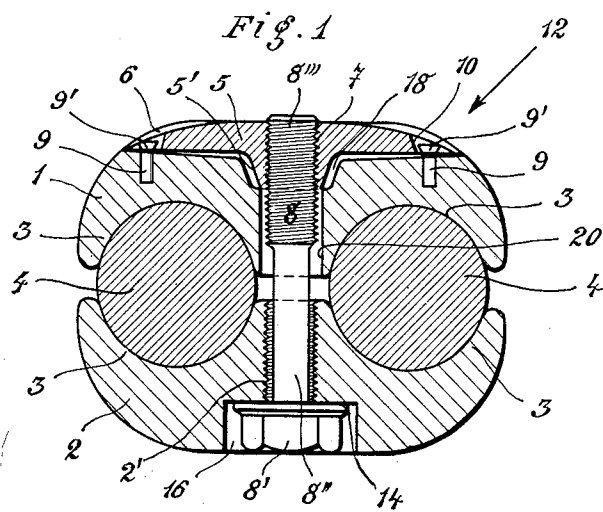
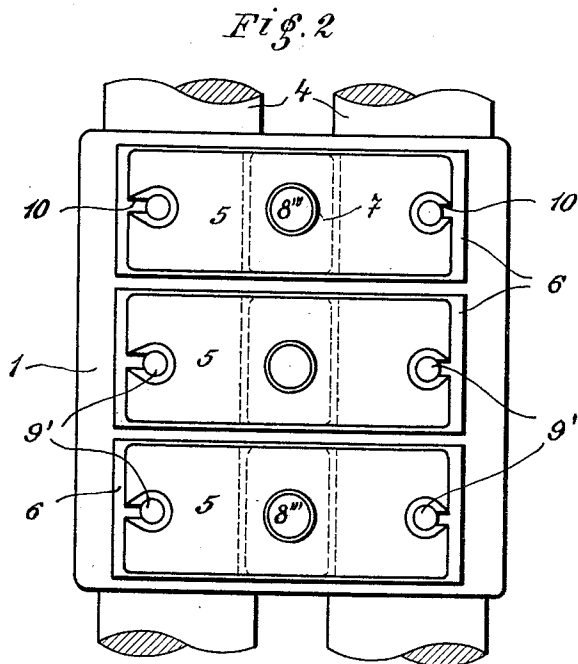


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ELECTRICAL CONNECTOR
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ELECTRICAL CONNECTOR

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The present invention relates generally to electrical terminals and particularly to terminals for use in connection with relatively large electric currents.

It is known in the prior art to provide heavy current terminals of the type having a pair of solid jaws which are clampable together by centrally disposed screw bolts and which have a spring plate, mounted between the bolt nut and one jaw to serve as a current antidiminishing or antifading device.

In such prior art devices, the spring plate serves as a retainer for the bolt nut and may be combined with the nut to form an assembly which is retained against rotation, the bolt nut being either fixed against rotation in the spring plate or the latter may be provided with a shoulder in which the nut thread is defined, i.e., the shoulder and spring plate are integral.

It is an object of the present invention to provide means attaining in a twin jaw heavy current terminal a reduction in the number of individual parts so as to decrease the weight thereof and to save material as well as to facilitate the assembly and disassembly thereof.

It is another object of the invention to provide means assuring in a heavy current electrical terminal maximum current transmission and permanent prevention of short circuits.

It is another object of the invention to provide means effecting obviation of overdimensioning of the spring plates and the achievement of a spring pressure, which is uniformly distributed over the entire surface of the clamping jaw.

It is a further object of the present invention to provide means minimizing well known corona effects at high voltages.

Another object of the present invention is to provide means facilitating easy and accurate assembly and disassembly of the parts of the electrical terminal whose number of parts is greatly reduced and which is substantially devoid of any protruding parts.

The above and other objects of the invention will become further apparent from the following detailed description, reference being made to the accompanying drawing, showing a preferred embodiment of the invention.

In the drawing which illustrates the best mode presently contemplated for carrying out the invention;

FIG. 1 is a transverse sectional view of an electrical terminal pursuant to the present invention; and

FIG. 2 is a top plan view thereof.

Pursuant to the present invention provision is made for a twin-jaw heavy current terminal 12 provided with a centrally disposed screw-threaded bolt 8 and a spring plate or member 5 functioning as a current antifading or antidiminishing device, said terminal being adapted to accommodate electrical conductors 4 of relatively large diameter, for example, and not by way of limitation, said conductors may have a diameter in the range of 30-40 millimeters. Since the dimensions of such heavy current terminals are considerably different from the dimensions of normal current terminals, it is of importance to reduce the number of individual parts in order to reduce weight and save material, as well as to facilitate the assembly and disassembly thereof, and also to assure maximum current transmission therethrough and the permanent elimination of short circuits.

It is an essential feature of the present invention that the spring plate 5 is provided with a screw thread 7 for receiving the threaded bolt 8 so as to eliminate the neces-

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sity for a separate nut for the bolt. Due to the relatively large dimensions of the spring plate 5, serving as an antifading current device, the plate may be made correspondingly thick in its central portion in order to be provided with a nut thread so as to achieve the mentioned advantages.

The twin clamping jaws 1 and 2 are preferably formed of a lightweight metal and are provided with confronting substantially semicircular grooves 3 to accommodate conductors 4 which are preferably formed by steel-aluminum cables. The conductors are of relatively large diameter, preferably at least 30 millimeters, and are encompassed by the walls of clamping grooves 3, which encompass almost the entire circumference of the associated cable, so as to assure maximum transmission of current through the terminal.

The spring member 5 is arched toward both its opposite ends and is countersunk in a recess 6 defined in the outer surface of clamping jaw 1, as best shown in FIG. 1. The spring member is formed preferably of spring steel and in the thickened center thereof is provided with an internal screw thread 7 which serves as the screw threading in a bolt nut for the threaded bolt 8. The bolt 8 extends from the clamping jaw 2 through clamping jaw 1, having a bolt head 8' and washer 14 which are countersunk in a recess 16 defined in the outer surface of jaw 2. The spring plate 5 is provided, on its inner central surface, with a projection or shoulder 5' through which the internal thread 7 extends to elongate the latter.

The shoulder serves primarily as a detent for the stressed spring member and abuts jaw 1 which is recessed, as at 18, to accommodate the shoulder.

In order to permanently unite the spring plate 5, in a loose manner, with jaw 1, but without interfering with or hindering the inherent movability of the spring plate, the plate is secured to the jaw to prevent it falling off therefrom. This securement can be accomplished in different ways. In the illustrated embodiment, it is accomplished through the use of the rivets 9 which are driven into the jaw 1. The rivets have conical heads 9' which slide in dovetail slots 10 defined at both ends of the spring plate 5. This loose joint between the spring plate and jaw 1 is a highly novel feature of the invention because during assembly or disassembly, which usually occurs far above the ground, the spring plate cannot fall down or get lost.

The terminal 12 is assembled by first inserting the threaded end 8'' of bolt 8 into the spring plate 5, which in its untensioned condition is highly arcuate or arched, and then tightening the spring until its shoulder 5' abuts the wall of recess 18 in jaw 1. This tensions the spring and the cooperating twin jaws 1 and 2 can then be firmly joined together, as needed, the spring plate remaining continuously in its tensioned condition.

With conductors of relatively large diameter, it is not possible to attain the compressive spring force required for the tensioning of the terminal by a single spring plate; therefore, as best shown in FIG. 2, at least two or three spring plates 5 are provided for a single jaw 1. As a result, overdimensioning of the spring plates is avoided, the assembly of the terminal 12 is facilitated and, of great importance, the resultant pressure is uniformly distributed over the entire outer surface of jaw 1.

The countersunk disposition of the spring plates 5 and bolt heads 8' results in a flush termination of the spring plates with the outer surface of jaw 1 and, in addition, projecting parts are obviated. As a result, coronas are minimized at the high voltages.

Another advantage of terminal 12 is of importance especially for the assembly of the terminal. This advantage results from the fact that bolt 8 is mounted in jaw 2 without the possibility of getting lost. For this purpose, jaw 2 has defined therein an internal screw thread

2' whose pitch exactly matches the internal thread 7 of spring plate 5, while the shank 8'' of bolt 8 has a somewhat smaller diameter than the inner diameter of thread 2' in jaw 2.

In assembling terminal 2, bolt 8 is first threaded through the lower jaw 2 and through an opening 20 in upper jaw 1, and then threaded into the spring plate seated in upper jaw 1, and both jaws are clamped together by tightening the bolt. In order to release the terminal, it is necessary only to withdraw the bolt from the spring plate and then permit its threaded end 8''' to rest in the lower jaw 2, so that it is protected from getting lost. This facilitation of the assembly proceeding is of importance because terminals of the described type are usually installed on masts at a relatively great height above the ground.

Various changes and modifications may be made without departing from the spirit and scope of the present invention and it is intended that such obvious changes and modifications be embraced by the annexed claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. An electrical terminal comprising a pair of cooperating first and second confronting clamping jaws, a bolt extending in unthreaded relation through both of said jaws, said bolt having an enlarged head at one end and being threaded at the other end, the headed end abutting said first one of said jaws, spring plate means mounted on said second one of said jaws, said spring plate having sides contacting the exterior face of said second one of said jaws and having an arched central portion spaced from said second jaw with an internal thread defined therein, and said threaded bolt end passing through said second jaw and being threadedly engaged with the internal thread of said spring plate, said spring plate means and said bolt clamping said jaws together under the tension of said spring plate means, and a permanent securement holding said spring plate to said second clamping jaw.

2. An electrical terminal comprising a pair of cooperating twin confronting clamping jaws, a bolt extending in unthreaded relation through both of said jaws, said bolt having an enlarged head at one end and being threaded at the other end, the headed end abutting one of said jaws, spring plate means mounted on the other of said jaws, said spring plate means having an internal thread defined therein, and said threaded bolt end passing through the other jaw and being threadedly engaged with the internal thread of said spring plate means, said spring plate means and said bolt clamping said jaws together under the tension of said spring plate means, said spring plate means having a permanent securement to and a loose joint with said other of said jaws, said securement and joint comprising dovetail slots defined at the opposite ends of said spring plate means and rivets provided with conical heads extending through said slots, respectively, and secured in said other of said jaws.

3. An electric terminal structure comprising a pair of complementary, confronting clamping jaws, each having a central bore, a bolt having at least one threaded part and extending through said central bores, a recess in one

of said jaws for accommodating therein one end of said bolt, the other jaw being provided with an enlarged opening communicating with the respective central bore, and a spring plate provided with a central projection, said projection having a threaded opening in registry with said bores of said jaws, said threaded part of said bolt being threadedly engaged with said threaded opening, so that said spring plate when tightening said jaw is hidden in said recess and protrudes with said projection into said enlarged opening, said central projection of said spring plate being located on the underface of said spring plate and centering said spring plate relative to said clamping jaw, said one jaw having a recess therein complementary to said projections, said projections extending into said recess, the threaded part of said bolt being partly located in the adjacent bore of said one jaw, said central projection of said spring plate forming a stop when accommodating said spring plate in said enlarged opening, and for tightening said jaws by said bolt.

4. An electrical terminal comprising a pair of cooperating twin confronting clamping jaws, a bolt extending in unthreaded relation through both of said jaws, said bolt having an enlarged head at one end and being threaded at the other end, the headed end abutting one of said jaws, spring plate means mounted on the other of said jaws, said spring plate means having an internal thread defined therein, and having a permanent securement to and a loose joint with said other of said jaws, said threaded bolt end passing through said second jaw and being threadedly engaged with the internal thread of said spring plate means, said spring plate means and said bolt clamping jaws together under the tension of said spring plate means.

5. An electric terminal structure comprising a pair of complementary, confronting clamping jaws, each having a central bore, a bolt having at least one threaded part and extending through said central bores, a recess in one of said jaws for accommodating therein one end of said bolt, the other jaw being provided with an enlarged opening communicating with the respective central bore, and a spring plate provided with a central projection, said projection having a threaded opening in registry with said bores of said jaws, said threaded part of said bolt being threadedly engaged with said threaded opening, so that said spring plate, when tightening said jaws, is hidden in said recess and protrudes with said projection into said enlarged opening, said central projection of said spring plate being located on the under face of said spring plate and centering said spring plate relative to said clamping jaws, said one jaw having a recess therein complementary to said projection, said projection extending into said recess, the threaded part of said bolt being partly located in the adjacent bore of said one jaw.

References Cited in the file of this patent

UNITED STATES PATENTS

2,771,591 Vordtriede Nov. 30, 1956

FOREIGN PATENTS

174,965 Austria May 26, 1953
193,455 Austria Nov. 25, 1957