May 26, 1931. L. F. MUTHER 1,806,815

CONTACT FOR ELECTRIC CIRCUITS

Filed Aug. 2, 1928

Fig. 1.

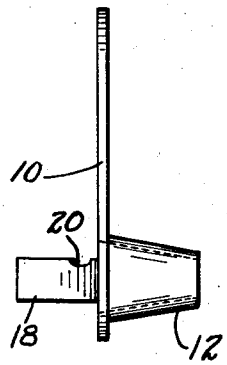
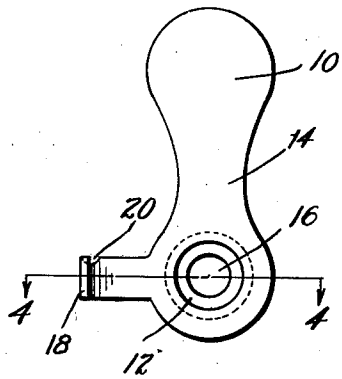


Fig. 2.



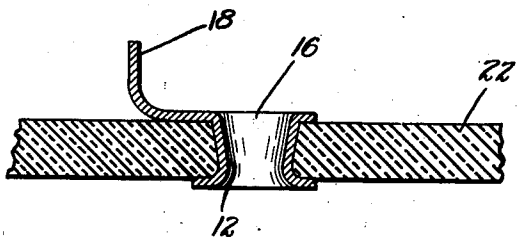


Fig. 4.

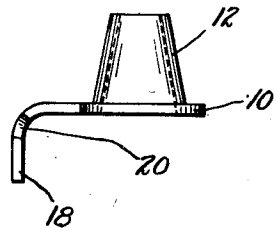


Fig. 3.

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Patented May 26, 1931 1,806,815

UNITED STATES PATENT OFFICE

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CONTACT FOR ELECTRIC CIRCUITS

Application filed August 2, 1928. Serial No. 296,928.

This invention relates to contacts for electric circuits and more particularly to devices of this character suitable for use in radio apparatus.

In the manufacture of radio apparatus, it is customary to fasten small contacts or contact plates to insulating material in sheet, plate or other form which contacts are used for connecting various parts of the apparatus electrically. It is generally customary to mold the insulating material and in this operation round holes are molded in the proper places for receiving eyelets for fastening the contacts to the material. The contacts have likewise been provided each with an eyelet hole. In fastening the contacts to the insulating material, it has been customary to employ an eyeleting machine equipped to feed eyelets and the operator places the insulating material on the lower set with the point thereof projecting up through the hole in which the eyelet is to be placed and then arranges the contact on the set point with its hole in register with the hole in the material. The machine is then tripped and the upper set moves downwardly taking an eyelet from the raceway and pushes it through the holes in the contact and insulating material and against the lower set which clenches the end of the barrel of the eyelet against the under side of the insulating material. This is a comparatively slow operation because the contact must be carefully placed and must be held in position by hand until fastened which adds to the expense of the operation. Since the contacts are small, injuries to the fingers of the operator by the descending upper set have been of frequent occurrence. The foregoing constitutes two serious objections to the use of this form of contact and method of fastening it to the insulating material but up to the present time, so far as I am informed, no practical remedy has been evolved.

One object of the invention is the production of a contact of the character described which is efficient and especially adapted for use in connecting up electric circuits for radio and other apparatus.

Another object of the invention is the production of a contact of such form that it can be fed and attached to insulating material by the use of automatic eyeleting or riveting machines.

Further objects of the invention are to reduce the expense of attaching contacts to insulating material and at the same time to eliminate all possibility of injury to the operator.

Other objects of the invention will be more specifically set forth and described hereinafter.

My invention contemplates a contact preferably formed out of sheet material and having a suitable portion to which electric wires or conductors may be attached and provided with integral means whereby the contact may be permanently secured to insulating material in plate or other form. Preferably, the latter means is in the form of an eyelet barrel formed in the contact by any suitable method and the contact is attached to the insulating material by clenching the end of the eyelet barrel thereon.

Another feature of my invention resides in the provision on the contact of a guiding member for positioning the contact in the raceway so that it will be delivered to the setting instrumentalities in proper position for attachment to the insulating material without requiring any handling by the operator. In the form shown the guiding means comprises a flat prong or finger bent at an angle to the main body of the contact and a raceway adapted to feed a contact of this character is shown in the application of William M. Spry for United States Letters Patent filed August 2, 1928, Serial No. 296,886, eyeleting machines.

Yet another feature contemplates the reduction in diameter of the body of the contact midway its ends to facilitate bending thereof. After the contact has been affixed to the insulating material and either before or after the circuit wires have been secured to the contact by soldering or otherwise, it may be found convenient to bend it in one direction or the other and the reduction in width of the body of the contact midway its ends facilitates this bending.

In the accompanying drawings illustrating one embodiment of the invention, Figure 1 is a side elevation of a contact made in accordance therewith; Fig. 2 is a plan view thereof looking from left to right in Fig. 1; Fig. 3 is an end elevation of the contact looking downwardly in Fig. 2 and Fig. 4 is a sectional view of a sheet of insulating material having a contact fastened thereto by the clenched eyelet barrel.

In the drawings is shown a contact embodying my invention in which 10 designates body portion having formed at one end an eyelet barrel 12 the center axis of which is perpendicular to the plane of the body portion. The body 10 may be made in any suitable manner and in various shapes but as shown is in the form of an elongated thin plate having rounded ends and a restricted central portion 14 to permit the plate to be bent midway when necessary or convenient. The eyelet barrel 12 may be formed by drawing out the metal to form a cone-shaped barrel after which the end may be cut off to make the hole 16 in the end of the barrel. The eyelet barrel is shown as formed on one end of the body portion but it may be located elsewhere in the body if desired or if necessary for particular uses.

Since the contact is designed to be fed by means of a raceway, the body portion of the contact should be of such shape that the contact is at all times held by the rails of the raceway against tilting out between said rails which would result in the contacts jamming together in the raceway to prevent free movement to the point of delivery. In the form of contact shown in the drawings this is accomplished by making the two ends of the elongated body 10 of greater width than the width of the barrel of the eyelet which regulates the distance of separation of the rails. The same result may be attained in other ways, however, as, for instance, by so regulating the width of the body for a sufficient distance to prevent tilting.

For guiding the contact into and through the raceway in proper position for presentation to the work, the contact is provided with a guiding member 18 adapted to engage a suitable groove in the raceway. The member 18 may be of various forms but preferably is a flat prong or finger bent at an angle to the body portion 10 with its end parallel to the longitudinal axis of the contact. The flat end when in the grove in the raceway prevents the contact from turning or oscillating on the guiding member as a pivot. To insure the contact entering the raceway eyelet end foremost, the guiding member is positioned to one side of the central longitudinal axis of the contact and at the eyelet end. The groove in the raceway enters the hopper containing a supply of contacts a distance just sufficient to receive the guiding member of a contact when in a correct position for leaving the hopper and consequently all the contacts leaving the hopper and passing into the raceway proceed eyelet end first.

The guiding member is cut away on one side at 20 to hold an electrical conductor thereon when the same is wound around the member at that point.

In Figure 4, to illustrate the method of mounting the contact on the insulating material, there is shown a piece of such material 22 having a contact fastened thereto. The material is first perforated with suitable holes to receive the eyelet barrels of the contacts or if the material is molded the holes are formed during the molding process and the contacts are fastened thereto by employing an eyeleting machine fitted with a raceway adapted for feeding the contacts. One form of raceway suitable for feeding the contact described herein is shown in the application of William M. Spry for United States Letters Patent filed herewith to which reference may be made for a more complete description of the feeding and setting operations. The operator places the insulating material in proper position in the machine with the lower set engaging the hole in which the contact is to be fastened and starts the machine whereupon the upper set moves downwardly taking a contact from the raceway by impaling the eyelet barrel and carries said barrel into the hole in the insulating material and pushes it against the setting shoulder on the lower set which turns the end of the barrel and clenches it upon the under side of the material. This operation is repeated for the setting of each contact.

It will be observed that by the use of automatic eyeleting machines the contacts may be set in insulating material with rapidity, efficiency and at a low cost. After the contacts have all been set the conductors or wires of the radio apparatus when required may be attached to the contacts by soldering or otherwise. The contacts are necessarily made of conducting material and the wires may therefore be connected to any portion or portions thereof. When the contact is fastened to the insulating material its body portion normally hugs the upper face of said material but if necessary the body portion may be bent midway at the restricted portion 14 to turn the free end upwardly or downwardly. A conductor may be connected to the contact by winding its end around the restricted portion 14 in loops and the enlarged free end of the contact will prevent the loops slipping off. The guiding member 18 may likewise be used for the same purpose, the recess 20 serving to retain the loops in place.

It is further to be noted that a contact made in accordance with my invention can be produced at a minimum cost and is adapted for many uses outside of and in addition to the radio art. My invention further makes it

feasible to feed and set such contacts in an entirely automatic manner thereby eliminating all handling of the contacts and hand labor and all injuries to the operators.

It is to be understood that my invention is not to be limited to the form of contact herein shown and described since it may be made in various other forms all within the scope of the following claims.

What I claim is:

1. An elongated contact plate of conducting material having a hole formed therein at one end and the material surrounding said hole drawn out to form an eyelet barrel perpendicular to said plate for attaching said contact to sheet material and having a guiding member on one side of said plate adapted for engaging a groove in a raceway.

2. An elongated contact plate of suitable material having an eyelet barrel formed therein at one end for attaching said plate to sheet material, the center axis of said barrel being perpendicular to the plane of said plate, and having an oppositely turned lateral guiding member at the eyelet end thereof.

3. An elongated plate of suitable material having an eyelet barrel formed in one end thereof and being provided with a lateral guiding member bent at an angle to said plate and said center axis of said barrel being perpendicular to the main body of said plate; said plate being of restricted width intermediate its two ends to permit the bending of said plate at said restricted portion.

4. A contact for electric circuits comprising a thin elongated plate having an eyelet barrel formed therein at one end for attaching said contact to insulating material and provided with a lateral guiding member bent at an angle to said plate for guiding said plate through the raceway of an eyeleting machine.

5. An elongated plate of suitable material having an eyelet barrel formed in one end thereof and a guiding member on one side thereof adjacent said eyelet barrel, said guiding member being bent at an angle to said plate and said center axis of said barrel being perpendicular to the main body of said plate.

6. A contact for electric circuits comprising a thin plate having an eyelet barrel formed therein for attaching said contact to insulating material and provided with a guiding member bent at an angle to said plate for guiding said plate through the raceway of an eyeleting machine; said guiding member being on one side of the longitudinal axis of said plate.

7. A contact adapted to be fed through a raceway in an automatic eyeleting machine to setting tools comprising an elongated body portion having an eyelet barrel formed at one end for attaching said contact to insulating material and having a laterally extending guiding member for guiding said contact into and through said raceway in proper position for attachment to said material.

8. A contact comprising an elongated plate having an eyelet barrel formed in one end and a guiding member off center and adjacent said eyelet-barrel, said plate being at both ends of greater width than the width of said eyelet barrel and being of restricted width intermediate said ends to facilitate bending of the plate.

9. A contact comprising a thin elongated plate having an eyelet barrel formed therein for attaching it to insulating material and being provided with an off-center guiding member adapted for engaging a groove in a raceway for guiding said contact therethrough, said plate being of greater width at both ends than said eyelet barrel and having a restricted portion intermediate said ends to facilitate the bending of said contact midway after attachment to insulating material.

In witness whereof, I hereunto set my hand this 30th day of July, 1928.

LORENZ F. MUTHER.