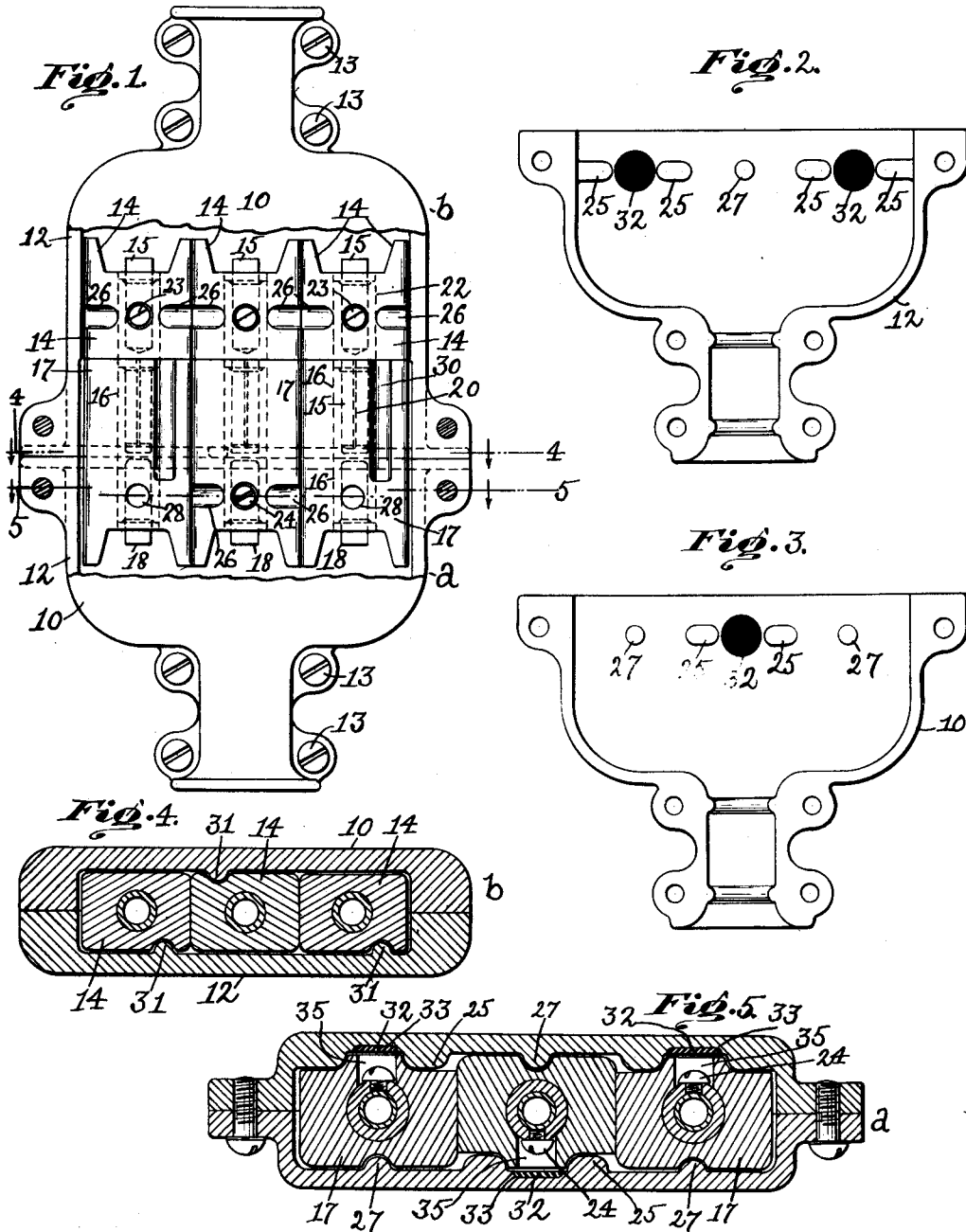


A. E. ANDERSON.
ELECTRIC CONNECTOR.
APPLICATION FILED JUNE 14, 1915.

1,183,516.

Patented May 16, 1916.



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UNITED STATES PATENT OFFICE.

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ELECTRIC CONNECTOR.

1,183,516.

Specification of Letters Patent.

Patented May 16, 1916.

Application filed June 14, 1915. Serial No. 33,892.

To all whom it may concern:

Be it known that I, ALF E. ANDERSON, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Electric Connectors, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to an electric connector of that class known as a plug and socket connector, which is commonly employed among other uses for connecting storage batteries with leads from main or other lines.

The present invention has for its object to provide a superior electric connector of the character described. To this end, the plug member or the socket member of the electric connector is provided with a casing preferably of metal, and with a plurality of contact-carrying insulators, one and preferably all of which is capable of a limited movement in different directions within the metal casing, so as to enable the contacts carried by the said insulators to be self-aligning with relation to the contacts of the cooperating connector member. The metal casing is provided with means for locating the insulators within the casing in a predetermined definite position and for taking the pressure upon the insulators when the connector members are forced together to complete the circuit. Provision may and preferably will be made for preventing a short circuit being established between the contacts carried by the insulators and the metal casing, as will be described. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a plan with parts broken away of one form of plug and socket connector embodying this invention. Figs. 2 and 3, details of the parts of the casing for one of the members shown in Fig. 1. Fig. 4, a section on the line 4—4, Fig. 1, and Fig. 5, a section on the line 5—5, Fig. 1.

Referring to the drawings, *a*, *b*, represent the members of an electric connector embodying this invention, which may be designated the plug and socket member respectively. Each member *a*, *b*, is provided with a casing, preferably of metal, and

preferably composed of two parts or halves 10, 12, which may be secured together by screws 13 or otherwise, and which when secured together form a chamber within which are located a plurality of insulators, herein shown as three in number. Each insulator of the socket member *b* is marked 14 and carries a contact member 22, which coöperates with the contact member 16 carried by the individual insulators 17 of the plug member *a*.

The contact member 22 of the socket member *b* may and preferably will be made as a rod, which is provided with a slot 20 extended longitudinally for a portion of its length to form spring fingers, (see dotted lines Fig. 1), and its rear end is preferably made hollow to receive a metal sleeve or bushing 15, which latter is secured in the hollow end of the rod 22 by a fastening device, which is herein shown as a set screw 23. The circuit wires not herein shown are soldered or otherwise secured to the sleeve or bushing 15.

The contact members 16 of the plug member *a* may and preferably will be made as metal sleeves or bushings, which are fitted into holes extended through the insulators 17. The sleeves 16 may have inserted into their rear end smaller sleeves 18 for the reception of the circuit wires not shown and the sleeves 18 are secured in the sleeves 16 by set screws 24. The insulators 17 project beyond the casing of the member *a* and enter the casing of the member *b*, consequently the member *a* may be designated the plug member and the member *b* the socket member.

In order to facilitate the entrance of the contact members 22 of the socket member *b* into the hollow contact members 16 of the plug member *a*, and also to allow for slight irregularities in the manufacture and fitting together of the contacts in their insulators, the latter are made separate from one another and are secured in their casings so as to have a definite and practically fixed relation to the casings, yet are capable of having a limited movement in different directions within said casings, so that the contact members of either of the plug or socket members are self-aligning. This result is accomplished by providing the casings with suitable means for coöperating with the insulators, and, in the present in-

stance, the casings are provided with one set of lugs or projections 25, which are elongated transversely of the casing and are adapted to fit loosely into cavities 26 extended transversely in the insulators on one surface thereof, and the casings are further provided with a second set of substantially spherical lugs or projections 27, which enter substantially semi-circular cavities 28 in the opposite surface of said insulators.

The projections 25 are preferably rounded so as to permit the insulators to have a rocking movement on them in one plane as for instance up and down, and the cavities 26 are made slightly longer than the projections so as to permit the insulators to move laterally, and the projections 25, 27 are made sufficiently smaller than the cavities 26, 28, to permit the insulators to move diagonally or in a direction which is a resultant of the up and down and the lateral directions. The projections 25, 27 also cooperate with the side walls of the cavities 26, 28, to take the end pressure when the contact members of the plug member are forced onto the contact members of the socket member.

The insulators 17 of one member, herein-shown as the member *a*, are also preferably provided with longitudinal slots 30, which cooperate with nubs 31 on the casing of the socket member to guide the insulators 17 in their entrance or initial movement into the casing 10, 12, of the socket member *b*.

The casings of the plug and socket members are provided with insulators 32, which are located opposite to the screws 23, 24, which secure the circuit wires represented by the sleeves 15, 18, to the insulators 14, 17, and, in the present instance, the insulators 32 are made as disks of insulating material, which are inserted into sockets or cavities 33 in the metal casings, so that the outer surfaces of the insulators 32 are flush or substantially flush with the inner surface of the metal casing. The insulator blocks 14, 17 are provided with sockets or openings 35 for the reception of the screws 23, 24, and the insulating disks 32 carried by the metal casings are arranged in line with the sockets or openings 35 (see Fig. 5), and practically form insulating end walls for the sockets or openings 35, so that, in case one or more of the screws 23, 24, should become loose and make contact with an insulating disk 32, a metallic contact with the metal casing is prevented and a short circuit is thereby avoided.

In the present instance, I have shown one construction of connector embodying this invention, but it is not desired to limit the invention to the particular construction shown.

Claims:

1. In an electric connector of the character described, in combination, a casing, a plu-

rality of insulators located therein, contact members carried by said insulators, and means within said casing for securing the said insulators in definite relation to the casing while permitting limited movement of the insulators individually in different directions.

2. In an electric connector of the character described, in combination, a casing, a plurality of insulators located therein and each provided with an opening for the reception of a contact member and with a socket extended from one surface of the insulator to said opening, contact members located in the openings in said insulators, means located in said sockets for securing the circuit wires to said insulators, and insulating devices carried by said casing and cooperating with said sockets to form end walls therefor.

3. In an electric connector of the character described, in combination, a casing, an insulator in said casing provided with a cavity in its outer surface, a contact member carried by said insulator, and a device on the inner side of said casing for entering said cavity to position the insulator within the casing while permitting a limited movement thereof within said casing.

4. In an electric connector of the character described, in combination, a casing, an insulator located in said casing and capable of being placed into and removed therefrom, a contact member carried by said insulator, and means within the casing cooperating with said insulator to position the insulator within the casing while permitting a limited movement thereof in different directions within the casing.

5. In an electric connector of the character described, in combination, a casing composed of members detachably secured together and provided on their inner surfaces with lugs or projections, a plurality of insulators located in said casing and having cavities for the reception of said lugs or projections to secure said insulators in fixed relation in said casing while permitting movement thereof in different directions, and contact members carried by said insulators.

6. In an electric connector of the character described, in combination, a casing composed of members detachably secured together, a plurality of insulators located in said casing, contact members carried by said insulators, and means within the casing cooperating with said insulators to position the insulators in definite relation to the casing while permitting limited movement thereof in said casing.

7. In an electric connector of the character described, in combination, a casing, a plurality of insulators located therein, contact members carried by said insulators, and means for positioning the insulators in defi-

nite relation to the casing while permitting limited movement of the insulators individually in different directions within the said casing.

- 5 8. In an electric connector of the character described, in combination, a casing provided on its inner surface with a circular cavity, an insulator located in said casing and provided with a contact member within
10 it and with an opening extended from one surface of the insulator to said contact member, said insulator being arranged in said casing to bring the opening in the insulator opposite to said circular cavity, means lo-
15 cated in said opening for securing a conduc-

tor to said contact member, and an insulating disk inserted into said cavity and frictionally retained therein with its outer surface substantially flush with the inner surface of said casing and coöperating with said opening to form an end wall for the latter.

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

ALF E. ANDERSON.

Witnesses:

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