F. KUHN.

ELECTRICAL PLUG CONNECTOR.

APPLICATION FILED OCT. 5, 1912.

1,107,318. Patented Aug. 18, 1914.

Fig. 1.

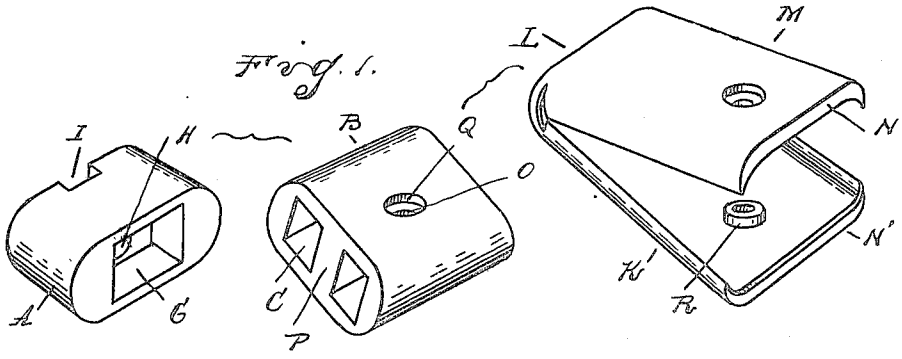


Fig. 2.

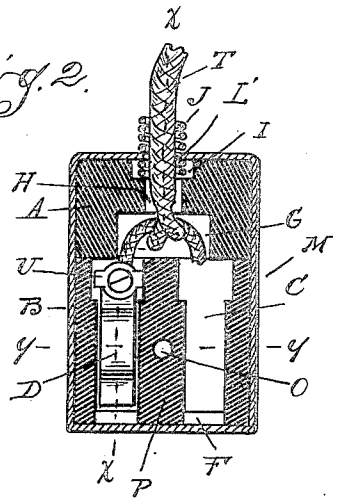


Fig. 3.

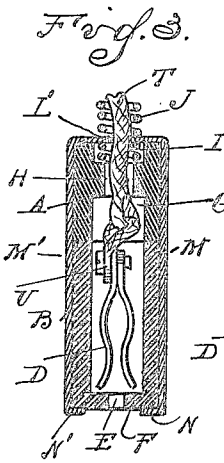
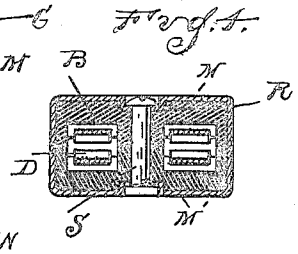


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

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ELECTRICAL PLUG-CONNECTOR.

1,107,318. Specification of Letters Patent. Patented Aug. 18, 1914.

Application filed October 5, 1912. Serial No. 724,170.

To all whom it may concern:

Be it known that I, FRANK KUHN, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Electrical Plug-Connectors, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to electrical connectors of the plug type, and it is the object of the invention to obtain a more durable construction, and one which may be manufactured at small cost.

To this end the invention consists in the peculiar construction, arrangement and combination of parts as hereinafter set forth.

In the drawings: Figure 1 is a perspective view of some of the parts of the plug detached. Fig. 2 is a longitudinal section through the plug. Fig. 3 is a section substantially on line *x*—*x* Fig. 2. Fig. 4 is a cross section on line *y*—*y*.

In the construction of plug connectors, it is usual to completely surround the contacts with an insulator so as to avoid accidental short circuiting. It is also common to form the insulators of a fragile material such as porcelain. In use, however, the porcelains are frequently broken so as to expose the contacts, with a resulting danger of short circuit. With my improved construction the insulators are effectively protected from breakage by a metallic housing, which is of such construction that it may be struck up from a single blank of sheet metal, and to guard against short circuiting the electrical contacts are held so as to be incapable of projecting outward beyond the insulator.

In detail, the insulator for the plug is formed in a plurality of sections, and, as shown, comprises sections A and B, forming different longitudinal portions of the plug. The section B is provided with parallel recesses C for receiving pairs of contact springs D entered therein from the inner end of the section. At the outer end of the section are slots E of sufficient width to permit the entrance of the coöperating electrical contacts, but preventing the outward movement of the contacts D by shoulders F. The section A is provided with a single central recess G of sufficient size to receive the knotted conductor, and having a contracted aperture H for the outward passage of said conductor. At the outer end of the section is a recess I of larger diameter than the aperture H for receiving the end of a resilient coil J, surrounding and protecting the end of the conductor.

K is a metallic case struck up from a flat blank of sheet metal, and having an end portion L and integral side portions M and M′, which are fashioned to surround the insulator sections A and B, with longitudinally-extending, meeting edges. The ends of these sections M and M′ are further provided with inturned flanges N and N′ which overlap the end of the section B and prevent its withdrawal from the armor.

O is an aperture extending transversely through the partition P, which separates the recesses C of the section B.

Q are enlarged recesses at opposite ends of the aperture O, and R are inwardly embossed portions of the armor K for fitting into said recesses and for receiving a clamping screw or rivet S, holding the opposite side of the armor in position. An aperture L′ in the end L of the armor permits the passage of a conductor T—but this aperture is preferably of lesser diameter than the recess I, and permits of securing the coil J by securing same in engagement therewith.

In assembling the parts, the conductor T may be engaged with the aperture L′ of the armor and threaded through the aperture H of the section A. It is then knotted to prevent withdrawal and the ends are connected to the contacts D by suitable screw-clips such as U. These contacts are then engaged in the recesses C of the section B and on sides M and M′ of the armor; are contracted about the sections A and B and secured by the bolt or rivet S. When thus assembled the insulators are completely incased in the armor, and the contacts D are protected from electrical connection with each other and with the metallic armor. By reason of the fact that the insulator is formed in sections, the insulator flanges F may be arranged at the outer end of the plug, and also the knotting and securing of the conductor is facilitated. On the other hand, the surrounding armor holds the two sections in fixed relation and in close contact with each other.

What I claim as my invention is:

1. An electrical plug connector comprising an insulator formed of a plurality of recessed sections placed end to end, elec-

trical contacts and connections within said sections, and an armor incasing said sections and holding the same in fixed relation.

2. An electrical plug connector comprising an insulator formed of a plurality of end to end adjoining sections, having recesses therein with entrance orifices at the inner ends of said sections, electrical contacts and connections within said recesses, and an armor inclosing said sections and holding the same in fixed relation.

3. An electrical plug connector comprising a plurality of end to end adjoining sections, having recesses therein with entrance orifices at the inner ends of said sections, an electrical contact in one of said recesses, a conductor connected to said contact, having a retaining knot in the recess of the adjoining section, and an armor for holding said sections in fixed relations.

4. An electrical plug connector comprising a recessed insulator, an electrical contact in said recess, and an armor for incasing said insulator, struck up from a sheet metal blank, having an end portion and opposite side portions with longitudinally-extending, meeting edges.

5. An electrical plug connector comprising a recessed insulator, a contact therein, a conductor connected to said contact and passing outward through one end of said insulator, and an armor struck up from a sheet metal blank, having an end portion apertured for the passage of said conductor, and complementary side portions fashioned to embrace said insulator, with longitudinally-extending, meeting edges.

6. An electrical plug connector comprising a recessed insulator, contacts within said insulator, and an armor for said insulator struck up from a sheet metal blank, having an apertured end portion, complementary side portions fashioned to embrace said insulator and having longitudinally-extending, meeting edges, end flanges for overlapping the opposite ends of said insulator, and a cross connection for clamping said side sections in fixed relation to each other against said insulator.

7. In an electrical plug connector, the combination with the insulator body of an armor therefor, struck up from a sheet metal blank, having an end section and opposite side sections fashioned to embrace the body, with longitudinal meeting edges; registering, inwardly-embossed portions on said opposite side portions, and a cross connection passing through said body having headed ends engaging said inwardly embossed portions.

8. In an electrical plug connector the combination with an insulator body apertured for the passage of the conductor, and having a recess in its end surrounding said aperture, of an armor for said insulator, provided with a registering aperture overhanging said recess, and a resilient spiral for protecting said conductor secured into engagement with said armor and seated in said recess.

9. An electrical plug connector comprising a plurality of longitudinally-adjoining insulator sections, one of said sections being provided with parallel recesses therein, with entrance orifices at the inner end of the section, and the other section having a central recess at its inner end registering with both of said parallel recesses, electrical contacts in said parallel recesses, conductors connected to said contacts, knotted to engage said central recess, and an armor inclosing said sections and holding the same in fixed relation.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK KUHN.

Witnesses:
JAMES P. BARRY,
DELBERT COLLINS.