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Hough

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[54] **DOUBLE LOCK ELECTRIC PLUG**

[76] Inventor: **David S. Hough,** 17055 Brewer Rd., Dundee, Mich. 48131

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[52] **U.S. Cl.** ..... **339/14 P,** 339/75 P, 339/82

[51] **Int. Cl.** **H01r 3/06**

[58] **Field of Search**..... 339/14 R, 14 P, 82, 75 R, 339/75 P, 37, 31 R, 31 B, 31 L, 31 M, 31 T, 339/32 R, 32 M, 33

[56] **References Cited**

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Primary Examiner—Joseph H. McGlynn
Assistant Examiner—Robert A. Hafer
Attorney, Agent, or Firm—Edward M. Apple

[57] **ABSTRACT**

A cylindrical body of di-electric material, having an axial bore with an electric cable received therein, and comprising; a first ring, having on one face, a tubular axial extension, and having on the other face, three conductive prongs, including a ground prong, for being received in a conventional power outlet, said prongs being connected to the wires of said cable; a second ring rotatable on said extension and a third ring on said extension, which serves as a thrust bearing for the second ring and a retainer for said cable. The ground prong has a bifurcated, or split, outer wall in which lies a rotatable cam rod, which extends through the first ring and into a cam slot formed in the second ring. The cam rod has at one end a flat coin-like locking head, which when rotated in one direction, expands the walls of said ground prong to prevent withdrawal of the plug from the socket.

At the other end of said cam rod is a cam for axially rotating the said rod, when the second ring is rotated on the said axial extension. Each said first and second ring has a perforated tab thereon for receiving a padlock, to prevent rotation of the two rings, with respect to each other, when said cam rod is in locking position.

5 Claims, 5 Drawing Figures

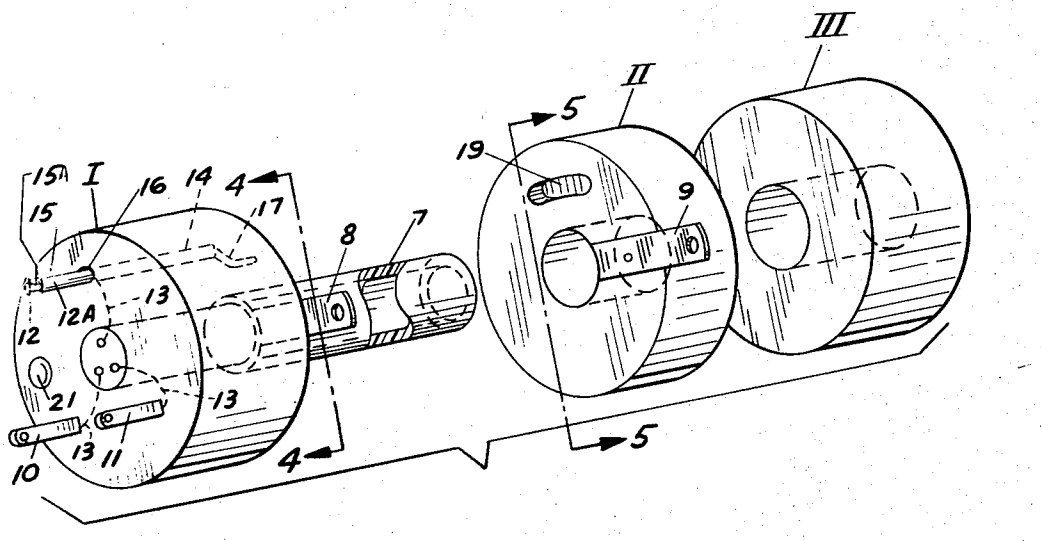
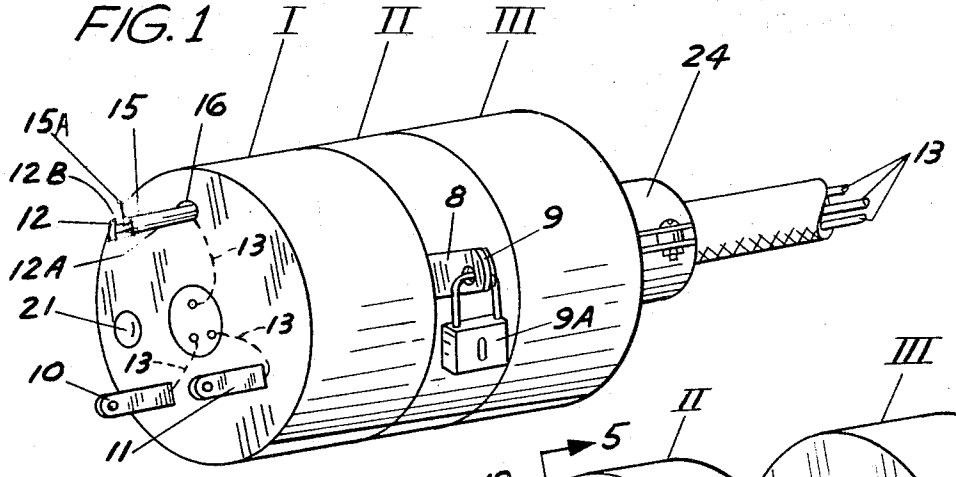


FIG. 1



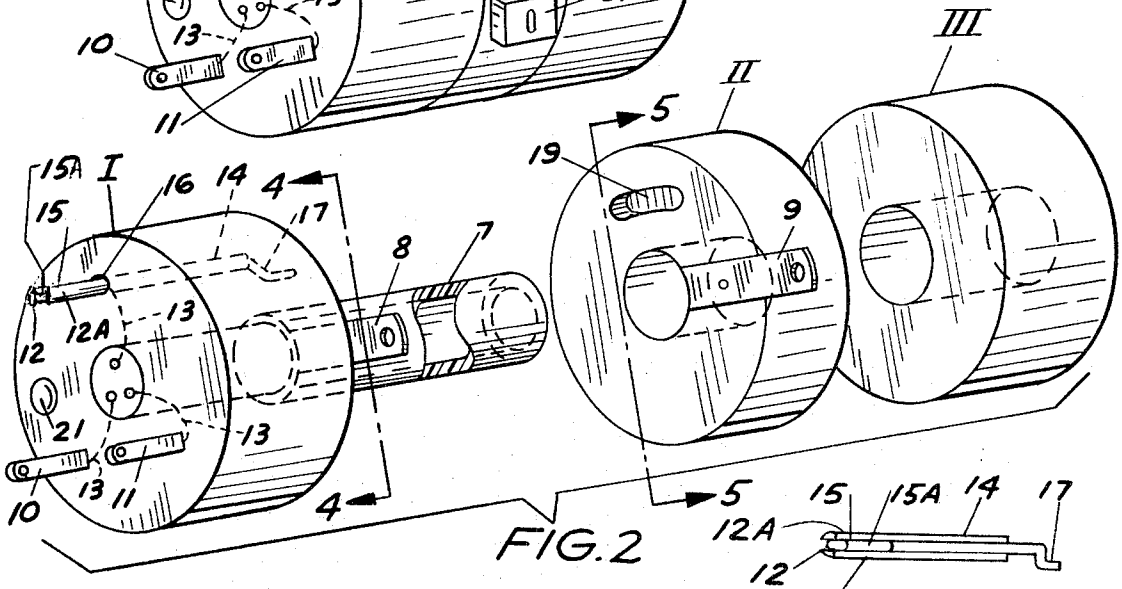


FIG. 2

FIG. 3

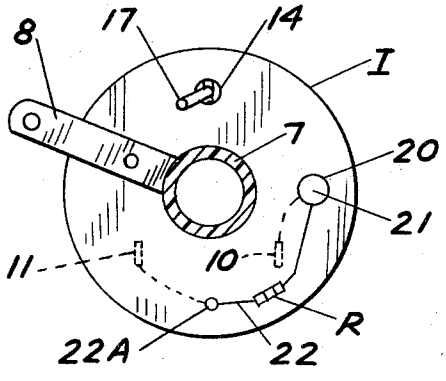


FIG. 4

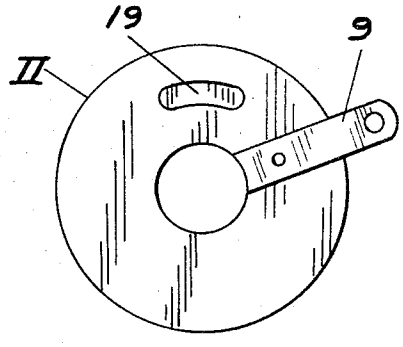


FIG. 5

DOUBLE LOCK ELECTRIC PLUG

This invention relates to electrical components and has particular reference to a three prong electric plug, by which a boat, camper, mobile home, power tools and the like may be electrically connected to a conventional 110–120 V, grounded, power outlet and may be double locked in position, so that the electrical connection may not be inadvertently, or accidentally broken. One of the locking means is automatic when the plug and outlet are properly mated. The other locking means is manually operated and uses a padlock to prevent the first locking means from being unlocked.

It is therefore an object of the invention to provide an electrical connection which may be doubly locked in working position.

Another object of the invention is to provide a remote power connection, with visible means to indicate that the connection is complete and that power is flowing through the plug and the outlet and to the power consuming element being activated.

Another object of the invention is to provide an electrical extension cord and outlet, with means to lock the parts together and with visible light means at the connection, to indicate to the operator that the electrical connection is effective, and without the necessity of returning to the power consumption end of the cord to make sure that the consuming element is being activated.

Another object of the invention is to generally improve electrical plugs and outlets and to provide such devices which are economical to manufacture, simple to assemble and efficient in operation.

The foregoing and other objects and advantages of the invention will become more apparent as the description proceeds, reference being made from time to time to the accompanying drawing, forming part of the disclosure, in which drawing:

FIG. 1 is a perspective view of the plug, in locked position, but removed from the electrical outlet, and with the cord, or cable, broken away.

FIG. 2 is an exploded view of the device shown in FIG. 1, with the padlock and cable removed and with parts broken away, and parts in section to show their relation with other parts.

FIG. 3 is an enlarged detail, in perspective of the split ground prong, in unlocked position and illustrating how the flat coin-headed cam rod normally rests therein.

FIG. 4 is the inside face of Ring I, showing the integral, axial extension, one of the perforated locking tabs, the cam end of the cam rod, the signal light, the resistor and part of the light circuit. This view is taken on line 4—4 of FIG. 2. FIG. 5 is the left side of Ring II, showing its central opening, which is received on the extension of Ring I, the cam slot for rotating the cam rod, and showing one of the matched, perforated locking tabs. This view is taken on line 5—5 of FIG. 2.

Referring now more particularly to the drawing, it will be understood that in its simplest terms, the device is made up of three nylon Rings I, II, and III. The Ring I is the widest, and has a tubular, axial extension 7, as shown in FIG. 2. The extension 7, serves as a bearing for the rotation thereon of the Rings II and III.

As shown in FIGS. 4 and 5, each of the Rings I and II has an apertured ear 8 and 9 on their adjacent faces, so that when they are brought together as shown in FIG. 1, a padlock 9A may be extended through the apertures to lock the two Rings against displacement from one another.

The exposed end of the Ring I, FIG. 1, is provided with three conventional prongs 10–11–12, as in an ordinary plug. Two of the prongs 10–11 are flat strips and are arranged to carry the electricity through two of the wires of the three wire cable 13, which extends through the central bore of the three Rings.

The third prong 12, which is the ground prong, is fastened to the end of the plug as in conventional practice. This prong 12 has a bi-furcated, or split section 14, and has lying therein a cam rod 15, which extends through a bore 16 in the Ring 1, which bore serves as a bearing for the rotation of the cam rod 15. The rod 15 has a coin-like flat portion at one end, as at 15A, and terminates at its other end in an L shaped cam 17, which is adapted to engage a cam slot 19, formed in the left face of the nylon Ring II, as shown in FIG. 5, so that upon rotation of the ring II on the extension 7, the cam slot 19 causes the rotation of the cam rod 15. The rod 15, at its outer end, as above stated, has the locking head 15A, which in the unlocked position lies flat between the walls 12A and 12B of the prong 12, which makes possible the insertion of the ground prong 12 into the conventional opening in an outlet. When the locking head 15A is rotated to lateral position FIGS. 1 and 2 between the walls 12A and 12B of the prong 12 it expands the walls 12A and 12B and prevents the plug from being withdrawn from the outlet, in which the plug is received.

As shown in FIG. 4, the Ring I has a small bore 20 in which is positioned a low voltage, light bulb 21, which is connected at one end, through a resistor R and a wire 22 in a bore 22A, to one of the flat prongs 10 of the plug, and is connected at the opposite end of the bulb to the other flat prong 11 of the plug. The plastic Ring I, therefore, serves as an insulator for the leads to and from the light 21, and also permits the light to be seen through the wall of the Ring I. When the light 21 is lighted, this indicates to the operator that all three of the prongs are properly mated, and there is current going through the plug and the line 13.

In assembling the device, the three Rings I–II–III are placed in position and the three wire cable 13 is extended through the plug, and the three wires are attached to the prongs as in conventional practice. In order to insert the three prong plug in a conventional outlet, the locking head 15A and the cam 17 should be in vertical position, FIG. 3, otherwise the ground prong will not enter the outlet. When the two tabs 8 and 9 are brought into the position shown in FIG. 1, the cam 17 will be rotated 90° from the vertical position, and the locking head 15A will be in horizontal position and will expand the side walls of the prong 12 to make the first locking position. The padlocking of the two tabs 8 and 9 prevents the rotation of the Ring II and the rotation of the cam rod 15. This padlocking of tabs 8 and 9 effects the second locking position.

The nylon Ring III is press fitted on the extension 7 and serves as a thrust bearing for the Ring II, and also serves as a carrier for a split clamp 24, which serves as a retainer for the three wire cable 13 as in conventional practice. It is believed that the operation of the device is obvious from the foregoing description.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. In a device of the character described, a plurality of axially aligned, non-conductive rings, having an electric cable received therein, conductive prongs on one of said rings and connected to the wires of said cable, said first ring having an axial extension thereon which serves as a bearing for a second and third ring, one of said conductive prongs being a laterally expandable ground prong, a cam rod in said ground prong, said rod having a flat head portion at one end and a cam at its opposite end, said cam being received in a cam slot carried by said second ring and arranged to rotate said cam rod and said flat head to open said ground prong when said second ring is rotated relative to said first ring, each of said first and second rings having perforated locking tab thereon, said perforated tabs being arranged to receive a padlock when brought together by the rotation of said second ring relative to said first ring.

2. The structure of claim 1, in which said second ring has a bore in which is received a low voltage electric bulb, which is electrically connected to two of said prongs, the light from said bulb being visible through

the walls of said second ring to indicate the flow of current through said device, when the device is received in a power outlet.

3. The structure of claim 1, being arranged to be received in a power outlet and further arranged to be first locked in said power outlet upon the expansion of said ground prong by the rotation of said second ring, and arranged to be second locked by a padlock which is received in the perforations of said tabs, which padlock prevents the rotation of said rings relative to one another.

4. The structure of claim 1, in which said second ring is rotatable on the said extension of said first ring and said third ring serves as a thrust bearing for said second ring and a support for said cable.

5. The structure of claim 1, including means to expand said ground plug, means to prevent the rotation of said rings relative to one another and visible means in said second ring to indicate that said ground plug is properly expanded.

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