C. N. BERGMANN.

CURRENT DISTRIBUTING APPARATUS.

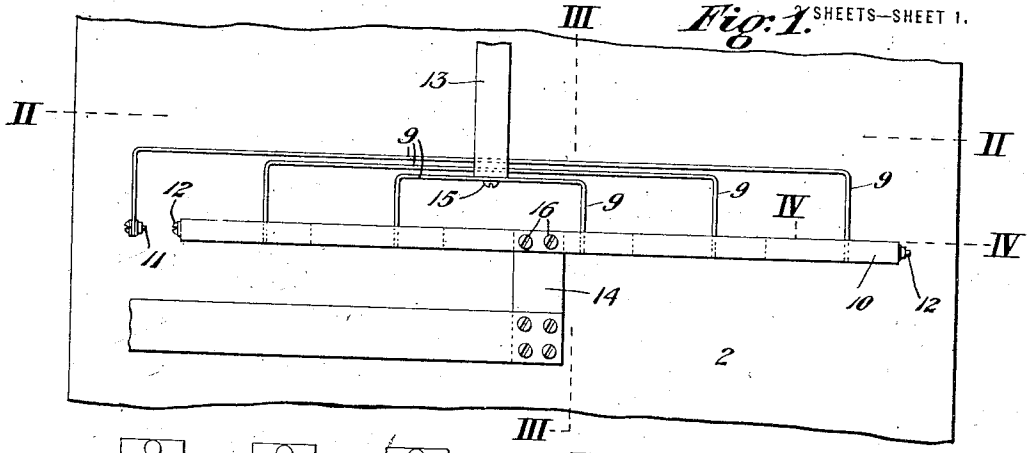
APPLICATION FILED OCT. 28, 1910.

1,162,553.

Patented Nov. 30, 1915.

2 SHEETS—SHEET 1.

Fig. 1.



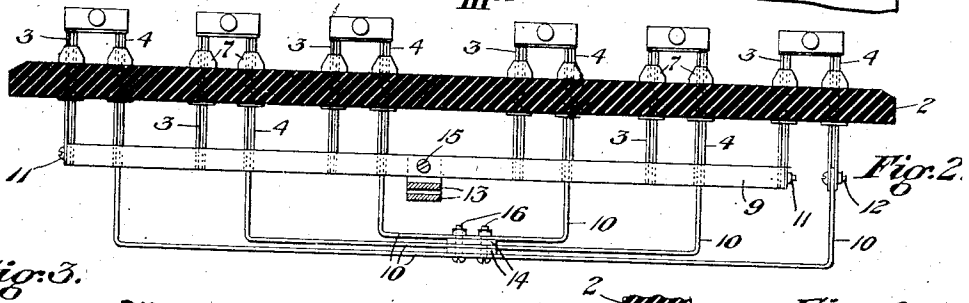


Fig. 2.

Fig. 3.

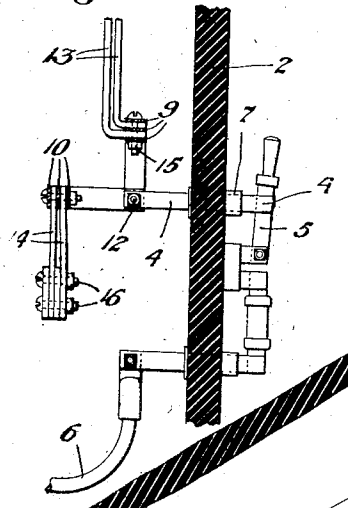


Fig. 4.

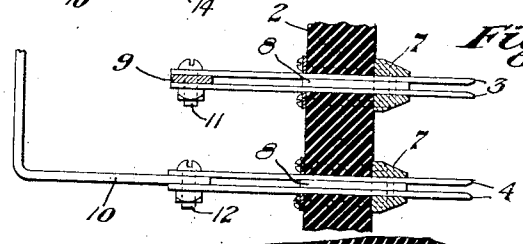


Fig. 5.

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2 SHEETS—SHEET 2.

Fig. 6.

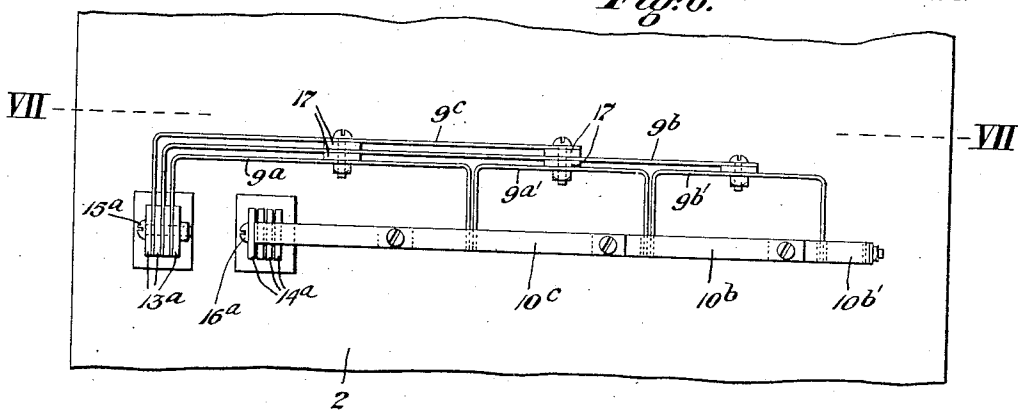


Fig. 7.

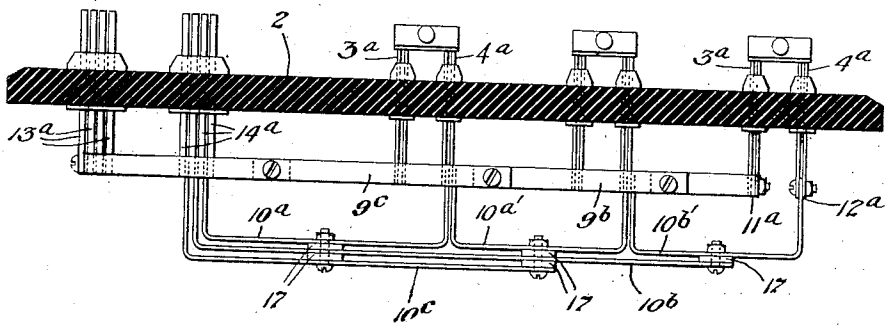
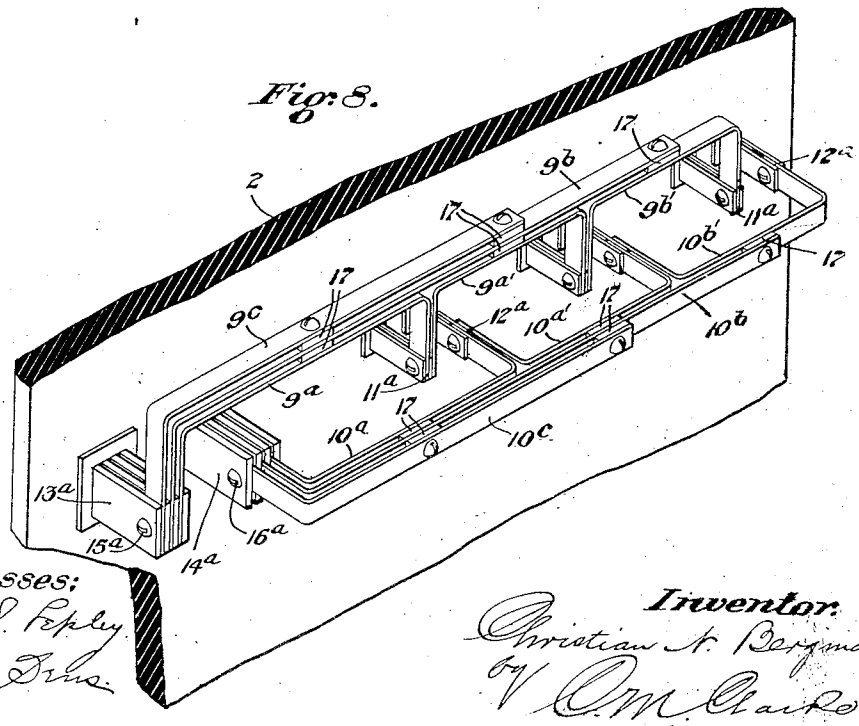


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHRISTIAN N. BERGMANN, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO CARL SCHUSTER, OF BELLEVUE, PENNSYLVANIA.

CURRENT-DISTRIBUTING APPARATUS.

1,162,553. Specification of Letters Patent. Patented Nov. 30, 1915.

Application filed October 28, 1910. Serial No. 589,637.

To all whom it may concern:

Be it known that I, CHRISTIAN N. BERGMANN, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Current-Distributing Apparatus, of which the following is a specification.

My invention consists of an improvement in current distributing apparatus for electrical conductors for panel boards and switch boards, or other similar apparatus.

The object of the invention is to provide means for mounting and distributing the various branch conductors from the main bus bar or other connections, for distributing the currents therefrom to utilizing devices as switches, etc., to reduce the number of joints and connections to a minimum, to provide continuous branch connections to the points of distribution or utilization, to insure ample contact with the main and branch conducting elements, and to facilitate and simplify the construction and distribution of the currents without loss, together with other features of advantage.

Different forms of the invention are illustrated in the accompanying drawings, in which:—

Figure 1 is a view in elevation, showing a series of continuous conductors connected with the main conductors and to a series of switch blades, mounted on an insulating base. Fig. 2 is a transverse horizontal section of the construction shown in Fig. 1, on the line II. II. thereof. Fig. 3 is a vertical sectional view indicated by the line III. III. of Fig. 1. Fig. 4 is an enlarged horizontal sectional view showing the connections through the insulating base, similar to the construction shown at the right hand side of Fig. 2, and indicated by the section line IV. IV. of Fig. 1. Fig. 5 is a perspective view showing the several connections in assembled position as mounted on the insulating base. Fig. 6 is a view similar to Fig. 1 showing a modified arrangement, utilizing lapped extensions and supplemental feed connections. Fig. 7 is a horizontal section of the construction shown in Fig. 6 indicated by the line VII. VII. thereof. Fig. 8 is a perspective view of the construction shown in Figs. 6 and 7.

2 represents the base of the switch board, distributing board or other apparatus, upon which the different conducting elements are mounted, of any suitable form or construction and of insulating material as slate, etc.

3, 4, represent pairs of blades constituting contact elements for circuit-establishing devices, as the switch blades 5 of ordinary knife switches, whereby to make and break connection between the contact terminals 3 or 4, with the branch conductor 6, as will be readily understood. Blades 3 and 4, in pairs, extend directly through the insulating base 2, being mounted therein by any suitable securing means as embracing frames 7 and preferably spaced apart by spacers 8, whereby to maintain the blades in fixed continuous parallelism, for the desired length and extending outwardly beyond the base at each side thereof, as shown. The ends of such blades at the back of the base are preferably at a uniform distance therefrom, whereby to provide uniformity of length outwardly from the base to the point where they are connected with the terminal of each particular conductor 9 or 10. Said conductors 9 and 10 as shown, are arranged in series or groups, of any number necessary according to the number of switches and for convenience of arrangement and economy of space the series of conductors 9 are arranged above the series of conductors 10, the terminals of each of series 9 being brought directly down and those of series 10 directly back, to connect with the rear ends of terminal blades 3 and 4 respectively, on the same plane. Such connections are made by fitting the ends of the conductor bars 9 and 10 between the ends of the contact blades 3 and 4 respectively as shown and connecting them together by bolts 11 and 12.

13 represents the main bus bar connections for the series of conductor strips 9; and 14 represents the main bus bar connections for the series of conductor strips 10. Said bus bars are connected with the strips in the same manner generally by means of bolts or screws 15, 16, the ends of the bus bars interfitting between the continuous strips 9 and 10, and being connected with the main conductors at their other ends in any suitable manner. It will be observed that by this arrangement, the conductor strips 9 and 10 respectively, are each continuous at each side of the bus bars, by which construction

the full contact is utilized to effect transmission of the current in either direction, avoiding the objections incident to separate connections for each switch. Thus, if a variable amount of current is required at any point, the full area of the bus bar and the particular connecting strip 9 or 10 is utilized to the fullest advantage.

A further advantage is in the economy of space, the large number of strips being capable of incorporation with the necessary supply conductors, while by arranging the strips in the manner shown in horizontal and vertical planes and bending their ends downwardly and inwardly, a large number of terminal connections may be made with ample space for inspection or manipulation, and within comparatively limited dimensions.

The continuous strips 9 and 10, extending in opposite directions at each side of the bus bar connections thus serve to distribute current to at least two switches by means of a single integral conductor. By making the joint connections as shown, the necessity of screws, studs, nuts or other usually very numerous parts employed in making connections in such work, is avoided and the distribution of the current is effected directly to the point of utilization.

By the use of the continuous integral flat strips and similar bus bars and contact blades for the switches, the separate elements are capable of being used with a large contact area and in the simplest possible manner.

In the construction shown in Figs. 6, 7 and 8 the branch connections from the main supply connections or bus bars 13^a and 14^a are distributed laterally in one direction only from said connections, and connected with the several pairs of blades 3^a, 4^a, respectively in the same manner generally, as to the arrangement. That is to say, the connections from the main supply 13^a extend in superimposed horizontal planes and are deflected downwardly and connected with the blades 3^a by an interfitting joint as at 11^a. Likewise the connections from the main conductors 14^a are extended in superimposed vertical planes and connected with the blades 4^a by similar interfitting joints as at 12^a. In such construction, however, the connections from the main conductors to the first adjacent pair of blades 3^a, 4^a, are by individual conductor bars 9^a, 10^a, respectively, while supplemental bars $9^{a\prime}$ and $10^{a\prime}$ respectively are extended from said first pairs of switch blades over to the next adjacent pair and are connected therewith in the same manner, additional similar supplemental bars $9^{b\prime}$ and $10^{b\prime}$ extend the connection to the next adjacent pair of switch blades, which arrangement may be extended to any desired extent. For the purpose of supplementing the carrying capacity of said conductor bars, and for providing an additional branch conductor for each particular pair of switch blades, or other utilizing connections, I provide the additional bars 9^b and 10^b, 9^c and 10^c, or as many more as are necessary, according to the number of distributing or utilizing connections for the current. All of said bars 9^a, 9^b, 9^c, and 10^a, 10^b and 10^c are connected with the main conductors 13^a and 14^a by an interfitting joint similar to that between bars 9 and bus bars 13 or bars 10 and bus bars 14 and by bolts or screws 15^a and 16^a as clearly shown. Bars 9^a, 9^b, and 9^c and bars 10^a, 10^b and 10^c are connected together at any suitable points, as between the main conductors and the switch blade connections, by filler blocks 17 of conducting material, and similar securing screws, whereby to provide ample contact area and good connections, as will be readily understood. By this construction, it will be seen that ample carrying capacity is provided for each pair of individual switch blades, whether all such blades or only one pair are being used at any one time. The current will be distributed through the various connections directly to the point of utilization; the carrying capacity of the several bars is such as to give the desired current under all conditions; the same advantages of facility for making the connections, direct transmission, reduction of parts, avoiding the use of stud or bolt connections, etc., are present and the arrangement may be used with equal advantage and success in an installation employing main conductors at one side of the switch board.

The advantages of the construction will be appreciated by all those familiar with this kind of apparatus and in use it has developed a higher degree of efficiency over constructions employing such types of joint connections referred to and which are avoided by my construction.

It will be understood that various other adaptations or modifications of the apparatus may be utilized to suit the requirements of special cases or utilizations, but all such changes are to be considered as within the scope of the following claims.

What I claim is:—

1. In a switch board, the combination of an insulating base, a plurality of knife switches mounted on one side of the base each having a plural blade stud extending through the base and providing spaced terminals at the other side thereof, main supply conductor bars, and continuous flat conductors connected in flat interfitting relation with the main supply bars and having deflected terminals connected with the spaced terminals of the switch blade studs, substantially as set forth.

2. In a switch board, the combination of an insulating base, a plurality of knife switches mounted on one side of the base each having a plural blade stud extending through the base and providing spaced terminals at the other side thereof, main supply conductor bars, and continuous integral U-shaped flat conductors connected in flat interfitting relation with the main supply bars and in flat interfitting relation with the spaced terminals of the switch blade studs, substantially as set forth.

3. In a switch board, the combination of an insulating base, a plurality of knife switches mounted on one side of the base each having a plural blade stud extending through the base and providing spaced terminals at the other side thereof, main supply conductor bars, and continuous flat conductors connected in flat interfitting relation with the main supply bars and having deflected end portions interfitting with the spaced terminals of the switch blade studs, substantially as set forth.

4. In a switch board, the combination of an insulating base, a series of knife switches mounted thereon each having a stud composed of continuous flat plural blades extending through the base and providing flat spaced terminals at the other side thereof, main supply bars, and continuous flat one-piece conductors connected in flat interfitting relation with the main supply bars and having terminals deflected from the plane of the conductors and in interfitting engagement with the spaced terminals of the switch blade studs, substantially as set forth.

5. In a switch board, the combination of an insulating base, a series of knife switches mounted thereon each having a laminated stud composed of continuous flat plural blades extending through the base and providing flat spaced terminals at the other side thereof, main supply bars, and continuous integral flat conductors connected in flat interfitting relation with the main supply bars and having terminals deflected flatwise of the conductors and in interfitting engagement with the spaced terminals of the switch blade studs, substantially as set forth.

6. In a switch board, the combination of an insulating base, a series of knife switches mounted thereon each having a stud composed of continuous flat plural blades extending through the base and providing flat spaced terminals at the other side thereof, main flat supply bars, and series of continuous integral flat conductors connected in flat interfitting relation with said flat supply bars and having deflected terminal portions connected in flat interfitting relation with the spaced terminals of the switch blade studs and forming looped connections therefor, substantially as set forth.

7. In a switch board, the combination of an insulating base, a series of knife switches mounted thereon each having a pair of studs composed of continuous flat plural blades extending through the base and providing flat spaced terminals at the other side thereof, main flat supply bars, and series of continuous integral flat U-shaped conductors connected in flat interfitting relation with said flat supply bars and having their terminals deflected at right angles and in interfitting engagement with the spaced terminals of the switch blades, substantially as set forth.

8. In a switch board, the combination of an insulating base, a series of knife switches mounted thereon each having a pair of studs composed of continuous flat plural blades extending through the base and providing flat spaced terminals at the other side thereof, main flat supply bars, and series of continuous integral flat U-shaped conductors connected in flat interfitting relation with said flat supply bars and having their terminals in interfitting engagement with the spaced terminals of the switch blades, substantially as set forth.

9. In a switch board, the combination of an insulating base, a plurality of knife switches mounted thereon each having two pairs of blades extending through the base provided with an intervening spacer and providing spaced terminals at the other side of the base, main flate supply bars, and continuous integral flat looped conductors connected in flat interfitting relation with the main supply bars having terminals in interfitting engagement with the switch blade terminals, substantially as set forth.

10. In a switch board, the combination of an insulating base, a plurality of knife switches mounted thereon each having two pairs of blades extending through the base provided with an intervening spacer and providing spaced terminals at the other side of the base, main flat supply bars, and continuous integral flat looped conductors connected in flat interfitting relation with the main supply bars having deflected right angle terminals in interfitting engagement with the switch blade terminals, substantially as set forth.

11. In a switch board, the combination with a main supply bar, of an insulating base having mounted thereon a plurality of knife switches having laminated studs extending through the base and connected together by a communicating series of integral flat U-shaped conductor bars bent flatwise extending from one stud to the other, each of said conductor bars consisting of a loop member connection between said studs, portions of said conductor bars being in parallel planes and connected in flat interfitting relation with and forming a part of a main supply bar, substantially as set forth.

12. In a switch board, the combination of an insulating base having mounted thereon a plurality of knife switches having laminated studs extending through the base and connected together by a communicating series of integral flat U-shaped conductor bars bent flatwise extending in successive looping arrangement from one stud to the other, and a main supply bar connected in flat interfitting relation with said series of U-shaped bars, substantially as set forth.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

CHRISTIAN N. BERGMANN.

Witnesses:
C. M. CLARKE,
CHAS. S. LEPLEY.