given size aperture.

As a result of my invention an electrical connecter is produced which of itself, and without additional parts serves both as a connecter and as a lock to prevent loosening of the binding screw or nut, and also improves the electrical contact between the parts.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. An electrical connecter of conductive material having a terminal shank and an end with teeth which are substantially square ended and warped so as to form two angular corners, one above and one below the plane of the plate for ensuring electrical contact and preventing accidental loosening of a binding screw or nut by rotation of said shank.

2. An electrical connecter of conductive material having a terminal shank formed at one end with an aperture for accommodating a binding screw or bolt and having resilient teeth arranged approximately radially with respect to said aperture, the teeth being substantially square ended and warped so as to form two angular corners, one above and one below the plane of the plate for preventing the loosening of a binding screw or nut by rotation of said shank.

3. An electrical connecter of resilient metal having a shank, an end of which is formed with an aperture around which are arranged teeth which extend radially inward each tooth being shaped and warped to present corners to adjacent surfaces for improving electrical contact and preventing accidental loosening of a binding screw or nut by rotation of said shank one of said corners being above and one below the plane of the plate.

4. An electrical connecter consisting of a flat strip of spring metal having a shank, an end of which is formed with an aperture for accommodating a binding screw or bolt, and teeth extending radially inward toward said aperture, the teeth being substantially square ended and twisted out of the general plane of the connecter for presenting their corners to the surfaces of the elements between which they are interposed, one of said corners projecting above and one below the plane of the plate for the purposes set forth.

In witness whereof, I have hereunto subscribed my name.

JOHN M. GRIBBIE.