

Aug. 18, 1942.

W. A. WULLE

2,293,635

CONNECTOR

Original Filed Dec. 19, 1940

Fig. 1.

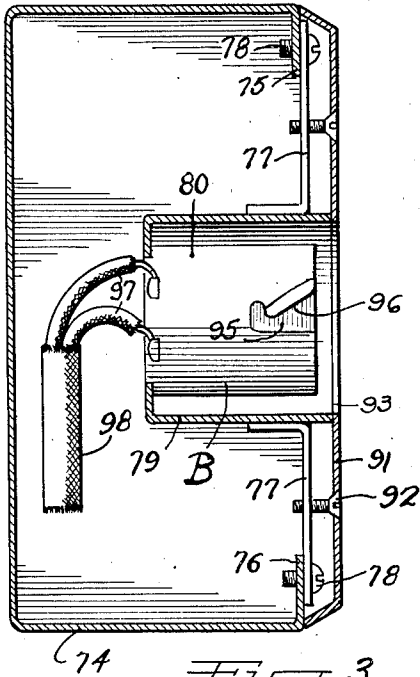


Fig. 2.

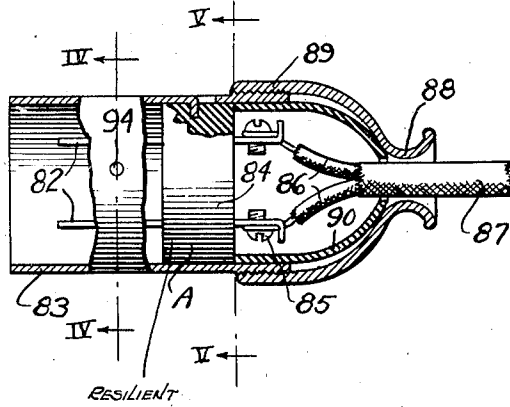


Fig. 3.

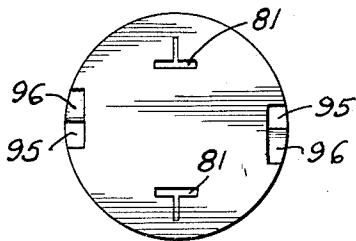


Fig. 4.

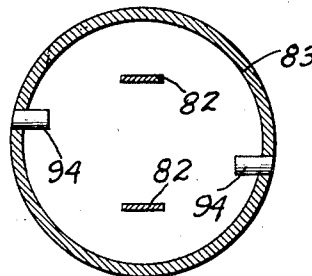
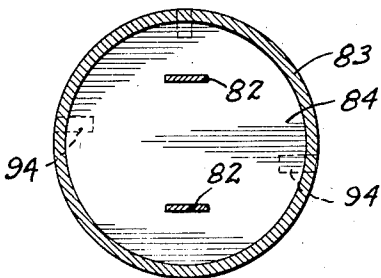


Fig. 5.



WILLE
WILLIAM A. WULLE.

Charles Allen
Fig. 6.

UNITED STATES PATENT OFFICE

2,293,635

CONNECTOR

William A. Wulle, Chicago, Ill., assignor to The Pyle-National Company, Chicago, Ill., a corporation of New Jersey

Original application December 19, 1940, Serial No. 370,750. Divided and this application May 21, 1941, Serial No. 394,431

4 Claims. (Cl. 173—330)

This application is a division of the copending application of William A. Wulle and Henry F. Dake Serial No. 370,750, filed December 19, 1940, now Patent No. 2,281,654, dated May 5, 1942, and covers structure disclosed in this copending application but of which the applicant is the sole inventor.

The invention relates generally to connectors and is concerned more particularly with electrical connectors of the separable type having means for automatically locking the parts together when the contacts are moved into fully engaged position.

The invention is herein illustrated and described as applied to an attachment plug and receptacle, but it may be utilized with connectors generally.

It is a primary object of the herein described invention to provide improved means for automatically locking together the separable parts.

A further object is to provide an improved separable connector in which the locked parts may be released readily by a simple manual manipulation, or the locked parts may be separated by the application of increased pulling forces tending to separate the parts by a rectilinear movement in an endwise direction.

A still further object of the invention is to provide a separable connector having component parts assembled in a novel manner, and in which certain of these parts are automatically interlocked upon movement to assembled relation.

Another object of the invention is to provide a separable connector having male and female connecting parts containing interchangeable plug and receptacle elements.

Still another object of the herein described invention is to provide in electrical connectors of the separable type, novel means for resiliently mounting the contacts of one of the connector parts and utilizing this resilient mounting for effecting actuation of the locking elements when the connector parts are moved in connected relation.

The various features of our invention are incorporated in the structure shown on the drawing, in which:

Figure 1 is a side elevation partly in section of one of the members to be connected or coupled together;

Figure 2 is a side elevation of the other member to be connected or coupled;

Figure 3 is a front elevation of the contact blade receiving member;

Figure 4 is a section on plane IV—IV of Figure 2; and

Figure 5 is a section on plane V—V of Figure 2;

The connector member shown on Figure 2 will be generally referred to as the male or plug member A and the member shown on Figure 1 will be referred to as the receptacle or female member B.

The female connector member is shown supported in a pull box 74, which is of well known construction.

The box is shown as being provided with inwardly extending lugs 75 and 76 at its open face to which supporting arms 77 may be secured as by screws 78—78. These arms extend from a cup 79 which is preferably of metallic construction and disposed with its open end facing outwardly of the pull box. This cup forms a housing for the cylindrical insulating body 80 of the female member B and is preferably constructed of a suitable hard insulating material and provided with spaced openings 81 in its exposed end for the entrance of blade type plug contacts 82 carried by the male connector element A. It will be noted that the insulating body 80 is of less diameter than the mounting cup so as to provide an annular space between the cup wall and the outer surface of the insulating body.

The male connector member A includes a metal shell or casing 83 which surrounds the plug contacts 82 and is of such diameter as to permit entrance of the insulating body 80 therewithin when the casing is moved endwise into the mounting cup 79.

The other end of the casing 83 is anchored to a resilient body 84 which may be of rubber, this body further serving as a support for the blade contacts 82—82. These blades are provided with terminal screws 85 by means of which the contact blades may be connected to wires 86 of a conductor 87 which is brought out through the tubular neck 88 of a closure cap 89. The closure cap may be constructed of any suitable material, and is shown as being constructed of a suitable rigid material such as metal and may be internally threaded adjacent its rim for threaded engagement with an end of the sleeve 83. An insulating liner 90 is preferably provided within the cap at this end of the sleeve to insulate these parts relative to the wires 86 and terminal connections with the blade contents.

The open side of the pull box is closed by a flush plate 91 which may be secured in position by screws 92 in threaded engagement with the brackets 77. This flush plate is provided with an

aperture 93 in registration with the open end of the mounting cup 19.

The casing 83 is provided on diametrically disposed sides with inwardly extending pins or projections 94 which are adapted to pass into substantially L-shaped slots 95—95 diametrically disposed on the insulating body 80. One leg of each slot 95 is shown as being disposed axially of the body, whereas the other leg is at right angles. The first leg has a wall thereof inclined as shown to form a camming surface 96.

In connecting the connector members A and B, the open end of the sleeve 83 is first inserted over the exposed end of the insulating body 80. As the connector members are moved together, the blade contacts enter the openings 81—81 and are guided into contact engagement with the receptacle contacts which are connected to wires 97 forming a part of conductor 98. During this movement, the pins 94 engage the cam surfaces 96—96 of the slots, and since the contact blades 82—82 are held against rotative movement by the insulating body 80, the cam surfaces act to rotate the casing 83. This rotation is resisted by the resiliency of the material composing the rubber body 84 so that when the blade contacts are in fully connected position, the pins 94 will have passed into the right angled end portions of the slots and will be snapped thereinto by a reverse rotation or recoil of the casing 83. The connector members are now locked together.

The invention has been described herein more or less precisely as to details, yet it is to be understood that the invention is not to be limited thereby, as changes may be made in the arrangement and proportion of parts, and equivalents may be substituted without departing from the scope and spirit of the invention.

I claim as my invention:

1. A separable electrical connector comprising a plug member and a socket member, said plug member comprising a cylindrical body of resilient rubber, a sleeve anchored to said body and extending therefrom, plug blades extending from said body into said sleeve, and diametrically disposed inwardly extending pins on said sleeve in front of said body, said socket member comprising a body for receiving said plug sleeve and having spaced passageways for receiving said plug blades, said socket member body having circumferentially extending locking slots for receiving said plug member pins, and cam surfaces on said socket member body for guiding said pins to said locking slot and for effecting rotation of said plug member sleeve against the torsional resistance of the resilient plug body, the recoil of said sleeve by said resilient body causing said pins to be snapped into said locking slots after cooperation thereof with said cam surfaces.

2. An electrical connector comprising a plug member and a socket member, said plug member comprising a cylindrical body of elastic material such as resilient rubber, contact blades supported by and extending from said resilient body, a sleeve anchored at one end around and

to said resilient body and enclosing said blades, said socket member comprising an insulating body for receiving said plug sleeve and having spaced passageways for receiving the plug member blades, a pin on said plug member sleeve and a cam surface on said socket member body engaged by said pin after entrance of said plug member blades into said socket member contact sockets, the engagement of said cam by said pin causing said plug member sleeve to be rotated against the torsional resistance of said resilient body, and a locking slot in said socket member body at the end of said cam surface into which said pin is moved by the recoil of said sleeve by said resilient body whereby said members will then be locked axially together.

3. A separable electric connector comprising a socket member and a plug member, said plug member comprising a body of elastic material such as resilient rubber, contact blades secured to and extending from said resilient body, a sleeve receiving and anchored at one end to said resilient body and surrounding said blades, said socket member comprising an insulating body adapted for entry into the plug member sleeve when said members are brought axially together and having contact passageways for receiving said plug member blades, an abutment on said sleeve and a cam surface on said socket member body engaged by said abutment after said blades have entered said contact passageways, the engagement of said cam surface by said abutment causing rotational movement of said sleeve relative to said socket member body against the torsional resistance of said resilient plug body, and a locking abutment at the end of said cam surface behind which said plug abutment is moved by the recoil movement of said sleeve by said resilient body, whereby said members are then locked axially together in connected position.

4. An electrical connector comprising a pair of connector elements, the first of said elements comprising a cylindrical body of elastic material such as resilient rubber, contact blades extending from said body, a cylindrical sleeve receiving at its inner end and secured to said resilient body with its outer end surrounding said blades, said other member comprising an insulating body having spaced passageways, said second member body being insertable into the sleeve of said first member for entry of said blades into said passageways for engagement with said socket members, an abutment on the inner side of said sleeve and a cam surface on said second member body engageable by said abutment after entry of said blades into said passageways and functioning to cause rotational movement of said sleeve against the torsional resistance of said resilient body as said members are brought into connected position, and a locking abutment on said second member body at the end of said cam surface behind which said sleeve abutment is shifted by the recoil movement of said sleeve by said resilient body whereby said members will then be locked in connected position.

WILLIAM A. WULLE.