Nov. 16, 1948. F. H. SEALS 2,454,221

ELECTRIC SERVICE OUTLET

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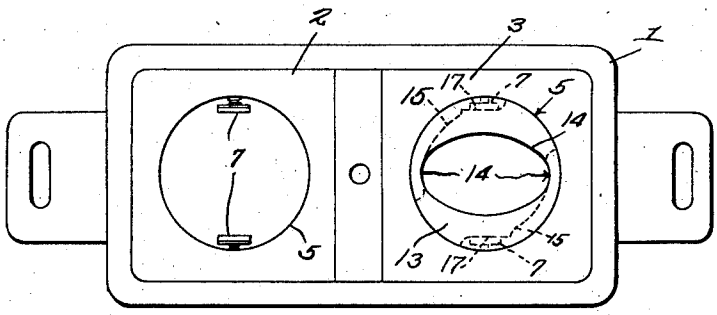


Fig. 1.

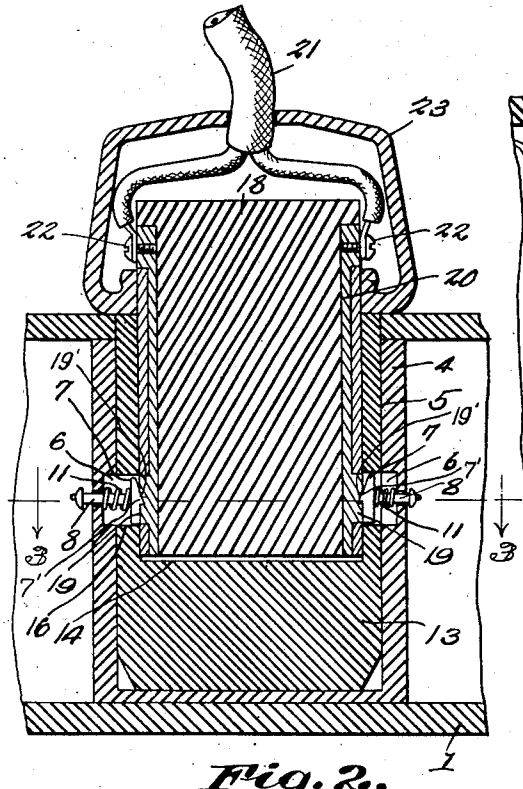


Fig. 2.

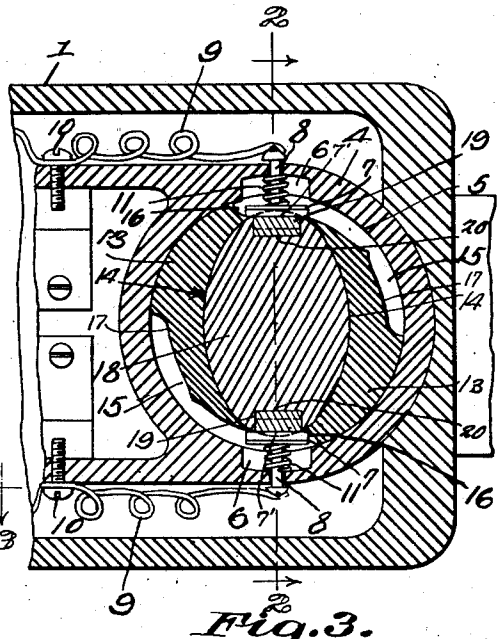


Fig. 3.

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ELECTRIC SERVICE OUTLET

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2 Claims. (Cl. 173—330)

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This invention relates to an electric service outlet and has for its object the provision of a receptacle and a plug, both of new and novel construction, adapted to inter-engage to prevent accidental separating of the parts by pulling on the service cord or from other causes.

It is another object of the invention to provide an electric service outlet which does not leave exposed any terminals which might be contacted by a user and thus cause injury.

A still further object is to provide an electric service outlet the parts of which are of simple construction and can readily be coupled or uncoupled.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

In the accompanying drawing the preferred form of the invention has been shown.

In said drawing

Figure 1 is a front elevation of the receptacle member of the device, said receptacle being of the duplex type and having the cam removed from one socket, the other cam being shown in normal position.

Figure 2 is an enlarged section through the plug and receptacle portions taken on the line 2—2 Fig. 3.

Figure 3 is a section on line 3—3 Fig. 2.

Referring to the figures by characters of reference 1 designates the casing or box portion of the service outlet which can be of the duplex type as shown or can contain one, two or more sockets. In Figure 1 the two units have been indicated at 2 and 3 and are identical. Each unit includes a cylindrical inner casing or lining 4 provided with a cylindrical socket 5 open at its outer end flush with the outer face of the casing or box 1 but closed at its inner end. This casing or lining is formed with opposed recesses 6 opening into the socket 5 and each recess is proportioned to receive a beveled contact element 7 carried by a stem 8 which is slidably mounted in the wall of the lining and is electrically connected as at 9 to one of the terminals 10 of the service outlet receptacle. Preferably, the opposed faces of the contact elements 7 are respectively formed with obliquely disposed or beveled upper portions, and with angular recesses in their

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lower portions, this construction resulting, as best shown in Figure 2, in the provision of opposed beveled projections 7'.

Coiled springs 11 mounted in the recesses 6 and bearing against the contacts 7 serve to hold the contacts normally pressed out of the recesses 6 as shown for example in Figure 3.

Mounted for rotation in the inner casing or lining 4 is an elongated cam or socket member 13 provided with a deep plug receiving recess which can be elliptical in cross-sectional contour or any other suitable cross-section configuration other than circular.

The outer surface of the wall of cam 13 has diametrically opposed portions reduced in thickness annularly so that opposed arcuate grooves 15 thus are provided which are of varying depth, each groove being deepest at one end where it penetrates or opens into the socket 14 where the socket is of greatest diameter and as indicated at 16. Thus when the cam 13 is rotated in one direction, the contact elements 7 are thrust backwardly from the openings 16 into the recesses 6. In Figure 3 the contact elements 7 have been shown extending into the openings 15 and it will be noted that during the radial displacement of these contact elements by rotation of the plug 13 in the direction indicated by the arrow in Figure 3 said contact elements will ultimately be engaged by seats 17 provided at those ends of the grooves 15 remote from the openings 16. This latter position is the normal position of the parts so that any person reaching into the open end of the socket 14 cannot touch the radially displaced contact elements 7 which normally are bearing against the seats 17.

The plug employed as a part of the invention comprises a member 18 elliptical in cross-sectional contour and proportioned for insertion into the socket 14. This member has opposed contacts 19 each having a transversely disposed beveled groove 19' formed in its outer face, for locking engagement with the beveled projections 7' on the contact elements 7. The contacts 19 are located in those portions of the surface of the member 18 which are furthest apart. They are also positioned at such points on the plug that, when the plug is inserted into the socket 14 the contacts 19 will be directly back of the openings 16 in the cam 13.

Conducting strips 20 are seated in the plug or insertable element 18 and those end portions thereof remote from the contacts 19 are connected to the terminals of a cord 21 as shown at 22.

A cap 23 can house the terminals of the cord and also the exposed end portions of conductors 20 to which the cord is attached.

It is to be understood of course that cap 23, insertable member 18, cam 13 and casing or lining 4 can all be formed of suitable insulating material.

As before stated the cam 13 is normally positioned with the contact elements 7 pressed against the seats 17 at which time the cam 13 is substantially at right angles to the position shown in Figure 3. When it is desired to make a connection, the plug, which is oval in cross-section in the form illustrated, is inserted into the socket 14 until the contacts 19 are brought into the openings 16. Cam 13 is then rotated in a clock-wise direction or in a direction opposite to that indicated by the arrow in Figure 3. Thus the seats 17 will be withdrawn from the contact elements 7 and these elements will gradually be pressed inwardly by their springs 11 until the openings 16 are brought to positions between the contact elements whereupon said elements will be thrust into locking engagement with the contacts 19 as shown in Figure 2. Consequently an electrical connection is established between the cord 21 and the connections 9. As the parts 7 and 19 interlock, as shown in Figure 2 while contact is being maintained, the plug cannot be withdrawn until after it and the cam 13 are rotated to displace the contact elements 7 radially toward or into the recesses 6.

What is claimed is:

1. An electrical service outlet and plug including a cylindrical receptacle, opposed beveled contact elements slidably mounted in the wall thereof, yielding means on the contact elements normally urging them toward each other, a cylindrical socket member rotatable in the receptacle, the socket member having opposed transversely disposed arcuate cam grooves in its side wall in which the contact elements are received and having a non-circular socket extended inwardly from its outer end, the grooves each being deepest at one end and communicating at said ends with the socket at opposite points in the same plane along the side wall of the socket, means at the respective other ends of the grooves adapted to engage the contact elements when the socket member is in one extreme position, a plug formed correspondingly to the socket for insertion thereinto, and opposed contacts mounted in the side wall of the plug and projecting into said deepest ends of the grooves, the contacts on the plug being transversely grooved for locking engagement with the contact elements on the receptacle, the socket member being rotatable from said extreme position with the plug inserted, to position the receptacle contact elements at the deepest ends of the cam grooves and thereby bring the plug contacts into locking engagement with said elements.

2. An electrical service outlet and plug including a cylindrical receptacle, opposed contact elements, having beveled projections formed on their opposed faces, slidably mounted in the wall of the receptacle, yielding means on the contact elements normally urging them toward each other, a cylindrical socket member rotatable in the receptacle, the socket member having opposed transversely disposed arcuate cam grooves, varying in depth from end to end of each groove, formed in its side wall in which said contact elements are received, the socket member having a non-circular socket extended inwardly from its outer end, the grooves being each deepest at one end and communicating at said ends with the socket at opposite points in the same plane along the side wall of the socket, said grooves having seats at their respective other ends wherein the contact elements are pressingly engaged when the socket member is in one extreme position, a plug non-circular in cross-section insertible into the socket, and opposed contacts mounted in the side wall of the plug and projecting into said deepest ends of the grooves, said contacts having transverse grooves formed in their outer faces for locking engagement with the beveled projections on the contact elements, the socket member being rotatable from said extreme position with the plug inserted, to position the receptacle contact elements at the deepest ends of the cam grooves and thereby bring the plug contacts into locking engagement with said elements.

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