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M. ALDEN

2,125,708

ELECTRIC CONNECTER

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Fig. 2.

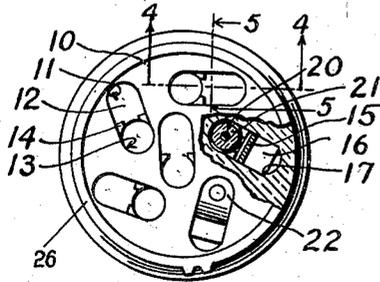


Fig. 1.

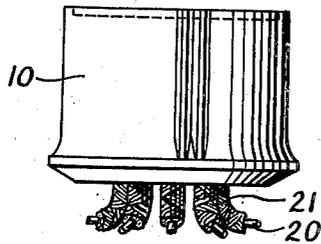


Fig. 3.

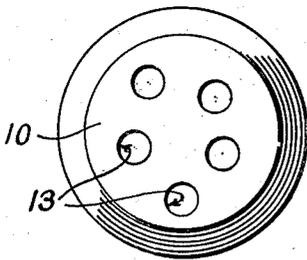


Fig. 6.

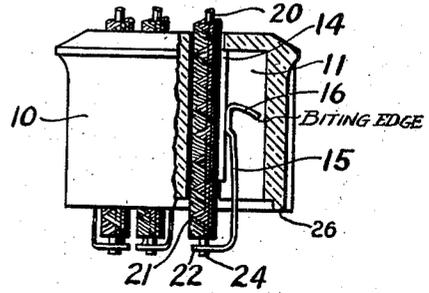


Fig. 4. Fig. 5.

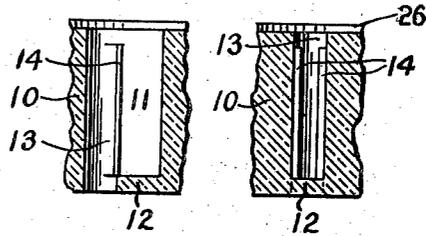


Fig. 7.

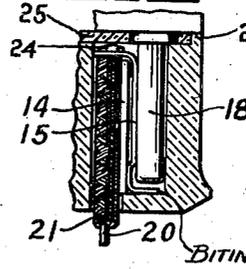
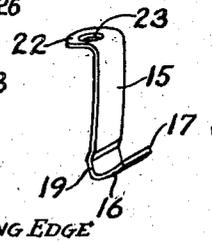


Fig. 8.



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2,125,708

ELECTRIC CONNECTER

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Application May 8, 1933, Serial No. 669,826

16 Claims. (Cl. 173—328)

My invention relates to what are sometimes termed wiring devices and particularly to a connector for the cable of electric devices such as radio sets employing a number of conductors and providing sockets for a plurality of prongs such as radio tube prongs and corresponding projecting terminals.

One object is to provide a contact and effective terminal for a cord.

10 A special object is to provide a construction of this character which is reliable and can be made cheaply.

Another object is to provide a small but compact and effective device which can accommodate a large number of conductors and terminal contacts and still avoid the electrical difficulties frequently found in such devices.

In carrying out the invention I provide an insulating body which has a number of recesses closed at one end of each and open at the other end for the reception of tube or other prongs. 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. 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 conductor alongside of the entrance to the recess.

30 The inner end of the contact strip is wedged into the bottom of the recess.

Fig. 1 is a side view of the construction embodying one form of my invention.

Fig. 2 is an end view and partial section showing contacts in some of the recesses and other recesses without contacts.

Fig. 3 is a view of the opposite end of the body.

Fig. 4 is a fragmentary section on the plane of the line 4—4 of Fig. 2 but omitting the contact and conductor.

Fig. 5 is a fragmentary section on the plane of the line 5—5 of Fig. 2.

Fig. 6 is a side view and partial section showing one of the contact strips partially assembled with its conductor.

Fig. 7 is a fragmentary section of the completed device showing one of the contacts and its connected conductor and inserted terminal prong.

Fig. 8 is a perspective view of one of the contact members.

50 The body 10 may be of any suitable moulded insulating composition provided with a series of contact recesses 11 each of which is open at its outer or entrance 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 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 and serve as a means of anchorage for the contact. Each recess is made enough larger than the prong 18 so as to allow for certain variations in the size of the prong and for the spring action of the contact 15. The bowed portion 15 of each contact is offset somewhat from 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 23 into which the tip 24 of 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 Fig. 6. That is, the conductors will be inserted through the reception passages with their tips projecting somewhat beyond the end of the body. 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 permits of the 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 suitable plungers corresponding to the prongs 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 prongs 18 of a tube or plug are withdrawn.

It will be seen that when the parts are assembled a pull on the conductor cable is resisted by the combined action of all of the conductors and the attached contacts. The insulation 21 is

completely protected within the body around the ends of the wires.

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.

The same insulating body shape can be used for three, four and more contacts. The construction makes it possible to use a maximum number of contacts for a given size of body. The same connector can be used to receive plugs having a less number of prongs than there are contacts in the body. The oval or elongated cross section of recess and passage and the offset arrangement allows for a maximum number of contacts for a given outer diameter of body.

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.

I claim:

1. An electric connector comprising an insulating body having recesses open at one end for receiving terminal prongs and closed at the other end and passages opening toward the latter end of the body and communicating with the open ends of the recesses, a contact strip arranged along one side of each recess with a foot resiliently bitingly engaging the wall of said recess near its closed end and having a lug extending transversely of the other end of the body in line with the adjacent passage, and a conductor in each passage having its end electrically connected to the lug at the end thereof.

2. An electric connector comprising an insulating body having a recess open at one end for receiving a terminal prong and closed at the other end and a passage open at both ends and extending through the body alongside of the recess, a contact strip arranged lengthwise in said recess and secured therein and having a lug extending transversely of the other end of the body in line with said passage, and an insulated conductor in said passage having its end electrically connected to said lug, said contact strip having its end opposite to the lug-carrying end provided with means for resiliently bitingly engaging the wall of the recess which contains said contact strip.

3. An electric connector comprising an insulating body having a recess open at one end for receiving a terminal prong and closed at the other end and a passage opening toward the latter end of the body and communicating with the recess, supporting ledges between parts of the recess and the passage, a contact strip laterally supported by said ledges with a foot secured in the closed end by resiliently bitingly engaging the wall of said recess near the closed end thereof and a lug at the other end of the body, and an insulated conductor in said passage having its end soldered to said lug.

4. A cord connector comprising a one-piece insulating body having a recess open at one end for receiving a terminal prong and a passage open at both ends and communicating with the recess throughout its entire length, supporting ledges between parts of the recess and the passage, a contact strip laterally supported by said ledges and having one end thereof provided with means for resiliently bitingly engaging the wall of said recess and a lug extending transversely of the body in line with said passage, and an

insulated conductor in said passage having its end electrically connected to said lug.

5. A cord connector comprising a one-piece insulating body having recesses each open at one end for receiving terminal prongs and closed at the other end and passages opening at both ends of the body and communicating with the respective recesses, a contact strip arranged lengthwise in each recess with a foot secured in the closed end of said recess, by resiliently bitingly engaging the wall thereof and having a lug at the other end of the body, and a conductor in each passage having its end electrically connected to the lug at the end thereof.

6. A connector comprising an insulating body having a recess and a passage arranged side by side, a contact strip having its inner end wedged into said recess by means resiliently bitingly engaged with the wall of said recess to hold the strip in place and having a laterally resilient contact portion along one side next to said passage and having its outer end in said passage and an insulated wire in said passage having its tip soldered to the outer end of the strip.

7. A connector having an insulating body with a recess open at one end and a passage alongside the recess open at the opposite end of the body and narrow ledges between part of the recess and part of the passage and a contact having one end wedged into the bottom of the recess by means resiliently bitingly engaged with the wall of said recess alongside of the ledges and an insulated conductor in the passage connected to the contact, said contact being adapted to frictionally engage a prong inserted in said recess in the same direction in which said contact is inserted therein, and said conductor entering said passage at the end thereof most distant from the open end of said recess.

8. A connector socket including a single integral block of insulation comprising the body thereof, said body being provided with a recess open at one end and at least partially closed at the other end, and also including a resilient contact strip having a lateral projection at one end thereof and extending longitudinally of said recess to the bottom end thereof, said projection bitingly engaging the wall of said recess when said contact strip is inserted therein, said contact strip and said recess cooperating to allow the easy insertion of the strip into the recess and to prevent the withdrawal of the strip when a contact plug moves longitudinally in said recess so as to make frictional contact with said strip, said block of insulation affording entry to said contact member in the same recess which affords entry to an inserted contact prong whereby said single recess acts both to retain said contact strip and to allow a prong to enter therein at said open end.

9. A connector socket including a single integral block of insulation comprising the body thereof, said body being provided with a recess at least partially open at one end, and also including a resilient contact strip having a lateral projection at one end thereof, said strip extending longitudinally of said recess and said projection bitingly engaging the wall of said recess when said contact strip is inserted therein, said contact strip and said recess cooperating to allow the easy insertion of the strip into the recess and to prevent the withdrawal of the strip when a contact plug moves longitudinally in said recess so as to make frictional contact with said strip, said block of insulation affording entry to said

contact member in the same recess which affords entry to an inserted contact prong whereby said single recess acts both to retain said contact strip and to allow a prong to enter therein at said open end.

10. In a female connector, an insulating block provided with an open-ended recess therein, a resilient contact member of narrower body width than said recess, having the major portion of its length lying in a single direction and being provided with a laterally extending tab biting engaging the wall of said recess, restraining said contact longitudinally in said recess and restraining its lateral movement substantially at one end only of said contact, whereby the body portion of said contact has lateral movement so as to adjust itself to make contact with a prong inserted in said recess of said connector plug, said block of insulation affording entry to said contact member in the same opening in the same recess which affords entry to an inserted contact prong.

11. An electrical socket for receiving the prongs of a plug, including a body of insulating material having therein a plurality of recesses open at the front end only, contact making members capable of insertion into said recesses, means adjacent the ends of said contact members nearest the front ends of said recesses, when said members are inserted therein, for fastening conductors to said contact members, said body also having therein a plurality of passages parallel to said recesses and respectively alongside said recesses, for leading said conductors alongside said recesses and substantially parallel thereto, said conductors passing through said passages and out of the rear of said body, whereby any pull upon said conductors will tend to force said contact members into said recesses.

12. In a female connector for receiving the prongs of a plug, at least two passages substantially parallel to and alongside one another, one of said passages being closed at the rear end of said connector, an insulating wall at least partly separating said passages, a contact member entering said closed passage, and means at the front end of said contact member for attaching a wire thereto, said wire lying in said other passage alongside said closed passage, so that pull upon said wire is transmitted to said contact member and resisted by the interior surfaces of said closed passage in which said contact member lies.

13. A socket connector for a radio plug comprising an insulating body having two recesses arranged side by side with a shoulder formed of insulating material at one side of each, one recess being open at the front face of the body and the other recess being open at the rear face, a laterally yielding contact extending longitudinally in that recess which lies open so as to receive a prong of said radio plug when inserted into the front face of said body, an insulated conductor inserted in the other recess from the rear end of said body and having its end fastened to the contact near the said opening for the prong whereby pulling strain upon said conductor will be communicated substantially as longitudinal strain to said contact, and tend to seat said contact more firmly.

14. A socket for a radio plug-in device consisting of an insulating body having an entrance passage for an insulated conductor leading through the rear face of the body into a recess in the front face, an extension recess laterally of the first mentioned recess, said body having supporting shoulders at the sides of the extension recess, a contact mounted in the extension recess and supported against said shoulders, the front end of the conductor remote from the entrance passage being secured to the front end of the contact and an insulating cover for the front of the body having an opening for insertion of a prong to engage the contact in the extension recess, said cover extending over the front end of the conductor and its insulation whereby pulling strain upon said conductor will be communicated substantially as longitudinal strain to said contact, and tend to seat said contact more firmly.

15. A connector for cooperation with a connecting plug, including a body holding in position a substantially flat strip of sheet metal having a portion shaped to lie along at least a portion of a cooperating plug, said strip having a bent portion extending laterally from said plug contacting portion adjacent the front end of said body at which the plug enters, a wire extending from the rear of said body along the portion of the connector engaging the plug, with insulation around the wire substantially contiguous thereto for a substantial length, the wire being free of its insulation for at least a short distance at its front end, said end being fastened to said lateral portion of said connector whereby said connector with its attached wire is economical of space both longitudinally and laterally of the connector and its cooperating plug and whereby strain upon said wire is imparted to said connector as longitudinal strain thereupon.

16. A connector for cooperation with a connecting plug, comprising a substantially flat strip of sheet metal having a portion shaped to lie along at least a portion of a cooperating plug, a bent portion extending laterally from said plug contacting portion adjacent the front end of said connector at which the plug enters, a wire extending from the rear end of said connector along the portion of said connector engaging the plug, with insulation around the wire substantially contiguous thereto for a substantial length, the wire being free of its insulation for a short distance and being fastened to said lateral portion of said connector and insulating guide means at least partly surrounding said insulated wire and substantially paralleling the portion of the connector engaging the plug, said lateral extension of said connector constituting an end portion for said guide means, the insulated wire being spaced from the plug by an amount substantially less than the diameter of said insulated wire, whereby said connector with its attached wire is economical of space both longitudinal and laterally of the connector and its cooperating plug, and whereby strain upon said wire is communicated to said connector as longitudinal strain thereupon.