April 13, 1954 H. L. JACOBS 2,674,772

CLAMP

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FIG. 1.

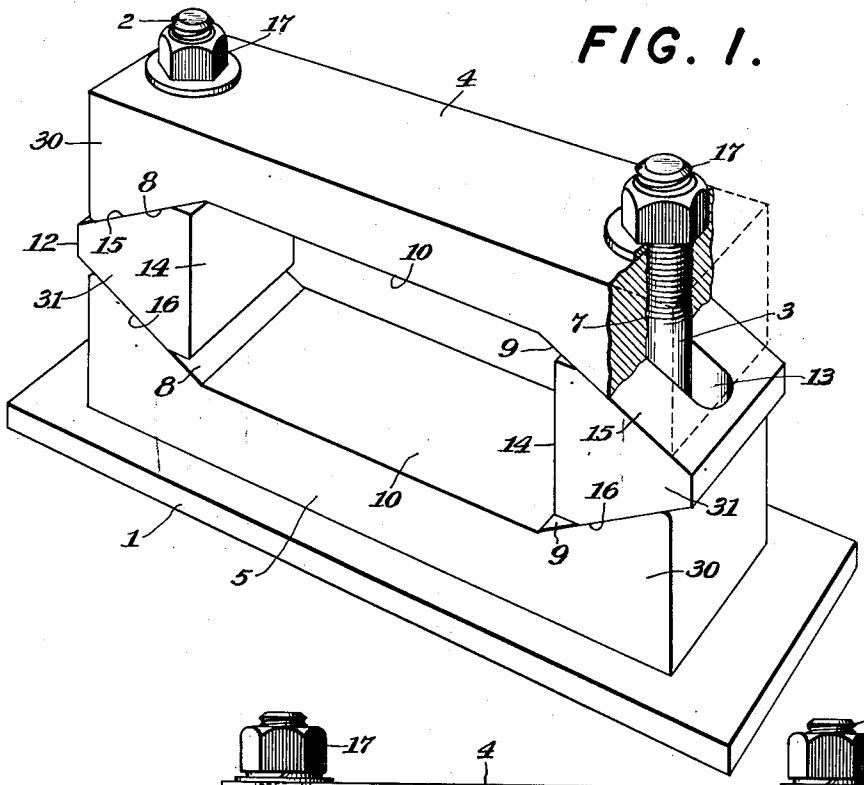
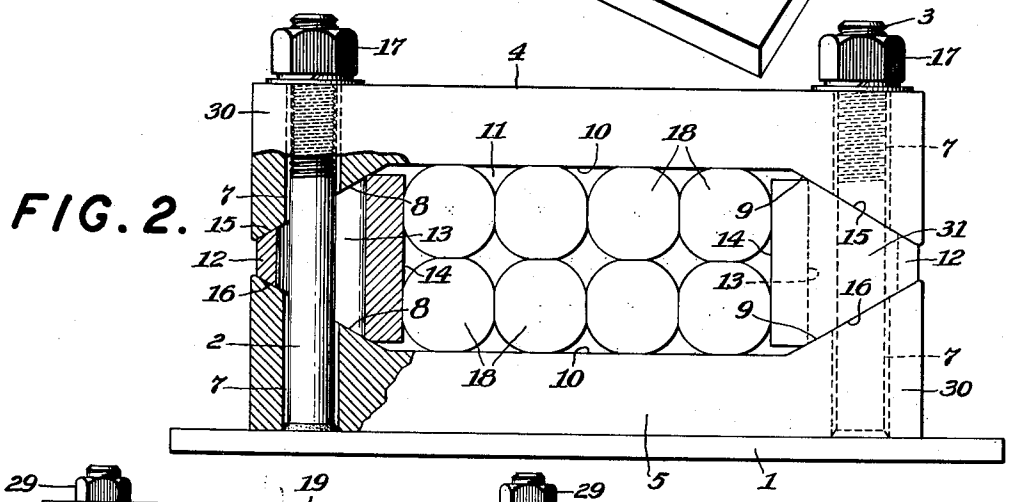


FIG. 2.



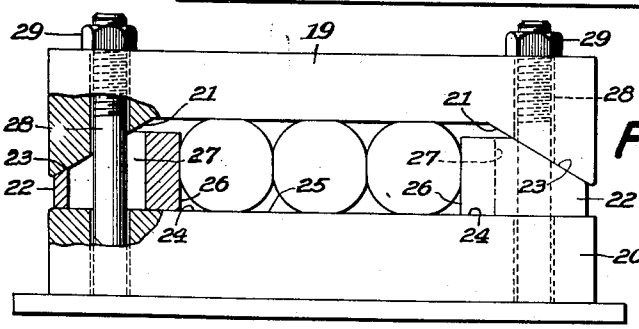


FIG. 3.

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CLAMP

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2 Claims. (Cl. 24—125)

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This invention relates generally to clamping devices for cables, particularly electric cables with heavy insulated covering, and it is an object of my invention to provide a clamp that will possess a high degree of lateral and vertical self-adjustment to clamp and support a group of individual parallel cables.

Another object is to provide an improved clamp that will exert clamping pressure on a group of cables from four directions by the application of an operating force from but one direction.

A further object is to provide a screw type clamp that eliminates bending or splitting of the cable clamping bars.

Other objects and advantages will be more apparent to those skilled in the art from the following description of the accompanying drawings in which:

Fig. 1 is a perspective of my novel clamp with an end portion thereof broken away to show an elongated hole through a wedge-shaped spacer member;

Fig. 2 is a side elevation of the clamp showing two tiers of cables, each tier containing four cables, clamped together by the device, and an end thereof being broken away to show passage of a stud through the clamping members; and

Fig. 3 is a side elevation of a modification of my clamp.

In the particular embodiments of the invention I have shown, in Figs. 1 and 2, a metal plate 1 forming either a separate base or a part of locomotive frame, to which are welded or otherwise secured two perpendicular threaded studs 2 and 3. Two identical cable support bars 4 and 5, preferably made of a hard wood, are provided with perpendicular holes 7 to receive threaded studs 2 and 3. The support bars have thick ends provided with inclined outwardly converging, substantially flat cam surfaces 8 and 9, through which holes 7 extend, these surfaces preferably being approximately at an angle of 30° with clamping surfaces 10 which are intermediate of the cam surfaces 8 and 9.

Positioned between the opposed pairs of inclined surfaces 8 and 9 are wedge-shaped lateral clamping members 12 having holes 13 laterally elongated. Each member 12 has a cable-engaging surface 14 and two converging surfaces 15 and 16 in sliding engagement with inclined surfaces 8 and 9.

With the four clamping elements mounted on the studs 2 and 3 as shown in Figs. 1 and 2, to form substantially a rectangular cable aperture

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11, the lateral clamping elements 12 are free to slide laterally inwardly as the top and bottom elements are drawn together by nuts 17 on the studs. Cables 18, or the like, having usually a resilient outer covering and running through cable aperture 11 are thus vertically and laterally clamped between surfaces 10 and 14. The relative lengths of the inclined surfaces on elements 4, 5 and 12 are such that pressure can be exerted both laterally and vertically on the cables before the bars come into contact with the lateral wedges.

As converging surfaces 15 and 16 are always in engagement with inclined surfaces 8 and 9, there is no possibility that excessive pressure on support bar 4 will bend or split the bar, as frequently happens in using some of the conventional clamps. So long as wedge-shaped members 12 can move inwardly no excessive pressure can be exerted by the screw means and when members 12 reach their limit by contact with the cables they function as a spacer to form a solid foundation against any excessive pressure that may thereafter be exerted by the screw means.

While Fig. 2 shows two tiers of cables disposed between support bars 4 and 5 and between wedges 12, it is to be understood that the length of cable-engaging surface 10 of the support bars may be altered to provide for more or less cables in each tier. Similarly, by merely altering the height of spacer member 12 and the lengths of studs 2 and 3, the number of tiers of cables may be increased or decreased as required.

In Fig. 3 I show a modification of my screw clamp to provide for cases where there is but one tier of cables. As in the preferred form, there are two parallel support bars 19 and 20, only one of which, however, is provided with inclined surfaces 21 corresponding to inclined surfaces 8 and 9 of the preferred form. Also, each wedge member 22 has but one inclined surface 23 in sliding engagement with an inclined surface 21 of bar 19. Another side 24 of member 22 slidingly engages cable-engaging surface 25 of bar 20, while the third side 26, at right angles to side 24, is also a conduit-engaging surface. An elongated hole 27 is similarly disposed through each wedge. Thus, when pressure is exerted on the clamping members by means of studs 28 and nuts 29, bars 19 and 20 move toward each other while spacer members 22 move inwardly along surface 25 of bar 20 and inclined surfaces 21 of bar 19.

In installations where the clamp is to be used against a metal surface, base plate 1 may be dispensed with and the studs welded perpendicu-

larly direct to the metal surface. The screw clamp described herein has the further advantage of better "sealing" the aperture of a wall through which the cables may pass against dirt, sand and other wind-borne particles in that sides **30** of the parallel support bars and sides **31** of the spacer members are flat and in the same plane, enabling the clamp to be placed directly against the wall or floor over the aperture through which the cables pass.

It is seen from the above description that I have provided a screw clamp that is self-adjusting to fit diameter variations in cables, and other conduits, that exerts clamping pressure from four directions against the cables by the application of pressure from but one direction, that prevents the bending or splitting of the cable support bars through the application of excessive pressure, and that "seals" the aperture in a flat surface through which the cables pass. The self-adjustment arises from the feature that the cable aperture always remains fundamentally of rectangular shape regardless of whether it is opened or closed to various extents to accommodate cables of one diameter for one installation or of another diameter for another installation.

It will, of course, be understood that various changes in details of construction and arrangement of parts may be made by those skilled in the art without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. A clamp for a plurality of cables or conduits of substantially the same diameter, comprising, a pair of support bars having opposed substantially parallel cable engaging flat surfaces, each surface being engageable with a plurality of said cables or conduits disposed in a flat layer with their axes lying in a plane parallel to said flat surfaces, lateral clamping elements disposed between said bars at each end thereof and provided with opposed substantially flat cable engaging surfaces normal to the flat surfaces of the support bars thereby forming a rectangular opening with the parallel cable engaging surfaces of the support bars being disposed intermediate of the lateral clamping elements and of the cam surfaces **8** and **9**, said lateral clamping elements and said support bars having outwardly converging complementary slidably engageable substantially flat surfaces whereby the support bars when moved toward each other effect a clamping force on each individual cable or conduit in a direction normal to the support bars and also effect movement of the lateral clamping elements toward each other to exert a lateral clamping force on the layer of cables or conduits in a direction aligned with the plane of their axes, thereby subjecting all of the cables or conduits individually to substantially the same clamping pressure in the plane of said layer and to substantially the same clamping pressure in the direction normal to said plane, and bolts extending substantially normal to the flat surfaces of the support bars and through said bars outwardly of said intermediate surfaces so as to effect said clamping pressures upon tightening of said bolts.

2. The combination set forth in claim 1 further characterized in that the lateral clamping elements have inclined surfaces on opposite sides respectively engageable with complementary inclined surfaces on each of the support bars at each end thereof, said surfaces converging toward each other at a point beyond the ends of the support bars, and the support bars extending over both of the inclined surfaces of the clamping elements.

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