June 28, 1955 C. A. HUMMA 2,712,118

SAFETY LOCK PLUG

Filed Oct. 30, 1951

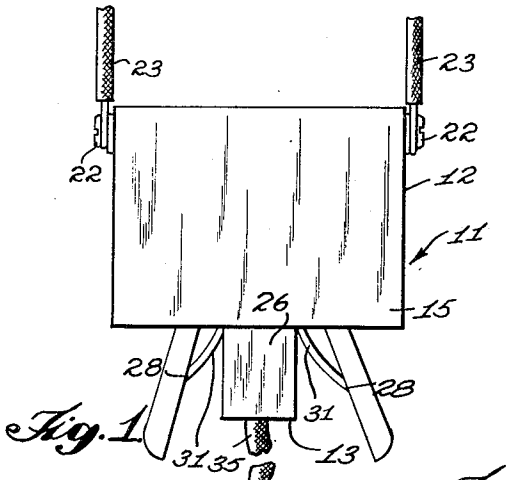


Fig. 1.

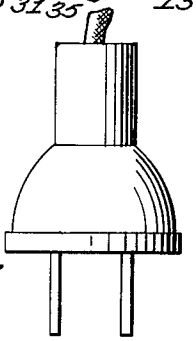


Fig. 2.

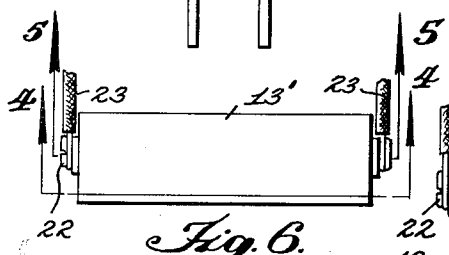
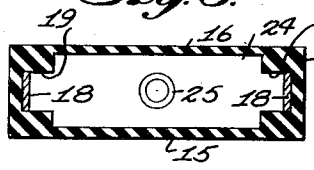


Fig. 6.



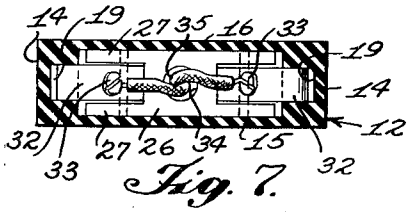


Fig. 7.

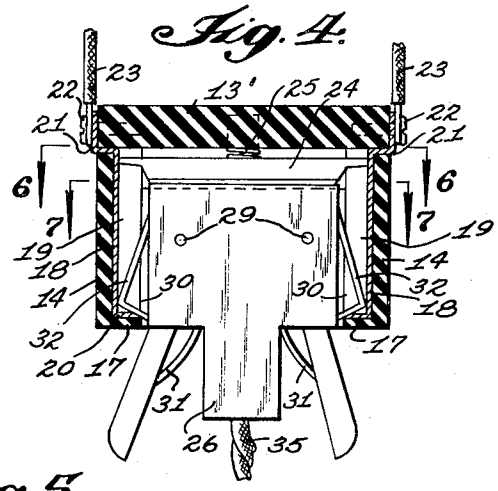


Fig. 4.

Fig. 5.

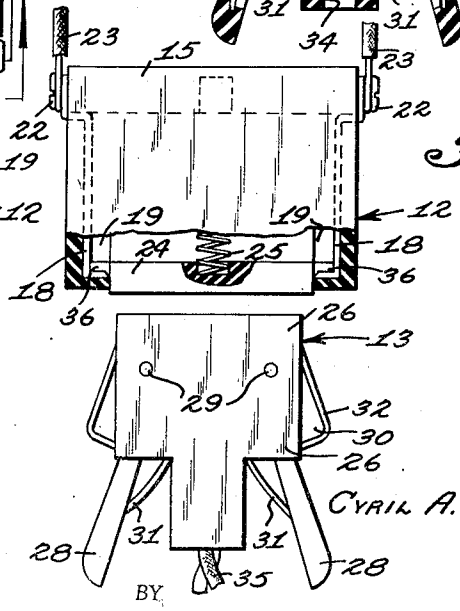


Fig. 3.

INVENTOR
CYRIL A. HUMMA

BY
McMorrow, Berman & Davidson
ATTORNEYS

United States Patent Office 2,712,118 Patented June 28, 1955

2,712,118

SAFETY LOCK PLUG

Cyril A. Humma, Reading, Pa.

Application October 30, 1951, Serial No. 253,857

2 Claims. (Cl. 339—74)

This invention relates to electric connection devices, and more particularly to an improved combination electric plug and socket.

The main object of the invention is to provide a novel and improved electric connection device which is simple in construction, which involves relatively few parts, and which substantially reduces the hazards of short circuits, shocks, broken wiring, and the like, as over plug and socket devices in present use.

A further object of the invention is to provide an improved combination plug and socket assembly which is inexpensive to construct, which is durable, which cannot be disengaged accidentially, which is safer to use than the currently employed devices, and which may be installed readily in any desired location.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a front elevational view of an improved combination plug and socket device according to the present invention, shown installed in an appliance and connected to a conventional plug for connecting the appliance to an electric outlet.

Figure 2 is a top view of the receptacle shown in Figure 1.

Figure 3 is a front elevational view, similar to Figure 1, with parts broken away to show details of interior construction and with the plug element thereof detached from the receptacle element.

Figure 4 is a cross sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a cross sectional view taken on the line 5—5 of Figure 2.

Figure 6 is a cross sectional view taken on the line 6—6 of Figure 4.

Figure 7 is a cross sectional view taken on the line 7—7 of Figure 4.

Referring to the drawings, the combination receptacle and plug device is designated generally at **11** and comprises the receptacle portion **12** and the plug portion **13**. The receptacle portion **12** comprises a rectangular housing of suitable insulating material having a generally rectangular internal cavity and having the top wall **13'**, the end walls **14**, **14** and the front and rear walls **15** and **16**. The end walls **14**, **14** merge with respective inwardly extending locking flanges **17**, **17** at the rim of the receptacle. Designated at **18**, **18** are respective metal contact strips secured against the opposing surfaces of respective longitudinally extending grooves **19**, **19** formed in the end walls **14**, **14**, said contact strips **18** having portions **20**, **20** engaged against the flanges **17**, **17** and having offset portions **21**, **21** at their opposite ends engaged by terminal screws **22**, **22** threadedly engaged in the opposite ends of the top wall **13'**. The wires **23**, **23** are utilized to connect the terminal screws **22**, **22** to the electrical element of the appliance.

Slidably disposed inside the housing **12** is a cover member **24** which is biased downwardly, as viewed in Figures

4 and 5 by a coil spring **25** having its ends seated in respective recesses provided in the cover member **24** and the top wall **13'** respectively, as shown in Figure 5.

The plug member **13** comprises a relatively flat main body **26** formed at its side edges with the respective parallel, spaced flanges **27**, **27** between which are pivoted the respective opposing arms **28**, **28**. The pivotal connections of the arms **28**, **28** are shown respectively at **29**, **29**, said pivotal connections being located near the upper ends of the arms **28**, **28**, as viewed in Figure 5. The arms **28**, **28** are formed with the locking shoulders **30**, **30** at their upper outer portions, as viewed in Figure 5, and said arms are biased away from the lower portion of the main body **26** by respective leaf springs **31**, **31** secured between the lower portions of the arms **28** and the intermediate portion of main body **26**, as shown in Figure 5, the leaf springs **31**, **31** being arranged to bias the lower portions of the arms **28**, **28** away from the intermediate portion of the main body. Secured to the external surfaces of the respective shoulders **30**, **30** are the contact elements **32**, **32**, the top ends of said contact elements being engaged by terminal screws **33**, **33** threaded into the top ends of the arms **28**, **28**.

The intermediate portion of the main body **26** is formed with an axial bore **34** through which the line cord **35** extends, the wires of the line cord being connected respectively to the terminal screws **33**, **33**.

Normally, when the plug **13** is out of the receptacle element **12**, the cover **24** closes the bottom opening of the receptacle **12**, in the manner shown in Figure 3, said cover being provided with the reduced end flanges **36**, **36** adapted to engage against the lower ends of the contact strips **18**, **18** and to allow the main body of the cover to project through the longitudinal aperture defined at the bottom of the receptacle. The spring **25** urges the cover **24** to seating position in said aperture as above explained. The main body **26** of the plug **13** is shaped to fit into the above mentioned rectangular aperture in the bottom of the recepatacle element **12**, and the shoulder portions **30**, **30** of the plug member are adapted to lockingly engage above the flanges **17**, **17** in the manner shown in Figures 4 and 5 when the plug is inserted into the receptacle. When the plug is thus inserted the contact elements **32**, **32** engage the contact elements **18**, **18** and establish electrical connections between the wires of the line cord **35** and the appliance wires **23**, **23**. The contact elements **32**, **32** are biased toward conductive engagement with the contact elements **18**, **18** by the leaf springs **31**, **31**. The plug **13** is also mechanically locked in the receptacle **12** by the biasing action of the springs **31**, **31**.

When it is desired to disengage the plug **13** from the receptacle **12** it is merely necessary to manually squeeze together the depending lower ends of the arms **28**, **28**, whereby the plug may be withdrawn from the receptacle by the inward movement of the shoulders **30**, **30** toward the intermediate portion of the body **26**, whereby said shoulders may be moved past the locking flanges **17**, **17**. When the plug **13** is removed from the receptacle **12**, the cover element **24** is urged downwardly by the spring **25** into closing position and seals the bottom aperture of the receptacle.

It will be readily apparent that the combination receptacle and plug described above cannot be separated accidentally, and cannot be separated except by manually squeezing together the protruding lower ends of the arms **28**, **28**. The plug and receptacle therefore cannot be detached accidentally, as by pulling on the line cord **35**, shaking the appliance, or in any other unintended manner. It will be further apparent that the plug and socket assembly above described may be employed not only for use with appliances but for permanent house wiring installations, the receptacle members **12** being usable

in place of the present socket receptacles and the plug members 13 being usable in place of the conventionally employed types of present plugs. The receptacle 12 may, of course, be installed in any steel receptacle box or outlet box with complete safety.

While a specific embodiment of an improved combination receptacle and plug assembly has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In combination, a hollow receptacle, respective contact members secured in opposite sides of the interior of said receptacle, respective inwardly extending locking flanges at the rim of the receptacle adjacent said contact members, a plug member having a forward end adapted to enter said rim, opposed insulated arms pivoted to the sides of said plug member adjacent the forward end thereof, respective contact elements on said arms arranged to engage said contact members when the arms are spread outwardly from the plug member subsequent to insertion of the plug member into the receptacle, spring means biasing said arms outwardly, locking shoulders on said arms arranged to lockingly engage behind said flanges to retain the plug member in the receptacle, a cover member slidably disposed in said receptacle, and means biasing said cover member toward engagement with said flanges, whereby the receptacle is closed when the plug member is withdrawn therefrom.

2. In combination, a hollow receptacle having a generally rectangular cavity, respective contact members secured in opposite ends of said cavity, respective inwardly extending locking flanges at the rim of the receptacle adjacent said contact members, a plug member having a forward end adapted to enter said rim and slidably engage in said cavity, opposed insulated arms pivoted to the sides of said plug member adjacent the forward end thereof, respective contact elements on said arms arranged to engage said contact members when the arms are spread outwardly from the plug member subsequent to insertion of the plug member into the receptacle, spring means biasing said arms outwardly, locking shoulders on said arms arranged to lockingly engage behind said flanges to retain the plug member in the receptacle, a cover member slidably disposed in said receptacle, and means biasing said cover member toward engagement with said flanges, whereby the receptacle is closed when the plug member is withdrawn therefrom.

References Cited in the file of this patent

UNITED STATES PATENTS

797,215	Osborne et al.	Aug. 15, 1905
1,277,071	Hastings et al.	Aug. 27, 1918
1,890,484	Allenic	Dec. 13, 1932
2,102,625	Hubbell, Jr.	Dec. 21, 1937
2,151,226	Ogle	Mar. 21, 1939
2,266,130	Theriault	Dec. 16, 1941
2,484,525	Norris	Oct. 11, 1949
2,524,701	Grill	Oct. 3, 1950