

Nov. 26, 1940.

C. C. SMITH

2,223,231

CONNECTOR PLUG

Filed Sept. 10, 1937

Fig. 1.

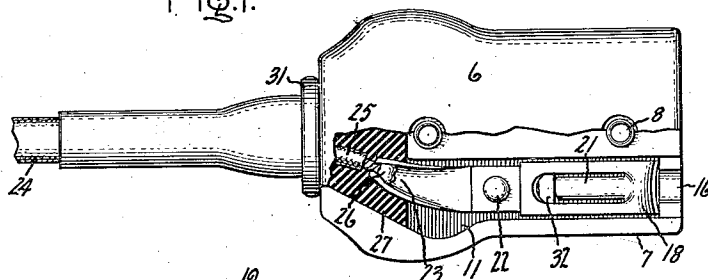


Fig. 2.

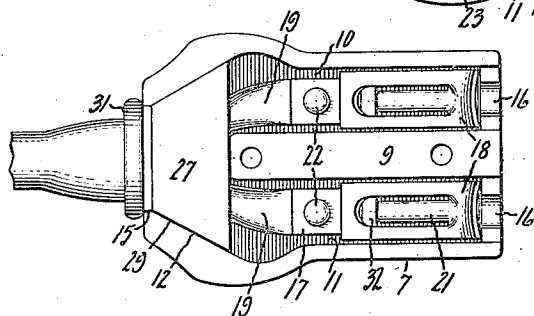


Fig. 3.

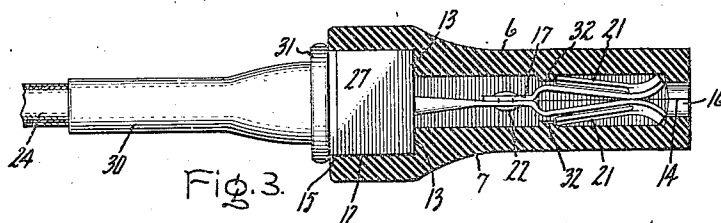


Fig. 4.

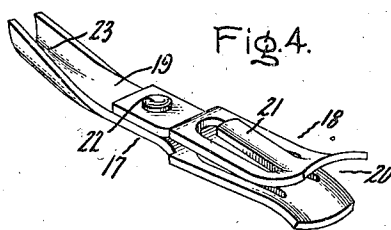
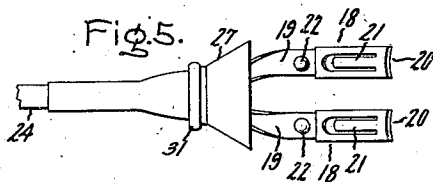


Fig. 5.



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UNITED STATES PATENT OFFICE

2,223,231

CONNECTOR PLUG

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Application September 10, 1937, Serial No. 163,281

1 Claim. (Cl. 173—322)

The present invention relates to connector plugs such as are used on cord sets for connecting heating devices and the like to a current source.

5 In the manufacture of electrical connector plugs for relatively small currents, it is known to mold the contacts and adjacent portions of the conductor cord which is connected to the contacts in rubber, or the like, to provide a non-
10 breakable plug and a strain relief for the connections between the cord conductors and the contacts.

In the manufacture of connector plugs for larger electric currents, as in the case of flatiron
15 connector plugs, for example, this has not been possible because of the high temperature which the contacts may reach during operation, temperatures of the order of 600° F. being met with sometimes.

20 One object of the present invention is to provide an improved plug structure wherein the connections between the cord conductors and the contacts are molded in rubber, or the like, to provide a strain relief and which avoids difficulties in so far as the high temperatures met
25 with are concerned.

A further object of the invention is to provide a plug structure wherein the cord is firmly anchored in the plug body so that any pull on the
30 cord is taken by the body of the plug.

A further object of the invention is to provide an improved construction of plug contact which is simple to manufacture and to which the conductor is connected without the use of screws.

35 Further objects and the advantages of the invention are pointed out in the following specification.

In the drawing, Fig. 1 is a top view of a plug embodying the invention, a portion of the plug
40 body being broken away; Fig. 2 is a top view of a connector plug with the upper half of the plug body removed; Fig. 3 is a longitudinal sectional view of the plug; Fig. 4 is a perspective view of one of the plug contacts, and Fig. 5 is a top view
45 of the two contacts with the strain relief member molded thereon.

Referring to the drawing, the plug comprises a plug body or housing formed of two complementary halves 6 and 7 fastened together by a
50 suitable means, such as rivets 8. The plug body is formed from a suitable molding compound, such as a phenolic condensation product or other resinous substance and a suitable filler, capable of withstanding the temperatures met
55 with. It may be formed from any of the mold-

ing compounds now in use for connector plugs of this type. The plug body is provided with a longitudinally extending partition 9 which divides the interior of the body into two longitudinally extending passages 10 and 11. The partition wall 9 terminates short of the rear end of the plug body and at this point the plug body is enlarged somewhat to provide a pocket 12. At the inner end of the pocket 12 are shoulders 13. The longitudinal wall 9 is formed preferably with a part integral with each of the plug body halves, the line of demarkation between the parts being indicated at 14 in Fig. 3. In the rear end of the plug body is an opening 15 which communicates with the pocket 12. In the front wall of the plug are openings 16 for the admission of contact posts or blades.

Located in the passages 10 and 11 are contacts 17. Referring particularly to Fig. 4, each contact comprises a clamping end or socket 18 and a relatively long shank 19 of relatively limited cross-sectional area to the outer end of which the conductors of the electric cord are connected. The walls forming the socket are curved outwardly as indicated at 20 to provide for the admission of contact parts or blades between them and each is provided at its central portion with a struck out spring tongue 21 which grips a contact post inserted between them. The contact is formed preferably of two strips which
30 are substantially alike except that one strip is provided with the relatively long extension 19 and the two strips are fastened together by suitable means as by riveting, as indicated at 22. The outer end of the extension 19 has its walls bent around to provide a tapered pocket 23 for the reception of the end of an electric wire.

An electric cord 24 having two conductor wires 25 is indicated in the drawing. The ends of the conductor wires are connected one to each of the contacts 17. This may be done by inserting the end of the wire in the tapered pocket 23 and fixing it in place by means of solder as indicated at 26; or after the wire is in place, the walls of the pocket may be squeezed down around the wire by the use of a suitable tool. After the two conductors have been connected to the two contacts, the two contacts are assembled in correct spaced relation to each other in a suitable fixture and a body 27 of suitable insulating material, such as rubber or the like, is molded directly around the outer ends of the extensions 19, the ends of the conductors 25, and the adjacent portion of the cord 24. This serves to anchor the connections between the conductors and contacts
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in the insulating body 27 and also to provide a strain relief for the connections. Body 27 is of a size and shape to fit in pocket 12 and it will be clear that any pull on the cord 24 will be taken by the body 27 engaging the wall of the pocket. 5 The body 27 at its inner end fits against the shoulders 13 and is held against the shoulders by the tapered walls of the pocket as indicated at 29. Preferably the adjacent portion of the 10 cord 24 has material molded around it for quite some length as indicated at 30; thus providing protection against sharp bending of the cord where it enters the body, also it is preferably provided with a bead or flange 31 which engages the outer rear face of the plug body. To hold 15 the contacts from longitudinal movement in passages 10 and 11, body halves 6 and 7 are provided with abutments 32 with which the inner ends of tongues 21 engage.

20 In use, as pointed out above, a connector plug of this type is subjected often to fairly high temperature, the contact sockets 18 reaching sometimes temperatures of the order of 600° F. This is a temperature higher than rubber or similar 25 material 27 in which the ends of the contacts are embedded, can withstand and the purpose of the relatively long shanks 19 on the contacts is to serve to dissipate heat and prevent the high temperature of the socket portion of the contact 30 from being transmitted to body 27. By use of a relatively long shank 19, I am enabled to dissipate a large amount of heat and thus maintain the temperature at the body 27 at a safe low value.

35 A pair of contacts 18 with the conductors of the cord 24 attached to the inner ends of the shanks and the body 27 molded thereon is shown in Fig. 5. This forms a unitary structure wherein the body 27 carries the two contacts 17 and which 40 can be handled as a unit. And in no way can the connections between the contacts and the cord be disturbed or become detached.

To assemble the plug, it is necessary merely

to place a molded unit between the two body members 6 and 7 with the sockets 18 in the front ends of the longitudinally extending passages 10 and 11 and the body 27 in pocket 12 and fasten 5 the body members together. Since the connection between the conductors and the contacts is a permanent one and protected from breakage by molded body 27, the two body members 6 and 7 can be permanently fastened together by rivets. 10 This is of advantage in that the fastening together can be done at low cost, and being permanently fastened together, the plug cannot be tampered with. The sockets 18 of the contacts fit loosely in the passages 10 and 11 so that they can float to a limited extent to permit of connection 15 to posts or contact blades which may be somewhat out of alignment.

What I claim as new and desire to secure by Letters Patent of the United States is:

A connector plug comprising a housing formed 20 of an insulating material capable of withstanding relatively high temperatures and having two spaced longitudinally extending passages and a pocket with which the rear ends of said passages communicate, contact sockets in the forward ends 25 of said passages, said sockets being provided with elongated shanks of relatively limited cross-sectional area extending from the socket through the passages to said pocket, an electric cord having its conductors connected to the ends of said 30 shanks and resilient insulating material surrounding and embedding the ends of said shanks and the connections of the conductors therewith and forming a body which fits in said pocket and is held in position by said housing, said insulating 35 material extending a distance back from said housing and surrounding said cord to form a strain relief sleeve, said shanks dissipating the heat from said contacts incident to connection of the plug to a heating appliance to protect said 40 body of insulating material from damage due to the effect of the heat.

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