To all whom it may concern:

Be it known that I, FREDERICK E. CARLSON, a citizen of the United States, and a resident of New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Circuit-Couplings for Electrically-Heated Utensils, of which the following is a specification.

This invention relates particularly to means for connecting electrically heated utensils of various sorts, such for instance as curling irons, combs, etc., into an electrical circuit, and has for its object the provision of a swivel connection which will permit of the utensil being turned without twisting the cord, and which is simple and inexpensive to manufacture and assemble, effective in providing a good electrical contact and easy to manipulate.

The invention is shown as applied to the handle of a utensil such as a curling iron, and—

Figure 1 is a central vertical section of the plug attached to the handle. Fig. 2 is a central vertical section of the receptacle. Fig. 3 is a bottom view of the plug member.

Referring to the drawings, a denotes the handle, b, b', the terminals of the heater circuit of the utensil, these terminals being separated by a wall c, of insulation. d is a cap of insulating material secured to the end of the handle, as by the screws e, and on which the contact plug f is mounted.

This plug comprises a metallic sleeve 1, reduced in diameter at its end as indicated at 2, to fit in an aperture 3 in the top of the cap d, and providing a shoulder which rests upon the cap at the edge of the aperture. Above this sleeve is located an insulating washer 4, and above this washer, a second metallic sleeve 5. A tubular bushing 6 of insulating material passes through these sleeves and washer, completely insulating the lower sleeve 1 from the upper sleeve 5. Through this bushing passes a screw 7, the head 8 of which is in electrical contact with the upper sleeve 5. Within the cap d and mounted on the end of the insulating bushing 6 so that it is in electrical contact with the sleeve 1 is a spring contact 9 adapted to bear upon and make electrical contact with one terminal of the heater circuit. A second spring contact 10, separated from the contact 9 by an insulating washer 11, is in electrical connection through the screw 7 with the sleeve 5, and is adapted to make electrical contact with the other circuit terminal b'. The spring contacts 9, 10, are passed through notches 13, 14, in the edges of the washer 11, to prevent them from turning relatively thereto, and the screws e extend through other notches 17, 18, in the edge of the washer to prevent the washer turning if the nut 12 should become loosened. This insures that under all conditions the spring contacts will be held in proper position to engage the ends of the terminal screws, b, b'. These sleeves, insulating washers and spring contacts, are held in assembled position on the screw 7 by the nut 13, and it will be seen that the circuit from the heater terminal b is through the spring contact 9 to the sleeve 1, and from the heater terminal b' through the spring contact 10, screw 7, screw-head 8, to the metallic sleeve 5. The sleeves 1 and 5 are circumferentially grooved as at 15, 16.

The complete receptacle shown in Fig. 2 and indicated generally by 20, comprises an inner shell 21 and an enclosing casing 22, these two parts being secured together as by a pin 23. The shell 21 is chambered as at 24 to receive the plug f which fits closely therein. The wall of the chamber in opposite sides and in alinement with the circumferential grooves 15, 16, is apertured as at 25, 26, to receive contact members such as the balls 27, 28, held in place by the springs 29, 30, so that they project slightly into the chamber 24, the apertures 25, 26, being so shaped that the balls cannot be pushed through them and fall out when the plug is removed. The springs 29, 30, are fastened to the shell 21 as by the screws 35, 36, under the heads of which the ends of the circuit wires 37, 38 are fastened, the shell having an upstanding wall 39 which is of course of insulating material, and isolates the two circuit terminals to avoid any possibility of short-circuiting at this point.
the shell is apertured as at 40 to receive the
circuit wires and the encircling spring

guard 41.

It is apparent that the form of the elec-
trical connection between the plug and the
receptacle is such that there is a good me-
chanical connection for both sides of the

circuit by the fitting of the exposed parts

of the balls into the grooves, and that this
connection is a complete and easily operat-
ing swivel which will permit the utensil to
be turned without limit and avoid twisting

of the cord. The plug is generally of uni-
form diameter and it is single so that there

can be no doubt as to the proper method of its
connection with the receptacle. The cir-
cuit terminals are inclosed within the shell

and out of alinement with one another, mak-
ing it quite difficult, if not impossible, to
accidently short-circuit them, and the man-
ner of connecting up the plug with the heater

terminals avoids the use of wire con-
nections.

I claim as my invention:

1. The combination with exposed circuit
terminals, of a cap inclosing said terminals
and secured in position, a plug supported by
said cap, contact members carried by said plug and
adapted for electrical engagement with said
exposed terminals, sleeves of conducting ma-

terial forming a part of said plug insulated
from one another, electrical connection be-
tween one of said sleeves and one of said

touches, and between the other of said
sleeves and the other contact, circumferen-
tial grooves formed exteriorly of each sleeve,
a receptacle chambered to receive said plug

contact members located in the walls of said
receptacle in alinement with and adapted to

fit in said grooves, yielding means for hold-
ing said contact members in place, and elec-
trical conductors connecting said contacts
with a supply circuit.

2. The combination with exposed circuit
terminals, of a cap inclosing said terminals,
a plug supported by said cap, said plug com-
prising a pair of spring contact members lo-
cated within said cap, electrically insulated
from one another at one end and having
their opposite ends adapted for electrical
contact with said terminals, sleeves of elec-
trical conducting material located outside of
said cap insulated from one another, elec-
trical connection between one of said sleeves

and one of said contact members, and be-
tween the other sleeve and the other contact
member, a circumferential groove in the ex-
terior surface of each of said sleeves, and
means for securing said cap and its support-
ed parts in place.

3. The combination with exposed circuit
terminals, of a plug connector comprising a
cap inclosing said circuit terminals and se-
cured in position, a sleeve of conducting ma-
terial arranged outside of said cap and hav-
ing an end shouldered and reduced to bear
against the end of said cap and fit into an
aperture therein, an insulating washer lo-
cated against the end of said sleeve, a sec-
ond sleeve of conducting material located
next said washer, circumferential grooves in
the exterior surface of both of said sleeves, a

tubular bushing of insulating material ex-
tending through said sleeves and washer, a
contact mounted upon said bushing at said cap and in electrical connection with
the first mentioned sleeve, a screw extending
through said tubular bushing and having
electrical contact with the second mentioned
sleeve, an insulating washer mounted on said
screw next to said contact member, and a
second spring contact member mounted on
said screw against said washer, and a nut
engaging said screw to unite the parts of
said plug to said cap, said contact members
being adapted to make electrical contact
with said circuit terminals.

4. In a device of the character described,
a receptacle chambered to receive a plug, ap-
ertures in the wall of said receptacle out of
alinement with one another, ball contacts lo-
cated in said apertures and normally pro-
jecting into said chamber, yielding means
for holding said contacts in normal position,
and electrical connection between said con-
acts and a supply circuit in combination with
a plug fitting the chamber, said plug includ-
ing contact members insulated from one
another and circumferentially channeled
to electrically and mechanically engage with
said ball contact and permit relative rota-
tion between said plug and receptacle.

5. In a device of the character described,
a chambered receptacle, a plug to fit said
chamber, and a single means supported and
movable in the wall of said receptacle for
detachably uniting said parts both electric-
ally and mechanically to permit relative ro-
tation between them.

6. The combination with exposed circuit
terminals, of a cap inclosing said terminals,
a plug supported by said cap and having
contact sleeves insulated from one another,
contacts mounted on the end of said plug
within said cap and adapted to engage said
circuit terminals, and an insulating washer
separating said contacts and having its edge
notched to receive said contacts.

7. The combination with exposed circuit
terminals, of a cap inclosing said terminals,
a plug supported by said cap and having
contact sleeves insulated from one another,
contacts mounted on the end of said plug
within said cap and adapted to engage said
circuit terminals, and a washer of insulating
material located between said contacts,
notches in the edge thereof to receive said
contacts, and means for preventing the rota-
tion of said washer and contacts relative to
said plug.
8. The combination with exposed circuit terminals, of a cap inclosing said terminals, a plug supported by said cap and having contact sleeves insulated from one another, spring contacts mounted on the end of said plug within said cap and adapted to engage said circuit terminals, and a washer of insulating material located between said spring contacts, notches in the edge thereof to receive said spring contacts, and fastening 10 screws for securing said cap with its supported plug in position, said screws passing through notches formed in the edge of said washer.

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Witnesses:
   JESSE J. FOSTER,
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