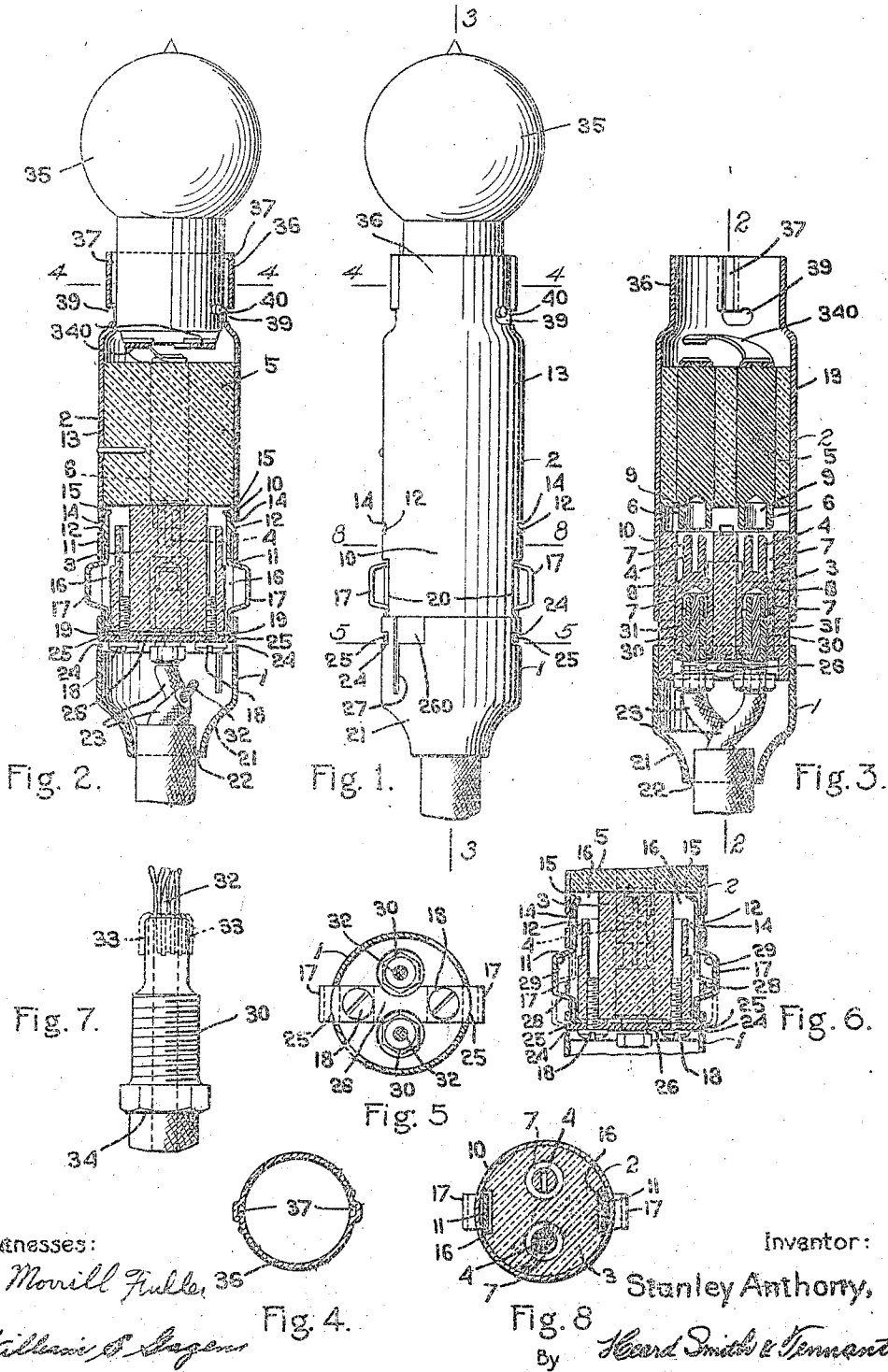


S. ANTHONY,
CONNECTOR.

APPLICATION FILED MAR. 10, 1915.

1,298,858.

Patented Apr. 1, 1919



Witnesses:

J. Morrill Fuller

William C. Rogers

Inventor:

Stanley Anthony

By *Harold Smith & Tennant*

Attorneys.

UNITED STATES PATENT OFFICE.

STANLEY ANTHONY, OF BOSTON, MASSACHUSETTS.

CONNECTOR.

1,298,858.

Specification of Letters Patent.

Patented Apr. 1, 1919.

Application filed March 10, 1915. Serial No. 13,462.

To all whom it may concern:

Be it known that I, STANLEY ANTHONY, a citizen of the United States, residing at Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Connectors, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to connectors for electrically and mechanically connecting conductor ends or for connecting a conductor to a lamp or other similar device, and the object of the invention is to provide a connector in which the contact elements and also the locking elements by which the two members of the connector are locked together are so constructed and located that when the two connector members are separated from each other both the contact elements and the locking elements are protected and do not present any projections that are liable to get caught on any object and bent out of shape, and also to provide a construction wherein the contact elements of the two members are so protected that when the members are separated from each other a short circuit cannot be formed by laying the elements down or bringing them into contact with a piece of metal. Further objects of the invention are to provide a novel construction for connecting the conductor cords to the contact elements, and otherwise to improve connectors, all as will be more fully hereinafter described and then pointed out in the appended claims.

In order to give an understanding of my invention I have illustrated in the drawings some selected embodiments thereof which will now be described, although I desire to state that the invention is not limited to the constructional features shown.

In the drawings, Figure 1 is a side view of a connector embodying my invention;

Fig. 2 is a longitudinal section taken through the connector on substantially the line 2—2, Fig. 3;

Fig. 3 is a section on the line 3—3, Fig. 2, showing the connector members partially separated;

Fig. 4 is a section on the line 4—4, Fig. 1;

Fig. 5 is a section on the line 5—5, Figs. 1 and 2;

Fig. 6 is a view similar to Fig. 2 showing a modification of the invention;

Fig. 7 is a detail view of the connecting member for connecting a conductor to the contact member;

Fig. 8 is a section on the line 8—8, Fig. 1.

My improved connector comprises two connector members, each of which carries an electrical contact element or elements that are adapted to engage corresponding elements carried by the other member. The contact elements will preferably be in the nature of the usual plug and socket elements, and for convenience, I will hereinafter refer to the connector member carrying the plug contact elements as the plug member, and the other member as the socket member. The plug member is designated generally by 1 and the socket member by 2. The plug member comprises a body portion 3 of insulating material carrying a plug contact member 4, and the socket member 2 comprises a body 5 of insulating material carrying a socket contact 6. The plug contact 4 and socket contact 6 are adapted to engage each other when the two members are connected together, thus completing the electrical circuit. The connector may be made with a single pair of plug-and-socket contact members, or with two pairs, depending on whether a single conductor or two conductors are to be connected. In the illustrated embodiment of my invention each of the connector members has two contact elements, there being two plug contacts 4 and two socket contacts 6.

One feature of my present invention relates to a construction wherein the contact elements are so protected that when the two connector members 1 and 2 are separated from each other the contacts are protected against being short-circuited by any accidental engagement of a piece of metal therewith. To this end the plug contact elements 4 are countersunk in the insulating body 3 so that said contact elements are situated entirely within the body 3 and do not project beyond the end thereof. As herein shown, the insulating body 3 is provided with two apertures 7 in which the plug contacts 4 are received, said contacts each being formed with a body portion 8 that fits the aperture and with a reduced contact end which is preferably split to make it resilient. The split contact end is of less diameter than the bore 7 so that the end of the bore forms a recess in which the plug elements are re-

ceived. The socket contact elements 6 are located in apertures formed in the insulating member 5 and are formed with sockets 9 in their ends to receive the plug contacts 4, the socketed ends of the contact elements 6 projecting beyond the insulating body 5, and being received in the recess 7 when the two members are connected together. This construction provides a plug member 1 having flush plug contacts which are confined within the body of the insulating member so that there is no possibility of the contacts being short-circuited when the connector member is separated from the member 2 and is laid on a piece of metal point. To protect the socket contact elements 6 the socket connector member 2 is provided with a shell-like extension 10 which extends beyond the ends of the socket contact elements and prevents their being short-circuited.

This shell-like extension 10 is the extending portion of an inclosing shell 13 of metal or any suitable material in which the insulating body 5 of the socket member 2 is received, and it forms part of the locking means by which the two members 1 and 2 are locked together. When the two parts are connected together the extension 10 telescopes over the body 3 of the member 1. The member 1 is provided with two resilient catches 11 provided with hooked portions 12 that are adapted to have locking engagement with the extension 10. This locking engagement may be provided for in various ways, and as herein shown, said extension 10 is formed with slots 14 into which the catches 12 are adapted to snap as shown in Fig. 2. One wall of each slot constitutes a catch-engaging surface or edge which has interlocking engagement with one of the catches. The ends 15 of the catches are preferably bent inwardly slightly so that when the two connector members 1 and 2 are brought together with an endwise movement, the resilient catches 11 will automatically enter the extension 10 and snap into the notches 14. The body portion 3 of insulating material is provided with side recesses 16 in which these catches are received. Said catches are herein shown as secured to the end of the body portion 3 by means of clamping screws 18, the ends 19 of the spring catches being bent over against the end of the body 3, as best seen in Fig. 2. Each spring catch is formed intermediate of its ends with the portion 17 which is bent outwardly to form a finger piece. These finger pieces constitute means for releasing the locking catches 12 from the notches 14, for it will be readily seen from Fig. 2 that by simply pressing on the two finger pieces 17 the catches will be released, thus permitting the parts to be separated. The extension 10 of the shell 13 is provided with slots 20 in which the portions 17 of the spring catches

are received when the parts are connected together.

The plug member 1 is provided with a cap or shell 21 which incloses the outer end thereof and provides a suitable finish for the end of the plug. This cap or shell will preferably be so constructed that it will meet the shell extension 10 when the parts are connected, as seen in Fig. 1. The cap or shell 21 is provided with an aperture 22 in its end through which the conductors 23 pass and it is preferably removably secured to the body portion 3. In the construction herein shown, the shell 21 is formed with the two notches 24 adapted to receive the rounded ends 25 of a plate 26 that overlies the inturned ends 19 of the spring catches and is secured to the body 3 by the clamping screws 18. The shell 21 is provided with two notches 260 adjacent the slots 24 and is also provided with the slits 27 which permit the slotted portions of the shell to give or yield. In removing the cap from the body 3 said cap is turned so as to bring the notches 260 in line with the projecting ends 25, said ends 25 being rounded so that when turning pressure is applied to the shell the notched portion thereof will spring outwardly and pass off from the end 25. When the end 25 comes into the notch 260 the shell may be withdrawn in a longitudinal direction. The reverse movements suffice to apply the shell to the body portion 3.

In the device shown in Fig. 2 the two connector members 1 and 2 are capable of separating entirely from each other. In some locations it is desirable merely to separate the two members 1 and 2 sufficiently to break the electrical connection without, however, entirely disconnecting said members. Where this construction is desirable I propose to make the shell extension 10 with bars or bridge pieces 28 extending across the slots 20, which bridge pieces occupy a position beneath the offset portion 17 of the spring catches. This construction is shown in Fig. 6 and when it is employed said bridge pieces 28 limit the amount which the two members 1 and 2 can be separated from each other by their engagement with the portions 29 of the spring catches, as shown in dotted lines Fig. 6. A construction of this sort is especially useful in a connector for a tail-light on an automobile where it is desirable to break the electrical connection without, however, entirely separating the two connector members.

I have herein shown a novel construction for connecting the conductors 23 to the contact elements. This construction is herein shown as employed in connecting the conductors to the plug contact members, but it might equally well be used for connecting them to the socket contact elements. The construction herein provided constitutes a

detachable connection which provides for the ready disengagement of the conductors from the contact elements. This connection is made by a connecting member 30 in the form of a screw-threaded plug adapted to have screw-threaded engagement with a screw-threaded socket 31 formed in the end of the contact element. The connecting member 30 is provided with a longitudinal bore through which the wires 32 of the conductor are extended, and in order to fasten the conductor wires to the connecting member 30, the ends of said wires are bent over the end of the member 30, as shown at 33 in dotted lines Fig. 7. The outer end of the connecting member 30 will rest against the insulation 34 of the conductor, and by bending the ends of the wires over the end of the connecting member the latter will be firmly secured to the conductor and the conductor in turn will be provided with a screw-threaded connection which can be readily screwed into the screw-threaded socket of the contact element. In the construction herein shown the socket contact elements 6 are connected to spring terminals 340 adapted to engage the terminals of a lamp 35 and the outer end of the shell 13 is formed as a lamp socket to receive the lamp 35. For this purpose the end of the shell 13 is provided with a neck 36 having formed therein grooves 37 which terminate at their inner ends in laterally-directed slots 39 adapted to receive the locking pins 40 on the lamp, this construction providing a bayonet joint connection. It will be understood, however, that instead of leading to a lamp, as herein shown, the socket contact elements 6 might be connected to other conductors in a manner similar to that in which the plug contact elements 4 are connected to the conductors 23.

The advantage of the grooved construction is that a structure with such grooves is much stronger than if the grooves were simply open slots. These grooves permit the locking pins 40 to enter and to be disengaged from the slots 39, and the fact that the shell is not slotted prevents the shell from spreading.

I claim:

1. A connector comprising two members, one of which has a body of insulating material and an inclosing shell that extends beyond the end of the body and is formed in its extended portion with catch-engaging surfaces, and the other of which members is constructed to enter said extended portion of the shell and is provided with catch-receiving recesses, a contact element carried by each member, and resilient catches secured to the second member and occupying said recesses, said catches being situated on the inside of the shell and constructed to have interlocking engagement with the catch-engaging surfaces, thereby to lock the two members positively together, said catches having portions other than those that engage said surfaces that project outwardly from the exterior of the connector, whereby when such projecting portions are pressed inwardly the catches will be forced inwardly and disengage from the catch-receiving surfaces.

2. A connector comprising two connector members, one of which has a body of insulating material carrying a contact element and an inclosing shell that extends beyond the body and is provided with two opposed openings and two opposed slots, and the other of which members is provided with catch-receiving recesses and a contact element which is adapted to engage the first-named contact element when the two members are in operative relation, and resilient catches secured to said second element and occupying said recesses, said catches constructed to have interlocking engagement with said slots to lock the two members positively together and also having portions projecting through the openings in the shell of the first-named member and beyond the wall of the connector.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

STANLEY ANTHONY.

Witnesses:

BERTHA F. HEUSER,
THOMAS J. DRUMMOND.