

June 29, 1926.

1,590,823

F. W. HEWITT

ELECTRIC CONNECTER PLUG

Filed April 22, 1924

2 Sheets-Sheet 1

Fig. 1.

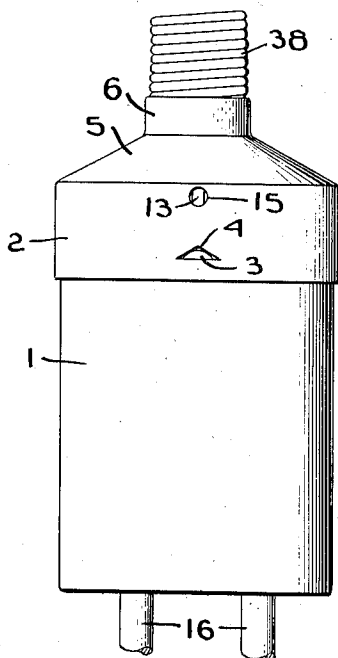


Fig. 3.

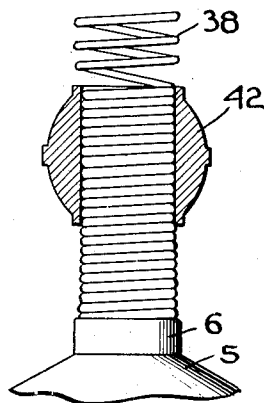
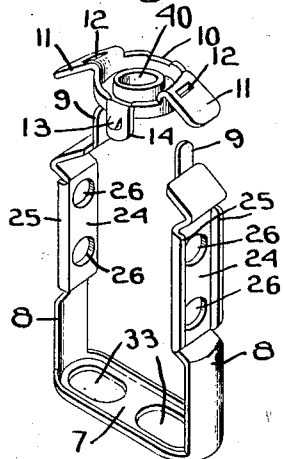


Fig. 2.



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Fig. 5.

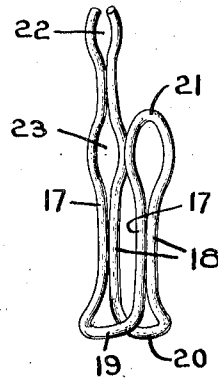


Fig. 6.

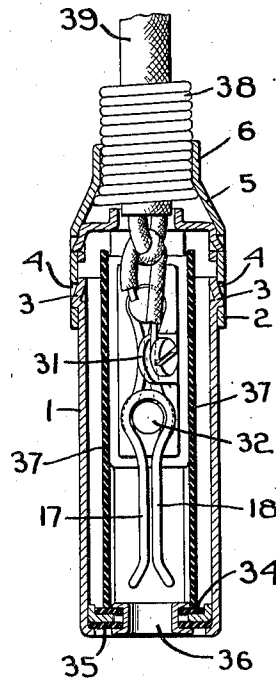


Fig. 4.

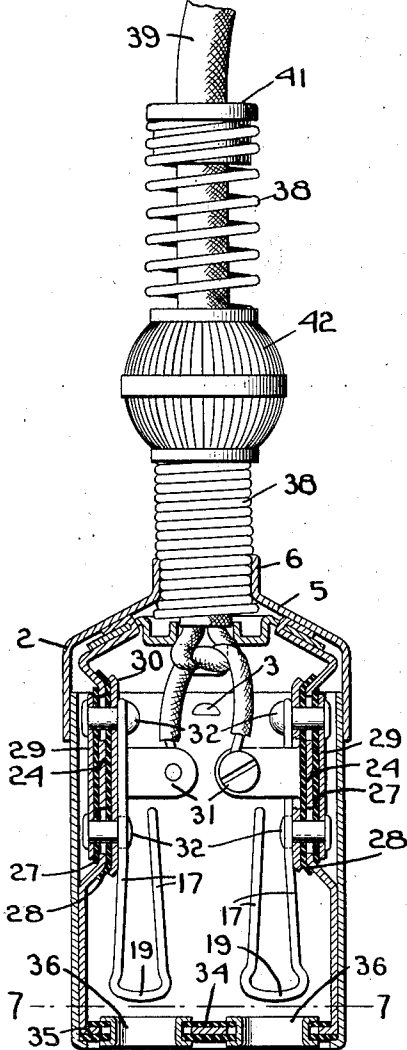
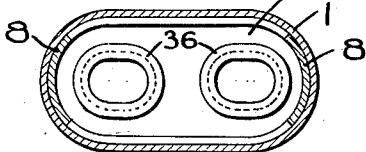


Fig. 7.



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ELECTRIC CONNECTER PLUG.

Application filed April 22, 1924. Serial No. 708,246.

This invention relates to an electric connector plug such as is connected to a flexible electric conductor and employed for making a separable attachment with an electric heating or other device such, for example, as a flat iron.

The object of the invention is to provide a substantially all metal plug which is thus for all practical purposes non-breakable and indestructible. Connector or attachment plugs of this type are commonly employed in connection with flat irons, small electric stoves and other devices frequently used by unskilled and careless persons. The present invention in the all metal feature presents a plug which can be subjected to extremely rough handling without impairing its usefulness or its appearance.

The object of the invention is further to provide such a connector plug which will present a pleasing and attractive appearance. This result is secured by a sheet metal enclosing casing which presents a smooth and attractive surface and may be given a finished appearance by nickel plating or otherwise.

The object of the invention is further to provide a connector plug which will act after the manner of a quick break switch. This result is secured by combining with the plug an anti-kink helical spring secured to the plug and surrounding the flexible conductor, and a heat insulating sleeve of a well known phenolic condensation product or other suitable material surrounding and engaging the spring. This sleeve also ensures a suitable hand-hold or grip which will not become heated even if the all metal plug becomes somewhat heated. When the operator desires to remove the plug from the device to which it is connected, the operator naturally takes hold of this gripping sleeve to pull the plug away from the terminals. The spring will thereupon expand until the pull transmitted therethrough to the plug is sufficient to overcome the friction between the plug and the device to which it is connected whereupon the plug will be suddenly disconnected from the device by the contraction of the spring, thus effecting a quick break of the circuit.

The object of the invention is further to provide a simple and efficient construction

of the all metal plug including various novel insulating features and a novel construction of a one-piece metal wire universal socket member.

These and other objects and features of the invention will appear more fully from the accompanying description and drawings and will be particularly pointed out in the claims.

In the drawings:

Fig. 1 is a side elevation of a connector plug embodying a preferred form of the invention with the upper end of the anti-kink spring and the gripping sleeve omitted and with the ends of the terminals of a device to which it is to be attached shown in place;

Fig. 2 is a perspective view of the body and bridge cap members of the metal skeleton frame forming a part of the device with these members shown ready for assembly;

Fig. 3 is a detail partially in longitudinal cross section showing the portion of the gripping sleeve on the anti-kink spring;

Fig. 4 is a view largely in transverse cross section showing the entire device;

Fig. 5 is a view in perspective of one of the socket members;

Fig. 6 is a view of the main portion of the device taken in cross section transversely to that of Fig. 4;

Fig. 7 is a view in cross section taken on the line 7-7 of Fig. 4 and looking toward the bottom of the plug.

The form of connection plug illustrated for disclosing a simple and preferred form of the invention is one suitable for use on a flexible electric connector extending to a lamp socket or receptacle and for attachment to a flat iron or other heating device.

In the construction illustrated the connector plug includes an exterior continuous sheet metal casing which is preferably finished to present a smooth, attractive design and nickel plated or otherwise suitably surfaced. This casing preferably comprises a body 1 and a cap 2. The body telescopes within the cap, as shown in Figs. 4 and 6, and is removably connected thereto by small lugs 3 struck out from the body and engaging apertures 4 formed in the cap. Thus the body may be connected to and disconnected from the cap in a manner similar

to the ordinary lamp socket. This casing is apertured at the top to receive the conductor. For this purpose the cap at the top is formed with a truncated cone-like shape 5 terminating in an open cylindrical sleeve 6. The casing is also apertured at the bottom or opposite end to receive the terminals of the device to which the plug is to be connected, as will appear from the subsequent description of the frame member.

The terminal receiving sockets and the insulating and connecting features of the connector plug are all preferably secured to and supported by a skeleton metal frame mounted within and enclosed by the casing. This frame is preferably made, for convenience of manufacture and assembling, in two sections rigidly connected together. These sections are shown separated readily for assembly in Fig. 2. The lower section comprises the generally U-shaped body having the base 7 and the uprights 8 terminating in the lugs 9. The upper section comprises a bridge cap member having the central annular portion 10 with the laterally extending wings 11. These wings are apertured at 12 to receive the lugs 9, and when the parts of the frame are assembled, the lugs 9 are bent back over the wings 11 as shown in Fig. 4, thus locking the two parts of the frame rigidly together. The entire frame is connected to the cap member 2 of the casing by lugs 13 struck out from the depending wings 14 of the bridge cap and fitting into apertures 15 in the cap 2. The base 7 of the frame and the lower portions of the uprights 8 fit snugly the body 1 of the casing, and thus the lower end of the casing is closed except for the apertures in the base of the frame. When, therefore, the body 1 of the casing is disconnected from the cap 2 of the casing the main portion of the frame and the parts supported thereby are all exposed and readily accessible.

The socket members which receive the terminals, such as 16, of the device to which the plug is to be connected, are of metal and in the preferred form present a one-piece skeleton wire construction. One of these socket members is separately illustrated in Fig. 5. As there shown the wire is bent to form a pair of longitudinal runs 17 oppositely disposed to another pair of longitudinal runs 18. The connecting runs 19 and 20 of these pairs are oppositely flared to form the socket mouth. Adjacent runs 17 and 18 of each pair are connected by the run 21 while the other adjacent runs 17 and 18 of each pair are extended longitudinally above the run 21 and bent to form eyes 22 and 23 to receive the attaching device for holding the socket member in place.

The uprights 8 of the frame body present re-entrant portions 24, each provided with

exterior longitudinal edge flanges 25 and each provided with a pair of apertures 26. The socket members and the binding posts are secured to these re-entrant portions 24 of the frame uprights in such a manner as to insulate the socket members with their binding posts from the frame and from each other. For this purpose apertured sheets of mica 27 and 28 are laid against the opposite faces of the portion 24. An apertured backing metal plate 29 is laid against the outer face of the mica sheet 27, the apertured base plate 30 of the metal binding post 31 is laid against the inner face of the mica sheet 28, and the socket member is laid against the inner face of the base plate 30, and then all these parts are firmly riveted together by the rivets 32 passing through the aligned apertures. The re-entrant portion 24 is so designed as to hold the rivets and all metal thus insulated from the frame well away from the casing 1. The construction is the same at both sides of the frame. The apertures in the mica sheets are much smaller than the apertures 26 in the frame and lateral shifting is prevented by the flanges 25 and longitudinal shifting by the portions of the frame above and below the re-entrant portion 24.

The base 7 of the frame is provided with large apertures 33. Apertured mica sheets 34 and 35 are placed above and beneath the base 7 and metal eyelets 36 are set up in the apertures of the mica plates and the base so as to clamp the mica plates and base together rigidly and leave the metal eyelets completely spaced and insulated from the metal of the base and these metal eyelets are arranged in axial alignment with the socket members. Consequently when the terminals of the device to which the plug is to be connected are passed through the eyelets 36 and into the socket members there can be no electrical connection between the terminals and the metal of the frame or casing.

The socket members in the form illustrated are of a universal type enabling any shape, round polygonal or flat, of terminal to make a contact and as these socket members are resilient this contact is a firm and yielding one.

Further insulation is provided between the frame and base by large sheets of mica 37 fitting the interior of the casing and laid in between the frame and the casing.

A helical wire spring 38 is forced into the cylindrical opening in the portion of the cap of the casing and expands at the bottom to form engagement therewith. The usual flexible, insulated, two-wire conductor 39 is led down through the interior of the spring and through a central aperture 40 in the bridge cap of the frame, and the wires spaced and knotted beneath this aperture, and the ends of the wires connected

in the usual manner to the binding posts 31. The usual thimble 41 is provided at the top of the spring 38.

A gripping sleeve 42, which may be of any suitable design, is herein shown as somewhat globular and of sufficient size to be readily grasped by the operator and forced over the spring and preferably engages therewith about midway of its length. This gripping sleeve should be of suitable heat insulating material such as a well known phenolic condensation product. Consequently if the all metal connector plug heats up somewhat this sleeve will remain cool. This sleeve serves, therefore, as a handle for the attachment and removal of the plug. Furthermore, by reason of its engagement with the helical spring, it causes the attachment plug to make a quick break or disconnection when removed from the device to which it is connected because when the operator seizes and pulls upon this sleeve the spring is expanded until the pull transmitted therethrough to the plug is sufficient to overcome the friction between the plug and the device to which it is connected, whereupon the plug will be suddenly disconnected and the circuit broken quickly which is a very desirable feature.

It will thus be seen that all the desired objects stated by the invention are secured by this connector plug and that there is thereby presented an extremely attractive, efficient, simple, non-breakable and indestructible, substantially all metal device.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. An electric connector plug comprising an exterior metal casing apertured at the top to receive an insulated conductor, a pair of metal socket members within the casing and insulated from the casing and from each other and connected to the conductor, and metal eyelets mounted in the bottom of the plug in alignment with the socket members and insulated from the casing and from each other.

2. An electric connector plug comprising an exterior metal casing presenting a body and a cap telescoping and removably connected, a metal supporting frame enclosed by the casing and having a U-shaped body and a bridge cap, means for securing the free ends of the frame body to the bridge cap, and a pair of metal socket members within the frame and insulated from the frame and from each other and held by the frame out of contact with the casing.

3. An electric connector plug comprising the construction defined in claim 2 together with means for securing the frame to the

casing cap whereby the force exerted in connecting and disconnecting the plug is transmitted to and taken by the frame.

4. An electric connector plug comprising an exterior peripherally continuous metal casing transversely separable into a body section and a cap section, a metal supporting skeleton frame within the casing, a pair of metal socket members respectively secured to and insulated from the opposite side members of the frame and separated from each other by an unobstructed air space, an aperture in the upper end of the casing to permit an electric conductor to be passed therethrough and connected to the socket members, and a pair of metal eyelets mounted in the bottom of the frame in alignment with the socket members and insulated from the frame and from each other and from the casing, whereby the casing body may readily be removed leaving the remaining parts of the plug supported by the frame and accessible.

5. An electric connector plug comprising an exterior metal casing apertured at the top to receive an insulated conductor, a pair of one-piece metal wire skeleton socket members within the casing and insulated from the casing and from each other and connected to the conductor, and metal eyelets mounted in the bottom of the plug in alignment with the socket members and insulated from the casing and from each other.

6. An electric connector plug including a one-piece skeleton wire socket member presenting four generally parallel and straight runs forming a skeleton terminal receiving socket, the connecting runs of oppositely disposed pairs being oppositely flared to form the socket mouth, and the opposite ends of adjacent runs of each pair being extended longitudinally beyond the run connecting the other runs of each pair at the socket head and bent to form attachment receiving eyes.

7. An electric connector plug comprising a metal supporting frame comprising apertured side bottom and top members, metal socket members secured to and insulated by apertured mica sheets from the side frame members, terminal receiving metal eyelets secured to and insulated by apertured mica sheets from the bottom frame member in alignment with the socket members, and an insulated flexible electric conductor extending through the aperture of the top member with its wires connected respectively to the socket members.

In testimony whereof, I have signed my name to this specification.

FRANK W. HEWITT.