Oct. 8, 1940. L. A. YATES 2,217,585

SAFETY CORD LOCK

Filed May 23, 1939

Fig. 1.

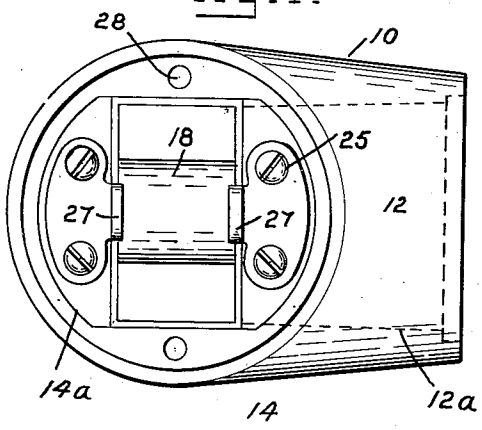


Fig. 4.

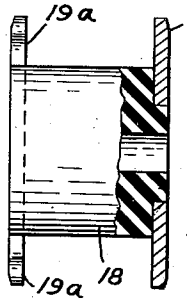


Fig. 5.

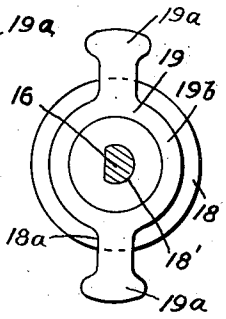


Fig. 3.

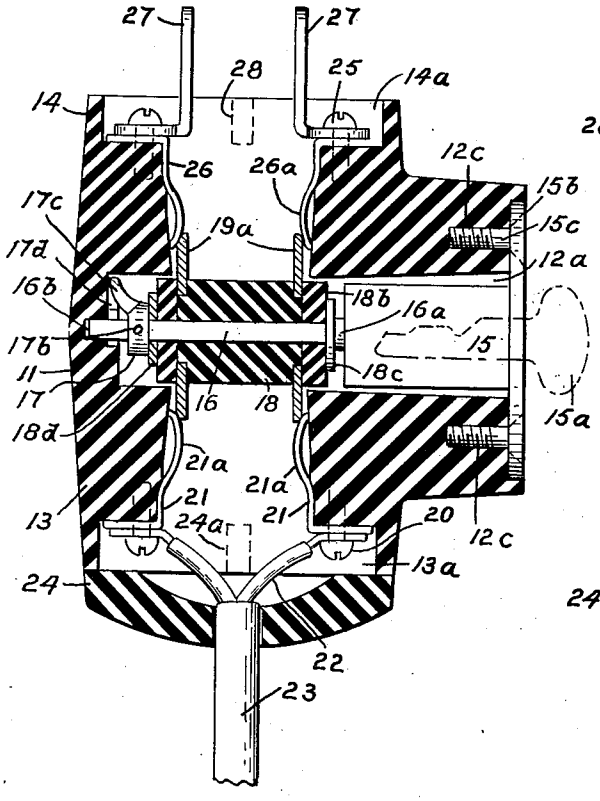
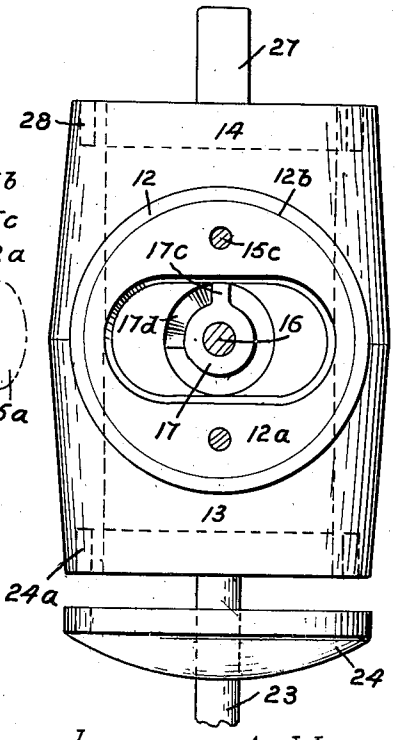


Fig. 2.



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SAFETY CORD LOCK

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Application May 23, 1939, Serial No. 275,298

5 Claims. (Cl. 200—51)

This invention relates to improvements in electric connector units and is especially concerned with a novel connector unit including a novel key controlled mechanism for interrupting an electrical circuit within said unit.

It is an object of the present invention to provide a connector unit, preferably a plug, to be used in connection with an electrical outlet which includes means for interrupting the electrical circuit through said plug in a manner such that unauthorized use of the device connected with the plug can be at least largely precluded.

Another object of the present invention is to provide an improved electrical plug including key controlled means whereby connection of the device attached to said plug with the power source is permitted only to the user of an appropriate key.

It is a feature of the device according to the present invention that it provides a safety control whereby unauthorized use as by children or other persons of devices connected with the plug can be controlled. This is accomplished by interposing in the electrical circuit whereby the device is connected with the power source a key controlled switching unit which has combined therewith a plug suited for use with conventional types of electrical outlets.

A noteworthy advantage of the device according to the present invention is that it can be manufactured, in a large part at least, by simple mode of operations which, in view of the present state of the plastic molding industry, promotes economical mass production. Moreover, the device comprises comparatively few parts, all of which are characterized by simplicity of construction and the assembly of the parts of the device to form the finished product, can be made without the necessity of use of skilled labor.

Other objects, advantages and features of the novel combination switch and plug, according to the present invention, will be apparent to those skilled in this art during the course of the following description.

Regarded in certain of its broader aspects, the present invention comprises a hollow casing formed of electrically insulative material substantially T-shaped in configuration and having located within the circular arm thereof a rotating key controlled switch and in another of said arms a terminal board, the other arm including a plug unit suited for use in conjunction with conventional electrical outlets, the switch serving upon occasion to connect or to disconnect an electrical circuit including the terminals of the terminal board and the terminals of the plug unit.

In order to facilitate a fuller and more complete understanding of the matter of the present invention a specific embodiment thereof is herein illustrated, it being clearly understood, however, that the embodiment herein illustrated and hereinafter described is provided solely by way of example and not non-limitative upon the scope of the present invention except as same is expressed in the subjoined claims.

Referring then to the drawing:

Figure 1 is substantially a top plan view of the novel combination plug and switch according to the present invention with a plug unit facing upwardly;

Fig. 2 is a substantially side elevational view of the device according to the present invention looking toward the portion of the device wherein the lock is normally positioned, the lock being omitted to display interior structure;

Fig. 3 is substantially a vertical sectional view of the device taken along the axis thereof with certain of the parts shown in full view;

Fig. 4 is substantially a side elevational view of the switch rotor; and

Fig. 5 is a top plan view of the switch rotor.

In the accompanying drawing, the combination plug and switch is generally designated by the numeral 10 and it will be noted that the device comprises a casing 11 formed of electrically insulative material and presenting three hollow radiating arms 12, 13 and 14, arranged in a T-shaped configuration. Within the casing arm 12 is located a key controlled rotating lock 15 of conventional type, the key 15*a* being shown in phantom in Fig. 3. It is preferred that the lock be mounted within the opening 12*a* of the arm 12 by attaching the lock to a plate 15*b* received in the circular recess 12*b* formed in the face of the arm, the plate 15*b* being attached to the arm by means including screws 15*c*, passing through openings in the plate and engaging with threaded openings 12*c* formed in the arm substantially as shown. It will be noted that, although the lock 15 is substantially cylindrical, the opening 12*a*, wherein the lock is received, is essentially elliptical in cross sectional outline.

The rotating cylinder of the lock 15 is provided at the end thereof with a shaft 16 united to the cylinder by the coupling 16*a*, the shaft extending axially through the casing and its end portion being received in the bearing 16*b* formed integral with the casing substantially as shown in Fig. 3. The shaft 16 in the preferred embodiment of the

instant invention is not circular in cross sectional outline, but instead one side is flattened for purposes which hereinafter will be more clearly apparent. It is to be noted that the shaft 16 carries thereon in a locality near the bearing 16b a collar 17 substantially fixedly attached to the shaft by means including a pin 17b essentially as shown in Fig. 3. The collar 17 is provided with a projecting arm 17c which extends into a segmental recess 17d formed in a portion of the casing 11 whereby rotative motion of the shaft 16 is restricted to substantially a quarter turn.

An essentially cylindrical block of electrically insulative composition 18, best illustrated in Figs. 3, 4 and 5, is provided with an axially extending opening 18' therein to receive the shaft 16 hereinabove described whereby the block may be carried upon the shaft in a manner such that relative rotation of the shaft and plug is precluded. At opposite ends of the block 18 are mounted switch elements 19 comprising an annular center portion 19b disposed concentrically with respect to the axis of the cylinder block 18 and provided with diametrically positioned radiating wiper arms 19a which extend from the block in spaced parallelism essentially as shown in Figs. 3 and 4. It is clearly to be noted that the switch elements 19 are retained in position with respect to each other and to the block 18 by means including the axially extending formations 18a in the end parts of the block together with the axially extending peripheral parts of the block 18 which surround the annular portions 19b of the switch elements essentially as shown in Figs. 4 and 5. The block 18 with the switch elements thereon is mounted on the shaft 16 between the washers 18b which are formed of electrically insulative material and which space the switch elements from the collar 18c formed integral with the shaft and the washer 18d against which the collar 17 presses.

Referring now especially to Figs. 2 and 3 and to the arm 13 of the casing 11 therein illustrated, it will be noted that terminal screws 20 received in tapped openings formed in a portion of the casing arm are provided for connection with wires 22 of the cable 23 essentially as shown in Fig. 3. A set of inwardly extending essentially parallel electrically conductive lugs 21, held by and electrically associated with the terminal screws 20 hereinabove described, are disposed within the casing in a manner such that during rotation of the block 18 hereinabove described the wiper arms 19a pass over end portions 21a of the lugs and form electrical contact therewith. A connecting cover 24, formed of electrically insulative material and suited to overlie the opening 13a formed in the casing arm 13 and to conceal the terminals 20 therein positioned, is held in place preferably by screws or the like received in openings 24a formed in the casing arm.

In the casing arm 14 provided with an opening 14a in the end thereof, corresponding to the opening 13a in the arm 13 hereinabove described, are mounted the terminal screws 25 received in threaded openings formed in the body of the casing essentially as shown in Fig. 3. The terminal screws hold and have electrically associated therewith a pair of inwardly extending essentially parallel electrically conductive lugs 26 having end portions 26a thereof positioned in a manner such as during rotation of the block 18 the wiper arms 19a of the switch elements 19 establish electrical contact with the end portions of the lugs 26 simultaneously with the wiping of the end portions 21a of the arms 21 hereinabove described, whereby an electrical circuit including the first set of lugs and the second set of lugs is completed through the switch elements. Essentially parallel standard prong connectors 27 are held by the terminal screws 25 and extend outwardly from the casing 11 in a manner such that the prongs may be inserted in a standard electrical outlet.

It will be evident from the foregoing description that in the use of the device the prongs 27 are inserted in a conventional electrical outlet and the key 15a inserted in the lock 15 will, when rotated, serve to establish electrical circuit between the plug prongs 27 and the cable 23 conveying power to the device when being used. Of course unauthorized use of the device connected to the power source through the cable 23 can be precluded by removal of the key 15a from the lock 15.

In some instances it may be desirable to interpose the device in a cable instead of using the device in combination with a plug as hereinabove described. In this instance the prongs 27 are removed from engagement with the terminal screws 25 and a cable is connected with the terminal screws substantially in the manner described in connection with the terminals screws 20. A suitable casing cover similar to or identical with the cover 24 hereinabove described can be attached to the open end of the casing arm 14 by appropriate fastening means received in and engaged with the openings 28 formed in the casing arm end.

Having thus described the present invention, what is desired to secure by Letters Patent is:

1. An electrical connector unit comprising a casing formed of electrically insulative material presenting three hollow radiating arms arranged in a T-shaped configuration; an axially rotating key-controlled locked mounted within the centrally located first arm of said casing; a pair of diametrically positioned electrical terminals mounted in end parts of a second arm of said casing; a first set of inwardly extending essentially parallel electrically conductive lugs mounted on and electrically connected to said terminals; corresponding and similar second terminals and a second set of lugs within the third arm of said casing; and means for electrically connecting said first with said second set of lugs, comprising a shaft associated with and rotatable by said lock; a collar, essentially fixedly mounted on said shaft, having a projecting formation engaging with parts of the casing for limiting rotation of said shaft; a block of electrically insulative material substantially fixedly mounted upon said shaft; and interconnected radially extending wiper elements, formed of electrically conductive material, mounted in parts of said block, adapted to sweep and make electrical contact with and between the said sets of lugs.

2. An electrical connector unit comprising a casing formed of electrically insulative material presenting three hollow radiating arms arranged in a T-shaped configuration; an axially rotating key-controlled lock mounted within the centrally located first arm of said casing; a pair of diametrically positioned electrical terminals mounted in end parts of a second arm of said casing; a first set of inwardly extending essentially parallel electrically conductive lugs mounted on and electrically connected to said terminals; essentially parallel standard prong connectors mounted on said second terminals and extending outwardly from said casing; corresponding and similar second terminals and a

second set of lugs within the third arm of said casing; and means for electrically connecting said first with said second set of lugs.

3. An electrical connector unit comprising a casing formed of electrically insulative material presenting three hollow radiating arms arranged in a T-shaped configuration; an axially rotating key-controlled lock mounted within the centrally located first arm of said casing; a pair of diametrically positioned electrical terminals mounted in end parts of a second arm of said casing; a first set of inwardly extending essentially parallel electrically conductive lugs mounted on and electrically connected to said terminals; a casing cover formed of electrically insulative material, suited to overlie the open end of said second casing arm and conceal the terminals therein positioned; corresponding and similar second terminals and a second set of lugs within the third arm of said casing; and means for electrically connecting said first with said second set of lugs, comprising a shaft associated with and rotatable by said lock; a collar, essentially fixedly mounted on said shaft, having a projecting formation engaging with parts of the casing for limiting rotation of said shaft; a block of electrically insulative material substantially fixedly mounted upon said shaft; and interconnected radially extending wiper elements, formed of electrically conductive material, mounted in parts of said block, adapted to sweep and make electrical contact with and between the said sets of lugs.

4. An electrical connector unit comprising a casing formed of electrically insulative material presenting three hollow radiating arms arranged in a T-shaped configuration; an axially rotating key-controlled lock mounted within the centrally located first arm of said casing; a pair of diametrically positioned electrical terminals mounted in end parts of a second arm of said casing; a first set of inwardly extending essentially parallel electrically conductive lugs mounted on and electrically connected to said terminals; a casing cover formed of electrically insulative material, suited to overlie the open end of said second casing arm and conceal the terminals therein positioned; corresponding and similar second terminals and a second set of lugs within the third arm of said casing; essentially parallel standard prong connectors mounted on said second terminals and extending outwardly from said casing; and means for electrically connecting said first with said second set of lugs, comprising a shaft associated with and rotatable by said lock; a collar, essentially fixedly mounted on said shaft, having a projecting formation engaging with parts of the casing for limiting rotation of said shaft; a block of electrically insulative material substantially fixedly mounted upon said shaft; and interconnected radially extending wiper elements, formed of electrically conductive material, mounted in parts of said block, adapted to sweep and make electrical contact with and between the said sets of lugs.

5. An electrical connector unit comprising a casing presenting hollow radiating arms arranged in a T-shaped configuration; a pair of electrical terminals mounted in end parts of a first arm of said casing; a first set of inwardly extending electrically conductive lugs mounted on said terminals; similar second terminals and a second set of lugs within the second arm of said casing; and means for electrically connecting said first with said second set of lugs, comprising a rotatable shaft coaxially mounted within the third arm of the casing, means for limiting rotation of said shaft; a block of electrically insulative material mounted upon said shaft; and interconnected radially extending wiper elements of electrically conductive material mounted in said block, adapted to sweep and make electrical contact with and between the said sets of lugs.

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