

June 22, 1937.

W. H. FRANK

2,084,580

BUS BAR SUPPORTING MEANS IN BUS DUCT

Filed Aug. 31, 1935

4 Sheets-Sheet 1

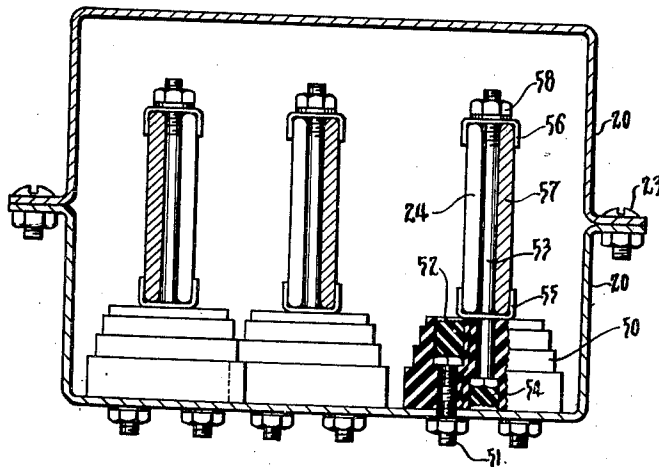


Fig. 1.

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4 Sheets-Sheet 2

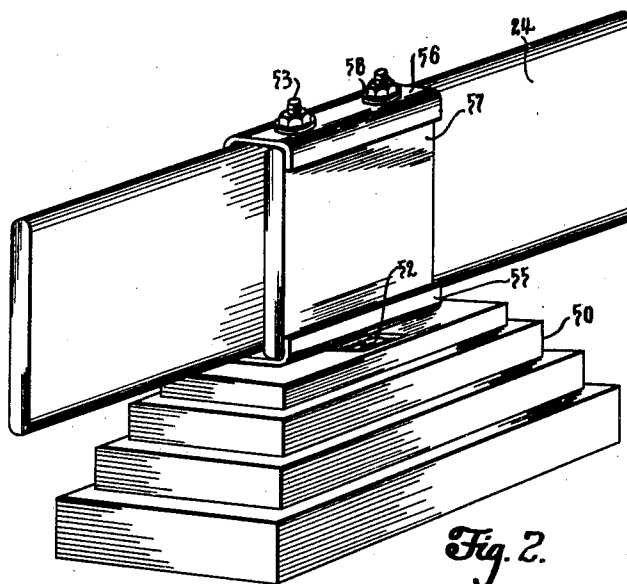


Fig. 2.

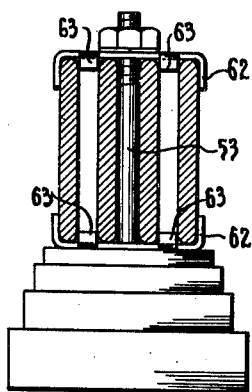


Fig. 5.

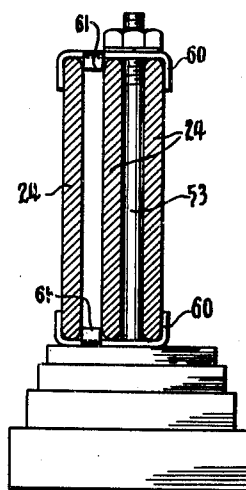


Fig. 4.

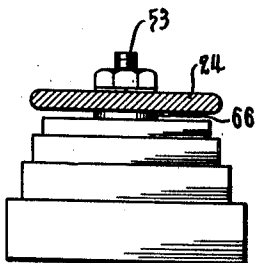


Fig. 7.

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4 Sheets-Sheet 3

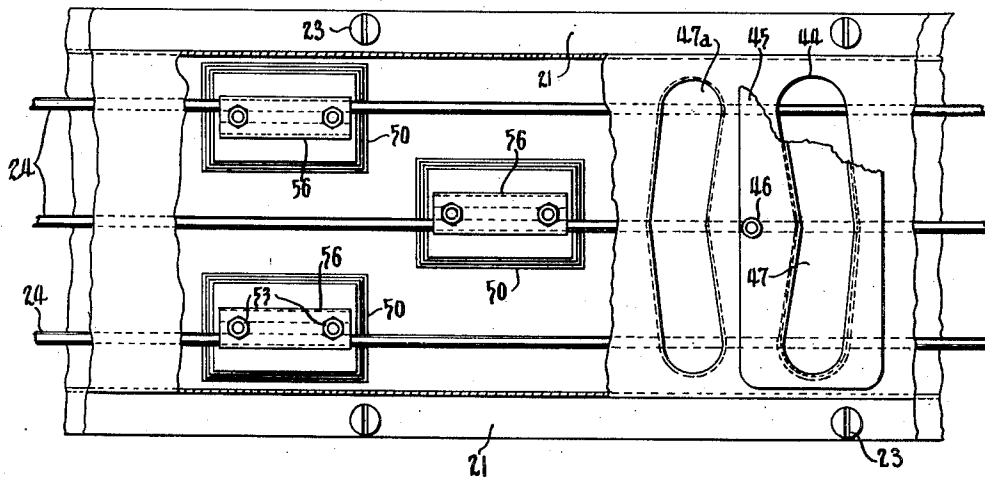


Fig. 3.

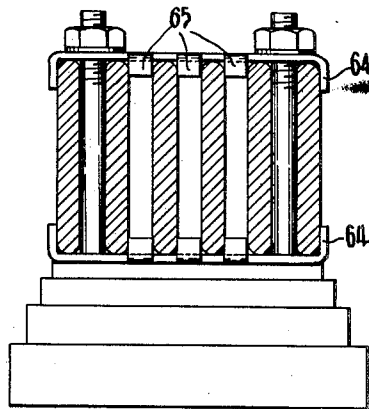


Fig. 6.

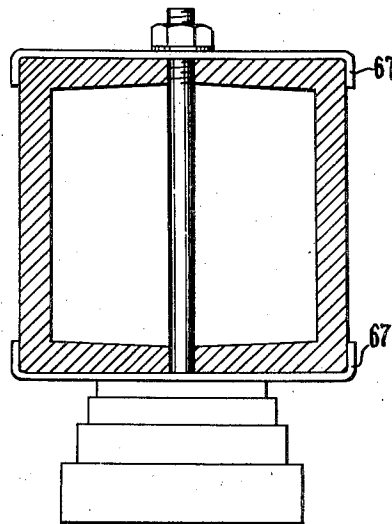


Fig. 8.

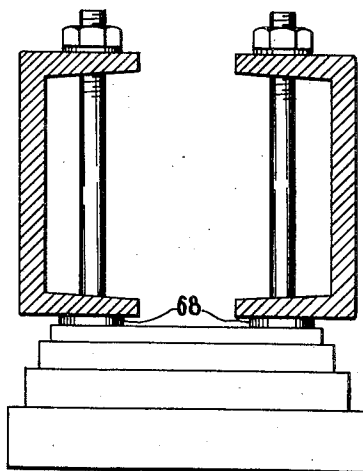


Fig. 9.

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4 Sheets-Sheet 4

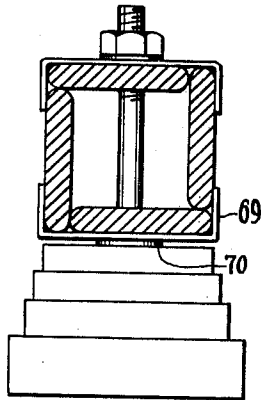


Fig. 10.

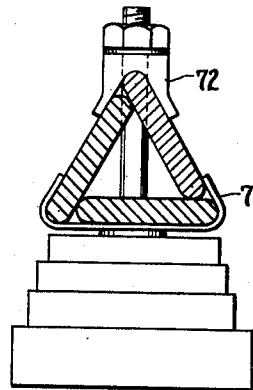


Fig. 11.

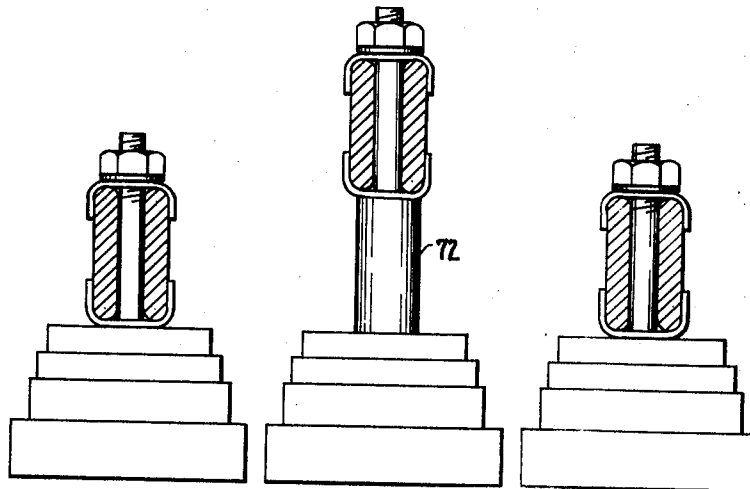


Fig. 12.

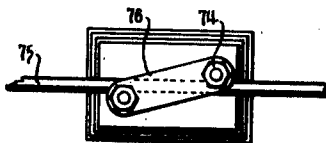


Fig. 13.

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UNITED STATES PATENT OFFICE

2,084,580

BUS BAR SUPPORTING MEANS IN BUS DUCT

William H. Frank, Detroit, Mich.

Application August 31, 1935, Serial No. 38,842

1 Claim. (Cl. 173-313)

This application relates to electrical distribution systems. The subject matter of this application was originally disclosed to the Patent Office in application Serial No. 735,743, filed July 18, 1934, which issued as Patent No. 2,009,376 of July 23, 1935 and was also disclosed in an application Serial No. 31,296, filed July 13, 1935, which issued into Patent No. 2,059,988 of November 3, 1936, and it is here claimed that the subject matter of this application is entitled to the benefit of the filing date of Serial No. 735,743, filed July 18, 1934.

The inventions of the present application relate to novel details of bus bar insulating and supporting means and these details can best be understood in connection with the appended drawings. In these drawings,

Figure 1 is a transverse sectional view of a bus-duct showing an arrangement using pedestal type insulators, instead of the flat base type insulators heretofore shown in application Serial No. 31,296;

Figure 2 shows a bus bar supported on a pedestal type insulator;

Figure 3 is a cut-away fragmentary plan view of a bus-duct showing bus bars supported on relatively staggered pedestal type insulators;

Figures 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13 show alternate arrangements of bus bars on pedestal type insulators.

In Figures 1, 2 and 3 there is shown an arrangement employing pedestal type insulators 50 for supporting three bus bars in a bus-duct. The insulators may be positioned in the bus-duct in staggered relation, Figure 3, for promoting space economy, and each pedestal is bolted to the lower section half by bolts 51, whose heads are sealed from the upper surface of the pedestal by gobs of sealing wax 52 in counterbores of the pedestal. Bolts 53 project upwardly from each pedestal and have their heads sealed from the section half upon which the pedestal is placed by gobs 54 of sealing wax in counterbores of the pedestal.

When a pedestal is to support one bus bar only, as in Figures 1-3, the pedestal is provided with a lower U-shaped clip 55, through which passes the bolts 53. The bus bar 24 is laid in one portion of the clip 55, adjacent the bolt 53, and an upper U-shaped clip 56 is positioned on the bolts to receive the upper edge of the bus bar. A spacer 57 of the size of the bus bar is positioned in the other portions of the clips 55-56 and a nut 58 is threaded down on each bolt 53 to complete the assembly.

If desired, the spacer 57 may be replaced by another bus bar, as, for example, when it is desired to utilize two bus bars for each pole of the system.

Figure 4 shows a pedestal of the type shown utilized to support three bus bars in clips 60; spacer lugs 61 on the clips are utilized to space the center bus bar from one outside bus bar, the center bus bar being spaced from the other outside bus bar by the bolts 53.

It is also observed that the pedestal type insulator may be utilized to receive wide bus bars, such as those of Figure 4, or narrower bus bars, such as those of Figure 3, the length of the bolts 53 measuring the capacity of the pedestal type insulator.

Figure 5 shows a pedestal type insulator supporting four bus bars. In this case, each of the clips 62 has two pairs of spacer lugs 63, and these are utilized in substantially the fashion shown.

Figure 6 shows a pedestal type insulator arranged with its major axis traversing the bus bars, instead of running along the bus bars, for the purpose of enabling the single pedestal to support as many as six bus bars; the clips 64 used in this case each have three pairs of spacer lugs 65.

In Fig. 7, a pedestal type insulator is shown as supporting a bus bar laid flat on the pedestal, being spaced therefrom by a spacing insulating washer 66. It is observed that as many bus bars as desired may be utilized in this fashion, being placed one upon the other, depending upon the length of the bolts 53 and the number of washers 66.

Figure 8 shows a pedestal type insulator used to support two bus bars which are of channelled cross-section, the assembly including wide clips 67 to accommodate the channel-shaped bus bars. In this case it is intended that both bus bars form one pole of a multiple bus duct.

Figure 9 shows a pedestal type insulator arranged with its major axis transverse of the bus bars, so that the pedestal may support two channel-shaped bus bars on insulating washers 68; the bus bars are spaced from each other and may be of the same or opposite polarity as desired.

Figure 10 shows a pedestal type insulator supporting four bus bars which are assembled to form what amounts to a hollow conductor of square cross-section. In this case wide clips 69 and insulating washers 70 are utilized as shown.

The value of this arrangement lies in the fact that it provides maximum current capacity per unit of bus bar cross-sectional area, for, as is well known, in a large capacity conductor, most of the current is carried by the outside portion of the conductor.

Figure 11 shows an arrangement for substantially the same purpose, but wherein only three bus bars are utilized, the clips 71 and 72 serving to wedge all three bus bars into a tight assembly.

Figure 12 shows how pedestal type insulators may be utilized to support a center bus bar at a distance with respect to the outside bus bars in a three-pole bus duct, for the purposes of reducing the induction effect. In this case the center bus bar is mounted on a different level from the other two, a large spacing washer 72 of insulation on each bolt 53 being utilized for the purpose of elevating the center bus bar.

Figure 13 shows a pedestal type insulator having bolts 74 offset from the centerline of the insulator to receive between them a bus bar 75, there being a clamping plate 76 traversing the bus bar and clamped by the nuts of the bolts.

This arrangement requires no spacer, such as is shown at 57, Figure 2, and is very satisfactory for an odd number of bus bars. If three or more bus bars be used, two or more of them may be on the outside of the bolts, and the remaining one disposed as shown.

If desired, the holes in the pedestal, receiving

the bolts, may be formed as slots, in which case, the bolts may be positioned on center, as in Figure 2, or off center, as in Figure 13, at the option of the installer of the system.

Now having described novel details and arrangements of bus bar insulator and supporting means of the bus duct shown in this application reference will be had to the following claim which determines the scope of the inventions of this application.

What I claim is:

An electrical distribution bus-duct having an elongated bus run spaced from a wall of the elongated duct, bus run supports comprising a plurality of separate spaced identical insulator pedestals disposed against that wall, each pedestal having a pair of bolts projecting from one surface thereof and through that wall of the duct, for securing the pedestal to that wall, with each bolt having its head embedded within the pedestal, each pedestal having means for securing the bus run to the pedestal, comprising a pair of bolts projecting from a surface of the pedestal opposite the first mentioned surface, with each of these bolts having its head embedded within the pedestal, the line connecting each pair of bolts being transverse to and intersecting that connecting the other pair of bolts, and being between the other pair of bolts.

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