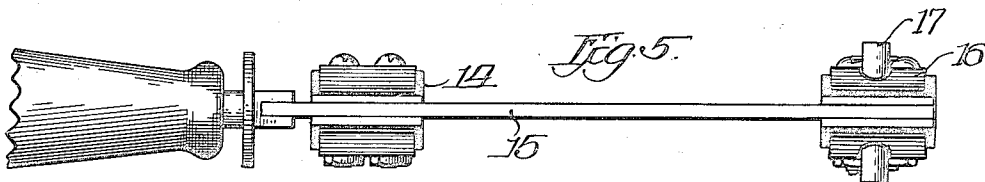
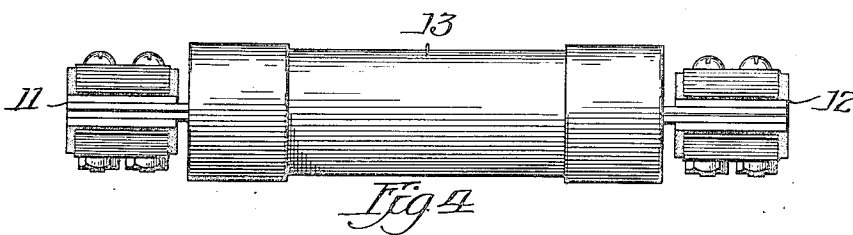
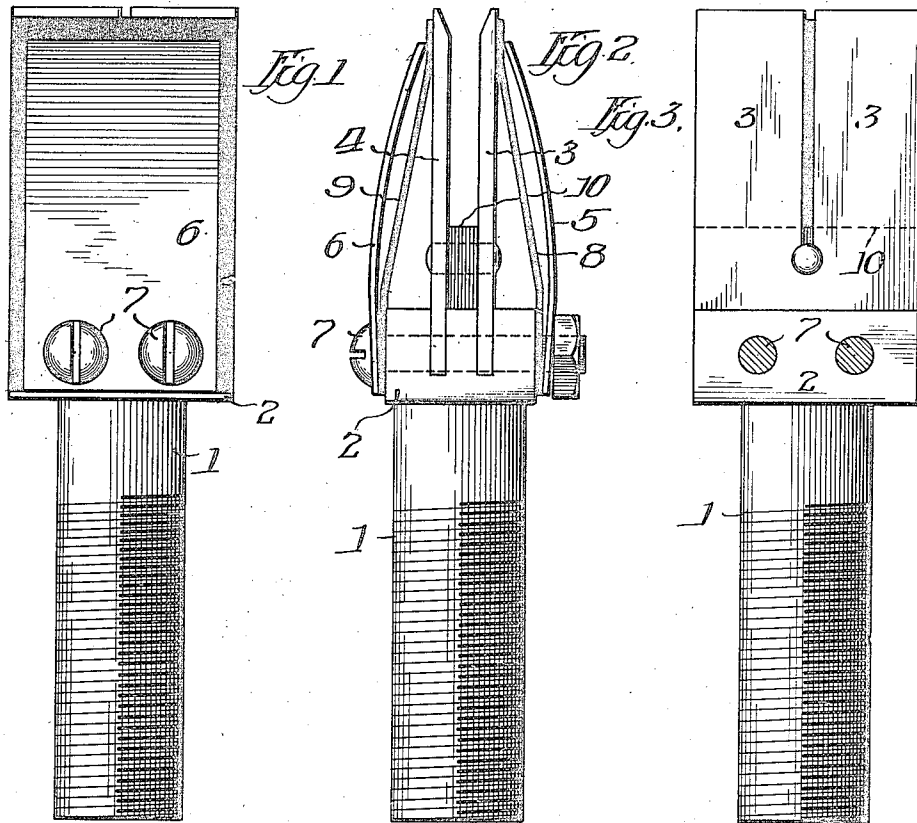


G. A. SCHAEFER.
ELECTRICAL CONNECTOR.
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1,169,431.

Patented Jan. 25, 1916.



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ELECTRICAL CONNECTOR.

1,169,431.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE A. SCHAEFER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrical Connectors, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to an improved form of electrical connector of the type having jaws for receiving between them the switch blade or similar conductor with which the connector is to be used. It is not limited to use in connection with switch blades, as it may be employed to advantage in connection with other flat conductors, as for example, the flat terminals of inclosed fuses.

The several drawings illustrating my invention are as follows:

Figure 1 shows the connector complete in side view; Fig. 2 shows the connector in edge view; Fig. 3 shows in a view similar to Fig. 1 the connector with one of the springs and insulating plates removed; Fig. 4 shows in plan view a pair of the connectors employed in connection with an inclosed fuse; Fig. 5 shows in a view similar to Fig. 4 one of the connectors employed to engage the blade of a knife switch.

Similar numerals refer to similar parts throughout the several views.

As shown in Figs. 1, 2 and 3, the connector consists of a tubular rod 1, of good conducting material, as for example copper, which carries at its upper end a rectangular block 2, preferably of the same material. The block 2 has rigidly secured thereto two contact plates 3 and 4 which project beyond the block 2 a sufficient distance to engage the conductor with which the connector is to be employed. The springs 5 and 6, preferably of tempered steel, are disposed outside of the plates 3 and 4 respectively, to engage said plates near their outer ends to hold them firmly in connection with the conductor inserted between them, and these springs are preferably secured to the block 2 by means of bolts 7, as indicated.

The springs 5 and 6 are separated electrically from the plates 3 and 4 by plates or sheets 8 and 9, preferably of refractory material, such as mica, so that current flow

through the springs 5 and 6 is prevented. These insulating plates 8 and 9 serve also to protect the springs 5 and 6 to a certain degree from being heated by conduction. As indicated in Fig. 3, the contact plates are preferably slotted to provide a large area of engagement between the plates and the conductor inserted between them, so as to preserve a good contact if for some reason the conductor is somewhat irregular in thickness. A limiting block 10, preferably of insulating material is disposed between the contact plates 3 and 4 adjacent to the block 2 to prevent the conductor being jammed between the plates 3 and 4 too great a distance. As a result of the construction described, when a conductor is in place between the plates 3 and 4 and as a result current flows through the conductor to said plates and thus through the rod 1, forming a part of the connector, current flow is entirely prevented through the springs 5 and 6, and thus all heating effect due directly to such current flow is avoided. Furthermore, the insulating sheets or plates between the springs and the contact plates serve to prevent to a great degree the conduction of heat from the contact plates to the springs. The contact plates will, of course, be heated, more or less depending upon the amount of current flowing through them relatively to their cross section, and it is well known that for devices of this kind carrying heavy currents the heating effect becomes great enough to soften the metal of which the contact plates is composed, thus leaving them without resilience and incapable of making good contact of themselves with the conductor inserted between them. It has also been found that in using large currents in electric circuits employing devices of the kind under consideration, when it is attempted to use springs to hold the contact plates in position, these springs which have heretofore not been insulated from the plates, conduct a large part of the current with the result that the springs are sufficiently heated by the current flow to nearly or quite draw their temper. By my present invention all of the advantages of a flat leaf spring are secured, and the springs are protected from this softening effect with the result that, although the plates 3 and 4 may be made soft after a time by the current

flowing through them, the springs 5 and 6 will keep the connector in efficient operating condition.

While it is desirable to employ steel springs on account of their effectiveness and cheapness, I do not limit myself to the use of this metal, but on the other hand may employ any spring metal desired and, furthermore I may secure it to the base of the connector in any equivalent manner to that shown without departing from the spirit of my invention.

While I have shown my connector as having plates or sheets of insulating material extending the whole length of the springs 5 and 6, it will be understood that the heating effect resulting from current flow through the springs may be entirely eliminated by properly insulating either end of each spring, regardless of whether the other end of the spring is insulated from the conducting parts with which it is associated or not. It is in all cases desirable, however, to insulate both ends of the spring so as to reduce to a minimum the amount of the heating due to conduction. Furthermore by employing a construction substantially as shown in the drawings a convenient means is afforded for supporting the sheets or plates of insulation.

Fig. 4 requires no particular description, as it shows clearly the use of two connectors 11 and 12 for receiving the flat terminals of an inclosed fuse 13, as a result of which construction the fuse may readily be removed from the connectors, and another fuse substituted therefor.

The use of one of the connectors 14 is indicated in Fig. 5 to constitute the jaw for a knife switch 15, in which connection the operation of the parts is so apparent as to require no particular description. The pivot jaw 16 is similar to the connector 14, being provided in addition with a pivot rod 17.

I do not limit myself to the particular uses shown and described for my connector, nor do I limit myself to any particular form of insulation or means of securing to it the connector, for as long as the insulation is of such a nature and so employed as to prevent current flow through the springs, my invention is realized.

What I claim is:

1. In an electrical connector, the combination of a base, contact blades extending from the base, flat springs supported by the

base outside of the contact blades tending to force the ends of said blades together, and insulating material between said springs and said plates to prevent electrical contact between them, said insulating material being practically coextensive with the springs to protect the latter from the heat of the blades.

2. In an electrical connector, the combination of a base, two flat contact plates extending from the base, a sheet of insulating material outside of each contact plate and the base, a spring outside of each sheet of insulating material, and fastening devices extending through the base, the insulating sheets and the springs for exerting spring pressure upon the outer faces of the contact plates, said insulating material being practically coextensive with the springs to protect the latter from the heat of the plates.

3. In an electrical connector, the combination of a cylindrical threaded rod, a rectangular block of conducting material carried by the rod, two parallel contact plates secured in the block and extending therefrom, a sheet of refractory insulating material outside of each contact plate and extending over one face of said block, a curved leaf spring disposed outside of each sheet of insulating material and extending adjacent to one of the faces of said block, and a bolt or bolts extending through said block, said sheets of insulating material and said springs to force the springs into a position exerting an inward pressure upon the contact plates, said insulating material being practically coextensive with the springs to protect the latter from the heat of the plates.

4. In an electrical connector, the combination of a conducting base, contact plates extending from said base, flat springs supported by the base for exerting inward pressure upon said contact plates, and insulating material between said springs and the remaining parts of the connector for preventing current flow through said springs, said insulating material being so disposed and formed as to prevent the communication of heat from said plates to said springs.

In witness whereof, I hereunto subscribe my name this 15th day of April, A. D. 1914.

GEORGE A. SCHAEFER.

Witnesses:

FRED W. IRVING,
HARRY R. FOSTER.