Oct. 30, 1934. A. ALSAKER ET AL 1,979,090

BUS CLAMP

Filed May 3, 1930 2 Sheets-Sheet 1

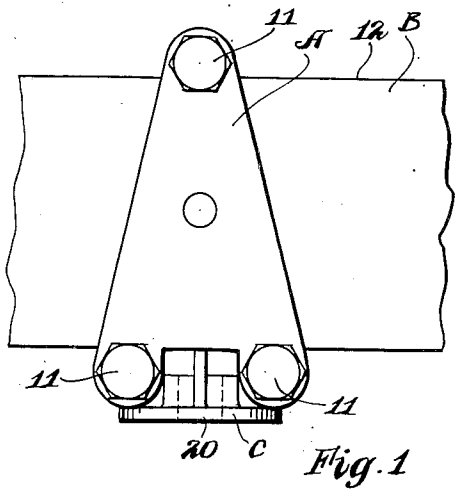


Fig. 1

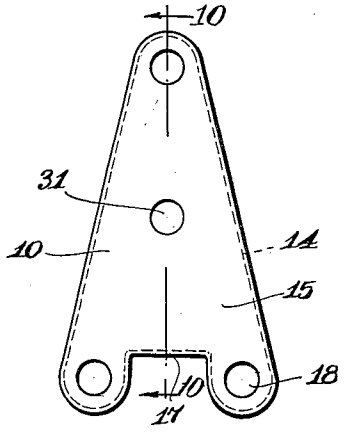
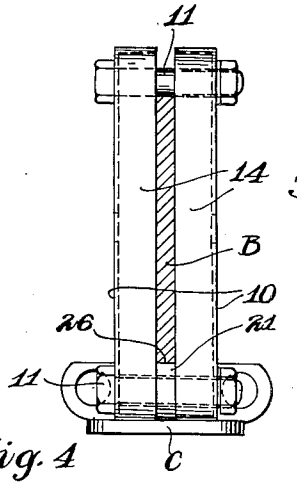


Fig. 2



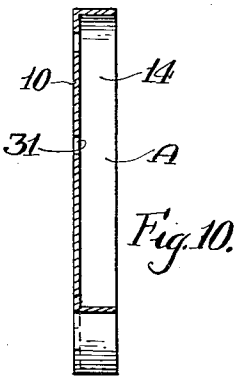


Fig. 10.

Fig. 4

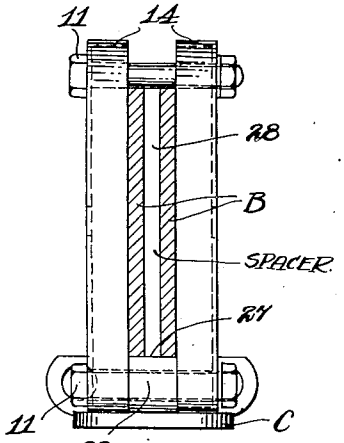


Fig. 5

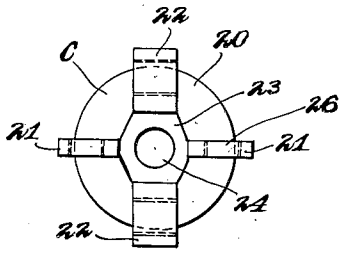


Fig. 3

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BUS CLAMP

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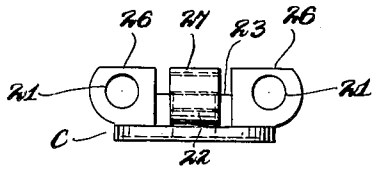


Fig. 6

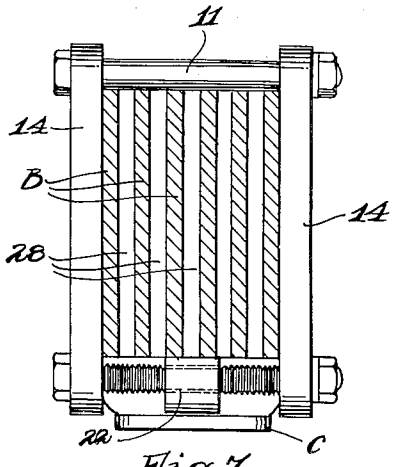


Fig. 7

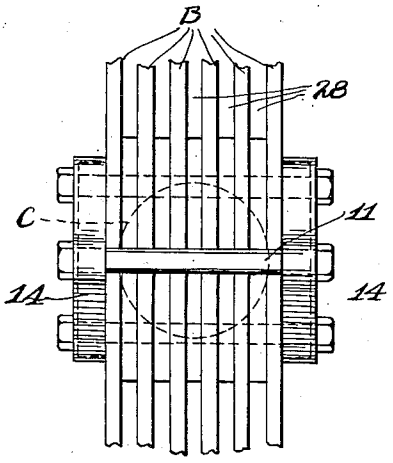


Fig. 8

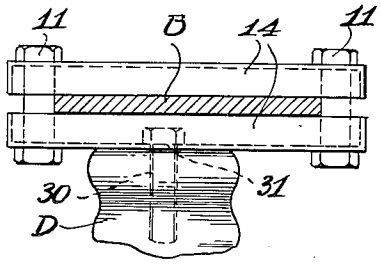


Fig. 9

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UNITED STATES PATENT OFFICE

1,979,090

BUS CLAMP

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Application May 3, 1930, Serial No. 449,529

8 Claims. (Cl. 173—251)

Our invention relates to bus clamps adaptable for clamping and supporting bus bars. These bars are ordinarily clamped on edge, with one or more in a run. Our clamp is adapted to hold the bus bars in this position in a novel and advantageous manner.

The object of our invention is to provide a bus clamp which is suitable for accommodating either a single bus bar, or a number of bus bars in a run in the same clamp. This feature is very important, as by providing a clamp of this nature adaptable for one or more bus bars, we eliminate the necessity of providing a different size clamp base for each number of bus bars which may be utilized.

In the past, heavy cast bronze or iron V clamps have been used for this purpose, in conjunction with a supporting base which in turn is bolted to an insulator. Expensive patterns for each size of bus clamp and for each size of base has been required in order to take care of one, two, three or more bus bars. These bases must rigidly hold the bus clamps against the bars to prevent the vibration of parts, and so must be sturdy. These facts have been very disadvantageous to the manufacturer, and also to the consumer, as the manufacturer must secure many patterns, and the consumer must stock many different sizes of clamps and clamp bases to be safe in case one support should need replacement or if an additional number of bus bars is needed.

Our bus clamp and base is designed to overcome these difficulties. A single bar may be held within the clamp, or several bars may be secured by the same clamp and base. A clamp originally used for supporting a single bus bar may be adapted for use with several bars in case of expansion of the plant, or enlargement to meet changing conditions, or a clamp supporting a number of bars may be adapted for clamping a single bar. Each clamping member is adapted to fit every base, and vice versa. Accordingly, our clamp is adaptable for various uses, and is advantageous over the ordinary types of clamps in common use.

It is a feature of our invention that the bus bars held within our clamp are supported directly upon the base of the support, and not by the clamping device itself. In this way the bus bars are supported securely, and with very little danger of the clamp breaking and allowing the bars to fall.

It is a feature of our clamp that the side plates may be utilized without the base plate when it is desired to secure the bus bars extending in a plane parallel to the top of the insulator, rather than perpendicular to it. Thus in installations where it is desired to extend the bus bars horizontally, or parallel with the top of the insulator, it is only necessary to secure one of the clamping plates to the top of the insulator by means of a bolt passing through a hole in the plate formed for this purpose, to position the bus bar upon this plate, and to clamp the complementary plate over the bar, drawing the complementary plate tightly down upon the bar.

These and other objects, together with a detailed description of our device, will be more fully and clearly set forth in the following specification and claims.

In the drawings forming a part of this specification:

Figure 1 is a side elevation of our clamp and support.

Figure 2 is a side elevation of one of the clamping members.

Figure 3 is a plan view of the base of our clamp.

Figure 4 is an end view of the clamp holding a bus bar therein.

Figure 5 is an end view of our clamping holding a pair of bus bars therein.

Figure 6 is a side elevation view of our base, the clamping members having been removed.

Figure 7 is an end view of our clamp, showing a multiplicity of bus bars held therein.

Figure 8 is a plan view of Figure 7, showing the position of the bars through the clamp.

Figure 9 is a side view of an alternate manner of clamping the bus bars.

Figure 10 is a cross-sectional view on the line 10—10 of Figure 2.

Our clamp A is made in such a manner as to be suitable for holding one or more bus bars B. These bars B ordinarily are supported standing on edge, and are shown in this position in the drawings.

The bus bars B are clamped tightly between a pair of clamping plates 10. These plates 10 may be made of sheet material pressed into the desired angular shape, and are clamped together by means of bolts 11. One of the bolts 11 extends through the upper portion of the clamping plates 10 and passes above the upper edge 12 of the bus bars B, while the other two bolts 11 extend through the lower portion of the clamping plates 10, and pass below the lower edge 13 of the bus bars B.

The plates 10 are formed of sheet material and pressed into shape with a peripheral inwardly extending flange 14 about the edge of the same

which reinforces or stiffens the plates to give the desired rigidity to the same. When in use the flange edge 14 presses against the bus bars B when the nuts 16 upon the bolts 11 are tightened against the body portion 15 of the clamping plates 10. The lower edge of the clamping plate 10 is recessed at 17 with the lower bolt holes 18 formed in ear-like portions which depend from the main body portion 15, as illustrated in Figure 2.

The base C is formed with a circular bottom plate 20 from the upper surface of which projects lugs 21 and 22 extending at right angles to each other with a depressed center portion 23. The depressed portion 23 is centrally disposed or axially positioned in relation to the upwardly projecting lugs 21 and 22. A hole 24 is formed in the center of this portion 23 for a bolt to fasten the base to an insulator.

The lugs 21 are narrower in width than the lugs 22. The lugs 21 are approximately the width of a single bus bar B, whereas the lugs 22 are of a width to permit a pair of bus bars B to be rested upon the same in spaced relation, as illustrated in Figure 5. Accordingly, when it is desired that a single bus bar be held within the clamp A, the base C is turned so that the narrow lugs 21 are in line with the direction of the bus bar B. The clamping plates 10 are then secured to the base, one of these plates being bolted to each side of the upwardly extending lugs 21, the bolts 11 passing through internally threaded holes formed in the lugs. The weight of the bus bar B is supported by the upper edge 26 of the lugs 21, providing a direct pressure on the base C. As the lugs 21 are very slightly narrower than the bus bar, the plates 10 may be drawn up to hold the bar B very tightly, and to eliminate any danger of vibration of loose parts.

When it is desired that two bus bars B be held in the clamp A, the base C is turned so that the wider lugs 22 extend in line with the bus bars B. The bars B are then placed upon the upper surface or edge 27 of the lugs 22, and spaced in the customary spaced relationship. The clamping plates 10 are then secured to the base C, one of the plates 10 being bolted to each side of the lugs 22. By tightening the bolts 11, which extend through threaded holes formed in the lugs, the two bus bars B, with the spacing member 28 inserted therebetween are clamped tightly together. In this manner of supporting the two bars, the weight of the bars B bears directly against the base C, and the bolts 11 are not called upon to support any of this strain.

In case the clamp is used to support more than two bus bars B, illustrated in Figure 7, the base C is turned in the manner described for the supporting of two bars, wherein the wider lugs 22 are placed in line with the direction of the bus run, and the spaced bars B are set upon the base C. The clamping plates 10 are bolted on either side of the bars B, the bolts 11 passing through the lugs 22. It is apparent that even in this manner of supporting the bus bars B, the weight of the bars is directed to the base, as the bars B in the center of the run bear against the upper edge 27 of the lugs 22, while those bars spaced from the center of the run or the outer bars, bear against the upper edge 26 of the thinner lugs 21. As the holes through the lugs 21 and 22 are threaded, the bolts 11 hold the clamped bars B centrally positioned on the base C.

Our bus clamp A may be easily secured to an insulating base, not illustrated in the drawings, by means of a bolt or stud passing through the hole 24 in the center portion 23 of the base C. The upper edges 26 and 27 of the lugs 21 and 22 are somewhat above the surface of the center portion 23, and the clamping plates 10 are recessed at 17, so that the head of the attaching bolt, or the retaining nut on the stud of the insulating base member will not interfere with the bus bars held within the clamp A or the clamping plates 10.

In Figure 9 of the drawings we illustrate the method of securing bus bars B to the insulator when the top of the insulator extends parallel with the bus bar. In this modification, a bolt 30 is adapted to hold one plate 10 to the insulator D, by passing through a hole 31 formed centrally in the plate 10, and into a threaded hole formed in the insulator D. The complementary plate 10 is clamped tightly over a bus bar 10 by means of bolts 11. In this manner the clamping plates may be utilized for holding the bus bar B parallel with the top of the insulator D.

Our clamp is preferably constructed of stainless steel, so as to provide a sturdy structure having a non-corrosive surface. Obviously, however, other materials could be used, such as hard drawn copper, with equal results and to accomplish the purpose of holding the bus bars in adjusted relation by the clamp.

In accordance with the patent statutes, we have described the principles of operation of our bus clamp, and have pointed out some of the principal features of the same, and while we have endeavored to set forth the best embodiment thereof, we desire to have it understood that this is only a means of carrying out our invention and that obvious changes may be made within the scope of the following claims without departing from the spirit of the invention.

We claim:

1. An adjustable bus bar clamp including, a base member, threaded lugs projecting from said base member, some of which are of a width to approximate the width of a single bus bar on edge to support the same and other of said lugs of a width to carry a pair of bus bars parallelly spaced on edge over said last lugs, and clamping plates adaptable to clamp the bus bars rigidly therebetween, said clamping plates having a sheet-like formation with a peripheral flange extending inwardly thereabout and adapted to clamp against the bus bars.

2. A bus bar clamp including, a base having projecting threaded lugs adapted to support a single bus bar on edge over said lugs, pressed sheet metal clamping plates having a peripheral inwardly extending clamping flange thereabout, bolts at opposite edges of the bar for clamping said plates to the sides of a bus bar and to said base, some of said bolts extending through said lugs, and a pair of bus supporting lugs extending angularly to said first bus supporting lugs adapted to support a pair of bus bars extending longitudinally thereover with said clamping plates clamping the several bus bars in relation to said base when more than one bus bar is clamped to said base.

3. An adjustable bus bar clamp including, a base, bus bar supporting lugs extending radially and projecting from the top of said base, some of said lugs having a width to support a single bus bar, and the other of said lugs having a width to support several bus bars, and clamping plates adapted to fit either of said lugs to clamp a single bus bar or several bars rigidly in relation to

said base with the weight of the bus bars on edge against said lugs.

4. An adjustable bus bar clamp including, a base plate, narrow lugs projecting from said plate, wider lugs extending at right angles to said first lugs, said narrow lugs being adapted to receive a single bus bar, and said wider lugs adapted to receive a pair of bus bars to rest on edge on said lugs, and clamping plates and bolts having a plate-like structure with a peripheral inwardly extending biting flange adapted to clamp the bus bars therebetween.

5. An adjustable bus bar assembly clamp having a circular base plate, upwardly projecting bus bar supporting lugs extending in pairs at right angles to each other, one of said pair of lugs having a narrow formation slightly less than the width of a single bus bar, the other pair of said lugs having a width slightly greater than a pair of bus bars, and clamping plates adapted to clamp bus bars resting on edge on said lugs either singly extending over and resting on said narrow lugs or in a pair extending over and resting on said wider lugs.

6. An adjustable bus bar supporting assembly comprising, clamping plates, a single bolt hole extending through one end of said plates, ears projecting from the other end of said plates and having a bolt hole through each ear, a base plate, pairs of aligned oppositely disposed bus bar supporting lugs projecting from said base plate spaced about the periphery thereof, bolt holes extending through said lugs and said ears for clamping said plates together, one pair of said lugs being wide to accommodate a plurality of bus bars thereon, and another pair of said lugs being narrow to accommodate a single bus bar resting thereon, and a recess between said ears in said clamping plates adapted to permit said clamping plates to straddle over the respective lugs and be clamped thereto.

7. A bus bar assembly including, a base plate, a center bolt opening adapted to permit said base plate to be bolted to an insulator, lugs projecting radially from the axis of said base plate in pairs, some of which are narrower than a bus bar and others of which are wider, bus bar clamping plates having a shape to straddle either pair of lugs in a manner to permit bus bars extending over said base plate to be clamped either singly or in pairs on one of the other pair of lugs.

8. A bus bar clamp assembly adapted to support bus bars singularly or in pairs extending on edge including a pair of sheet metal clamping plates having a peripheral reinforcing flange thereabout, bolts for said plates, a base for receiving said plates, a pair of narrow lug flanges, and a pair of wide lug flanges projecting from said base, said narrow flanges adapted to receive a single bus bar on edge thereon, and said wide flanges adapted to receive a pair of bus bars thereon, said assembly being adapted to support a multiplicity of bus bars with the inner pair resting upon said wide pair of lugs longitudinally of said lugs and the outer bus bars extending transversely over said narrow lugs.

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