Aug. 2, 1955 H. B. CRANE 2,714,711

ELECTRICAL CONNECTORS

Filed Jan. 13, 1954

Fig. 1.

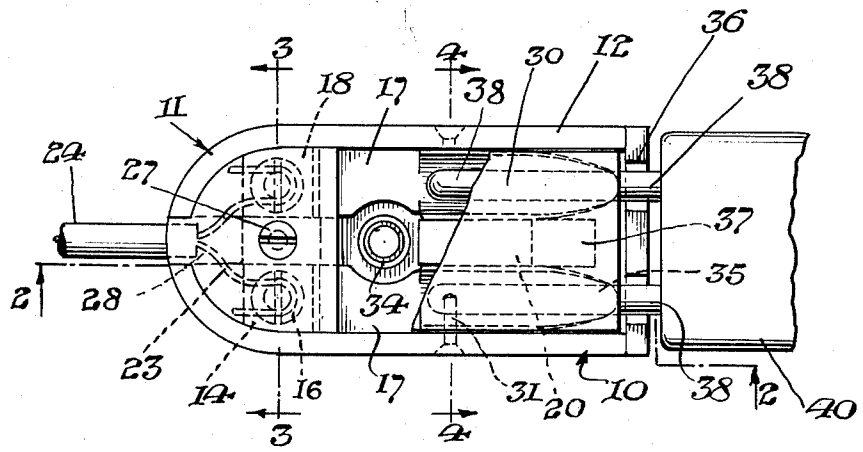


Fig. 2.

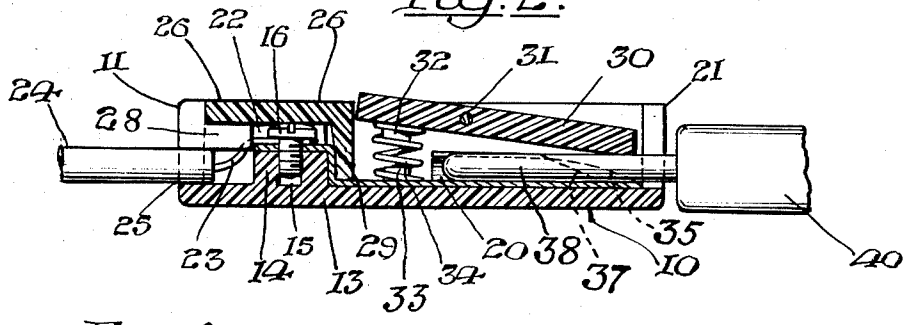


Fig. 3.

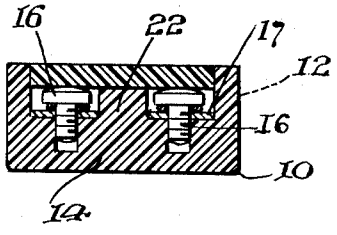


Fig. 4.

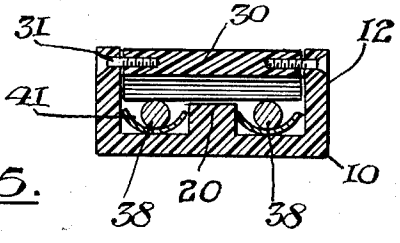
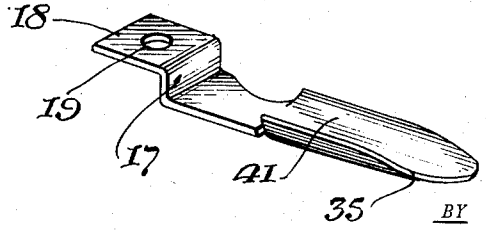


Fig. 5.



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ELECTRICAL CONNECTORS

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3 Claims. (Cl. 339—74)

The present invention relates to electrical connectors and particularly to plug connectors for connecting appliances having terminal prongs to cords which are in turn connected to a power source.

At the present time many appliances such, for example, flat irons, are provided with upstanding cylindrical prongs over which a plug comprising cylindrical sleeves is placed, the cylindrical sleeves of the plug being connected to an electrical cord which is in turn plugged into the ordinary electrical outlet. Such plugs are retained on the prongs of the appliance only by the friction of the sleeves. Moreover, when such a plug is removed from the appliance the sleeves remain connected to the power source and the device is dangerous because these sleeves being thus connected may impart an electrical shock to anyone who handles the connector.

The present invention provides a plug connector having the parts thereof so organized that the frictional contact between the appliance prongs and the mating portions of the connector is exerted under spring pressure and furthermore having the parts so arranged that when the connector is removed from the appliance the openings in the housing, through which the prongs of the appliance extend, are closed and the user cannot inadvertently come into contact with the contact elements.

It is an object of my invention to provide an electrical plug connector which is resiliently retained in position on the prongs of the appliance with which it is used.

It is another object of my invention to provide such a connector so organized that upon removal of the connector from the prongs of an appliance the housing is closed and the electrically live portions of the connector sealed from the exterior thus eliminating all shock hazard.

It is another object of the invention to provide such an electrical connector having few parts and being simply constructed and therefore inexpensive to manufacture.

Other objects and features of the invention will be apparent when the following description is considered in connection with the annexed drawings, in which,

Figure 1 is a top plan view of the plug connector of my invention having a portion of the outer housing broken away in order to show the position of the internal parts;

Figure 2 is a longitudinal cross-sectional view of the device of Figure 1, the section being taken on the plane of the line 2—2 of Figure 1;

Figure 3 is a transverse cross-sectional view of the electrical connector, the view being taken on the plane of the line 3—3 of Figure 1;

Figure 4 is a transverse cross-sectional view taken on the plane of the line 4—4 of Figure 1; and

Figure 5 is a perspective view illustrating the shape of the contact member which in use makes contact with one of the appliance prongs.

Referring now to the drawings, there is shown at **10** a housing member which is generally rectangular in shape having one rounded end **11** and which is formed from electrically insulating material such for example as Bakelite. The member **10** includes the upstanding rim portion

12 which extends upwardly from base **13** on all sides thereof. Formed integrally with the base **13** is an upstanding transverse rib **14** having bores **15** therein to receive the ends of screws **16**. Contact members **17**, such as shown in Figure 5, are formed with bent-off portions **18** which are provided with openings **19** centrally thereof, these openings being adapted to receive the threaded shanks of screws **16** to thus hold the contact members **17** in place on the rib **14**.

In order to ensure proper positioning of the contact members **17** a longitudinally extending rib **20** (Figs. 1, 2 and 4) is provided centrally of the base **13** and adjacent the squared end **21** of the housing. The right hand ends of contact members **17**, which are bent into semicylindrical form as shown at **41** (Fig. 5) fit between the outer rim **12** and the rib **20** thus definitely determining the proper location of the contact members.

The contact members **17** and the heads of screws **16** are separated from each other at the ends **18** by means of a thickened portion **22** (Figs. 2 and 3) of the upstanding transverse rib **14**. This barrier portion **22** also serves to separate the lead-in conductors **23** which have their ends stripped in the usual manner and placed under the heads of the screws **16** as indicated in Figures 1 and 2.

The usual double conductor cord **24** comprising two conductors **23**, as above mentioned, is positioned in an opening **25** in the rim **12** at the left end of the housing **10**, this opening extending from the upper edge of the rim to the base **13**.

A cover member **26** is provided which cover member seats upon the rib or barrier portion **22** and is fixed thereto by means of a screw **27**. The cover **26** has a thickened portion **28** located on the longitudinal center line thereof which portion extends to the left as seen in Figures 1 and 2 abutting against the barrier **22** at its right hand end and extending into the opening **25** at its left hand end. The cover thus serves to clamp the cord **24** in position against the base as well as to prevent contact with the screws **16**. Additionally, the cover **26** has a downwardly extending portion **29** which overlies the offset of the contact member **17**.

The housing is completed by means of a pivoted cover and gripping member **30** which is pivoted to the side portions of the rim **12** by means of screws **31** which screws extend through the rim **12** and into threaded openings in the sides of the cover member **30** or by means of a bolt extending through a transverse bore provided therefor. The cover member **30** is provided with a downwardly extending boss **32** beneath which there is formed integrally with the base **13** a second boss **33**. A coil spring **34** seats around the bosses **32** and **33** and presses the cover and gripping member **30** in a clockwise direction as seen in Figure 1. The right hand ends of the contact members **17** are bevelled as indicated at **35** in Figure 5 thus making it possible for the member **30** to move to a position at which its right hand end lies against the base **13** closing the openings **36** in the upstanding rim **12** and preventing access to the interior of the housing **10**. The rib **20** is also bevelled at its right hand end as indicated at **37**, Figure 1, in order to permit the required clockwise movement of the cover member **30**.

It should be noted that member **30** has a sufficient thickness so that when moved to its most clockwise position no gap is left at the left hand end through which access could be had to the interior of the device. At the same time by simply depressing the left hand end of the member **30** against the pressure of the spring **34** prongs **38** of an appliance plug or the like designated **40** (and only a fragment of which is shown in the drawings), may be inserted through the openings **36** and lie on and make contact with the semicylindrical ends **41**

of the contact members **17**. Thereupon the release of the member **30** will permit the spring **34** to urge the right hand end of member **30** against the prongs **38** to hold them in position or more accurately to hold the entire plug connector in position on the prongs **38**. Removal of the plug connector from the prongs will permit the spring **34** to urge the member **30** an additional amount in a clockwise direction closing the openings **36** and preventing access to the interior of the plug connector, thus avoiding the shock hazard which is present in other devices of this same general character.

While I have described a preferred embodiment of the invention, it will be understood that I wish to be limited not by the foregoing description, but solely by the claims granted to me.

What is claimed is:

1. An electrical plug connector comprising, in combination, a housing having a cavity therein, a pair of longitudinally extending contact members spaced apart from each other in said cavity and adapted to receive the prongs of an appliance plug, openings through said housing into said cavity adjacent the ends of said contact members, said ends of said contact members adjacent said cavity openings being semicylindrical in cross-section and being bevelled to a point adjacent said cavity wall openings, a cover for said cavity, means pivotally mounting said cover and means urging said cover to rotate to a position to close said cavity wall openings, said end then seating against the bevelled ends of said contact members, said cover also serving to hold the prongs of an appliance plug against said contact members when said prongs are inserted through said cavity wall opening.

2. In an electrical plug connector, in combination, a housing having a cavity therein, a thickened rib extending transversely of said housing at one side of the transverse center line thereof, a pair of contact members extending longitudinally of said housing, each said contact member having an upwardly offset portion lying on said thickened rib and a main longitudinally extending portion lying on the base of said cavity, said main longitudinally extending portion being bent to form a substantially semicylindrical surface, an upstanding longitudinally extending rib lying between said main portions of said contact members and spacing them apart, openings in said housing adjacent the terminal ends of said contact members, a cover means for said cavity, means for pivotally mounting said cover means in the upper portion of said housing and resilient means for urging said cover means in a direction to close said openings when no plug prongs extend therethrough, said resilient means serving when plug prongs extend through said openings and lie in the semicylindrical portions of said contact members to press said plug prongs into contact with said contact members, the ends of said contact members adjacent said housing openings being bevelled to permit said cover member to close said openings when no plug prongs extend therethrough.

3. In an electrical plug connector, in combination, a housing comprising a generally rectangular base and integral upstanding walls, said housing being formed of electrically insulating material, a transversely extending rib projecting upwardly from said base at one side of the transverse center line thereof, a pair of contact members having offset portions resting on said rib and longitudinally extending portions resting on said base at either side of the longitudinal center thereof, said contact members having upwardly curved sides bevelled near the extremities thereof an upstanding longitudinal rib formed integrally with said base, said rib extending between said contact members and serving with said upstanding walls to position said contact members, means for fastening said contact members to said transversely extending rib, said means also being adapted to fix cord conductors to said contact members, a slot extending from the top of the upstanding wall downwardly to the base at the end of said housing adjacent said transversely extending rib, said slot being adapted to receive a conductor cord, a thickened portion of said transversely extending rib between said contact members, a cover mounted on said thickened portion, said cover overlying said offset ends of said contact members and closing one end of said housing, a downwardly extending central rib on said cover, said rib lying adjacent the thickened central portion of said transverse rib and extending into said conductor cord slot to thereby clamp said conductor cord in position against the base of said slot, means for fastening said cover to said transversely extending rib, a main cover member extending from said first mentioned cover member to the remote end of said housing, means pivotally mounting said main cover member in the upstanding walls of said housing, the edge of said main cover member lying adjacent said first mentioned cover member being sufficiently thick so that no appreciable gap exists between said cover members in any position of said main cover member, means urging said main cover member to rotate in a direction to press one end thereof against the base of said housing at the end remote from said transverse rib, and openings in said housing adjacent the ends of said contact members, said openings being adapted to receive appliance plug prongs, said main cover member serving to press appliance plug prongs against said contact members, and to close said openings when no appliance prongs extend therethrough by pressing downwardly against the said bevelled ends of said contact members.

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