

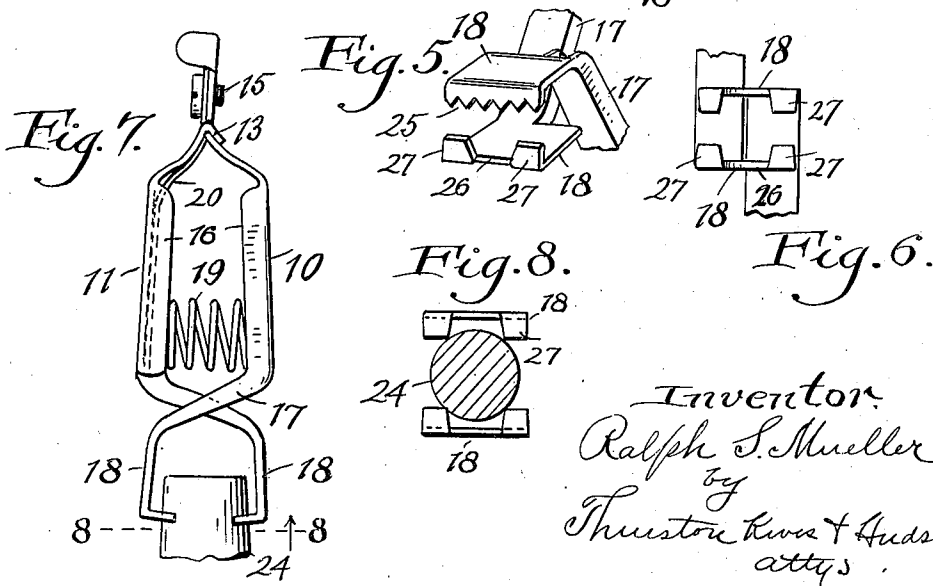
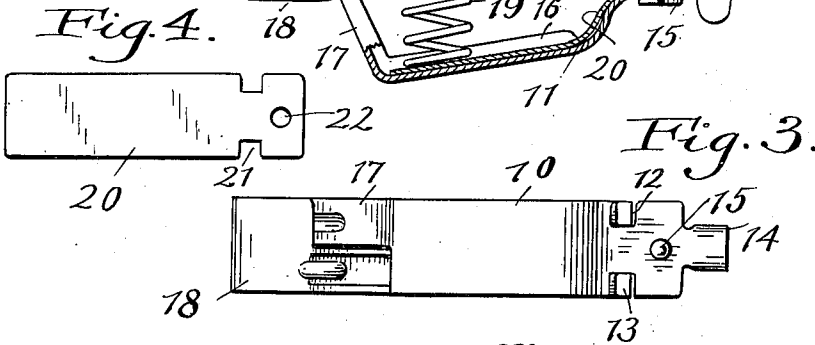
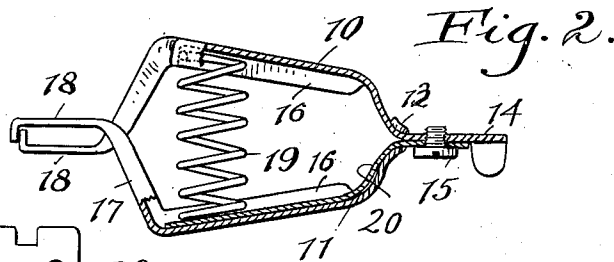
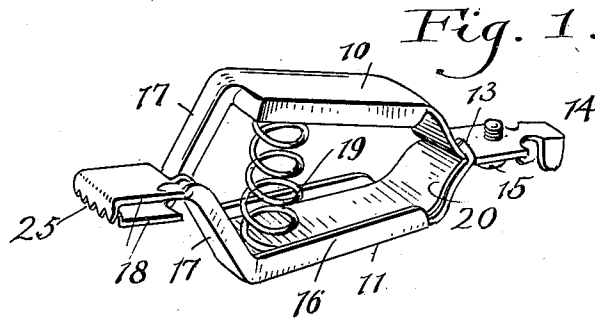
Jan. 6, 1925.

1,521,903

R. S. MUELLER

CONNECTION CLIP

Filed April 25, 1921



Inventor
Ralph S. Mueller.
by
Thurston Knapp & Hudson
attys.

UNITED STATES PATENT OFFICE.

RALPH S. MUELLER, OF CLEVELAND HEIGHTS, OHIO, ASSIGNOR TO MUELLER ELECTRIC COMPANY, A PARTNERSHIP COMPOSED OF RALPH S. MUELLER AND MAUDE K. MUELLER.

CONNECTION CLIP.

Application filed April 25, 1921. Serial No. 464,313.

To all whom it may concern:

Be it known that I, RALPH S. MUELLER, a citizen of the United States, residing at Cleveland Heights, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Connection Clips, of which the following is a full, clear, and exact description.

This invention relates to electrical connection clips which are commonly employed at the present time for making temporary electrical connections such as for testing purposes, and generally consist of two members connected together at the rear end of the clip, and provided with forward crossed portions having jaws which are pressed together or toward each other by a spring located between and acting on the two members at the rear of the crossed portions so as to spread them apart.

It has been found with the clip most commonly employed, that the current does not at all times pass equally through both members of the clip from one end thereof to the other, i. e. from the rear end of the clip to which the conductor is attached to the conductor gripped by the jaws, or from the jaws to the rear end of the clip. In other words, if, due to corrosion, oxidation or other causes, one member of the clip becomes wholly or partially insulated at the pivot or joint from the other member to which the electric conductor is attached, the current will pass forwardly along one member of the clip, and a part or all the current will pass through the spring to the other member which is insulated at the pivot or joint, the amount of current passing through the spring under these circumstances, depending upon the degree of insulation at the joint or pivot between the rear portions of the two members of the clip, and to an extent upon whether both jaws have the same degree of conductivity with the conductor which the jaws engage.

The passage of current through the spring as above explained, is undesirable inasmuch as it heats the spring, weakens it, and thereby reduces the effectiveness of the clip.

One of the objects of the invention is to provide an effective means for protecting the spring against passage of current there-through, irrespective of the conductivity of

the joint or pivot between the two members of the clip. Further the invention aims to accomplish this result not only in an effective, but also in an inexpensive manner.

In another aspect the invention relates to certain improvements in the shape or form of the conductor gripping portions of the jaws, the aim of the invention in this particular aspect being to give the jaws a shape such that they are better adapted than the ordinary serrated jaws to be readily clamped onto a fairly large conductor, such as the terminal post of a storage battery, and so that the clip will remain in position with respect to the part that it grips without danger of the clip falling or swinging from the position in which it was initially placed, usually in alignment with the conductor.

The invention may be briefly summarized as consisting in certain novel details of construction, and combinations and arrangements of parts which will be described in the specification and set forth in the appended claims.

In the accompanying sheet of drawings, Fig. 1 is a perspective view of the preferred form the clip to which my improvements can be advantageously applied, this view showing the clip provided with my improved spring protector in the form of a shunt; Fig. 2 is a view of the same, partly in side elevation and partly in longitudinal section; Fig. 3 is a top plan view of the same; Fig. 4 is a detached view of the shunt or spring protector; Fig. 5 is a perspective view of the jaws showing one form or embodiment of my invention in the shape of the jaws, the jaws being slightly spread apart; Fig. 6 is an end view looking toward the jaws with the jaws similarly spread and showing a slight modification over the construction shown in Fig. 5; Fig. 7 is a side view with the clip in vertical position clamped to an upright conductor, this view serving to illustrate the function of the jaws shaped as in Figs. 5 or 6; and Fig. 8 is a sectional view along the line 8—8 looking in the direction of the arrows, and illustrating, simply by way of example, the jaws shown in Fig. 6.

Referring now to the drawings, it will be observed that the clip is composed of

two main members 10 and 11, which are pivoted together near the rear end of the clip by providing slots 12 along the sides and near the rear end of the part 10, and
 5 by providing tongues 13 on the companion part 11, which extend through the slots 12 and are bent forwardly, this being the type of pivotal joint or articulation illustrated in patent to George B. Dusing, No. 963,425,
 10 of which patent I am sole owner.

The part 10 has an extension 14 which projects rearwardly beyond the pivotal connection or joint of the two parts 10 and 11, and to this extension the end of an electrical conductor is adapted to be secured,
 15 in this case by a binding screw 15. Furthermore, the body portions of both members 10 and 11 have intumed flanges 16, and at their forward ends they are provided with channel-shaped necks 17, which are
 20 crossed, as shown, the necks terminating in forward jaws 18 which are pressed yieldingly together by a spring, in this instance a coil spring 19, located between the flanges
 25 of the members 10 and 11, just rearwardly of the necks 17.

The clip so far described, is and has been sold by me for some time, and is used very extensively.

30 Coming now to the improvements constituting the subject matter of the present invention, to protect the spring 19 against the passage of current therethrough, I provide a protector in the form of a shunt 20,
 35 consisting of a strip of good conducting material which lies inside the member 11 between the flanges 16 thereof. The spring 19 bears against and presses one end of the shunt 20 against the clip member 11, and
 40 from the spring the shunt 20 extends rearwardly along the member 11, across the joint or pivot point between the members 10 and 11, the rear end of the shunt lying along the face of the extension 14 of the
 45 member 10, and being clamped in good electrical contact therewith by means of the binding screw 15. This shunt has notches 21 which register with the notches 12 of the member 10 of the clip, and at its rear end
 50 has a hole 22 to accommodate the binding screw 15.

It will be observed that the effect of this shunt is to electrically connect the member 10 to the member 11 around or in shunt to the spring 19, and to provide a conducting
 55 path from the extension 14 of the member 10 to the member 11, which is independent of both the spring 19 and the points of contact at the joint or pivot between the
 60 two members 10 and 11.

It will be seen that since this shunt is firmly attached at its rear end to the extension 14, and at its forward end is pressed tightly against the clip member 11, current
 65 will pass substantially equally along both

clip members 10 and 11, irrespective of the efficiency of the pivotal joint between the members 10 and 11 for current conducting purposes, and that no current will pass
 70 through the spring 19 from one member of the clip to the other if the jaws are both in good engagement with the conductor to which the clip is clamped.

The members 10 and 11 of the clip are preferably formed of sheet steel which may
 75 be lead coated if used as a test clip in connection with storage batteries, and the shunt 20 is preferably formed of copper which may be likewise lead coated.

In so far as the shunt or spring protector
 80 is concerned, the forward conductor gripping portions of the jaws may assume any form, such as the ordinary toothed or serrated shape or form. I prefer, however, that these portions of the jaws be shaped
 85 either as illustrated in Fig. 5, or in Figs. 6 and 8, to more effectively adapt the clip for certain uses, as when it is desired that the clip grip a round or tapered conductor and remain in the position in which it was
 90 initially placed, which may be a position of alignment with the conductor, such as the conductor 24 of Figs. 7 and 8, irrespective of whether the clip stands in vertical position as in Fig. 7, or in any other position.
 95 In explanation of this it might be mentioned that while the ordinary toothed or serrated jaws are admirably adapted for certain purposes, they will not grip a fairly large conductor such as illustrated in Figs.
 100 7 and 8, as for example, the upright terminal of a storage battery, without liability, and the probability that the clip will fall over, instead of standing in an upright position. To render the clip self-sustaining
 105 as far as remaining in its original and desired position is concerned, I give at least one of the jaws a novel shape other than the toothed or serrated shape. In Fig. 5, one jaw 18 has a current engaging portion
 110 formed by an intumed lip with a large number of teeth or serrations 25 of usual form, and the other jaw 18 has the middle portion of the lip fully cut away, as shown
 115 at 26, leaving at the corners of the jaw only a pair of inwardly projecting teeth 27. In Fig. 6 both jaws 18 are formed like the lower jaw of Fig. 5, i. e. with the inwardly projecting corner teeth 27 and with the intermediate single large gap 26.
 120

With either the construction shown in Fig. 5, or in Fig. 6, i. e. with one or both
 125 of the jaws provided with the corner teeth and intermediate wide notch, the connection with the conductor, from an electrical standpoint, is very effective, and at the same time the full notched jaw or jaws sufficiently embrace a fairly large conductor and the conductor is so held between the corner teeth that it will stand in its
 130

original position without swinging by gravity from that position, irrespective of the direction in which the conductor extends, such, for example, as horizontal or vertical.

It will be seen, therefore, that I have provided two distinct improvements of considerable merit which are capable of conjoint or separate use in a connection clip. Furthermore, while I have shown my improvements embodied in a clip of well-known make, I do not desire to be confined to the precise details shown, as the parts, particularly certain of them, may be otherwise shaped and connected.

Having described my invention, I claim:

1. An electrical connection clip comprising two pivotally connected clip members, a spring acting on both members for pressing the jaws yieldingly together, and means for protecting the spring against the passage of current therethrough comprising a shunt independent of the pivot forming means and electrically connected to both members.
2. An electrical connection clip composed of two connected members having jaws, one member having means for receiving an electric conductor, a spring for imposing tension in the jaws, and a protector for the spring comprising a shunt extending across the joint from one member to the other

and electrically connected to, or engaging both members.

3. A connection clip composed of two connected clip members with jaws and a spring for imposing tension in the jaws, one of the members having an extension to which an electric conductor is adapted to be attached, and a protector for the spring comprising a shunt connected to said extension of the one member and extending across the joint to the other member and into electrical engagement therewith.

4. An electrical connection clip composed of two clip members having jaws, a spring extending between the members for imposing tension in the jaws, and a protector for the spring comprising a shunt having one end attached to one member and its other end held by the spring into engagement with the other member.

5. An electrical connection clip composed of two connected members having jaws, a spring extending between the two members for imposing tension in the jaws, and a shunt connected to one of said members extending across the joint between the two members and held by the spring into good electrical contact with the other member.

In testimony whereof, I hereunto affix my signature.

RALPH S. MUELLER.