Aug. 30, 1932. J. M. GRIBBIE 1,874,507

ELECTRICAL CONNECTER

Filed Dec. 13, 1929

Fig. 1.

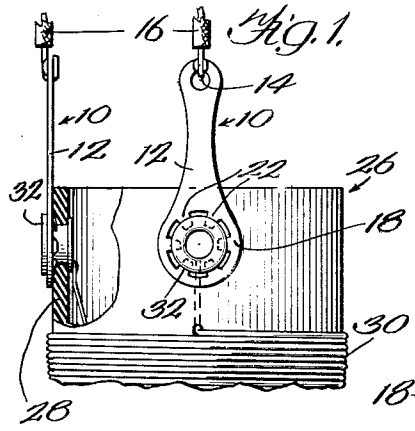


Fig. 2.

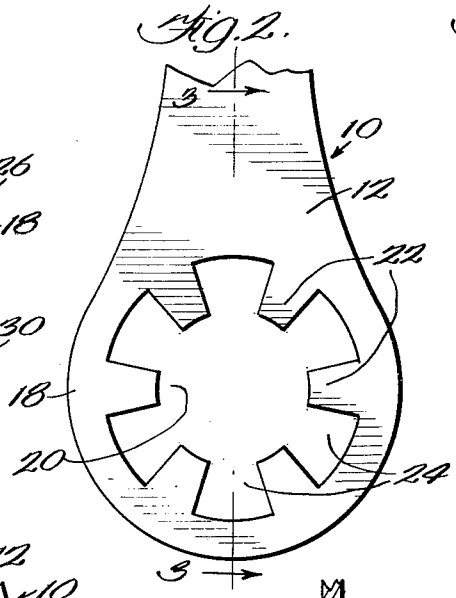


Fig. 3.

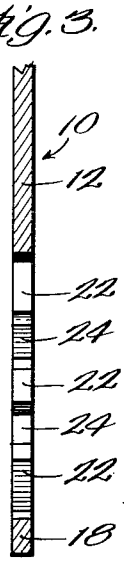


Fig. 4.

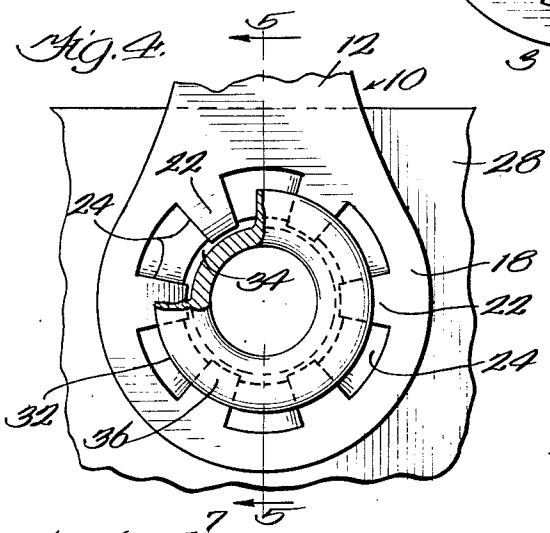


Fig. 5.

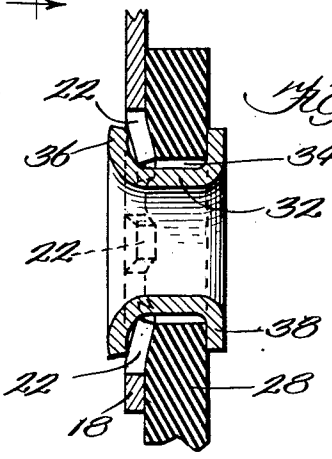


Fig. 6.

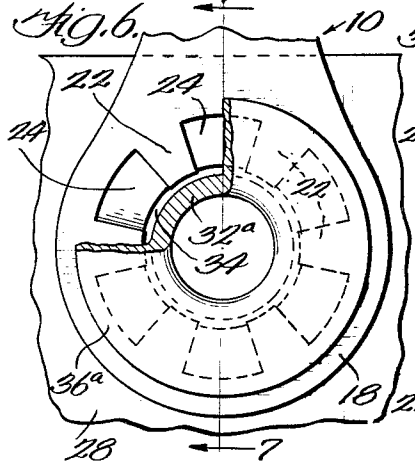
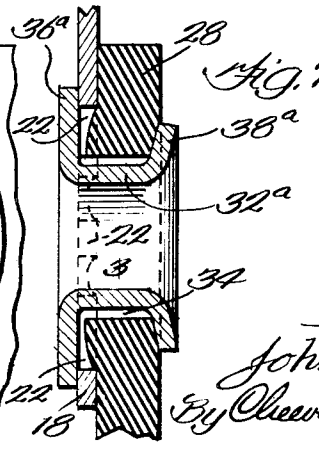


Fig. 7.



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Patented Aug. 30, 1932 1,874,507

UNITED STATES PATENT OFFICE

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

ELECTRICAL CONNECTER

Application filed December 13, 1929. Serial No. 413,739.

My invention relates generally to electrical connecters or terminals but more particularly to terminals for use with impressionable insulating materials or other materials of like nature.

In the electrical field and particularly in the manufacture of radio apparatus, it is sometimes desired to secure elements in position upon sheets of insulating material such as fiber by means of annular rivets. These rivets may be inserted within an aperture in the element and a companion aperture in the fiber and the rivet may then be pressed against the associated elements so as to hold them in position. Frequently it is desirable to employ elongated terminals or connecters which must project a considerable distance beyond the margin of the insulating material or fiber and in such instances the outer or projecting portion of the terminal is subjected to forces while in use which would have a tendency to overcome the clamping action of a rivet or other suitable clamping means and thereby cause said terminal to be displaced.

It is one of the primary objects of my present invention to provide a terminal or connecter construction which will avoid any tendency for connecters or terminals to become displaced and to this end I propose to provide a connecter from flat stock of very simple construction, which will become firmly imbedded within the insulating material with which it is associated when a rivet or other fastening means is clamped thereagainst.

More specifically my invention contemplates the provision of a connecter as above set forth, having a plurality of teeth positioned wholly within the plane of the connecter stock, said teeth being so constructed and arranged that when the pressure of the rivet is applied thereto, said teeth will become firmly imbedded within the insulating material and thereby positively prevent said connecter from being displaced.

Another object of my present invention is to provide a connecter with a plurality of teeth which need not be hardened in order to render the same lockingly effective and to this end I propose to provide a connecter in which the teeth are so arranged that the same may be deflected when a rivet is tightened thereagainst and in which cut-outs are provided to permit insulating material to be forced into locking engagement with said teeth.

My invention further contemplates the provision of an electrical connecter having work engaging teeth which are not twisted or otherwise warped out of the plane of the connecter stock but which may be formed by a simple blanking out method, the teeth being such that when the same are pressed against the work, such as fibroid or other suitable insulating material, said teeth will become firmly lodged within said material.

These and numerous other objects and advantages will be more apparent from the following detailed description when considered in connection with the accompanying drawing, wherein:

Figure 1 discloses a connecter embodying my invention, the same being shown in combination with a cylindrical insulating member;

Figure 2 is an enlarged fragmentary view of the portion of the connecter in Figure 1 which is provided with a plurality of work engaging teeth;

Figure 3 is a transverse sectional view taken substantially along the line 3—3 of Figure 2;

Figure 4 is an enlarged fragmentary elevational view of the connecter shown in Figure 1, the rivet associated therewith being broken away to disclose the position of the connecter teeth;

Figure 5 is a transvese sectional view taken substantially along the line 5—5 of Figure 4 disclosing the manner in which the connecter teeth may be pressed into the insulating material in response to the clamping action of the rivet;

Figure 6 is a view similar to Figure 4 disclosing the manner in which a rivet having a comparatively wide flange, may be used in association with my improved connecter; and

Figure 7 is a transverse sectional view taken substantially along the line 7—7 of

Figure 6 disclosing the manner in which the insulating material may be forced into the spaces between the connecter teeth.

Referring now to the drawing more in detail wherein like numerals have been employed to designate similar parts throughout the various figures, it will be observed that one embodiment of my invention contemplates the provision of a connecter which I have designated generally by the numeral 10. This connecter or terminal 10 includes a shank 12 which is formed at one extremity with an aperture 14 to receive an electrical conductor 16. The opposite extremity of the shank 12 is provided with a body portion or section 18 having a central aperture 20. Spaced along the inner margin of the section 18 is a plurality of teeth 22 which are separated by cut-outs or spaces 24. It is to be noted that these teeth 22 are positioned wholly within the plane of the connecter stock as clearly shown in Figure 3.

In order to illustrate one practical application of my invention I have disclosed the connecter 10 in operative association with a cylinder 26 which comprises a sheet of insulating material 28 such as fiber or the like which has an impressionable surface. That is to say, the insulating material 28 is sufficiently rigid to serve as a mounting for a coil 30 but is impressionable to such a degree that the teeth 22 of the connecter may be readily forced into the material or said material may be readily forced into the spaces 24 which separate said teeth. In mounting the connecter 10 upon the cylindrical sheet of insulating material 28, a rivet 32 is inserted within the aperture 20 of the connecter and through a registering aperture 34, Figures 4 and 5 in the insulating material 28. The flange 36 of the rivet 32 is clamped against the connecter teeth 22 and the flange 38 of the rivet is clamped directly against the insulating material. It is to be noted that the external diameter of the flange 36 of the rivet shown in Figures 1, 4 and 5 is less than the diameter of the circle whose circumference is coincident with the roots of the teeth 22. Thus, when the flange 36 is pressed against the teeth 22, said teeth will be forced into the softer material 28. Obviously, if the connecter stock is sufficiently rigid, and the insulating material 28 sufficiently impressionable, the clamping action of the rivet may cause material 28 to be forced into the cut-outs 24 and the teeth 22 subjected to little, if any, deflection. In some instances, depending upon the relative structural characteristics of the connecter stock and the insulating material, both the teeth 22 and the insulating material may be subjected to displacement. In other words, the teeth 22 may be forced or pressed into the insulating material and said insulating material may also be forced into the spaces 24. In any instance, the interlocking of the teeth and the softer insulating material in response to the clamping action of the rivet, will serve to securely mount the connecter 10 in position upon the member or cylinder 26. In certain classes of electrical goods such as radio equipment, it is very desirable to have the connecter project beyond the margin of the insulating material and to have said connecter maintained in a vertical or horizonal fixed position. The interlocking of the teeth 22 with the work or insulating material positively insures the connecter against lateral displacement.

Referring to Figures 6 and 7, it will be observed that I have disclosed the manner in which my improved connecter may be effectively employed with rivets having flanges of relatively large diameter. In these figures I have shown a rivet 32*a* which is provided with flanges 36*a* and 38*a*. It will be noted that the flange 36*a* is greater in diameter than the circle which is coincident with the roots of the teeth 22. Thus, the pressure of the flange 36*a* against the teeth would not have a tendency to cause the teeth to be deflected but the clamping action of the flange 38*a* against the insulating material would be such as to cause said material to be forced into the spaces or cut-outs 24. In this manner the teeth 22 would serve to effectively secure the connecter in position without being deflected out of the plane of the connecter stock.

From the foregoing it will be understood that my invention contemplates the provision of terminals or connecters of extremely simple construction which may be expeditiously formed from inexpensive flat stock. Heretofore in using terminals provided with twisted or warped locking teeth in connection with terminal binding posts and the like, it has been customary to form these connecters from sheet material such as phosphor bronze and the like in order to lend sufficient rigidity to the teeth. In other words, by using material such as bronze, the locking teeth which are twisted or warped out of the plane of the stock will be sufficiently rigid to withstand the clamping action of a terminal nut and will dig into the metallic stock so as to secure the parts against loosening. My present invention however enables a terminal member or connecter to be produced from material which is much cheaper and considerably softer than phosphor bronze because the above mentioned rigid tooth construction is not required. In fact, the connecter teeth may be sufficiently pliable to enable the same to be bent and forced into the surface of the insulating material in response to the clamping action of the rivet. It will thus be apparent that my invention is particularly applicable for use in connection with relatively soft sheet material such as fiber or other impressionable insulating materials. While I have disclosed one particu-

lar application of the invention for illustrative purposes, it will be understood that said invention is capable of many other uses and should only be limited by the scope of the appended claims.

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

1. A terminal member having an aperture for receiving a clamping member, and a work engaging tooth positioned at the apertured end of said terminal, said tooth being positioned wholly within the plane of the terminal stock and adapted, when clamped against impressionable material, to interlock therewith.

2. A terminal of the class described formed from flat stock having an aperture for receiving a clamping device, and a plurality of work engaging radial teeth said teeth being positioned wholly within the plane of the connecter stock and adapted, when clamped against impressionable material, to lockingly engage therewith.

3. A terminal device of the class described formed from flat stock having an aperture for receiving a clamping member, and a plurality of internal annularly arranged teeth lying wholly within the plane of the terminal stock, said teeth being adapted, when clamped against impressionable material, to lockingly engage therewith.

4. A terminal of the class described formed from flat stock having an aperture for receiving a clamping device, and a work engaging tooth positioned wholly within the plane of the terminal stock, said tooth being constructed of resilient material to effect the bending of the tooth about its root when clamped in position against the work.

5. In combination with a sheet of impressionable material, an apertured terminal member, said terminal member having a plurality of resilient teeth adapted to be deflected out of the plane of the terminal stock, and a clamping member extending through said aperture and said impressionable material, said clamping member having a flange which clampingly engages the impressionable material and a flange which clampingly engages the work engaging teeth, said teeth being deflected out of the plane of the stock in response to the action of said clamping member, the impressionable material being lodged against opposite edges of said teeth so as to effectively secure the parts against relative movement.

6. In combination with a sheet of impressionable material, an apertured terminal member of flat spring stock, said member having a plurality of resilient teeth annularly disposed about said aperture, and a cylindrical clamping member extending through said aperture and said impressionable material, said clamping member having an annular flange which clampingly engages the impressionable material and another annular flange which clampingly engages said resilient teeth, one of said flanges having a diameter not greater than the diameter of the circle determined by the roots of said annularly disposed teeth.

7. In combination with a sheet of impressionable material, an apertured terminal member of flat spring stock, said member having a plurality of resilient teeth annularly disposed about said aperture, and a cylindrical clamping member extending through said aperture and said impressionable material, said clamping member having an annular flange which clampingly engages the impressionable material and another annular flange which clampingly engages said resilient teeth, the diameter of one of said flanges being less than the diameter of the circle determined by the roots of said teeth and the diameter of the other flange being greater than the diameter of said circle.

In witness whereof, I have hereunto subscribed my name.

JOHN M. GRIBBIE.