

Aug. 8, 1939.

M. ALDEN

2,168,382

METHOD OF CONNECTOR ASSEMBLY

Original Filed May 8, 1933

Fig. 1.

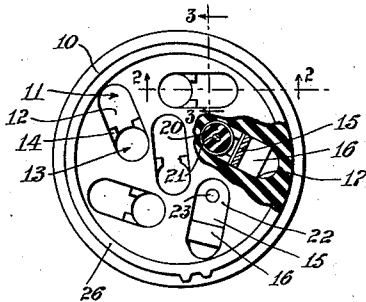


Fig. 2.

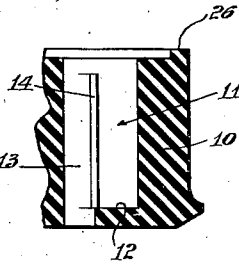


Fig. 3.

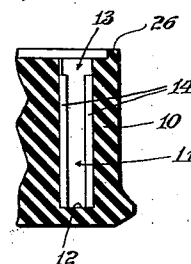


Fig. 4.

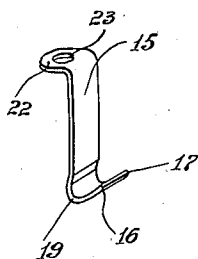


Fig. 5.

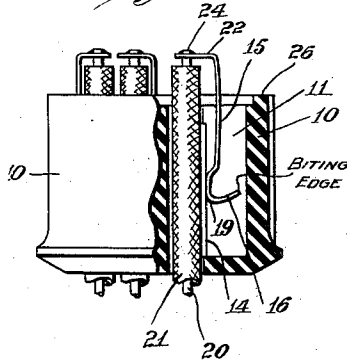
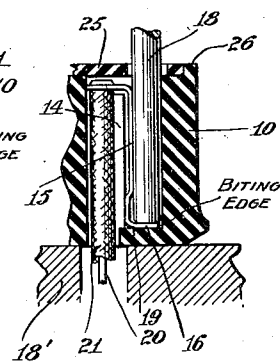


Fig. 6.



INVENTOR
Milton Alden
BY *X.S. Myer*
ATTORNEY

UNITED STATES PATENT OFFICE

2,168,382

METHOD OF CONNECTOR ASSEMBLY

Milton Alden, Brockton, Mass.

Original application May 8, 1933, Serial No. 669,826, now Patent No. 2,125,708, dated August 2, 1938. Divided and this application March 22, 1938, Serial No. 197,532

5 Claims. (Cl. 29—155.55)

This application is a division from my application Serial No. 669,826 filed May 8, 1933, for an Electrical connector now Patent Number 2,125,708, granted August 2, 1938.

5 This invention relates to a method for the assembly of an electrical contact and an insulating body housing the same. More particularly it relates to a method for assembling a contact of the character set forth in my application above referred to, in combination with a socket body into the material of which the contact is partly embedded or has a fastening which may be termed a "biting" grip. Likewise this invention includes the method of assembling the contact, 15 the socket body and a wire making electrical connection with the contact.

One object of this invention is to provide an assembly method for the elements above set forth, which method shall be quick, effective and 20 economical of labor and cost.

Another object is to provide an assembly method which can be carried out by automatic or semi-automatic machinery, and which may be simultaneously practiced upon all the contacts 25 and wires of a socket, which frequently, especially in the radio art, combines in a single structure as many as eight or ten such contacts and wires, although I do not limit this invention to any specific number of contacts or wires, as it may be practiced upon any number of such elements. 30

As an illustration of one way of carrying out the practice of this invention, I herein describe the invention as applied to a specific form of 35 contact and socket body, but it is to be understood that this description is merely illustrative, and not exclusive.

In this illustrative description, I show an insulating body, having a number of recesses each 40 closed at one end and open at the other end for the reception therein of a tube or other plug prong. Adjacent each of such recesses is a passage open at both ends of the body and adapted to receive one end of an insulated conductor of the cord or cable connecting to the 45 body. In each recess is secured a single conducting strip serving as a resilient contact along one wall of the recess and having a lug at its outer end connected to the tip of the adjacent 50 conductor alongside the entrance to the recess. The inner end of the contact strip is wedged into the bottom of the recess so as to bite into the substance of the insulating body at that point.

Fig. 1 is an end view and partial section of one 55 form of body and contact which may be used in

practicing my invention, showing contacts in some of the recesses and other recesses without contacts.

Fig. 2 is a fragmentary section on the plane of the line 2—2 of Fig. 1, but omitting the contact 5 and conductor.

Fig. 3 is a fragmentary section on the plane of the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of one of the contact members before assembling with the wire 10 and socket body.

Fig. 5 is a side view and partial section showing some of the contact members partly assembled with their conductors.

Fig. 6 is a fragmentary section of the assembly 15 at the completion of the operation, showing one of the contacts, a conductor connected thereto, and an assembly tool still in place within the insulating body.

Referring now to the form of elements here 20 shown, which may illustratively be used to describe my invention, the body 10 may be of any suitable material such as molded insulating composition provided with a series of contact recesses 11 each of which is open at its outer or entrance 25 end and closed at the inner or opposite end 12. Alongside of each recess and communicating with it is a passage 13 for a conductor and open at both ends.

The ledges or shoulders 14 are provided between each recess 11 and its adjacent passage 13. These ledges extend from the bottom or near the bottom of each recess to points near the outer end of the corresponding recess.

Each contact and terminal member is formed 35 of a single strip of metal of suitable resilient character having a contact portion 15 which is preferably somewhat bowed and a foot 16 adapted to be wedged into a recess 11 so that each corner 17 can dig into the insulating material 40 and serve as a means of anchorage for the contact. Each recess is made enough larger than the tool 18 so as to allow for certain variations in the size or angle of entry of the tool and for the spring action of the contact 15. The bowed portion 15 of each contact is offset somewhat from 45 the lower portion 19 adjacent the foot 16 so as to provide room for the resilient action of the spring.

The conductor 20 of any suitable type is provided with a covering of insulation 21 and the passage 13 is made large enough to accommodate this conductor and its insulation.

The strip 15 is provided with a lug 22 having perforation or recess 23 into which the tip 24 of 55

the conductor may be inserted and soldered or otherwise suitably secured. The ends of all the wires and lugs may be completely covered by an insulating disc 25 held snugly within the flange 26 and perforated to receive the tube or other prongs.

The parts may be assembled as shown in Figs. 5 and 6. That is, the conductors may be inserted through the reception passages with their tips projecting somewhat beyond the end of the body, as shown in Fig. 5. The contact strips are then inserted in their respective recesses and the ends of the conductors soldered to the lugs of the contacts. This construction and assembly method permits of the convenient simultaneous soldering of all of the conductors to their respective contact lugs. When the conductors have been soldered the contact strips may all be forced into place simultaneously by placing the body on a bed 18' and inserting suitable plungers, as illustrated by tool 18, so that the corners 17 of the contact strips are wedged into the adjacent walls of the respective recesses. This wedging action is sufficient to prevent the contacts from being pulled out when the tool 18 or the prongs of a tube or plug are withdrawn, during assembly or during later usage of the socket assembly.

It should be understood that the shape of the contact portion 15 may be altered or modified in any suitable manner, for instance, to increase the strength or gripping quality of the contact according to well known methods, and yet the assembly can be performed according to my invention.

By the terms "front" or "forward" end or side I refer to the portion of the connector into which a plug is inserted, and by the terms "rear" or "back" portion I refer to that portion of the connector disposed oppositely to the "front" end.

While I have illustrated my invention by describing a specific contact and body, yet it is to be understood that it is applicable to the assembly of any type of contact within a suitable recess, where the contact possesses a lateral extension at its end, which extension is forced into biting engagement with a wall of the recess, by the insertion of a tool or plunger into the recess which will bring about such biting engagement.

I claim:

1. A method of assembling a socket body having an aperture extending completely there-through and also having another bottomed aperture, a contact with an acutely bent projection at one end and a projection extending substantially at right angles at the other end and an electrical wire, including the steps of inserting said wire through said open aperture so that it projects therefrom at one end thereof, partly inserting said contact into said bottomed aperture so that the right angled projection of said contact is in contact with said wire, mechanically fastening together said wire and said right angled projection, pulling said wire so as to move said contact substantially completely into said bottomed aperture,

and bending out said acutely bent projection of said contact so that it bites into said socket body and thereby causes said contact to be locked into said aperture.

2. The method according to claim 1, further characterized in that a plurality of wires and a plurality of contact projections are mechanically fastened together with solder by a single operation, wherein said solder in a molten state is simultaneously applied to a plurality of junction points of said wires and said contact projections, each junction point comprising at least one wire and a single contact projection.

3. The method of assembling a socket body having a passage extending completely there-through and also having a bottomed recess alongside of said passage, a contact with a bent projection at its rear end and a wire anchorage at its front end and a conductor wire, including the steps of inserting said wire through said open passage so that it projects therefrom at the front thereof, securing the end of the wire to said wire anchorage, inserting the bent projection of said contact into said recess, moving said wire and said contact to insert said contact substantially completely into said bottomed recess, and bending out said bent projection of said contact in a direction substantially transverse to the longitudinal axis of said bottomed recess, so that it engages a wall in the recess of said socket body and thereby causes said contact to be locked into said recess.

4. The method of attaching a conductor wire to the front end of a contact for a plug prong which contact has a foot bent at an angle at its rear end and inserting the contact into an insulating socket body having a passage for a wire through the body and a recess for a contact and prong alongside of the passage which comprises inserting the end of the conductor wire into the passage from the rear of the body, projecting said end of the wire from the front end of the passage, securing the end of the wire to the front end of the contact, pulling the conductor wire back in its passage and forcing the foot of the contact into its recess so that said foot shall lie substantially transversely of said recess, and securing it therein.

5. The method of mounting a contact having a bent-over foot at its rear end and a connected conductor wire substantially parallel with the main part of the contact in an insulating socket body having a passage through the body and a recess alongside of the passage which comprises mechanically and electrically connecting the front end of the contact to the tip of the wire, drawing the wire along the passage and inserting the rear end of the contact in the recess and forcing the bent-over foot into the bottom of the recess so that it assumes a position substantially transverse to the longitudinal axis of said recess and securing it therein.

MILTON ALDEN