

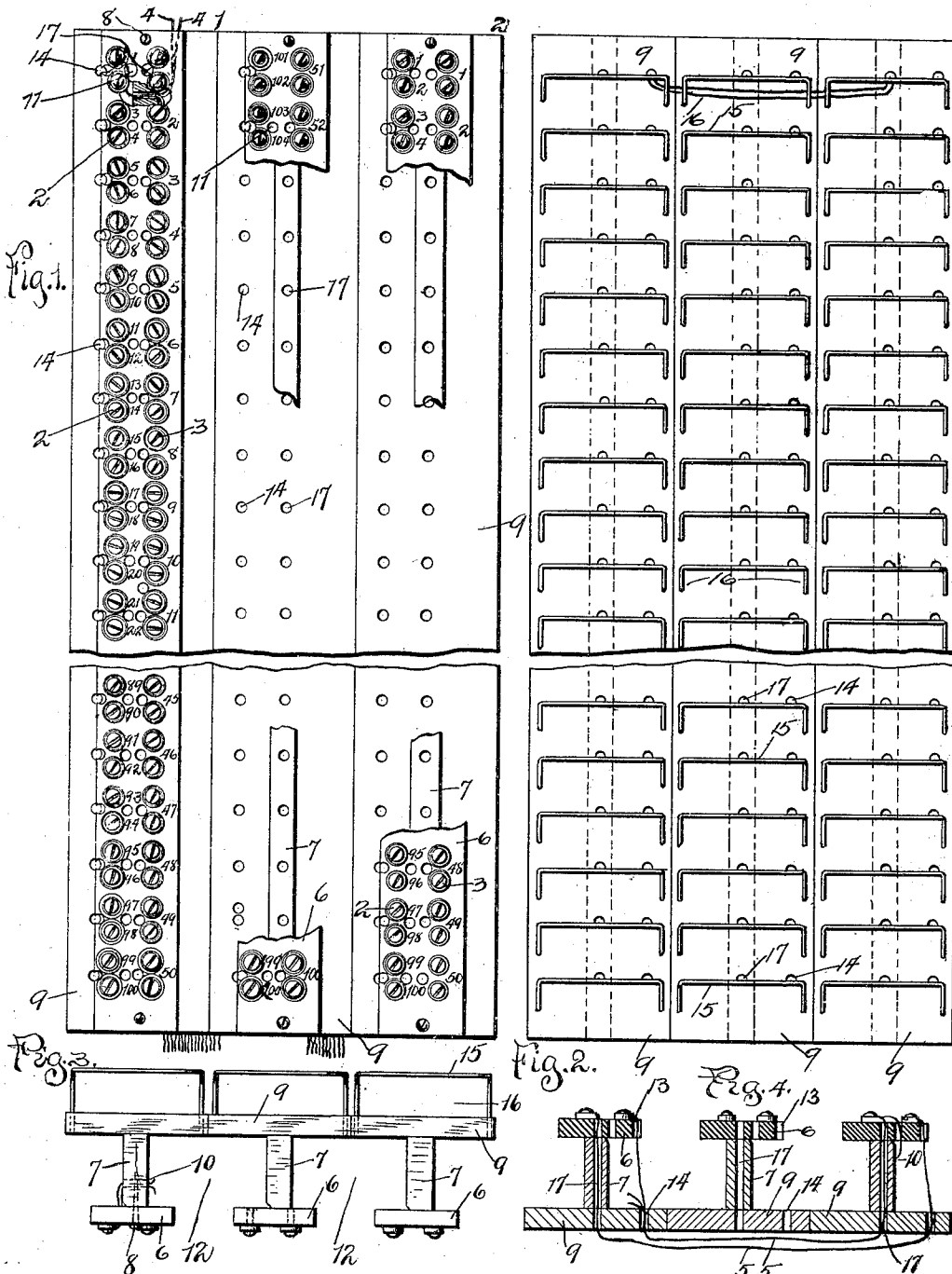
F. B. COOK.

APPARATUS FOR TELEPHONE SYSTEMS.

(Application filed Apr. 17, 1899.)

3 Sheets—Sheet 1.

(No Model.)



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3 Sheets—Sheet 2.

Fig. 5.

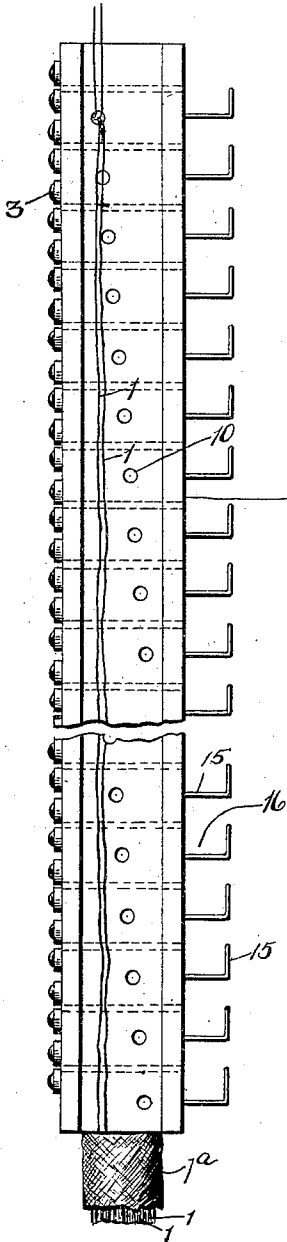


Fig. 6.

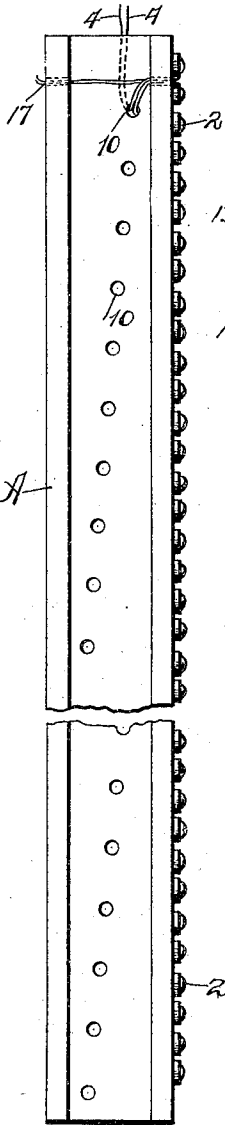


Fig. 7.

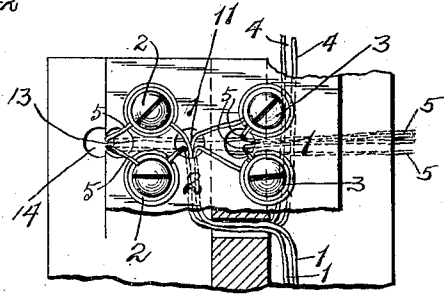
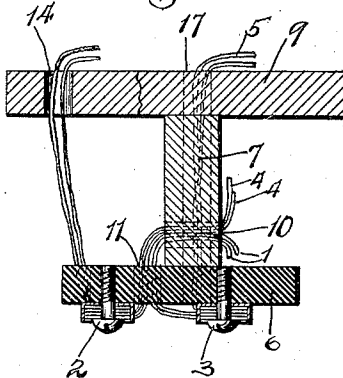


Fig. 8.



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No. 684,602.

Patented Oct. 15, 1901.

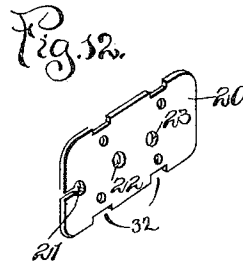
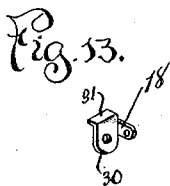
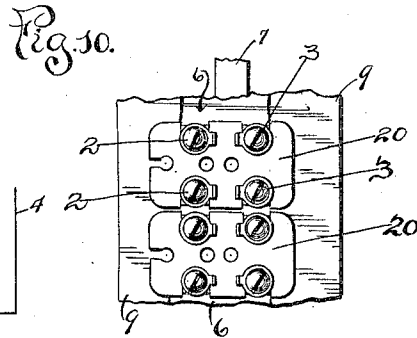
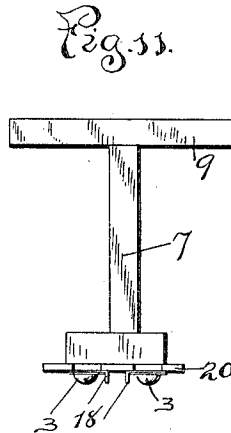
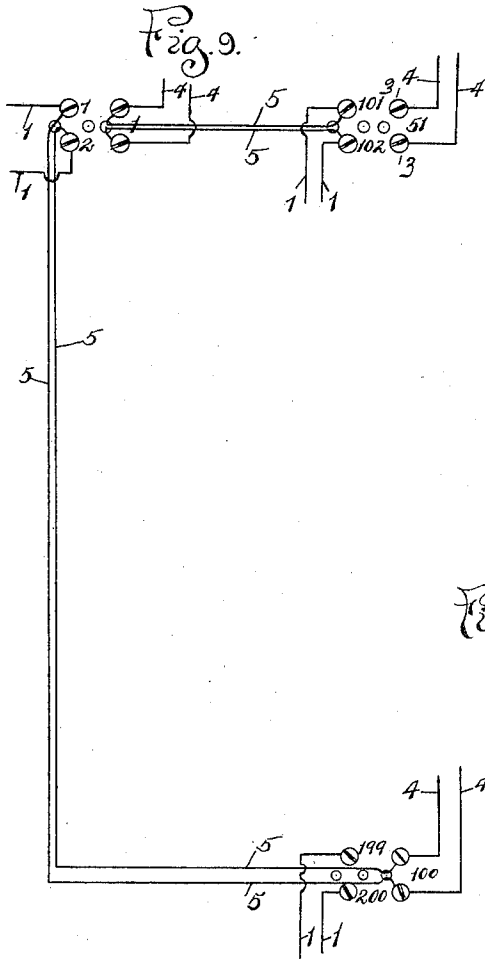
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(Application filed Apr. 17, 1899.)

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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

FRANK B. COOK, OF CHICAGO, ILLINOIS.

APPARATUS FOR TELEPHONE SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 684,602, dated October 15, 1901.

Application filed April 17, 1899. Serial No. 713,245. (No model.)

To all whom it may concern:

Be it known that I, FRANK B. COOK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Apparatus for Telephone Systems, of which the following is a specification.

My invention relates to distributing-boards such as are commonly employed in telephone-exchanges as a means of simplifying the termination of subscribers' lines. In the system employing these boards subscribers' lines are terminated at the distributing-board and permanently connected to a series of contacts or binding-posts arranged thereon. The spring-jacks of the switchboard of the station are respectively connected permanently with another series of contacts or binding-posts on the distributing-board by a series of supplementary or independent conductors. So in order to connect any line with any desired spring-jack on the switchboard the proper line and switchboard contacts on the distributing-board are connected with one another by means of suitable independent and changeable conductors or connections. The employment of these distributing-boards in central stations or exchanges is due to the existence of the following conditions: The lines of the various subscribers in different districts in the system are formed into separate cables which respectively extend into these several districts. In each district the lines are extended from the cable leading thereto to the various subscribers situated therein. At the exchange the subscribers are assigned to the various spring-jacks on the switchboard generally in the order in which they are received and regardless of the particular district from which they respectively extend. Consequently at the exchanges there are terminated a large number of cables the various conductors from each of which are to be connected to the station-switchboard at irregularly-disposed and widely-separated points. The confusion, inconvenience, and embarrassment which must necessarily result from an attempt to connect this myriad of conductors directly to the exchange-switchboard in this promiscuous way is at once apparent; but by the employment of a distrib-

uting-board, between which and the switchboard are extended a series of conductors corresponding in number to the spring-jacks on the switchboard and at which the conductors from the various cables are terminated and connected by suitable connections with these independent and supplementary conductors leading to the switchboard, these various difficulties and disadvantages entirely disappear.

Prominent objects of my invention are to provide a simple, inexpensive, and durable distributing-board of the kind mentioned, to simplify its construction, to reduce to a minimum the number of parts employed in it, and to conceal and protect all the conductors connected with it.

To the attainment of the foregoing and other desired ends my invention consists in matters hereinafter set forth.

In the accompanying drawings, Figure 1 is a front elevation of a section of a distributing-board embodying my invention and having its middle portion broken away for convenience of illustration. Fig. 2 is a rear elevation of the same. Fig. 3 is a view looking down on the board as it is shown in Fig. 1. Fig. 4 is a cross-section of the board in the position shown in Fig. 2. Figs. 5 and 6 are side elevations of the sections of board as illustrated in Figs. 1 and 2, respectively. Figs. 7 and 8 are front views and cross-sections, respectively, of a small section of board shown on a larger scale. Fig. 9 is a diagrammatic view of the board and its connections with the switchboard and the cables. Fig. 10 is a front elevation. Fig. 11 is a top plan of a section of a modified form of the board. Figs. 12 and 13 are views of details.

The line conductors 1 1, extending from the cables, are terminated at the distributing-board A and permanently connected to a series of contacts or binding-posts 2 2. The contacts or binding-posts 2 2 correspond in number with the number of conductors in the cable and are given numbers as a means of identification of the lines. They are arranged in vertical rows, with any desired number in each row. In the section of board shown there are three rows, with one hundred in each row. The first row, of course, is numbered from "1" to "100" and the second row from

"101" to "200." By preference the third row is numbered from "1" to "100" again, the board being arranged in groups of two hundred each. The spring-jacks and associated line annunciator or drop of the switchboard are respectively and permanently connected with a series of binding-posts or contacts 3 3 on the distributing-board A by a series of supplementary and independent conductors 4 4. The number of contacts or posts 3 3 corresponds with the number of drops and associated spring-jacks on the switchboard. The contacts or posts 3 are arranged in pairs, one for each side of the circuit, and each pair given a number which corresponds with the number applied to the drops and switchboard spring-jacks to which they are connected. They are likewise arranged in vertical rows, which are for convenience disposed between the rows of line contacts or posts 2 2. The number of contacts or posts 3 3 in each row desirably corresponds with the number of line contacts or posts 2 2, and the various contacts are set opposite one another horizontally. Inasmuch as the numbers are applied to the switchboard-contacts in pairs, the first row of these contacts or posts will be numbered from "1" to "50" and the second from "51" to "100." The third row is numbered from "1" to "50" again, and so on. It will thus be seen that the line binding-posts 2 2 are numbered, so that each one has a separate and different number, which in practice is also the number of the line connected to it. The binding-posts 3 3, however, are always numbered in pairs—that is, one number for each pair of posts. These in practice are connected to the two sides of a metallic circuit spring-jack and a drop. The arrangement of the posts 2 2 and 3 3 upon the same strip is simply a matter of convenience, not of necessity. In order to connect any drops and corresponding spring-jacks of the switchboard with any pair of cable and line conductors, the proper connections are made on the face of the distributing-board by means of suitable connections, such as a couple of cross-connecting bridle wires 5 5. For instance, if it is desired to connect switchboard spring-jacks No. 51 with cable-conductors 99 and 100 a pair of cross-connecting bridle-wires 5 5 is extended from the two distributing-contacts forming the pair 51 to the two line-contacts 99 and 100. If any of the lines are to have a common return and not an all-metallic circuit, one of the contacts or posts forming a pair of switchboard-contacts on the distributing-board is connected with the common return, while the other one is connected with the proper line contact or post.

In accordance with my present invention the various rows of line and switchboard contacts or terminals are arranged together in pairs, and each pair is mounted on a long strip 6 of insulating material, preferably ebonite. These long strips of ebonite or the like are

strips 7 of wood or the like, to which they can be fastened in any suitable way—as, for instance, by means of screws 8, as shown in Fig. 3. The strips of wood 7 are in turn supported and held in position by a number of flat base or rear strips 9, preferably made of wood and arranged at right angles to the wooden strips 7 and parallel with the ebonite strips 6. These strips of wood 9 are of such width as to permit of their being arranged side by side, abutting one another, as best shown in Fig. 3, so as to hold the pairs of rows of line and switchboard contacts at a suitable distance from one another. The arrangement of contacts and supporting means, therefore, which I have just illustrated and described obviously affords opportunity to distribute the line, switchboard, and cross-connecting or bridle conductors to the various contacts on the board in a variety of advantageous ways. In the drawings I have shown an exceedingly simple and desirable arrangement which I prefer to employ in constructing distributing-boards involving the foregoing described features of construction. In this arrangement of mine the line conductors are brought to the bottom of the distributing-board and are distributed to the various contacts thereof from that end, while the switchboard-conductors are brought to the top and distributed to the switchboard binding-posts from that end. In this distribution they are confined within spaces 12, formed between the intermediate strips 7 7, and are led from these spaces 12, first through holes 10 in such strips and thence through holes 11 in the insulating-strips 6 6, as best shown in Figs. 7 and 8. From the latter the two line conductors are led to the left, as shown in Figs. 1 and 7, and connected with the binding-posts 2 2, and the switchboard-conductors are led to the right and connected with the two switchboard binding-posts 3 3. The cross-connecting or bridle wires 5 are led, after connection with the line-contacts or binding-posts 2 2, through holes or notches 13, formed in the left-hand side of the insulating-strips 6 6 rearwardly and thence through holes 14 14 in the rear or base strips 9 9 to the rear of the board. Thence they are led to the proper switchboard contacts or binding-posts forwardly through holes 17 17, formed in the rear strips 9 and intermediate strips 7, and the front insulating-strips 6 6. In this way the line and switchboard conductors are concealed and protected and at the same time are easy of access for arrangement by reason of the space between the front strips 6 6; also, the cross-connecting or bridle conductors are advantageously arranged and are separated from the line and switchboard conductors. In order to hold the wires 5 5 in horizontal position, they are arranged in channels 16 between the successive series of horizontally-arranged wire staples 15. It will be seen that in this way the various series of conductors are maintained separate from one another.

other, that the line conductors are concealed and protected, and that the bridle or cross-connecting wires are securely held in position and are also suitably protected on the rear of the board. The contacts or binding-posts 2 2 and 3 3 could be of any suitable construction or form. The ones I have shown are constructed with a flat circular base, between which and the screw used for holding them in place bridle-wires can be held, and they are also constructed with upwardly-extending ears 18 18, Fig. 13, to which the line or switchboard conductors, as the case may be, can be permanently connected. In making up the board rear supporting-strips 9 9 are arranged in a suitable frame in sufficient number to provide for the number of lines employed in the exchange. In this way the board can be constructed of any suitable size by assembling together the proper number of the strips.

In the modified form of distributing-board shown in Figs. 10, 11, and 12 a series of disks or plates 20 20 are interposed between each set comprising a pair of line and a pair of switchboard contacts and the insulating-strips 6 6 and secured to the latter by means of the screws which secure the contacts to the insulating-strips. These disks 20 20 are provided with notches 21 21 and holes 22 22 23 23, which serve the purpose of the corresponding holes formed in the insulating-strips 6 6 and heretofore described. When installed, the plates 30, Fig. 13, are placed beneath the binding-screws with the downward bends 31 in the notches 32 in the plates 20, all as shown in Fig. 10. This modified form of board involving these interposed disks, which are preferably made of fiber, I prefer and consider a matter of further improvement over the previously-described construction.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a distributing-board, the combination of a plurality of strips provided with terminals; and a corresponding number of supporting-strips extending transversely from the rear faces of the first-mentioned strips, said supporting-strips being provided with apertures extending from front to rear, and also with other apertures extending from side to side.

2. In a distributing-board, the combination of a plurality of insulating-strips provided with terminals; a back in the rear of the insulating-strips; and supporting-strips arranged between the back and the insulating-strips, said supporting-strips being provided with holes extending from front to rear and also with transverse holes extending from side to side, and the insulating-strips and the back being provided with holes forming continuations of the holes extending from front to rear of the supporting-strips.

3. In a distributing-board, the combination with a plurality of strips provided with ter-

minals, of supporting-strips arranged in the rear of the first-mentioned strips, said supporting-strips being provided with apertures extending from front to rear, and the other strips being provided with apertures registering with the front ends of the apertures in the supporting-strips.

4. In a distributing-board, the combination with line-terminals and spring-jack terminals mounted thereon, of cross-connecting or bridle wires to variously connect said terminals and running between said terminals, and staples having upturned end portions mounted on the back of said board and forming channels for said cross-connecting wires.

5. In a distributing-board, a plurality of long, insulating-strips, each carrying a row of line binding-posts or contacts, and a row of switchboard binding-posts or contacts, and having formed in them a couple of rows of holes through one of which can be led the line and switchboard conductors, and through the other of which can be led the connecting or bridle wires; a corresponding number of base-strips arranged in the rear of the first-mentioned strips and provided with holes through which can be led the cross-connecting or bridle wires; a corresponding number of intermediate strips arranged between and at right angles to the aforesaid sets of strips, and forming between them spaces in which the line conductors can be confined, and having formed in them a couple of series of holes, one series being formed transversely so as to provide apertures through which the line and switchboard conductors can be led for connection with the line-contacts or binding-posts, and the other being formed from front to rear in continuation of the series of cross-connecting conductor-holes in the insulating-strips so as to provide apertures through which the cross-connecting conductors can be led to the latter; and a series of staples, or the like, secured to the rear of the board and adapted to provide horizontal and vertical channels for the arrangement and protection of the cross-connecting or bridle lines.

6. In a distributing-board, the combination with a front strip provided with terminals, of a back strip parallel therewith, a supporting-strip located edgewise between the said strips and having transverse apertures and other apertures extending from front to rear, cables between the front and back strips and at one side of the supporting-strips, wires from the cables passing through said transverse apertures to the said terminals, and cross-connecting or bridle wires passing through said other apertures to variously connect said terminals.

7. In a distributing-board, the combination with a strip, of a plurality of insulating-plates thereon side by side having holes through and notches in their edges for the passage of wires, said plates having other holes near the edges and notches in the edges adjacent to said other holes, binding-plates

adapted to rest upon said insulating-plates over said other holes and having their edges bent over and fitting within the said adjacent notches, and binding-screws passing through
5 both said plates to secure the same to the strip and connect the wires thereto.

8. In a distributing-board, the combination with a plurality of front strips, insulating-plates side by side on the face of said strips, terminals on said plates, back strips in the
10 rear of the front strips, supporting-strips between said front and back strips and provided

with holes extending from front to rear and also with transverse holes extending from side to side, the said strips and plates being
15 formed with holes registering with those extending from front to rear through the supporting-strips.

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

FRANK B. COOK.

Witnesses:

CHARLES C. BULKLEY,
JOHN B. WEIR.