May 19, 1936. G. F. LINCKS 2,041,613

TERMINAL CLAMP

Filed June 2, 1932

Fig. 1.

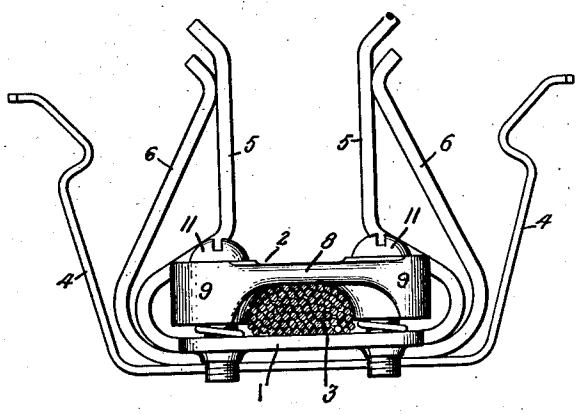
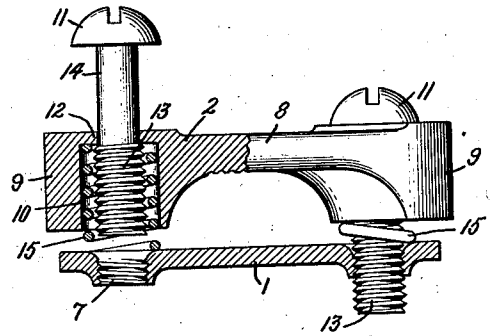


Fig. 2.



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TERMINAL CLAMP

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5 Claims. (Cl. 173—263)

The present invention relates to terminal clamps such as are used for connecting an electrical conductor to a terminal, an application of the invention being in connection with terminal clamps for fuse cutouts.

The object of my invention is to provide an improved terminal clamp wherein the screws are fixed in one of the clamping members so that they cannot drop out but wherein, at the same time, either screw may be entirely unscrewed independently of the other and this without placing undesirable stresses on the clamping members or in any way mutilating the threads of the screws.

For a consideration of what I believe to be novel and my invention, attention is directed to the accompanying description and the claims appended thereto.

In the drawing, Fig. 1 is an end view of a terminal clamp embodying my invention, it being shown as clamping a conductor in position, and Fig. 2 is a view of the clamping members shown in Fig. 1, parts being in section for the purpose of illustrating the operation of the construction.

Referring to the drawing, 1 and 2 indicate two clamping members or plates between which the conductor, such as the conductor 3, (Fig. 1) is clamped. Clamping member 1 is a base plate and may be a part of a terminal clip structure such as is used in fuse cutouts, 4 being supporting arms for fastening the clip structure in the cutout housing and 5 being the clips between which the contacts on the fuses are held. At 6 are spring arms for backing up the clips 5. The terminal clip construction is shown only by way of example. Its specific arrangement forms no part of the present invention. In clamping member 1 are spaced threaded holes 7. Holes 7 may be arranged either in line with each other or at diagonally opposite corners of plate 1. In the latter case the clamping member 2 stands at an angle relatively to plate 1.

Clamping member 2 comprises a yoke 8 at each end of which is an enlargement or post 9 provided with an unthreaded opening 10 for the passage of the fastening screws 11. Or, otherwise considered, clamping member 2 comprises a bar having a recess between its ends for the reception of a conductor to be clamped, openings 10 being formed in the ends of the bar. The recess beneath the yoke and between the posts is sufficiently deep to accommodate the conductor to be fastened between the clamping members. This will be clear from inspection of Fig. 1. Each opening 10 is of a diameter such that screw 11 can be moved freely therein and at its upper end the wall surrounding the opening is turned or peened in to provide a stop or shoulder 12 with which the threads of the screw engage to prevent the screw from coming out of the opening. Screw 11 has a threaded portion 13 and an unthreaded portion or shank 14, the threads being larger in diameter than the shank. Such a construction is provided in the case of a screw having an ordinary rolled thread. The threaded portion 13 of the screw is of a length such that it may be enclosed or substantially enclosed in opening 10 as shown at the left-hand side of Fig. 2, and shank 14 is of a length such that the threaded portion may be screwed into opening 7 in base plate 1 with the head of the screw against the top surface of post 9. This means, in a construction such as that illustrated in the drawing, that the shank should have a length about the same as that of the threaded portion. The screw may be assembled in opening 10 by first inserting the screw through the opening from the top until the threads are below the upper edge of the top of the post and then turning or peening in the top edge of the opening around the shank to provide the stop or shoulder 12.

By the above described arrangement, I provide a construction wherein the screws are fastened in the holes in member 2 so that they cannot fall out but wherein, at the same time, either screw may be screwed back entirely out of engagement with the threaded opening in plate 1 with which it engages, quite independently of the other screw and without putting any strain on the clamping member 2 or tending to tilt it to an angular position. For example, referring to Fig. 1 wherein the conductor 3 is shown as being held between the two clamping members 1 and 2, if it is desired to release the conductor, first one screw and then the other may be backed entirely out of engagement with plate 1, the one screw holding the clamping member 2 while the other is being unscrewed. This result is accomplished by reason of the fact that the stops or shoulders 12 for the screws are spaced a distance from the threads of the screws, (in other words, the shank 14 is of such a length) that the screws may be screwed entirely out of plate 1 before the threads engage the stops. Likewise, in tightening up the clamping members, either screw may be tightened up to any desired extent in advance of the other without the clamping member 2 assuming an angular position and without placing side stresses on either of the screws.

A terminal clamp is often located in a somewhat inaccessible position. This makes it desirable that the screws be fastened in the one clamping member so that they cannot drop out. At the same time, however, it is desirable that the arrangement be such that the screws can be readily screwed in or out to effect clamping or unclamping of the conductor without having to operate each screw a little at a time in order to avoid damaging the coupling or the threads on the screws. As it will be clear, this is accomplished by my invention wherein either

screw may be screwed entirely out or in quite independently of the other screw and without tending to force the clamping members to angular positions relatively to each other.

Since terminal clamps are often in inaccessible positions, it is desirable to provide means to insure the separation of the two clamping members when the holding screws are unscrewed. According to my invention, I accomplish this result by spring means placed between the two clamping members. In the present instance, this spring means is shown as being in the form of coiled springs 15 located in openings 10 around screws 11, one end of each spring engaging the shoulder 12 and the other end being adapted to engage clamping plate 1. To accommodate the springs, openings 10 are counterbored an amount sufficient to leave an annular space surrounding the screws large enough to accommodate the springs. With this arrangement, when screws 11 are unscrewed, the clamping member 2 will be forced away from clamping member 1 by the springs, the springs serving to keep clamping member 2 in engagement with the heads of the screws. While I prefer to use the spring construction shown in the drawing, this being a construction well adapted to accomplish the desired result, it will be understood that other spring arrangements may be used if found desirable.

In accordance with the provision of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative and that the invention may be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A terminal clamp comprising a pair of clamping members between which a conductor is held, one of said clamping members having spaced threaded holes for the reception of clamping screws and the other clamping member having complementary unthreaded holes, screws mounted in said unthreaded holes, said screws each having a head, an unthreaded shank portion adjacent the head and a threaded end portion, said shank portion being of less diameter than said threaded portion, and means forming stops on the side of the clamping member adjacent to the screw heads with which the threads engage to prevent the screws from coming out of the unthreaded holes, said shanks having a length such that the threaded portions of the screws may be unscrewed from engagement with the threaded holes on the one clamping member before the threads strike said stops, and spring means located between said clamping members for separating the clamping members as the screws are loosened.

2. A clamp comprising a clamping member having a threaded opening therein, a second clamping member having an unthreaded opening at one end, a screw housed in said unthreaded opening comprising a head, an unthreaded shank adjacent the head, and a threaded end portion of greater diameter than the shank and of lesser diameter than the unthreaded opening, a shoulder spaced from one end of the unthreaded opening against which the threaded portion of said screw strikes to prevent the screw from coming out of the opening, said threaded portion being of a length such that it may be brought within said unthreaded opening before the threads strike said shoulder, a spring in said unthreaded opening for separating the clamping members when the screw is partially loosened, and another means at the opposite end of the second clamping member for effecting clamping action between the clamping members.

3. A clamp comprising a clamping member having a plurality of threaded openings therein, a clamping member having a plurality of unthreaded openings, a screw housed in each of said unthreaded openings, comprising a head, an unthreaded shank adjacent to the head and a threaded end portion of greater diameter than the shank and of lesser diameter than the unthreaded openings, a shoulder spaced from one end of each unthreaded opening, against which the threaded portion strikes to prevent the screw from coming out of the opening, said threaded portion being of a length such that it may be brought within said unthreaded opening before the threads strike said shoulder, and spring means in said unthreaded openings for separating the clamping members as the screws are loosened.

4. A clamp comprising a clamping member having spaced threaded openings, a clamping member having spaced unthreaded openings, a screw housed in each unthreaded opening comprising a head, an unthreaded shank, and a threaded end which is of larger outside diameter than the shank but of smaller diameter than the diameter of the unthreaded opening, and a shoulder adjacent the upper end of the unthreaded opening against which the threaded end of the screw strikes to prevent the screw from coming out of the opening, said shoulder being spaced from the lower end of the opening a distance equal to the length of the threaded end of the screw whereby the screw may be withdrawn entirely from the threaded opening before the threads strike the shoulder, said clamping members being separable when the screws are partially loosened.

5. A clamp comprising a clamping member having two spaced threaded openings, a clamping member comprising a yoke having a post formed integral with each end, each post provided with an unthreaded opening, a screw housed in each unthreaded opening comprising a head, an unthreaded shank, and a threaded end which is of larger outside diameter than the shank but of smaller diameter than the diameter of the unthreaded opening, and a shoulder adjacent the upper end of the unthreaded opening against which the threaded end of the screw strikes to prevent the screw from coming out of the opening, said shoulder being spaced from the lower end of the opening a distance equal to the length of the threaded end of the screw whereby the screw may be withdrawn entirely from the threaded opening before the threads strike the shoulder, said clamping members being separable when the screws are partially loosened.

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