

J. M. ANDERSEN.  
ELECTRICAL CONNECTION.  
APPLICATION FILED DEC. 19, 1910.

985,241.

Patented Feb. 28, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

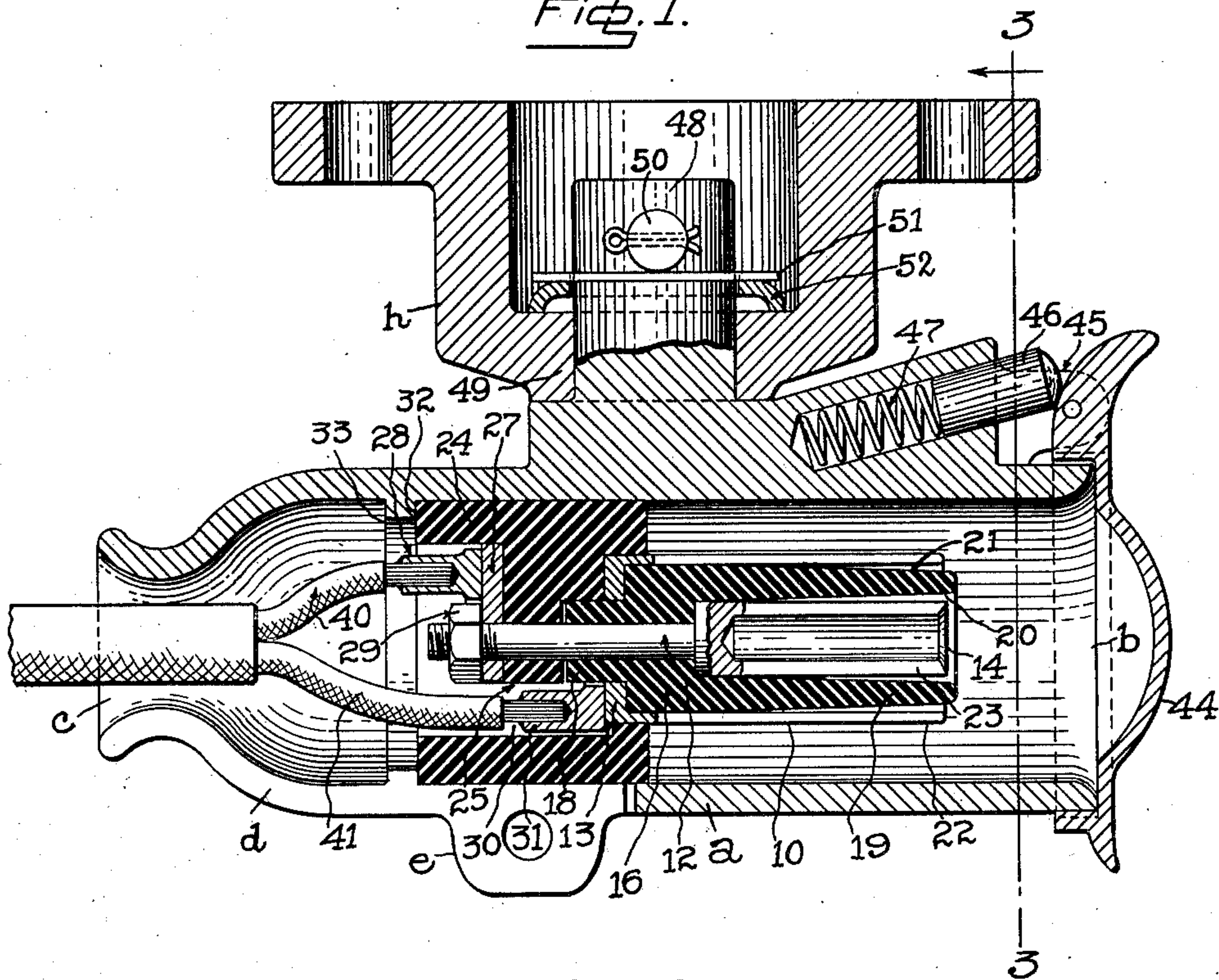
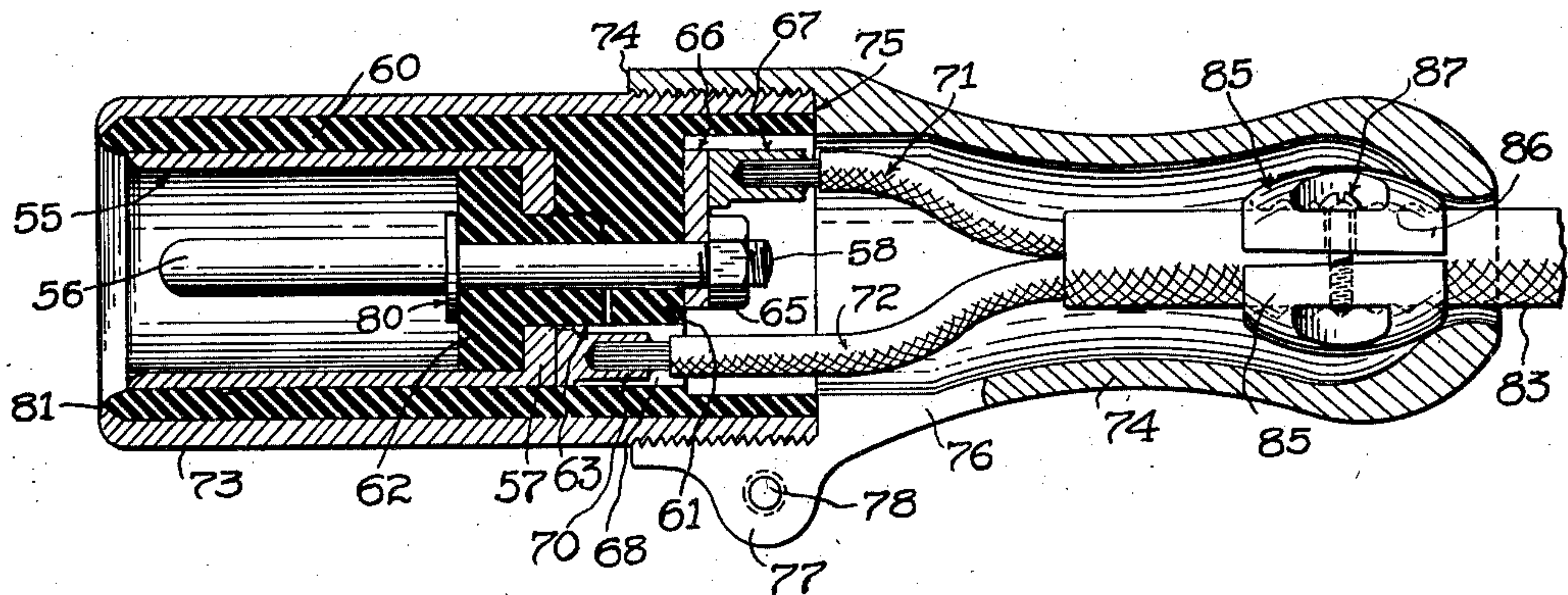


Fig. 2.



Witnesses:  
McCrozier  
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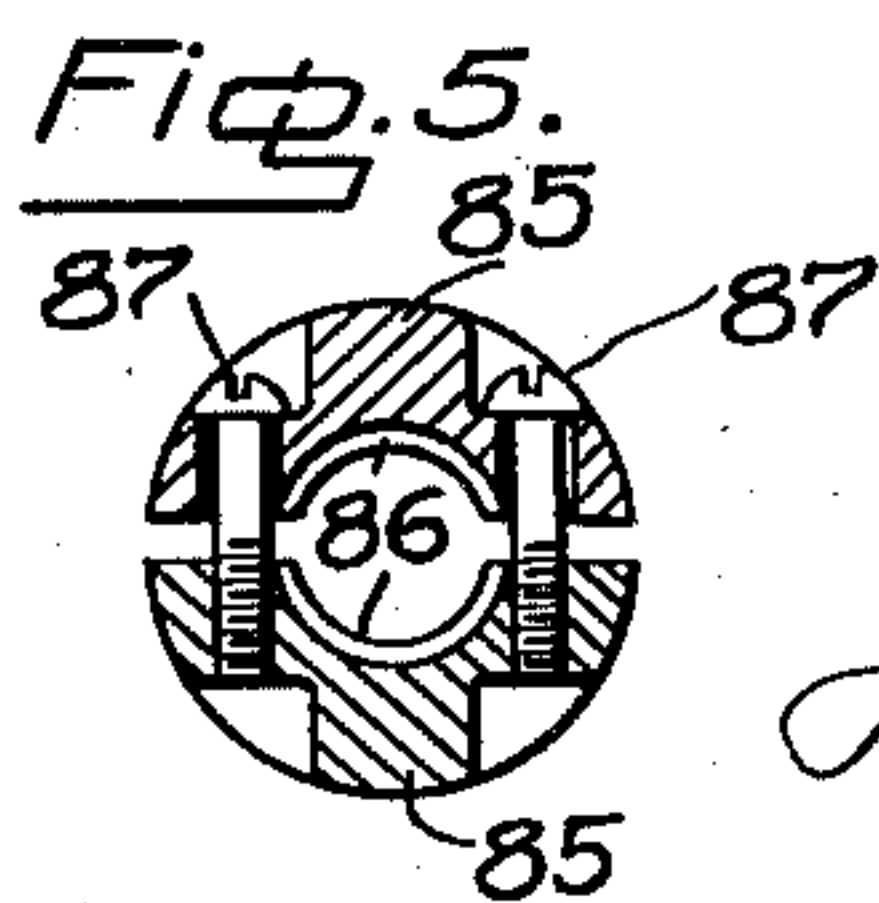
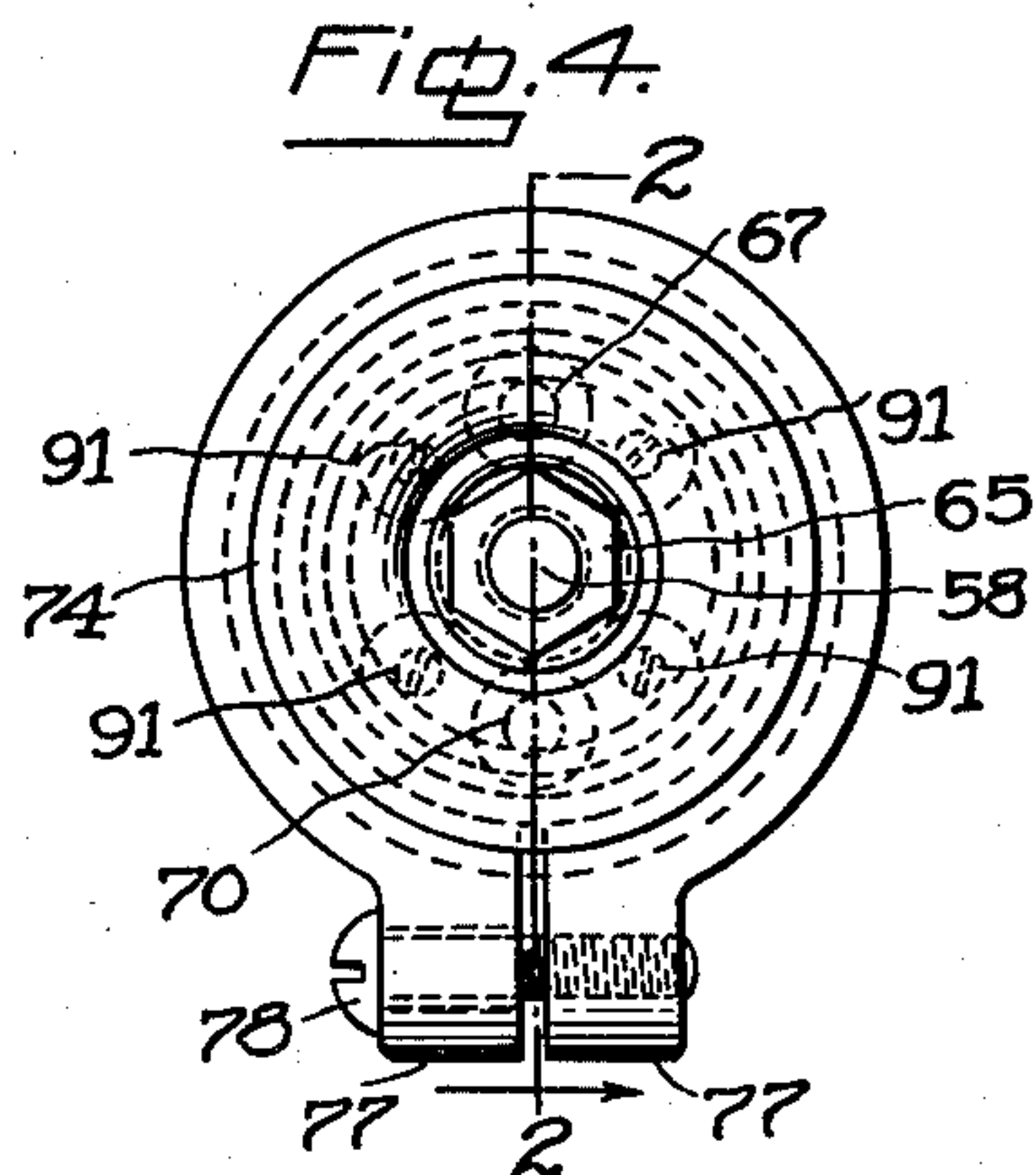
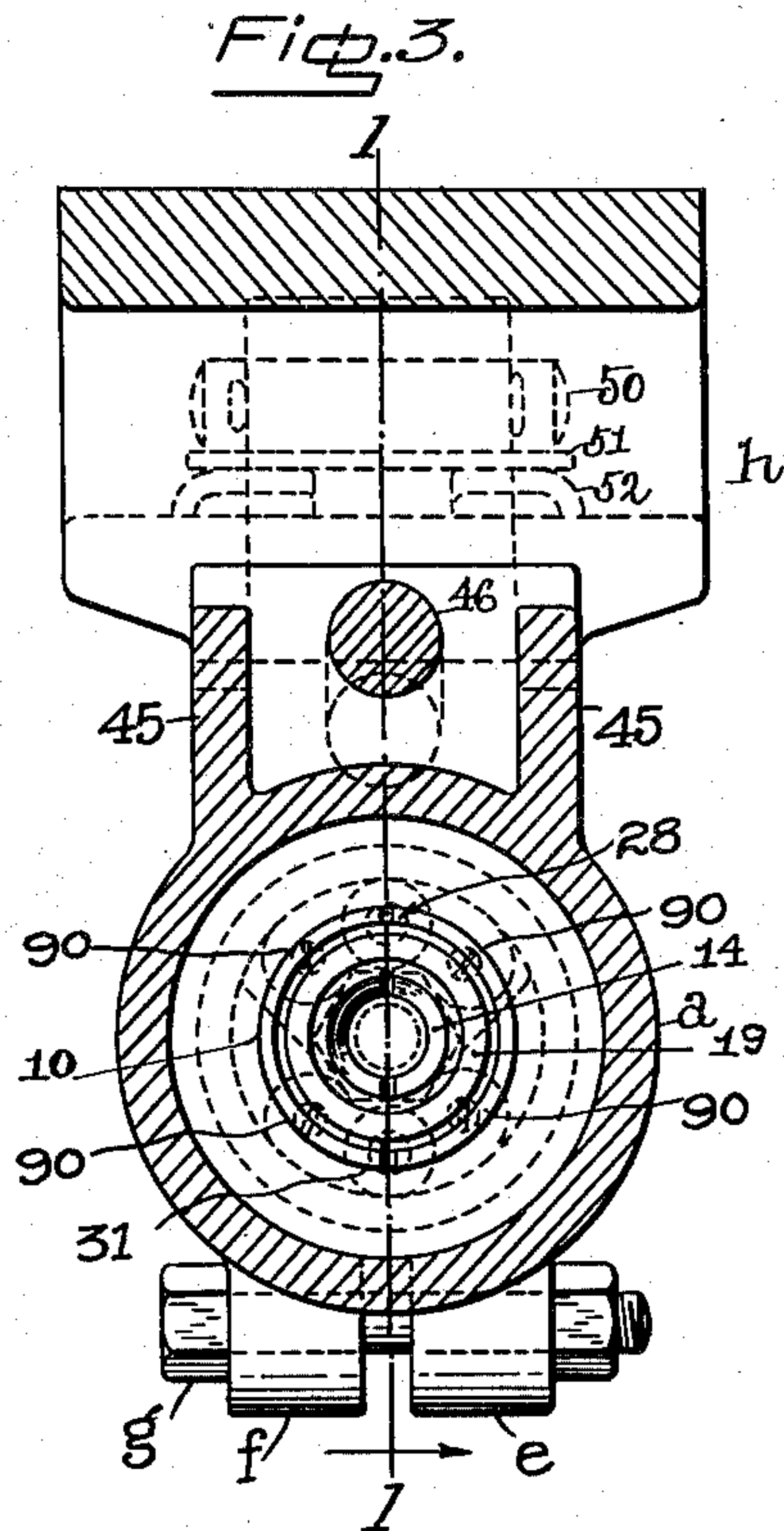
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2 SHEETS-SHEET 2.



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# UNITED STATES PATENT OFFICE.

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## ELECTRICAL CONNECTION.

985,241.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed December 19, 1910. Serial No. 598,115.

### *To all whom it may concern:*

Be it known that I, JOHAN M. ANDERSEN, a citizen of the United States, residing in Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Electrical Connections, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to an electrical connection comprising a socket member and a plug member adapted to be inserted into and removed from said socket member.

The invention has for its object to provide an electrical connection of the class described, in which the contact members are fully insulated from each other, are capable of being quickly and easily assembled or removed, and are supported in their operative position in such manner as to avoid bending of the contacts by the conductors, especially when a heavy cable is used, and which are protected from injury from external sources.

The invention further has for its object to reduce the cost of construction and increase the life and usefulness of the apparatus.

These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a longitudinal section on the line 1—1, Fig. 3, of the socket member of an electrical connection embodying this invention. Fig. 2, a like section on the line 2—2, Fig. 4, of the plug member. Fig. 3, a cross section on the line 3—3, Fig. 1. Fig. 4, an end elevation of the member shown in Fig. 2, and Fig. 5, a detail to be referred to.

The socket member of the electrical connection comprises a metal cylinder or casing *a*, preferably of cast iron, provided at one end with a mouth *b* of the full diameter of the cylinder and at its opposite end with a mouth *c* of smaller diameter, said cylinder having in its rear end a longitudinally extended slot *d*, which is extended for substantially one-half the length of the cylinder *a* as herein shown, and is provided with ears *e*, *f*, for the reception of a clamping screw *g*, for a purpose as will be described.

The cylinder *a* is provided at its top with means as will be described, for attachment

to a support shown as a bracket *h* adapted to be secured in a fixed position.

Within the cylinder *a* are located two contact members 10, 12, of brass or other suitable metal of good conductivity, which are concentrically arranged and are insulated from each other and from the metal cylinder or casing *a*. The contact member 10 comprises as herein shown a cylinder, which is open at its front end and provided at its rear end with a head 13, and the contact member 12 comprises a bolt having a cylindrical head 14 located within the contact member 10 concentric therewith. The contact members 10, 12 are supported within the casing *a* by an insulator comprising two parts or members of any suitable insulating material. One member of the insulator is made as a disk 16 of substantial thickness, which fits snugly within the contact member 10 and abuts against the head 13 of said member and is provided on one side with a neck or projecting portion 18, which is extended through a hole or opening in the head 13 of the contact member 10, and on its other side with a cylindrical extension 19, preferably made longer than the cylindrical portion of the contact members so as to form an effective barrier between the ends of said members. The cylinder 19 of insulating material is preferably provided with tapering inner and outer surfaces 20, 21, which extend from the rear toward the front end of the said cylinder, so as to leave spaces between said cylinder and the contact members 10, 12, whereby opportunity is provided for movement toward each other of the free ends of said members, said members being provided with one or more longitudinally extended slots 22, 23, to permit said movement. The other member of the insulator is made as a cylinder 24 provided intermediate its ends with a wall or partition 25, against one end of which the head 13 of the contact member abuts and also the neck 18 of the disk 16, and through which the shank of the bolt 12 is extended. Within the opposite end of the cylinder 24 is located a terminal bar 27 provided with a terminal socket 28 and secured against the wall 25 by a nut 29 on the threaded end of the bolt 12, which serves to firmly secure the two parts of the insulator together as one piece, so that said in-



insulator may be assembled together with the contact members 10, 12, and terminals secured thereto, before the insulator is inserted into the casing *a*. The intermediate wall 25 forms with a portion of the cylindrical member 24 a passage 30 into which is extended the terminal socket piece 31 attached to the head 13 of the contact member. The insulator assembled together as described, is inserted into the casing *a* until it abuts against a shoulder formed by an annular flange 33 on the inside of said casing, and when thus positioned, it may be secured in fixed relation to the casing *a*, by the clamping screw or bolt *g* inserted through the holes in the ears *e*, *f* attached to the casing *a* on opposite sides of the longitudinal slot *d*.

By reference to Fig. 1, it will be seen that the two part insulator carrying the contact members may be quickly and easily inserted into and removed from the metal shell or casing *a*, and that the circuit wires 40, 41, can be soldered to the terminal sockets 28, 31, outside of the casing or shell and the contact members secured in fixed relation to the insulator 24 by turning up the nut 29 until the head 13 of the contact member 10 bears against one side of the wall 25, after which the insulator and the contact members may be drawn into the casing or shell, or the latter slipped over the insulator until the latter engages the shoulder formed by the flange 33, at which time the clamping screw *g* may be turned to contract the rear end of the casing or shell and secure the insulator in fixed position within the casing or shell.

The casing or shell *a* has cooperating with its mouth *b* a cover 44, which is pivoted to ears 45 and normally held closed by a plunger 46, acted upon by a spring 47 in a socket in an enlargement or projection on the casing or shell, said enlargement having extended from it a pivot rod or arm 48 which extends through an opening in the cross bar 49 of the bracket *h*, said pivot arm being connected with the said bracket by a pin 50, which rests upon a washer 51, which in turn rests on a spring washer 52 supported by the cross bar 49 of the bracket *h*. In this manner the socket member is swiveled to its supporting bracket.

The socket member of the electrical connection has cooperating with it a plug member comprising contact members 55, 56, which cooperate with the contact members of the socket member. The contact member 55 is made as a metal cylinder provided with a head 57, and the contact member 56 is made as a bolt having a solid head and a threaded shank 58.

The contact members 55, 56 of the plug member are secured to a two-part insulator comprising a cylindrical member 60, of in-

ulating material having an intermediate wall 61 and a disk 62 provided with the projecting neck 63. The metal cylinder 55 is located in one end of the cylindrical member 60 and the contact member 56 is carried by the disk 62 and has its shank 58 extended through the intermediate wall 61 and engaged by a nut 65. The cylindrical member 60 on the other side of the wall 61 contains the terminal bar 66 having the terminal socket 67, and said bar is secured to the said wall by the nut 65. The wall 61 forms within the cylindrical member a passage 68 for the reception of the terminal socket 70 attached to the head 57 of the contact member, 55.

The two parts of the insulator for the plug member with the contact members and terminals carried by them, may be assembled together and the wires 71, 72 soldered to the terminals 67, 70 before the insulator is inserted into a cast iron or other metal casing 73, which has detachably secured to it a hollow handle 74. In the present instance, the metal casing 73 is provided at one end with screw-threads for engaging an internally threaded cylindrical portion 74 of the hollow handle, which is provided within it with a shoulder 75 against which the metal casing 73 and the insulator abut, (see Fig. 2). The cylindrical portion 74 of the hollow handle may and preferably will be provided with a longitudinally extended slot 76 and with ears 77 on opposite side walls of said slot, through which are extended a clamping screw 78, by means of which the hollow handle may be detachably clamped to the metal casing or shell 73.

The shank 58 of the contact member 56 may have on it a metal washer 80 to bear against the disk 62 of the insulator, and against which the head of the contact member bears when the nut 65 is set up.

The metal casing 73 may be provided at its outer or free end with an inturned annular lip 81, which serves to protect the outer end or edge of the cylindrical member 60 of the insulator.

The metal casing or shell 73 of the plug member is designed to enter the metal casing or shell *a* of the socket member, and the thickness of the metal casing or shell 73 plus that of the cylindrical member 60 of the insulator and of the contact member 55 are substantially equal to the width of the space between the metal shell *a* of the socket member and the contact member 10 thereof, so that a good sliding contact is obtained between the contact members 55, 10, and at the same time, a substantially close fit is obtained between the metal shells or casings *a*, 73, whereby bending strain upon the contact members of the plug and socket members is avoided, which enables a heavy cable 83 to be used without danger of the weight of



said cable tending to tilt the plug in its socket and thereby bend the contact members thereof. Furthermore the hard metal casing 73 of the plug serves as a guide for the plug member, and enables the latter to be quickly inserted into the hard metal shell or casing of the socket member without danger of injuring the contact members of brass or other softer metal. So also the guiding and supporting metal casing 73 of the plug member, serves to protect the insulation 60 within the same against chipping or breaking when the plug member is dropped or falls to the floor or strikes a hard object. The contact members of the plug being located within the cylindrical member of the insulator, which in turn is located in the metal shell or casing 73, protects the plug from making an electrical contact with piping or other objects that the plug might be engaged with in handling the same.

Provision is made for anchoring the cable 83 within the plug, so that when strain is placed on the cable, the plug will be pulled out of the socket member without strain on the wires and terminals in the plug. To this end, the hollow handle 74 of the plug has located in it a hollow button 85 through which the cable is passed, said button being composed of two halves, having corrugations or biting projections 86 on their inner circumference to engage the cable. The two parts or halves of the button are connected together by screws 87, but are separated from each other by a sufficient space to enable the said halves to be adjusted toward each other by the said screws, so as to secure the button in fixed position on the cable, which position is such that a slight pull on the cable will bring the button into engagement with the rear end of the handle 74, and further pull upon the cable will be transmitted to the handle, so as to withdraw it from the socket member without imposing strain on the terminals of the plug to which the cable wires are soldered or otherwise secured.

The terminal sockets to which the circuit wires are soldered are detachably secured as by the screws 90 91, shown in Figs. 3 and 4, to their cooperating contact members. This construction enables the wires to be soldered to the terminal sockets before the latter are connected with their cooperating contact members, which avoids the danger of injury to the insulator carrying the contact members, if it were attempted to solder the wires in the circuit terminals after the latter had been attached to the insulator.

#### Claims:

1. In an electrical connection of the class described, in combination, a metal casing provided with an open end, an insulator located in said casing and composed of separa-

ble members, a cylindrical contact member having a head interposed between the members of said insulator, and a contact member located in said cylindrical contact member and having a shank extended through both members of the said insulator, and means cooperating with said shank to secure the members of the insulator together, substantially as described.

2. In an electrical connection of the class described, in combination, a metal casing provided with an open end, an insulator located in said casing and composed of a cylindrical member having a wall intermediate of its ends, and a disk member having a neck portion adjacent to said wall, a contact member interposed between said intermediate wall, and said disk member, and a second contact member having a shank extended through said disk, neck and intermediate wall, and a nut engaging said shank on the side of the intermediate wall opposite to the contact members, substantially as described.

3. In an electrical connection of the class described, in combination, a metal casing provided with an open end, an insulator within said casing comprising a cylindrical member having a wall intermediate of its ends, and a disk member, a contact member interposed between said wall and disk member, and a second contact member extended through said disk and said wall, and means cooperating with the second contact member to secure the members of the insulator together, substantially as described.

4. In an electrical connection of the class described, in combination, a metal casing provided with an open end, an insulator within said casing comprising a cylindrical member having a transversely extended wall, and a disk member, a contact member having a head interposed between said wall and disk member, and a second contact member having a shank portion extended through said disk member and said wall, and means cooperating with said shank portion to secure said insulator members together, substantially as described.

5. In an electrical connection of the class described, in combination, a metal casing provided with an open end, an insulator within said casing comprising separable members, a contact member having a portion interposed between said members and extended toward the open end of said casing, a second contact member having a portion extended through both members of the insulator away from the open end of the casing, and means cooperating with said second contact member to secure the members of the insulator together, substantially as described.

6. In an electrical connection of the class described, in combination, a metal casing provided with an open end, an insulator



within said casing comprising separable members, a contact member supported by one member of said insulator, a second contact member supported by the other member of said insulator, and means cooperating with said second contact member to secure the members of the insulator, together, substantially as described.

7. In an electrical connection of the class described, in combination, a metal casing provided with an open end, a cylindrical member of insulating material located in said casing and provided with a transversely extended wall, a cylindrical contact member having a head engaging said wall, an insulating member within the cylindrical contact member engaging the head of the said contact member, a second contact member within the cylindrical contact member and having a shank portion extended through the insulating member within the cylindrical contact member and through said wall, and means cooperating with said shank portion to secure said second insulating member to said wall, substantially as described.

8. In an electrical connection of the class described, in combination, a metal casing provided with an open end, an insulator within said casing comprising separable members, a contact member supported by one member of said insulator, a line terminal secured to said contact member, a second

contact member supported by the other member of the insulator, a line terminal secured to said second contact member, and means cooperating with the second contact member to secure said contact members and insulating members together to enable the same to be inserted into and removed from the casing as one piece, substantially as described.

9. In an electrical connection of the class described, in combination, a socket member provided with a metal casing having within it an insulator and contact member supported thereby away from the walls of said casing, and a plug member comprising a metal casing of substantially the internal diameter of the casing of the socket member to enter the latter and provided within it with an insulator and contact members supported thereby to cooperate with the contact members of the socket member, the metal casings of said plug and socket members cooperating to prevent injury to the cooperating contact members by weight placed upon the plug member, substantially as described.

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

JOHAN M. ANDERSEN.

Witnesses:

JAS. H. CHURCHILL,  
J. M. MURPHY.