Nov. 21, 1939. W. H. WALLS 2,180,569

ELECTRICAL CONNECTOR

Filed Feb. 23, 1938

Fig. 1

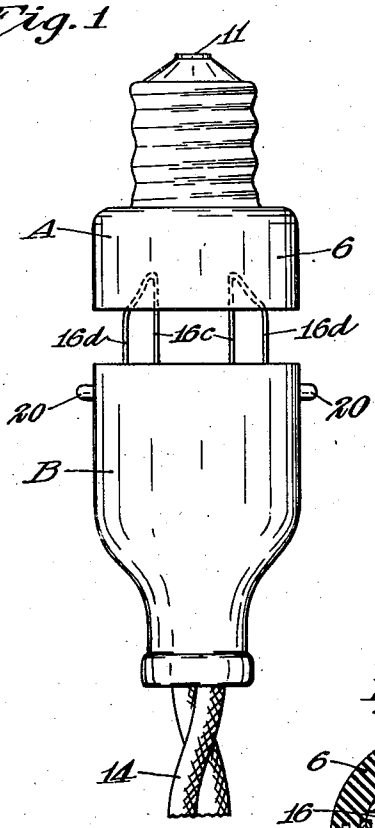


Fig. 2

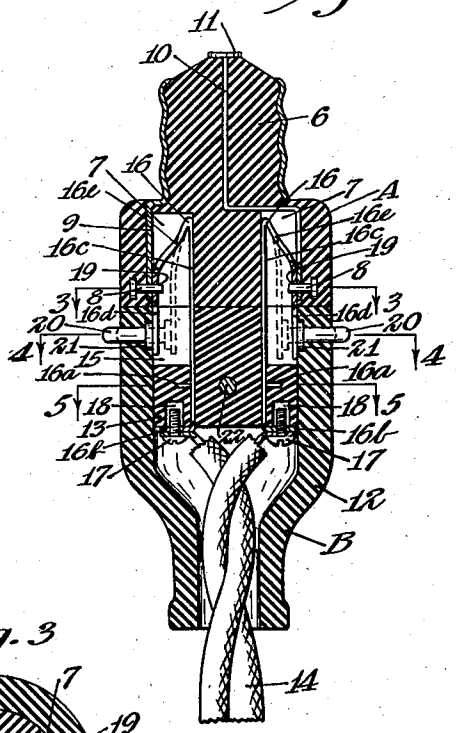


Fig. 3

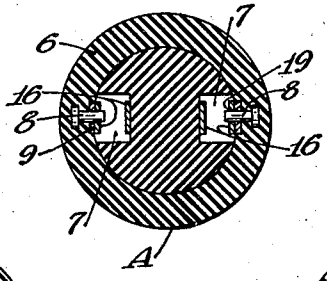


Fig. 4

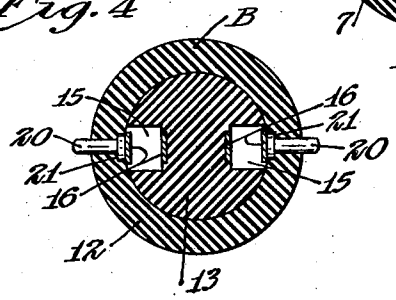
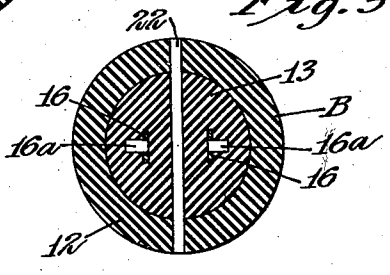


Fig. 5



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ELECTRICAL CONNECTOR

Walter H. Walls, Darwin, Minn.

Application February 23, 1938, Serial No. 192,033

1 Claim. (Cl. 173—361)

This invention relates to separable electrical connectors.

It is the general object of this invention to provide a novel and improved separable electrical connector of cheap and simple construction including a receiver and a pronged plug and so constructed that when the plug and receiver are connected together they will be locked until it is intentionally desired to disengage the same.

Another object of the invention is to provide a separable electrical connector including a pronged plug and a receiver, the prongs of the plug being lockingly engageable with the receiver and push keys for disengaging the prongs from the receiver when it is desired to disengage the connector.

The objects and advantages of the invention will more fully appear from the following description, made in connection with the accompanying drawing, in which like reference characters refer to the same or similar parts throughout the various views and in which,

Fig. 1 is a view in side elevation of the separable connector as it will appear just prior to the time that the pronged plug is engaged with the receiver;

Fig. 2 is a longitudinal view taken through the engaged separable connector, the prongs and push keys being shown in one position in full lines and in another position in dotted lines;

Fig. 3 is a sectional view taken substantially on the line 3—3 of Fig. 2, as indicated by the arrows;

Fig. 4 is a sectional view taken substantially on the line 4—4 of Fig. 2, as indicated by the arrows, and

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 2, as indicated by the arrows.

In accordance with the invention, a separable electrical connector is provided including a receiver designated as an entirety by the letter A and a plug designated as an entirety by the letter B.

The receiver A in the illustrated embodiment, consists for the most part of a body 6 formed of suitable electrical insulating material such as hard rubber, "Bakelite", porcelain, etc. The head end of this body 6 is provided with a pair of spaced prong receiving recesses 7, which as the connector is viewed in Figs. 1 and 2, extend upwardly from the lower end of the body 6. A pair of pins 8 carried by the body 6 and preferably molded therein when the body is cast, project radially toward the center of the body 6 and part way into the recesses 7. An outer electrical contact 9 has a bar portion lining a part of the outer wall of one of the recesses 7 and it has a sleeve-like screw threaded portion which fits about the screw threaded exterior of the upper part of the body 6, as viewed in the drawing, as is conventional. A center electrical contact 10 has a bar portion lining a part of the outer wall of the other recesses 7 and it, in turn, is connected to a head 11 at the central part of the extreme upper end of the body 6, as viewed. Accordingly, the receiver A is adapted to be screwed into an ordinary electrical socket to make electrical connection therewith. It will, of course, be appreciated that any type of electrical connections can be made between the bar portions of the two contacts 9 and 10 and other electrical conductors.

The plug B consists of an outer shell-like casing 12 and an inner cylindrical head 13 received therein, both of these parts being formed of suitable electrical insulating material, such as hard rubber, "Bakelite", porcelain, etc. At its lower end, as viewed in the drawing, the plug casing 12 tapers to a reduced portion through which a pair of electrical wires 14 extend. The upper part of the head 13 as viewed, is provided with a pair of diametrically opposed prong receiving notches 15.

Carried by the plug B are a pair of prongs 16 formed of spring metal. These springs are preferably inserted in the head 13 at the time that the head is molded and in order to prevent shifting movement of the prongs relative to the head 13, the prongs are provided with projecting tabs 16*a* pressed therefrom embedded within the head 13. The lower ends of the prongs 16, which lower ends are designated 16*b*, bear against the bottom of the plug 13, as viewed, and carry screws 17 by means of which the ends of the wires 14 are connected to the prongs 16. Recesses 18 are provided in the head 13 to accommodate the screws 17. From their ends 16*b* the prongs project straight through the head 13 to present outwardly extending portions 16*c* which project well beyond the connecting end of the plug B. From the outer ends of the outwardly projecting portion 16*c* the prongs 16 are reversely bent inwardly to form inwardly projecting portions 16*b*, the inner parts of which are received within the notches 15. Of course, portions 16*d* are disposed greater radial distances from the central longitudinal axis of the plug B than are the portions 16*c*. Also in producing the reverse bends in the prongs 16, the portions 16*d* are placed under spring tension urging these portions to move radially away from the central longitudinal axis of the plug B into contact with the inner walls of the casing 12. The portions of the

prongs 16 joining the portions 16c and 16d are bent as shown in Fig. 2, to form cam surfaces 16e causing the portions 16d to spring in toward the axial center line of the plug by reason of contact of the cam portions 16e with the pins 8 during receptive movement of the prongs in the prong recesses 7 of the receiver A. Pin openings 19 are provided in the portions 16d of the prongs to receive the pins 8 when the plug B and receiver A are fully connected with the head ends of each in abutment

A pair of press keys 20 are slidably mounted in radial passages in the casing 12 and these keys have heads which may be pushed into the notches 15 and these heads bear against the portions 16b of the prongs. To at times receive the heads of press keys 20 without permitting the heads to project into the notches 15, the inner wall of the casing 12 is countersunk at the two points 21. The head 13 is removably connected to the casing 12 as by a pin 22 which can be driven out of pin openings through the head and casing when it is desired to remove the head from the casing.

In connecting a pair of wires such as the wires 14, to the plug B, the pin 22 is first removed whereupon the head 13 can be removed from the casing 12 and the ends of the wires 14 can then be secured to the prongs 16 by means of the screws 17. The head 13 can then be reinserted in place within the casing 12 whereupon the pin 22 may be reinserted. By reason of the fact that the heads of the push keys 20 may be received within the countersunk portions of the casing 12 located at the points 21 the head can be easily slid in and out of the casing 12 without interference by the push keys 20.

To connect the plug B to the receiver A, it is merely necessary to aline the prongs 16 with the recesses 7 and push the plug and receiver together. As this is done the cam portions 16e striking the pins 8 cam the prong portions 16d inwardly against their spring tension until the pin openings 19 aline with the pins 8, whereupon the portions 16d spring outwardly radially to receive the pins 8 within the pin openings 19. The plug B is then securely locked to the receiver A and cannot be removed therefrom until the two push keys 20 are pressed inwardly. When it is desired to disconnect the connector, it is merely necessary to press the push keys 20 inwardly thereby swinging the portions 16d of the prongs from the full line positions shown in Fig. 2, to the dotted line positions there shown thereby releasing the pins 8 from the pin openings 19, whereupon the plug B can be pulled apart from the receiver A.

It will be seen that a simple and efficient locking type of electrical connector has been provided.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of the present invention, which generally stated, consists in the matter shown and described and set forth in the appended claim.

What is claimed is:

In a separable electrical connector, a plug comprising an outer shell, a block of insulating material in said shell and substantially filling the forward portion of the shell, said block having a pair of oppositely disposed channels open at the front end thereof and at opposite sides thereof and terminating forwardly of the rear end of said block, a pair of contact bars having rear portions extending through and anchored in the rear portion of said block, the extreme rear ends of said contact bars being bent against the back of said block and having binding posts thereon, said bars extending forwardly from the rear of the block and having medial portions lying in the bottoms of said channels, the forward portions of said bars extending forwardly of said block and shell and being reversely bent to bring the outer ends of said bars into said channels in spaced relation to said medial bar portions, said forward ends being flexible toward said medial bar portions between the walls of said channels and having apertures therein, and pins slidably mounted in said shell and contacting the forward ends of said bars, said pins being slidable inwardly with respect to said shell to permit flexing of the ends of said bars inwardly, whereby said bars can be detachably connected to projecting portions in a cooperating socket where said projections are adapted to fit into the apertures in the ends of said bars.

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