

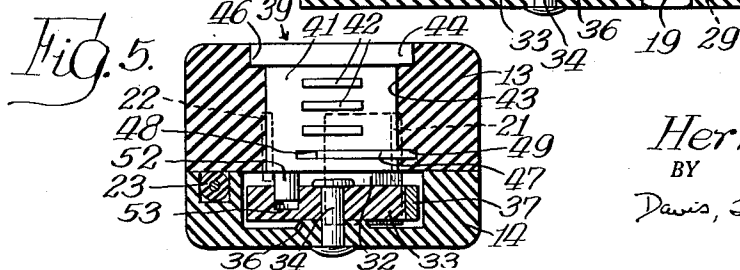
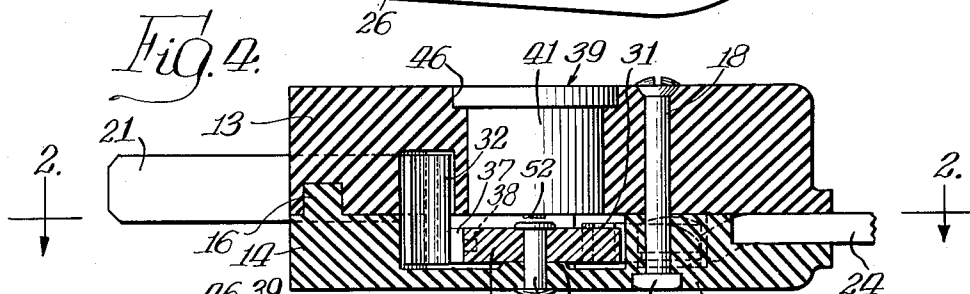
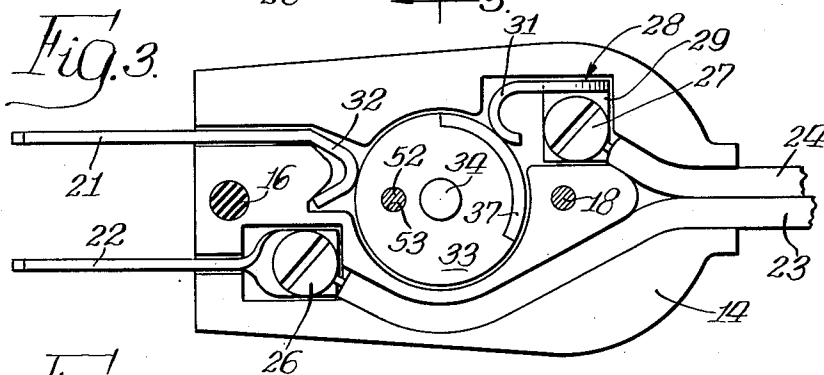
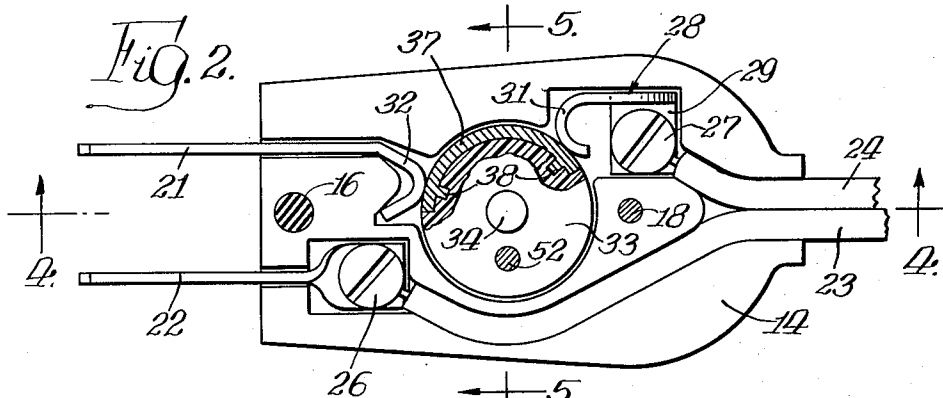
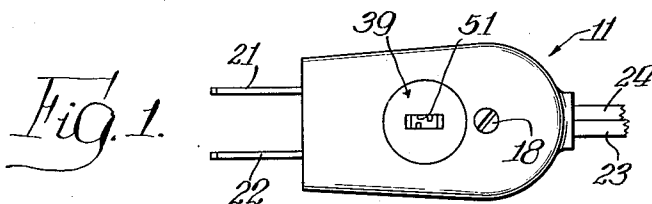
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H. C. TEETOR

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ELECTRIC PLUG WITH DISABLING MEANS

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INVENTOR.
Herman C. Teetor,
 BY
Davis, Lindsay, Hilborn & Noyes
Attys.

1

2,761,028

ELECTRIC PLUG WITH DISABLING MEANS

Herman C. Teetor, Hagerstown, Ind.

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This invention relates to improvements in electric connector or attachment plugs and more particularly to an electric plug having novel means for disabling the plug when desired in order to prevent its use.

In the case of many types of electrically operated devices and appliances, such as radio and television sets, record players, power tools, etc., it would be extremely desirable to have an inexpensive and convenient means for preventing unauthorized use of the device, e. g. by children or others. Along these lines, it has been suggested heretofore to provide a separate cover or shield adapted to be locked around and to enclose the contact prongs of the attachment plug on the electric cord of the device or appliance and thereby prevent the device from being used without permission. Other suggestions toward the same end have also been made but there are various objections to the different schemes heretofore proposed on the grounds that they are too inconvenient and cumbersome in use or that they are not entirely effective and safe.

Accordingly, it is a primary object of the present invention to provide an improved electric plug having novel means for disabling the plug at will in order to prevent unauthorized use thereof.

A further object of the invention is to provide in an electric attachment plug a novel key locked mechanism for disabling the plug and rendering it inoperable.

Another object of the invention is to provide a novel electric plug having means for disrupting the electrical connections to one of the contact prongs of the plug and thereby disabling the plug when desired.

Other objects and advantages of the invention will become apparent from the subsequent detailed description taken in conjunction with the accompanying drawings wherein:

Fig. 1 is a top plan view of an attachment plug comprising one specific embodiment of the invention;

Fig. 2 is a longitudinal sectional view on an enlarged scale showing the internal construction of one-half of the plug as seen substantially along the line 2—2 of Fig. 4;

Fig. 3 is a view similar to Fig. 2 but showing the operating part of the plug in a different position;

Fig. 4 is a longitudinal sectional view as taken along the line 4—4 of Fig. 2; and

Fig. 5 is a transverse sectional view as taken along the line 5—5 of Fig. 2.

Broadly speaking, the objects of the invention are achieved by providing in an electric plug a movable contact or switch element which is preferably a rotatable element and which coacts between one of the contact prongs of the plug and a fixed contact to which one of the electrical conductors of the plug is connected. The movable element is rotatable between "on" and "off" positions for rendering the plug operative or inoperative as desired. A key operated lock is also provided for locking the movable element in its inoperative position so that once the plug is disabled and the key removed it

2

cannot again be rendered operative except by use of the key to unlock the disabling mechanism.

Referring now to the drawings, an electric attachment plug 11 is shown having a two-part casing comprising complementary casing sections 13 and 14 of a suitable insulating material such as plastic or the like. A locating pin 16 extends integrally from the casing section 13 into a mating opening in the opposite casing section 14 for aligning the respective sections, and the casing is held in assembled relation by means of a screw 18 and a nut 19 in the usual manner. A pair of parallel contact prongs 21 and 22 are mounted in the casing section 13 and project from slots at one end thereof for insertion in an electric socket or outlet. An electric cord, comprising in this instance two insulated wires or conductors 23 and 24, enters the casing 13—14 through an opening at the opposite end thereof. The conductor 23 is connected by means of a screw 26 to the inner end of the contact prong 22. The other conductor 24 is connected by a screw 27 to a fixed contact member 28 having a flat attaching portion or lug 29 into which the screw 27 extends. An integral contact portion 31 having a reversely curved resiliently deflectable outer end extends laterally from the attaching portion 29 of the contact member 28 and is disposed in spaced relation from the inner end of the contact prong 21 which is also formed with a resiliently deflectable reversely curved contact portion 32. As best seen in Fig. 4, the end contact portion 32 on the prong 21 is of enlarged width so as to extend laterally into the casing section 14 in opposed coacting relation with the contact portion 31.

For completing the circuit between the conductor 24 and the contact prong 21, I provide a movable switch member which in this case is in the form of a narrow drum or disk 33 supported for rotary movement on a pin or rivet 34 extending transversely through an inwardly projecting boss 36 in the casing section 14. The disk 33 is made from an insulating material such as nylon or other suitable plastic, and a contact element in the form of a curved strip of metal or other conductor 37 is rigidly embedded in recessed relation at the outer periphery of the disk 33 so that the outer surface of the metal strip 37 is substantially flush with the outer periphery of the disk. In this instance the curved strip 37 is secured to the disk 33 by means of a pair of inwardly projecting pins or prongs 38 embedded in the body of the disk. When the disk is in the rotary position illustrated in Fig. 2, the conducting strip 37 bridges the gap between the contact portions 31 and 32 for completing the circuit from the conductor 24 to the prong 21. The resilient construction of the curved contact portions 31 and 32 insures good electrical contact of these portions with the strip 37. However, when the disk 33 is rotated to its Fig. 3 position, the electrical connection between the contact portions 31 and 32 is disrupted so that the plug is temporarily disabled.

For actuating the rotatable switch means 33—37, a rotary locking mechanism is utilized which has a suitable operating connection with the disk 33. Thus a lock 39 having a rotary cylindrical barrel portion 41 with a plurality of spring pressed tumblers 42 (Fig. 5) of the usual construction is mounted in a transverse bore 43 in the casing section 13 in opposed coaxial relation with the rotatable disk 33. Although not seen in the drawing, it will be understood that the casing section 13 is provided with a pair of grooves for receiving the projecting ends of the tumblers 42 when the barrel 41 is rotated to either of its extreme positions for locking and unlocking the device. The lock 39 is retained in position in the casing section 13 by means of a collar 44 at the outer end of the barrel 41 which seats in a counterbore 46 and by an arcuate key or spline 47 which is received in a

peripheral groove 48 in the barrel 41 and a coating groove 49 in the casing section 13. As hereinafter explained in connection with the operation of the device, the barrel 41 is adapted to be rotated about its axis by means of a key (not shown) which is inserted through an axial opening 51 (Fig. 1) and releases the tumblers 42 in the usual manner to permit rotation of the barrel 41 by twisting of the key. A connecting pin 52 extends longitudinally from the inner axial end of the rotatable lock barrel 41 in eccentric relation with respect to the axis of rotation thereof and is received in a corresponding socket 53 in the disk 33 so that the disk 33 will rotate in unison with the lock barrel 41.

When it is desired to render the attachment plug inoperative to prevent unauthorized use of the device or appliance to which the plug is connected, the user merely inserts the proper key in the opening 51 of the lock and rotates the barrel 41 thereof in a clockwise direction (as seen in Figs. 2 and 3), so as to move the metal strip or insert 37 out of engagement with the contact end portion 32 of the prong 21 thereby disrupting the circuit between the conductor 34 and the prong 21. The user then withdraws the key from the lock and the tumblers 42 thereof are automatically projected into their coacting groove in the casing whereupon the barrel 41 is held against rotation and the switch means 33—37 is thereby locked in "off" or inoperative position and cannot be released except by operation of the lock 39 with the proper key. Obviously, when the switch means 33—37 is locked in its "off" position it will be impossible for a child or other unauthorized person to use the electrical appliance or device even if the plug is inserted in the electrical socket or outlet. In order to use the attachment plug in the normal manner the lock 39 is unlocked by means of the key so as to rotate the barrel 41 and the disk 33 in the opposite or counterclockwise direction to the position illustrated in Fig. 2 wherein the metal insert or strip 37 bridges the contact portions 31 and 32 for completing the electric circuit and thereby rendering the plug operable. Of course, when the key is withdrawn the tumblers 42 are again automatically projected into a groove in the casing for holding the lock barrel in "on" position.

From the foregoing it will be seen that my invention provides a very effective means for disabling an electric plug and rendering the same inoperative at will. In operation, the device is exceedingly simple to use and does not entail a separate cover or shield or the like. The fact that the locking mechanism is operative by an ordinary key is a distinct advantage and makes the device highly attractive to parents and others who desire to prevent unauthorized use of electrical devices and appliances.

Although the invention has been described with reference to a certain specific structural embodiment thereof, it is to be understood that various modifications and alternative structures may be resorted to without departing from the scope of the invention as defined in the appended claims.

I claim:

1. An electric plug comprising a casing including a pair of interconnected casing sections, a pair of fixed contact prongs mounted in one casing section and extending from the casing for insertion in a socket, a fixed contact member mounted in the other casing section and adapted to have an electrical conductor connected thereto, a lateral extension on the inner end of one of said prongs extending into said other casing section in spaced relation from said fixed contact member, a movable contact rotatably mounted in said other casing section intermediate said extension and said fixed contact member, said movable contact being rotatable between an operative position bridging said extension and said fixed

contact member for completing an electrical connection therebetween and an inoperative position wherein said connection is disrupted, lock means having a rotary barrel portion rotatably mounted in said one casing section in opposed relation coaxially with said movable contact, and means interconnecting said barrel portion and said movable contact for rotation of the latter in response to manipulation of said lock means.

2. An electric plug comprising a casing, a pair of contact prongs extending from the casing for insertion in a socket, a fixed contact member mounted in the casing in spaced relation opposite the inner end of one of said prongs and adapted to have an electrical conductor connected thereto, said fixed contact and said inner end of said one prong having resilient deflectable contact portions, rotary drum means rotatably mounted in the casing for movement between operative and inoperative positions, said drum means comprising a generally cylindrical member of non-conducting material with a metallic insert recessed in and extending partially around the circumference thereof, said insert having its outer surface substantially flush with the outer circumference of said cylindrical member whereby to provide a continuous peripheral surface on said drum means, said drum means being adapted to extend between said contact portions with the latter engaging said surface in all positions of said drum means under resilient pressure for completing an electrical connection therebetween in said operative position of the drum means and said connection being disrupted in said inoperative position of the drum means, and rotary lock means mounted in the casing coaxially with said drum means and operatively connected thereto for movement of the drum means in response to manipulation of the lock means and for locking the drum means in either of said positions.

3. An electric plug comprising a casing including a pair of interconnected casing sections, a pair of fixed contact prongs mounted in one casing section and extending from the casing for insertion in a socket, a resiliently deflectable fixed contact member mounted in the other casing section and adapted to have an electrical conductor connected thereto, a resiliently deflectable lateral extension on the inner end of one of said prongs extending into said other casing section in spaced relation from said fixed contact member, drum means rotatably mounted in said other casing section intermediate said extension and said fixed contact member, said drum means being rotatable between an operative position bridging said extension and said fixed contact member for completing an electrical connection therebetween and an inoperative position wherein said connection is disrupted, said drum means being a cylindrical member of non-conducting material with a metallic insert recessed and extending partially around the circumference thereof, said insert having an outer surface substantially flush with the outer circumference of said cylindrical member whereby to provide a continuous peripheral surface on said drum means, lock means having a rotary barrel portion rotatably mounted in said one casing section in opposed relation coaxially with said drum means, and means interconnecting said barrel portion and said drum means for rotation of the latter in response to manipulation of said lock means, said extension and said fixed contact member being in resilient engagement with said drum means in all positions of said drum means.

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