

No. 822,590.

PATENTED JUNE 5, 1906.

F. J. DOMMERQUE.  
DISTRIBUTING BOARD.  
APPLICATION FILED OCT. 11. 1902.

2 SHEETS—SHEET 1.

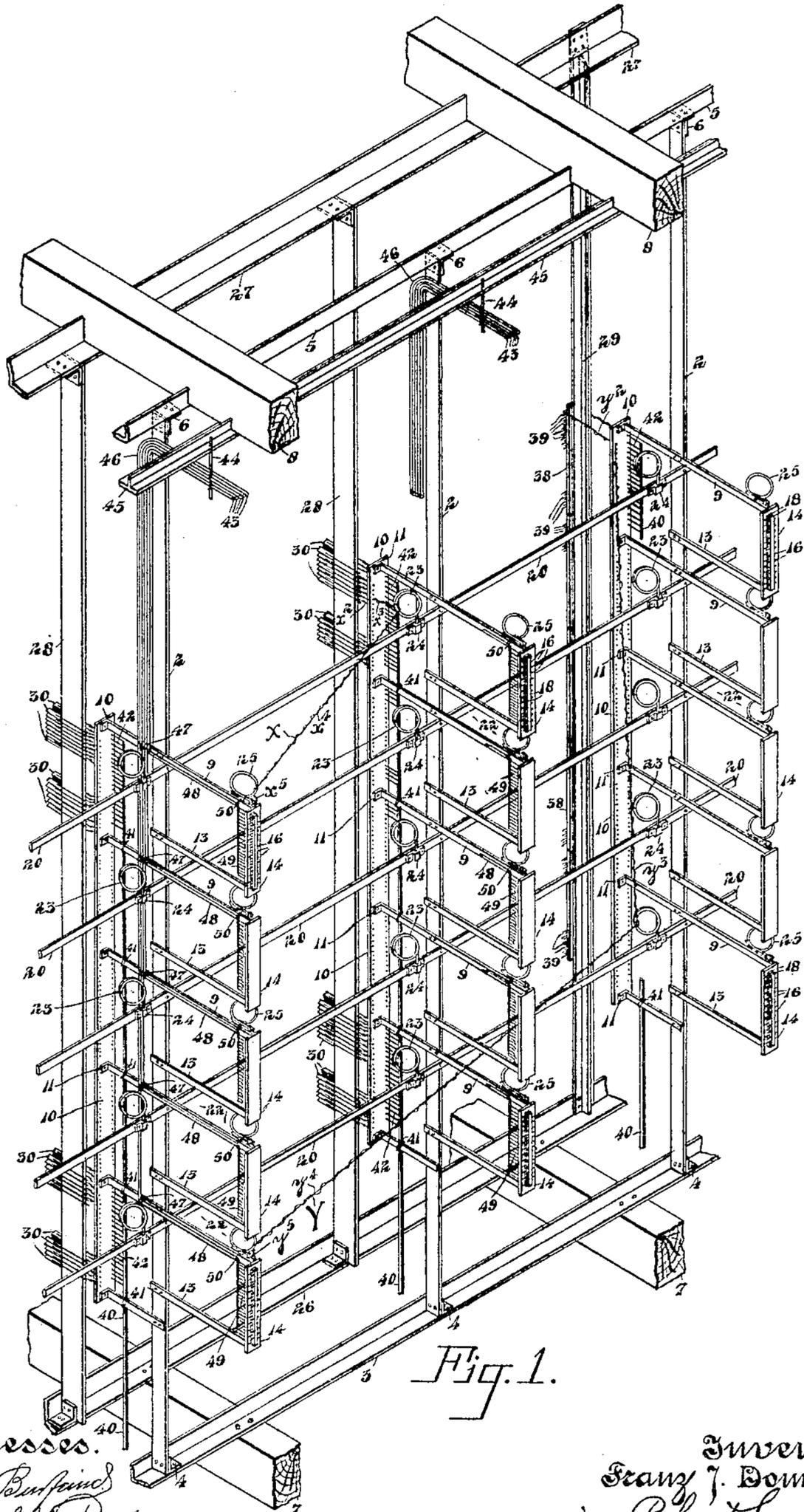


Fig. 1.

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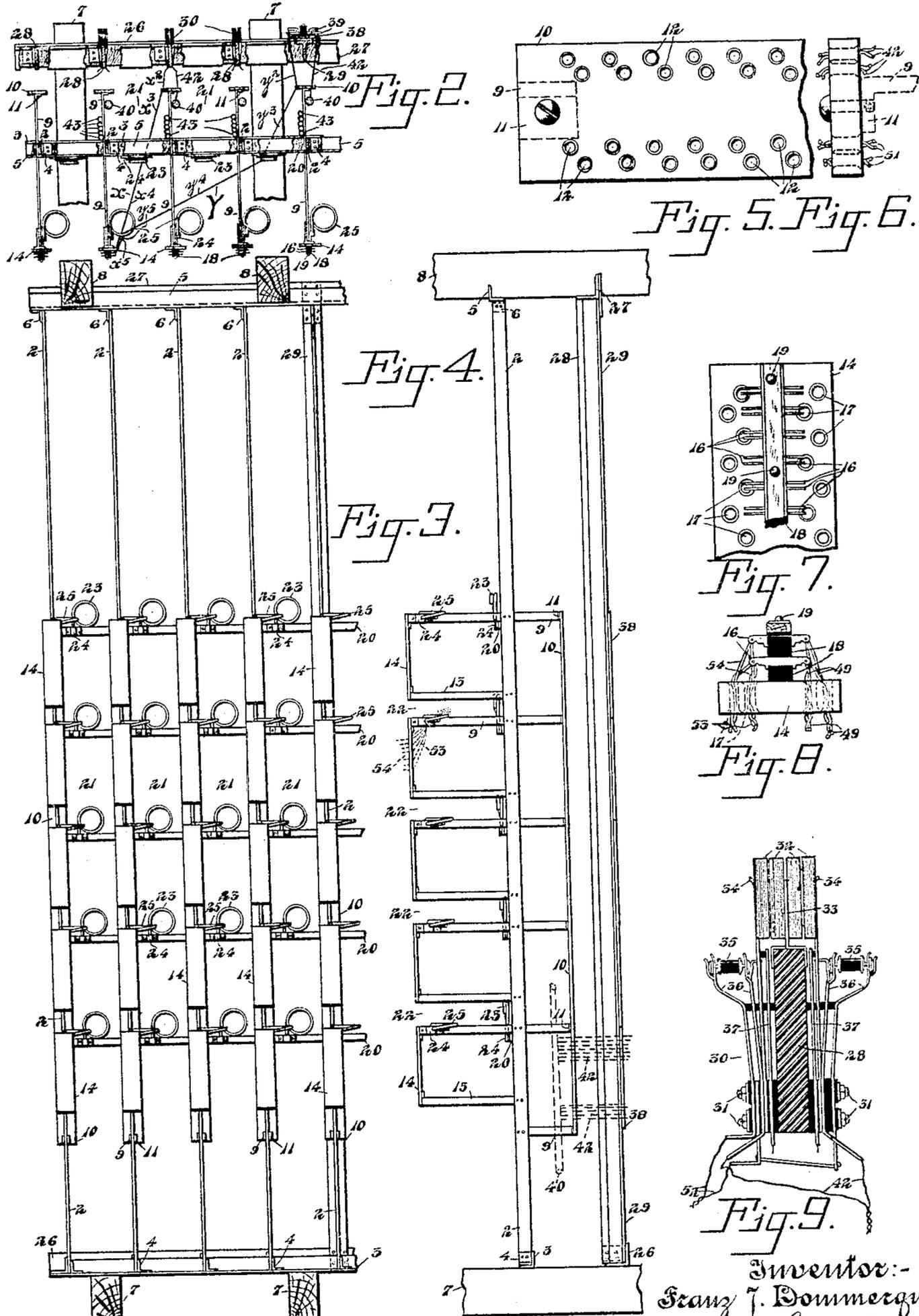
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2 SHEETS—SHEET 2.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## DISTRIBUTING-BOARD.

No. 822,590.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed October 11, 1902. Serial No. 126,877.

*To all whom it may concern:*

Be it known that I, FRANZ J. DOMMERQUE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Distributing-Boards, of which the following is a specification.

My invention relates to improvements and means for interconnecting the terminals of the street-cables in telephone-exchanges with the terminals of the cables leading to the switchboard. Such devices, known as "distributing" boards or frames, commonly consist of an open metal framework carrying terminals upon one side, with which the street-cables are connected and a second set of terminals upon the other side, with which the switchboard-cables are connected. The cross-connecting or interconnecting wires, commonly termed "jumper-wires," extend between these terminals, the open framework being arranged to permit them to be carried either up or down from the terminals on one side to the horizontal line of the set on the other side and thence horizontally until they reach the said other set of terminals with which they are to connect. One of the said sets of terminals usually comprises a lightning-arrester set, which is designed, in case of abnormal currents upon the line, to be suitably actuated to sever the line and sometimes ground the same. For this latter purpose the distributing-frame is ordinarily grounded. In this type of frame the "arrester-strips," as the strips upon which the lightning-arresters are mounted are called, form a part of the framework of the distributing-frame and must be placed therein at the time of the construction and installation of the frame, and are hence incapable of removal after the frame is once installed in position.

My invention simulates in general form and purpose these prior devices; but it comprises certain improvements whereby the frame may be readily adapted for the installation of any exchange and whereby it is capable of ready modification or extension to suit it to the varying conditions of the use and growth of the exchange. This feature is of advantage in installations in large cities, where a portion of the street-ca-

bles is of the underground type and where the remainder is of the aerial type. Only the latter require the presence of lightning-arresters at the distributing-frame; but in the usual installation it has been found necessary to provide arresters for all lines on account of the inflexible construction and arrangement of the frame.

I accomplish the desired result in one form, which has been worked out for commercial purposes, by providing an auxiliary frame and a main frame, the former being sometimes referred to as the "arrester-frame." This frame is entirely separate from the main frame, and its arrester-strips are readily removable without disassembling the structure and may be replaced by suitable terminal strips, so that either arresters or ordinary connection-terminals may be used.

An additional object is accomplished in the separation of the arrester-frame from the main frame in that the arrester-frame is electrically insulated from the main frame, whereby lightning upon the lines is not so liable to reach the main frame, and thus danger from this cause is avoided.

Other features and advantages of my invention are explained more in detail hereinafter in connection with the accompanying drawings, forming a part hereof, in which the same reference characters designate like parts throughout the several views, and in which—

Figure 1 is an isometric view of my invention. Fig. 2 is a plan view thereof. Fig. 3 is a front elevation of the same. Fig. 4 is an end view of the distributing-board. Fig. 5 is a detailed face view of one of the jumper-strips. Fig. 6 is an end view of the same. Fig. 7 is a front view of a portion of one of the terminal strips. Fig. 8 is an end view of the same, and Fig. 9 is a plan view of one of the arrester sets.

The main frame consists of the vertical metallic bars or standards 2, placed at the desired distances apart, usually about nine inches, (the intermediate bars or standards being omitted for the sake of clearness in Fig. 1,) and secured at their lower ends to the horizontal angle-bar 3, by angle-plates 4, bolted or riveted thereto, and at their upper ends to a similar bar 5 by the plates 6. The

angle-bar 3 may be bolted directly to the floor joists or beams 7 or a floor may be laid therebeneath, if preferred. Similarly the upper bar 5 is shown bolted directly to the ceiling-joists 8, the flange of the said bar being notched to fit the said joist. It is obvious, however, that the frame might be otherwise secured to the supports. These uprights or standards 2 are provided with a plurality of metallic transverse bars 9, riveted or bolted thereto, as shown, and carry at the ends of their shorter arms the jumper-strips 10, the ends 11 of said bars being bent transversely, to which ends the said strips are bolted or otherwise firmly secured. These jumper-strips, as shown more clearly in Fig. 5, consist merely of strips of wood or other suitable material, in which are bored along each side the rows of holes 12, the holes in the adjacent rows being preferably staggered.

Other transverse bars 13 are secured to said uprights 2 and extend parallel with the longer arms of the bars 9. Terminal strips 14, of suitable length to extend between the free ends of the bars 9 and 13, are rigidly secured to the said ends in any desired and suitable manner. These terminal strips are of the construction shown more clearly in Figs. 7 and 8—that is, upon the outer face of the strip a plurality of terminal clips 16 are mounted in pairs, with their ends adjacent the holes 17 in the strips, the latter being of wood or other insulating material. These clips are secured in position upon the face of said strips 14 by being placed in transverse slits in the insulating-bars 18, which are held in place by screws 19, passing through an outer clamping-strip and the two strips 18, and thence into the strip 14. The uprights 2 are tied together by the longitudinal bars 20, which are suitably riveted or bolted thereto in any desired manner. Such is the construction of the main distributing-frame, it being remembered that the uprights and attached parts are comparatively close together, as shown in Figs. 2 and 3. By reference to Fig. 2 it will be seen that vertical channels or ways 21 are formed between the transverse bars 9 and the longitudinal bars 20, and, as shown more clearly in Fig. 4, the horizontal ways or channels 22 are provided between the adjacent bars 9 and the bars 13 next above and reaching to the uprights 2. These channels or ways, as hereinafter more fully described, are for the purpose of accommodating the jumper-wires in extending vertically and horizontally between the different sets of terminals located upon the opposite sides of the frame. For the purpose of guiding these jumper-wires and holding them in an orderly manner guide-rings 23 are secured to the longitudinal bars 20 midway between the uprights 2, as shown more clearly in Figs. 2 and 3, these rings being formed, preferably, from a coil

of heavy wire, one end of the coil being extended at a tangent and held in place by a clamping-piece 24. These rings 23 serve as turning-points between the longitudinal and horizontal portions of the jumper-wires. Adjacent each terminal strip 14, as indicated in Figs. 1, 2, and 4, are located similar guiding-rings 25, which are disposed in horizontal planes and secured as before to the ends of the bars 9.

The auxiliary frame of this invention is electrically insulated and mechanically separable from the main frame. It comprises a horizontal angle-bar 26, secured to the floor-joists 7, and the upper horizontal angle-bar 27, secured to the ceiling-joists 8. Between these two bars the vertical strips 28 extend, which strips carry the arresters or simple connection-terminals, as desired. I have shown at 28 strips adapted to carry the arrester sets and consisting of plain metallic bars, while at 29 is a T-bar, adapted to carry the simple connection-strips. The arrester sets 30 are adapted to be mounted upon the strips 28 in front of the corresponding holes in the jumper-strips 10. These arrester sets are shown more clearly in Fig. 9 in plan view and comprise opposed groups of superposed flat springs mounted flatwise upon the opposite sides of the strip 28, said opposed groups being secured to the bar 28 by the bolts 31, extended through the bar and the two groups. The lightning-arresters 32, consisting of two opposed carbon plates with an interposed thin mica dielectric, are held in place against a plate 33, which is riveted to the bar 28, by the inner spring 34, and the sneak-current arrester 35 is held in place by the two springs 36. The operation of this arrester set is such that when lightning is present upon the line it finds a path to ground through the lightning-arrester 32 and the plate 33, which is grounded, and when sneak current is present and persists for an undue length of time the arrester 35, which may consist of a short stick of carbon or carbon mixture soldered by a low-fusing solder to its metallic terminals, becomes heated and permits either or both of its terminals to be separated from the carbon member by the springs 36. This opens the conductor in which these parts are included and grounds that portion of the conductor connected to the inner spring 36, since a projection carried at its free end passes freely through an aperture in spring 34 and strikes a spring 37, depressing it into contact with the plate 28. At the same time a signal-circuit is closed through the said spring 37 and plate 28. This arrester set may be any desired type; but the one here shown is more fully described in the patent to Kaisling, No. 717,212, dated December 30, 1902, to which reference may be had for a full disclosure of the same. The sneak-current arrester is

shown in the patent to Taylor, No. 717,300, dated December 30, 1902, but any other may be employed.

At the T-bar 29 are shown the sections 38 of the common connection terminal strips, which are provided with the terminals 39. These strips are secured to the outer face of the T-bars 29 and in front of the jumper-strips 10, to which they correspond in location and arrangement. The strips 38 have rows of holes at the edge of the T-bar adjacent the ends of the terminals 39, which are suitably secured thereto. These terminals are preferably arranged so as to be opened for testing; but as this feature does not enter into my invention I do not deem it necessary to show the same.

The cabling is all installed with reference to and in connection with the main frame, and the installation is permanent in character. The street-cables 40, comprising, preferably, one hundred pairs of insulated copper wire, are brought in through the floor upon the right-hand side of the bars 9 and in the rear of the jumper-strips 10, as shown in Figs. 1 and 2, and are tied to each of the bars 9, as shown at 41, to secure them in position. At each jumper-strip 10 twenty pairs of wires are fanned out horizontally, as shown at 42 in Fig. 1, and which pass through the holes 12 upon the same side of the adjacent jumper-strip 10, these wires 42 being also indicated in Fig. 6. While any desired number of holes 12 may be provided in the jumper-strips, it is preferable to arrange for twenty pairs of wires in each section or between each pair of bars 9, and the cables are preferably provided with one hundred pairs of such wires, whereby one cable, such as the cable 40, is sufficient for five panels or sections of the jumper-strips. The height of the frame may be extended as much as desired, some frames being built to accommodate two such street-cables, in which case the board is ten sections or panels high instead of five, as shown in the drawings. The described arrangement of the street-cables is the same at the sections opposite the T-bars 29 as at the sections opposite the arrester-bars 28; but it will be understood that the lines connected to cables terminating at the arrester-bars are of the aerial type, while the others are of the underground type.

The cabling extending to the switchboard or relay rack is indicated by the cables 43, which are preferably brought in above the frame and are supported in any desired way, as by means of the rods 44, suspended from the T-iron 45, secured in any desired way to the ceiling-joists 8. These cables are turned at 46 and descend upon the opposite side of the bars 9 from the street-cables 40, to which bars they are tied, as at 47, to keep them in place. At each of the bars 9, except the lowest, one of the cables is carried horizontally,

as shown at 48, along the bar 9 until the terminal strip 14 is reached. The wires of the cable are then fanned out, as shown at 49, Fig. 1, and its separated wires are carried through the holes 17 of the jumper-strip 14 below the bar 9, on which the horizontal part 48 of the cable is fixed, and are permanently soldered to the ends of the corresponding terminal clips 16, as shown in Fig. 8. These cables preferably accommodate twenty pairs of wires each, whereby a single cable is only required for each terminal strip 14. The ends of these cables, it will be understood, are secured in position by tying the same to the bars 9 at 50.

The ends 42 of the pairs of wires of the street-cables at the arrester-bars are permanently connected, as by soldering, to the fixed ends of the inner springs of the pairs 36, the opposed groups or pairs of springs being used for each pair of wires, and therefore for each metallic line. The wires 42 are likewise soldered to the ends of connection-terminals 39 at the T-bar sections.

With this disposition of the cables and permanent connections it is apparent that the aforementioned channels or ways, both vertical and horizontal, have been left entirely unobstructed, whereby the jumper-wires may be employed as desired to complete the connections. This is accomplished through the medium of the short sections of twisted pairs of wire known as the "jumper-wires." These wires are extended in separate pairs through the holes 12 in the jumper-strips 10 on the opposite side from the pairs 42 of the street-cables 40, as shown at 51, Fig. 6, and are connected with the outer springs of the pairs 36, as at 52, Fig. 9. They are thence led either upwardly or downwardly in the vertical channel or passage-way 21 to the proper guide-ring 23 and thence horizontally through the passage 22 to the ring 25, located adjacent the terminal strip 14, which carries the terminal clips 16, corresponding to the desired switchboard connection. They then extend downwardly through the said ring 25, as seen at 53, Fig. 4, and pass through the proper hole 17 upon that side of the terminal strip 14, as shown at 54 in Figs. 4 and 8. The two ends of the pair are then separated and connected to the adjacent ends of the proper clips 16. In the case of jumpers extending to the T-bars 29 they pass through the holes in strips 38 and are soldered to the adjacent ends of terminals 39. One of the jumpers is shown at X and consists of the portion  $x^2$ , extending through the jumper-strip 10 and secured to the arrester-springs 36. It then extends up in channel 21, as shown at  $x^3$ , to ring 23, and thence horizontally by the portion  $x^4$  through the horizontal channel 22 until the proper ring 25 is reached. It then dips down, as shown at  $x^5$ , to the proper hole of the terminal strip 14, through which it ex-

tends to the terminals 16. The jumper Y likewise extends through the jumper-strip 14 and thence to a terminal connection 39 by portion  $y^2$  at the upper panel, thence downwardly in vertical channel 21 by portion  $y^3$  to the lowest ring 23, and thence horizontally in channel 22 by portion  $y^4$  to the lower left-hand ring 25, from whence it continues down to the proper hole in strip 14 by portion  $y^5$ .

10 The subscribers' lines thus completed comprise the street-cable connections at one end of the jumper-wires and the switchboard connections at the other ends thereof. It will thus be seen that when it is desired to

15 connect any line or street-cable with any switchboard-cable it is readily done by means of the jumper-wires.

By the arrangement of the arrester-bars and T-bars in the auxiliary frame the aerial

20 lines can be readily supplied with arresters, since they can be brought into the bars 28, while the underground-cables, which do not require arresters, can be brought to bars 29. In case of extensions of the distributing-

25 frame the number of arrester-bars and terminal bars required for the auxiliary frame can be proportioned to the probable needs thereof, and in case of desired changes in the relative number of such bars after installa-

30 tion they also may be readily made. By thus separating the auxiliary from the main frame the lightning or other charges are confined to the auxiliary frame and are not liable to destroy the main frame and associated

35 parts.

Having thus described my invention, what I claim is—

1. A distributing-board for telephone central-office installations comprising an open

40 framework having ways and channels for the passage of the jumper-wires and permanent fastenings and connections for the street and switchboard cables, and interchangeable

45 parts for said board provided with different types of connective devices adapted to be connected with the circuits of said cables, whereby some of the circuits of said cables may be supplied with connective devices of one type and some with another, substantially as de-

50 scribed.

2. A distributing-board for telephone central-office installations comprising an open framework having ways and channels for the

55 passage of jumper-wires and permanent fastenings and connections for the street and switchboard cables and interchangeable parts for said board some of which are provided with protective devices and others with simple connectors, said protectors and con-

60 nectors being adapted to be connected in the circuits of said cables, whereby some of the circuits of said cables are supplied with protective devices and others with simple connectors, substantially as described.

65 3. A distributing-board for telephone cen-

tral-office installations comprising an open framework having ways and channels for the passage of jumper-wires and permanent fastenings and connections for the street and switchboard cables and interchangeable

70 parts for said board some of which are provided with protective devices and others with test-connectors, said protectors and connectors being adapted to be connected in the circuits of said cables, whereby some of

75 the circuits of said cables are supplied with protective devices and others with test-connectors, substantially as described.

4. A distributing-board for telephone central-office installations comprising a main

80 frame and an auxiliary frame, said main frame consisting of a light open framework on which the incoming ends of the street-cables and the outgoing ends of the switch-

85 board-cables are permanently mounted and having ways and channels to accommodate the jumper-wires, the said auxiliary frame having interchangeable parts carrying dif-

90 ferent types of connective devices adapted to be included in the circuits of said cables, whereby some of the circuits of said cables are supplied with connective devices of one type and some with another, substantially as described.

5. A distributing-board for telephone cen-

95 tral-office installations comprising a main frame and an auxiliary frame, said main frame consisting of a light open framework on which the incoming ends of the street-

100 cables and the outgoing ends of the switchboard-cables are permanently mounted, and having ways and channels to accommodate the jumper-wires, said auxiliary frame hav-

105 ing interchangeable parts some of which are provided with arresters and others with terminal connectors, the said arresters and terminal connectors being adapted to be connected in said circuits, whereby some of the circuits of said cables are provided with ar-

110 resters and others with terminal connectors, substantially as described.

6. A distributing-board for switchboard-cables consisting of upright supports, hori-

115 zontal rods attached thereto and projecting on each side of said upright supports, vertical jumper or fanning strips attached to the ends of said projecting rods on one side of said upright supports and terminal blocks

120 attached to the other ends of said rods, a second frame having a like number of upright supports, said second frame being placed near said first frame on the side next to the said jumper or fanning strips, and means whereby any upright of said second frame may be removed without in any way disturb-

125 ing the position or condition of said first frame, substantially as described.

7. A distributing-frame having ways and supports for switchboard-cable, ways and supports for outside cable, terminal block

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for the switchboard-cable, ways and supports for jumper-wires, and jumper or fanning strips for said jumper-wires and for the wires of the outside cable, and a second frame near  
5 said first frame carrying either protectors or connectors with which the wires from said jumper or fanning strips are adapted to connect, substantially as described.

8. A complete distributing-frame consisting  
10 of the combination of two frames, means whereby the frames may be electrically separated and at the same time be placed in proximity so that wires may extend between  
15 them without intermediate supports, and means whereby the upright supports of one frame may be of either of two characters,

one adapted to carry protectors only and the other adapted to carry connectors only, substantially as described.

9. In a distributing-frame consisting of  
20 two distinct parts, of means whereby the uprights of one part may be removed and replaced by uprights of a different form without disturbing the rigidity of the frame as a whole, substantially as described. 25

Signed by me at Chicago, county of Cook, State of Illinois, this 30th day of September, 1902.

FRANZ J. DOMMERQUE.

Witnesses:

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GAZELLE BEDER.