

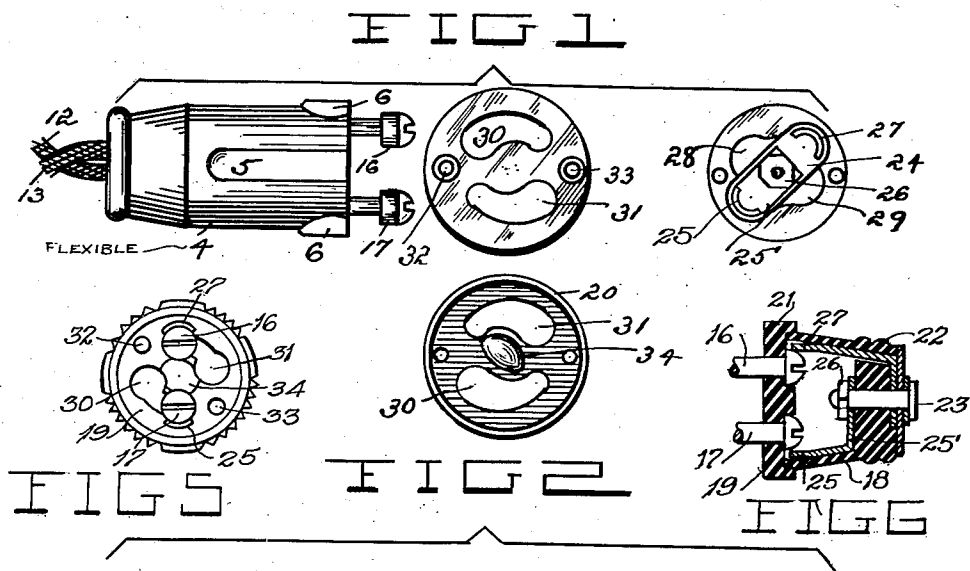
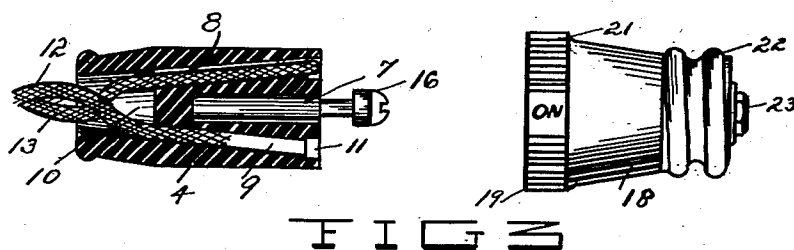
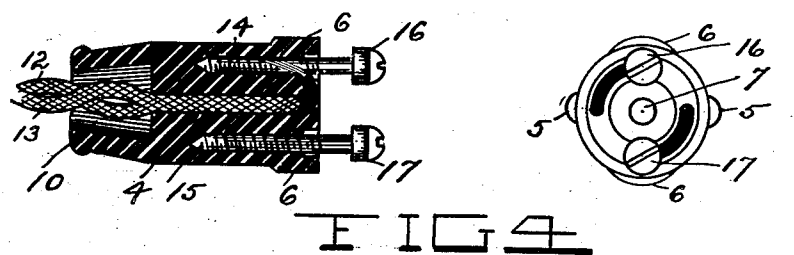
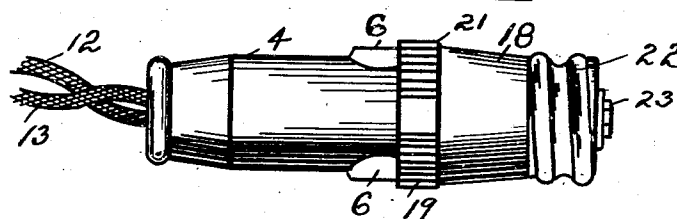
Feb. 5, 1935.

H. H. ICE

1,989,752

UNI-PLURAL PLUGGING IN AND SWITCH DEVICE

Filed Nov. 2, 1931



INVENTOR

Herbert H. Ice

UNITED STATES PATENT OFFICE

1,989,752

UNI-PLURAL PLUGGING IN AND SWITCH
DEVICE

Herbert H. Ice, Muskogee, Okla.

Application November 2, 1931, Serial No. 572,533

6 Claims. (Cl. 173—343)

This invention relates to an electric uni-plugging-in and switch attachment, the object whereof being to provide a device not only adapted to make a positive connection, but to permit the making and breaking of the circuit when the current is or is not desired, without removing any part of the attachment, thus providing an additional feature to the plugging-in device—that of using the same for a switch.

10 In the usual commercial plug, there are time-receiving slots, and tines proceeding from its cap which are there secured by screws, and these tines soon become loose, wear, break off or bend, so that they neither properly and freely enter the slots, but when loose and worn, do not make the proper contact, especially since the commercial current varies between 105 to 115 volts, and this, causing vibration of the tines in the slots, develops a make and break or fluttering contact.

15 This is detrimental to the use of highly sensitive therapeutic, scientific and precision devices which are electrically controlled, and especially is it highly noticeable in electrically controlled radio-receiving-sets, and this deficiency in steady current flow is often mistaken for interference and static.

20 The device herein provides not only for a making and breaking of the circuit, at will, but when contact is made, the arrangement and structure of the device, provides for and insures positive contact as will be seen.

30 On the sheet of drawing, accompanying and forming a part of the specification,

35 Figure 1 includes four views of the uni-plural plugging-in and switching device, that of a side elevation of the flexible plug; and the top of the primary plug in elevation; the plug and its contacts, and well, in elevation, and top inverted to show the rim to go over the body of the primary plug.

40 Figure 2 shows the primary plug in elevation, and the secondary plug in section;

45 Figure 3 shows the secondary plug also in section, the same being taken as the plug is given a quarter turn from the position of it shown in Figure 2; also a front end view showing the lead wires separating channel and the body bore,

50 Figure 4 shows in elevation the assembled device ready for use,

Figure 5 shows the use of the contact head forcing cam pressing the contacts into the clips, and

55 Figure 6 is a sectional view showing the primary and the secondary plugs, partly disengaged.

In these several views, similar characters of reference will indicate similar parts.

Considering first the secondary plug, the body 4 is constructed of yieldable material, such, for instance, as rubber, and the exterior thereof is provided with elongated grips 5, and contact depressors 6, the object whereof will appear. To lend yieldability to the body 4, the same has a bore 7 passing into the body axially, and angularly with relation to this bore, and running through the body 4 are two channels 8 and 9 which communicate with an end chamber 10 and an annular recess 11, the former at the rear and the latter at the front of the secondary plug 4. Into the chamber 10 and through the channels 8 and 9 are threaded the lead wires 12 and 13 of a suitable drop cord, and before being skinned to fray the wires, are nested in opposite directions in the recess 11 and then the skinned free frayed wires of the drop cord are threaded down into openings by inserting elongated pointed screws 14 and 15 with which the wires now contact,—the flexibility of the yieldable body 4 furnishing pressure to hold the frayed wires firmly against the threads of the contact screws 14 and 15, thus insuring positive contact connections at all times.

The extreme outer projecting rounded ends of these elongated pointed screws extend from the forward end of the body 4 and form the contacts 16 and 17 of the secondary body.

30 These rounded heads of the contacts will be seen later on in the description, to furnish facilitating means for guiding them quickly into openings in the primary plug. By pointing the screws, the insertion of the frayed wires of the lead wires may be had without snapping off the strands which would be done by a blunt screw, and as said, the screws and the wires make positive contact, which is more fully assured also by the yieldability of the body 4 of the secondary plug.

Referring now to the primary plug, or socket insertable member 18, the same is provided with an attachable cap 19 having an under-flange 20 (see Figure 1) and this cap 19 has its periphery knurled at 21 to facilitate in screwing the plug 18 into or removing it from a socket. The body 18 is provided with the usual metallic screwthreaded part 22, and has a contact piece 23 at the base thereof. Looking at the extreme right of Figure 1, the cap 19 is removed to show the interior of the body 18. Regarding the positions shown in Figure 1, this body has running diametrically across it a deepened recess 24, in which is seated a contact 25 consisting of a base plate and a semi-

circular shaped upright piece 25 which receives and retains the head 17 of the contact protruding from the body of the secondary plug. The plate of this contact is provided with an opening to take a shank proceeding from the base contact piece 23, and a nut 26 holds the plate in place. This gives readiness and ease of manufacture and assemblage, as well as of repair. The contact 27 is also likewise shaped to receive the head 16, and is connected to the metal of the screw-threaded band 22.

On either side of the deep recess 24 are offsets 28 and 29, the walls whereof serve to guide the heads 16 and 17 to pull them to and along the wall which allows them to readily snap into the semi-circular contacts 25 and 27 and these offsets register with enlarged portions of openings 30 and 31 in the attachable cap 19 previously referred to and through which the heads of the contacts 16 and 17 are to slip in a manner to be explained. This cap 19 is held to the body 18 by set screws which pass through openings 32 and 33 in the cap 19. The underside of this cap 19 is provided with a contact head guiding cam 34 which guides the heads of the prongs 16 and 17 into the seat or bight of the spring contacts 25 and 27, where they are held both by the springiness of the yieldable body 4 and the springiness of these clips, thus insuring perfect and positive contact.

By reference to Figure 1, it will be seen that the contacts 16 and 17 are normally wider apart than the openings 30 and 31, so that normally, these contacts would not readily slip into these openings. This is for the purpose of holding the heads of the contacts 16 and 17 eccentrically beneath the cap when they have been inserted, and for the further purpose of holding the primary body 18 and the secondary body 4 in workable relationship at will. By pressure of the fingers on the depressors 6, however, on the body of the secondary plug, the heads of the contacts 16 and 17 will readily slip into the openings 30 and 31 by reason of their rounded heads, because of now being in alignment with these openings, and when the heads are slipped into place, and the finger pressure on the depressors 6 is released, the heads will take the eccentric position aforementioned, while the shanks of the screws 14 and 15 will now press outwardly against the wall of these openings, due to the pressure from the resilient body 4. As the secondary body 4 is turned clockwise with reference to the primary plug 18, these shanks guided by the walls will finally force the heads to snap into the semi-circular springy contacts 25 and 27, where they will be positively held both by the spring contacts and by virtue of the springiness of the body 4, to give a continuous positive contact, and both plug bodies are rigidly united. It is only when the secondary body 4 has been partially turned clockwise that the contacts will slip out of place and ride the walls of the openings 30 and 31 back to the non-contacting position, and here it is to be noticed that not only is the contact definitely broken, and the contacts are sufficiently far apart to prevent arcing, but the heads of the contacts 16 and 17 still being beneath the detachable cap 19, and eccentrically related to the openings, this causes them to hold the body 4 firmly in relation to the body 18 of the device. In this way the device is both a plugging-in device, and as such, is also a switching device, and contact and the breaking thereof may be had without pulling the one plug from the other, as in the usual commercial plug. This has many

advantages. It lengthens the life of the drop cord; prevents the breaking of parts; as is customary in the usual plug, and will meet many of the requirements of the national and local fire underwriters. If, for any desired reason, separation of the plugs is needed, pressure on the depressors 6 may be again had while the body has been turned anticlockwise, and the heads of the contacts 14 and 15 may be readily withdrawn from the openings 30 and 31. It will be noted also that due to the resilience of the body 4, the pressure always being in an outward direction, thus causing the shanks of the screws 14 and 15 to frictionally bear against the openings walls, there is provided means to prevent the body 4 and the contacts 16 and 17 from accidentally shifting over against the contacts 25 and 27 to either make contact or permit arcing, which would be undesirable and dangerous. Again, by the body 4 being constructed of yieldable material, not only are the advantages aforementioned obtained, but the device is positively insulated while being handled in use.

Thus it will be seen that there is provided a simple, effective commercially article of manufacture, simple to manufacture and repair, practical in operation, safe in use, and one that will give positive continued contact at will, and the same may be broken without rupture of the parts or drop cord.

The following claims seek to cover the combination with a wall or socket plug, a connection therefrom and to which a lead off or drop cord may be applied, and to use the device both as a plugging-in and switch device, at will.

Having set forth the invention, I claim:

1. A uni-plural plugging in and switching device, consisting of a rigid primary plug, and a hollow secondary plug of flexible material, one axially movable with relation to the other, the face of the primary plug having oppositely converging elongated openings, contacts beneath the face and in registry with the smaller portions of the openings, contacts extending axially from the secondary plug and normally in disalignment with the larger portions of the openings in said face of the primary plug, the contacts of the secondary plug being aligned with the larger part of the openings when the secondary plug is flexed, and means to force the secondary plug contacts to a positive contacting position after insertion by a relative partial rotation of the plugs.

2. A uni-plural plugging in and switching device, consisting of a primary plug having a depression therein, of contacts rising in said depression, a cap for the body and having elongated openings in the plane of its face and tapering in opposite directions, the smaller part of each opening registering with said contacts, a secondary hollow plug of flexible material having axially extending contacts for entering into the tapering openings at the larger portions thereof, and tending to disalign with respect thereto, means inherent in the secondary plug for forcing the contacts after insertion against the walls of the openings, said contacts being only in contact with the contacts of the primary plug when the plugs are relatively partially turned.

3. A uni-plural plugging in and switching device, consisting of a hard primary plug and a secondary hollow plug of flexible material, one axially movable with relation to the other and separable therefrom, the face of the primary plug having oppositely converging elongated openings, contacts beneath the face and in reg-

istry with the smaller portions of the openings, contacts extending axially from the secondary plug and in disalignment with the larger portions of the openings in said face of the primary plug, means inherent in the secondary plug for permitting the contacts to be brought into alignment with the larger portions of said openings in said face to effect ease of insertion of the contacts carried by the secondary plug, and said inherent means effecting the disalignment of the contacts again after the contacts are in said openings.

4. A uni-plural plugging in and switching device, consisting of a primary plug having a substantial depression, of contacts rising in said depression, a cap for the body and having elongated slots in the plane of its face and tapering in opposite directions, the smaller part of each opening registering with said contacts, a hollow secondary plug of flexible material having axially extending contacts for entering into said openings, and tending to disalign with respect thereto, means for forcing the contacts against the wall of the openings when the contacts are within the primary plug, said contacts being only in contact with the contacts of the primary plug when the plugs are relatively partially turned clockwise.

5. A uni-plural electric plugging in and switch device, consisting of a primary hard plug and a secondary hollow plug of flexible material, flexible contacts in the primary plug, a cap for said primary plug, and having two elongated and tapering openings tapering in opposed directions,

contacts projecting from the face of the secondary flexible plug and normally out of alignment with the larger portions of the tapering openings, and adapted upon squeezing the flexible plug to enter the larger parts of the tapering openings, heads on the contacts, a cam on the underside of the cap and between the elongated openings and pointing in opposite directions, along which the heads of the contacts on the plug of flexible material will ride when the plugs are relatively partially turned, said contacts on the plug of flexible material holding both plugs together when they are inserted into the primary plug.

6. A uni-plural plugging-in and switching device, consisting of a rigid primary plug, and a hollow secondary plug of flexible material, one axially movable with relation to the other, the face of the primary plug having oppositely converging elongated openings, contacts beneath the face thereof and in registry with the smaller portions of the openings, contacts relatively movable to each other and extending from the secondary plug of flexible material and normally in disalignment with the larger portions of the openings in said face of the primary plug the contacts of the secondary plug of flexible material being aligned with the larger portion of the openings when the secondary plug is flexed, and means to force the secondary plug contacts to a positive contacting position after insertion by a relative partial rotation of the plugs.

HERBERT H. ICE.