June 28, 1960 J. A. HERRMANN ET AL 2,943,292

ELECTRIC RECEPTACLE

Original Filed Oct. 20, 1951 2 Sheets-Sheet 1

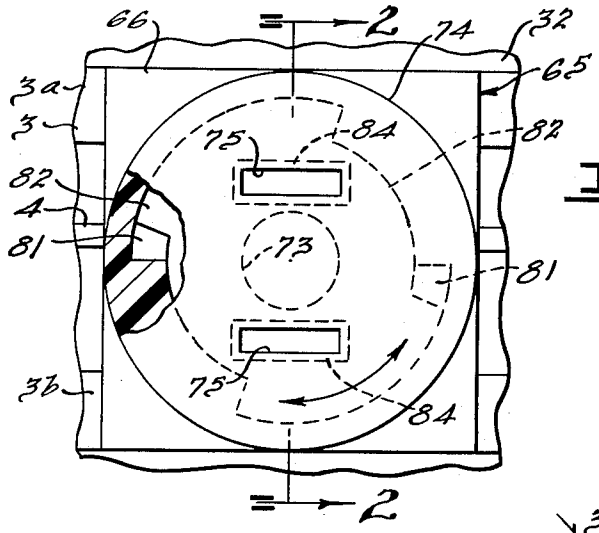


FIG. 1.

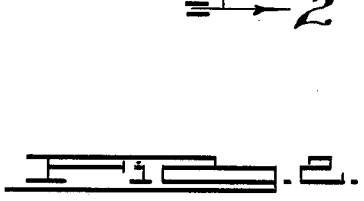
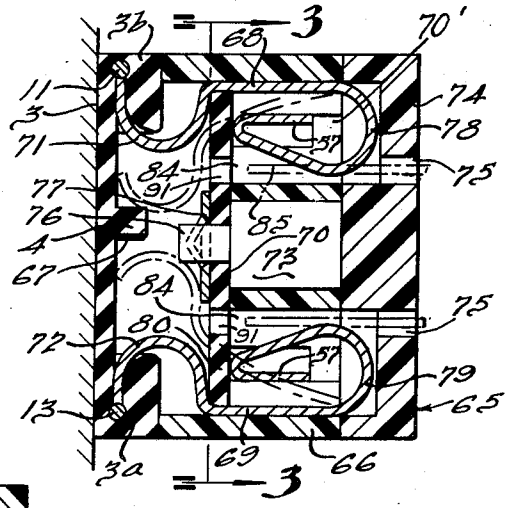


FIG. 2.



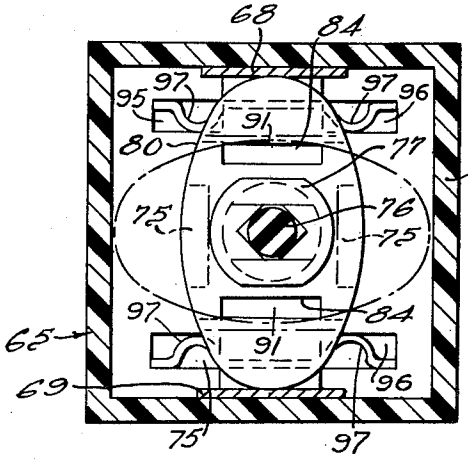


FIG. 3.

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FIG. 4.

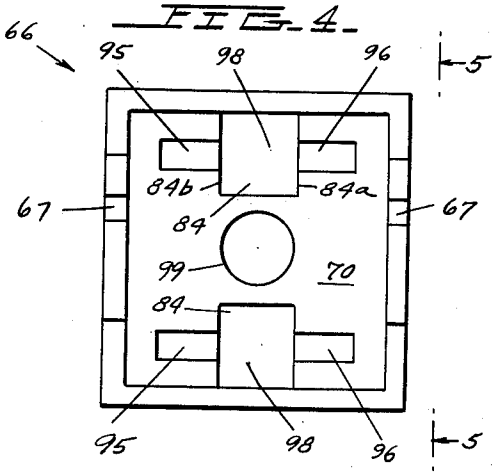


FIG. 5.

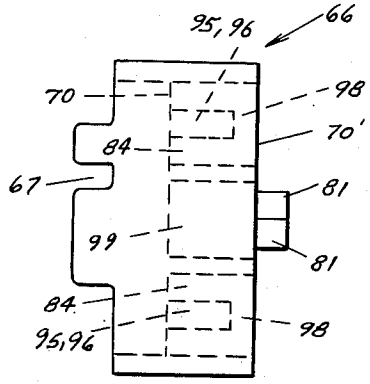
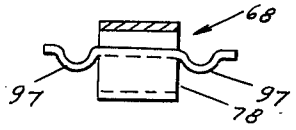


FIG. 6.



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ELECTRIC RECEPTACLE

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Original application Oct. 20, 1951, Ser. No. 252,272. Divided and this application Jan. 3, 1956, Ser. No. 556,905

1 Claim. (Cl. 339—79)

This invention relates to a continuous outlet electric distribution system generally and particularly to an outlet receptacle utilized with such system.

Such a system comprises a flexible duct formed of a dielectric material which contains a pair of concealed conductors, and outlet receptacles and feed-in devices that are readily attachable to the duct at any point along its length. The receptacle used is of the type that contains a plurality of apertures into which conventional pronged connector plugs can be inserted.

This application is a division of application number 252,272, now abandoned, which was filed October 20, 1951, and assigned to the assignee of this application.

A primary object of the invention is to provide an outlet receptacle for use in a continuous outlet distribution system which is easily and directly connectible thereto at any point along its length without requiring piercing of the conductor insulator covering, or any other type of connection that may require tools or special working.

Another object is to provide a novel type of outlet receptacle that is easily and positively attachable to the continuous outlet conductors, this receptacle being of simplified design and presenting an attractive functional appearance.

Another object is to provide a means for establishing the polarity of the outlet receptacle so it can be attached to the conductor duct in only one way to insure proper fusing of the system, etc., or in instances having one wire grounded, the grounded conductor may be uniformly recognized by its relation to the polarizing scheme employed.

Another object is to provide a detachable outlet receptacle for such a distribution system designed so that it is impossible to detach the receptacle from the duct while there are pronged plug connectors (which would indicate a load) attached to the outlet receptacle. This arrangement is such that arcing, if any occurs, will always be between the connector plug prongs and the associated receptacle contact apertures rather than between the receptacle connections to the duct conductors within the distribution system.

A further object of this invention is to provide a snap-on outlet receptacle having positive, direct electrical contact between the receptacle and the duct conductors.

Still other objects and advantages of this invention will be apparent to those skilled in the art after a consideration of the description and drawings wherein:

Fig. 1 is a top elevational view of a receptacle, which is an embodiment of the invention, attached to a conductor duct.

Fig. 2 is sectional elevational view along line 2—2 of Fig. 1 showing the receptacle attached to a conductor duct.

Fig. 3 is a sectional elevational view of the receptacle along line 3—3 of Fig. 2.

Fig. 4 is a back view of the receptacle case.

Fig. 5 is a side view of the case looking in the direction of arrows 5—5 of Fig. 4.

Fig. 6 is a cross-section of one contact taken through line 3—3 of Fig. 2.

Referring to Fig. 1 of the drawings a receptacle 65, which is an embodiment of the invention, is shown in position on a conductor duct 3. The conductor duct 3 which is shown in cross section in Fig. 2 supplies electric current to the receptacle. The duct 3 comprises a body portion formed of a relatively thin flat strip of dielectric material that has the side edges 3*a*, 3*b* thereof folded over on the body portion of duct 3 but spaced very slightly above the body portion 3 so as to provide slots that receive the pair of conductors 11, 13. The conductor duct 3 includes a rib 4 which is integrally formed with the body portion and which is slightly offset from the center line thereof. Rib 4 functions to polarize the distribution system to insure proper fusing, and connection of the receptacles and equipment connected thereto. For further detailed description of the conductor duct reference is made to co-pending divisional application Serial Number 556,907, filed January 3, 1956 of the above mentioned application 252,272.

As illustrated in Figs. 1, 2 and 3, the receptacle 65 comprises substantially a hollow, box-like case 66 of suitable dielectric material and having a substantially square cross section that has a substantially closed front wall 70' (Fig. 2) and a open back side. The lower edges of a pair of opposed side walls of the case 66 are notched as at 67 (Fig. 2) to provide openings to receive the polarizing rib 4 of the duct strip 3. Notches 67 insure that the receptacle 65 will be properly positioned on the duct strip 3 so that its contact elements 68 and 69 can have their free ends 71, 72 selectively moved into and out of engagement with the duct conductors 11, 13. Case 66 includes intermediate wall 70 extending rearwardly intermediate the front and back of the case. Front wall 70' has openings 98 therethrough that receive the body portions 78 and 79 (Fig. 2) of the contact elements 68 and 69. While the body portions of the contacts 68 and 69 are located in recesses 98 in the front wall 70' of case 66, the free end portions 71, 72 respectively of contacts 68, 69 are located in the open area to the rear of intermediate wall 70. Outwardly extending ears 97 of contacts 68, 69 are disposed within slotted outward extensions 95, 96 of recesses 98.

Rotatably mounted in the central opening 99 defined by intermediate wall 70 of the case 66 is a hollow shaft 73 that carries at its outer end the circular locking knob 74. The knob 74 has a pair of diametrically opposed slots 75 piercing its top surface which slots are adapted to receive a pair of plug-in connector prongs. The shaft 73 has an axially projecting stud 76 on its lower end that extends into the open area past the back end of wall 70. Stud 76 has fixedly mounted thereon a cam plate 80 that is adapted to be rotated by the knob 74 to cause actuation of the free ends 71 and 72 of the L-shaped contact elements 68 and 69. Cam plate 80 is fixedly held on the stud 76 by means of the spring clip fastener 77 (Fig. 3).

On rotation of the knob 74 in a clockwise direction, after placement of the receptacle 65 on the duct strip 3, the cam plate 80 will force the free ends 71 and 72 of the contact elements 68 and 69 outwardly into engagement with the duct conductors 11, 13 so as to lock the receptacle 65 to the duct 3 and establish at the same time a good electrical connection between duct conductors 11, 13 and the contact elements 68, 69 of the receptacle 65. Rotation of the knob 74 is limited to a ninety degree arc by stop members 81 (see Fig. 1) that are mounted on the top of case 66 and seat in arcuate slots 82 formed in the underside of the knob 74. The

front wall **70'** of the case **66** as seen in Fig. 2 also has a pair of diametrically opposed slots **84**, comprising the inner portions of recesses **98** between walls **84***a*, **84***b*, extending therethrough and arranged to receive the prongs **85** (Fig. 2) of a conventional plug-in connector. With the specific arrangement of slots **75**, **84** the knob **74** must be rotated 90 degrees clockwise from its normal detached position to bring the knob slots **75** into alignment with the case slots **84**. After alignment of slots **75**, **84** the pronged contacts of a plug-in connector may be inserted through the slots **75** and into the slots **84**. The prongs **85** will bear against the receptacle contact elements body portions **78**, **79** so as to establish an electrical contact with the contact elements **68**, **69**. The pronged plug inserted in the receptacle **65** must first be removed from the receptacle **65** before the knob **74** can be rotated 90 degrees counterclockwise to disengage cam plate **80** from the contacts **68**, **69** so as to permit the springlike contacts **68**, **69** to retract to the positions shown in broken lines in Fig. 2.

Cam plate **80** is provided with slots **91** which are aligned with knob slots **75**. Slots **91** are provided to receive the tips of lengthy cap prongs.

After the contact elements' free ends **71**, **72** have retracted to the positions shown in broken lines in Fig. 2 then the receptacle **65** can be detached from the duct strip **3**. To attach the receptacle to the duct strip **3** it is necessary to merely align the case notches with the polarizing rib **4** and thereafter rotate the knob **74** through a 90 degree clockwise turn to align the prong receiving slots **75**, **84**. Rotation of the knob **74** clockwise causes cam plate **80** to force contact fingers **71**, **72** apart to seat in the slots beneath the lips **3***a*, **3***b* and contact the conductors **11**, **13**. Receptacle **65** is now locked on duct **3** and electrically connected to the conductors **11**, **13**.

The above specification presents a novel outlet receptacle for use in a continuous duct electrical distribution system. Polarization of the receptacle provides a safe, efficient readily usable source of electricity.

For a determination of the scope of the invention reference should be had to the following claim in which we claim:

An outlet receptacle adapted to be removably mounted to an electric distribution system, said receptacle comprising a case having a pair of prong receiving apertures extending to the interior thereof, a pair of prong receiving contact elements mounted within the case and aligned with the prong receiving apertures, a pair of spaced resilient conductor engaging contacts having portions fixedly mounted within recesses of said case with each contact being integrally formed with an individual one of said prong receiving contact elements, and rotatable means including a cam plate carried by said case and when rotated in a first direction being operative through the engagement of said cam plate edge with said conductor engaging contacts to move end portions of said conductor engaging contacts from a first to a second position; said end portions being more widely spaced when in said second position than when in said first position; said conductor engaging contacts including integral biasing means urging said end portions against said cam plate edge to said first position; said rotatable means including a pair of prong receiving apertures aligned with said case prong receiving apertures when said end portions are in said second position; said pairs of prong receiving apertures being out of register with each other when said end portions are in said first position; said case also comprising means for establishing rotational limits for said rotatable means to thereby provide a first and a second position for said rotatable means corresponding to the first and second positions for said end portions of said conductor engaging contacts; said case also including notches operatively positioned to receive an off-center polarizing rib of said electric distribution system only when said receptacle is positioned in a predetermined relationship with respect to said electric distribution system; said rib being operatively positioned to prevent mounting of said receptacle to said electric distribution system except in said predetermined relationship.

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