

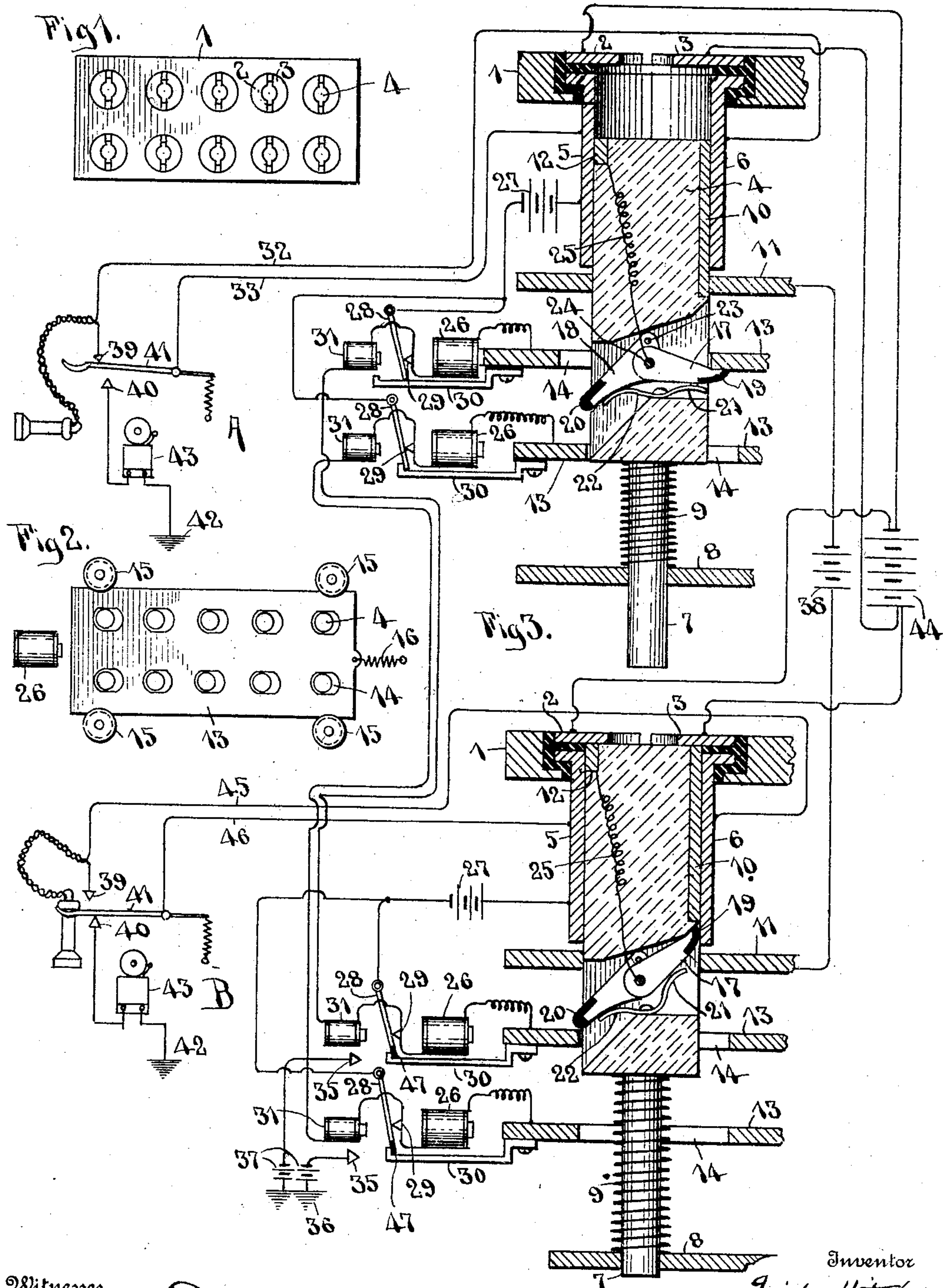
No. 765,142.

PATENTED JULY 12, 1904.

I. KITSEE.
TELEPHONY.

APPLICATION FILED AUG. 27, 1903.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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TELEPHONY.

SPECIFICATION forming part of Letters Patent No. 765,142, dated July 12, 1904.

Original application filed March 7, 1901, Serial No. 50,232. Divided and this application filed August 27, 1903. Serial No. 170,896. (No model.)

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, a citizen of the United States, and a resident of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Telephony, of which the following is a full, clear, and complete disclosure.

My invention relates to improvements in telephony, and involves particularly those parts of telephone systems located at the central exchanges, especially switchboards and their accessories for making connections between different subscribers' stations.

The object of my invention is to facilitate the connecting of two subscribers' circuits, doing away with the inconvenient and cumbersome "cord-circuits" or cord connections, thereby reducing the number of operations necessary in making connections and at the same time making many of said operations automatic in their action.

The subject-matter of the present application involves certain features of the systems above referred to which have been particularly described and claimed in my prior application, Serial No. 50,232, filed March 7, 1901, of which this application is a division. The features of my invention covered in this application involve certain details of construction, particularly those of the switchboards, plugs, and connections therefor.

For a full, clear, and exact description of these features of my invention reference may be had to the following specification and to the accompanying drawings, forming a part thereof, in which—

Figure 1 represents an elevation of a switchboard; Fig. 2, a view of one of the connecting-plates and its operating-magnet; and Fig. 3, a view showing the connections for two plugs in the call and distributing switchboards, respectively, together with details of the plugs and their sockets.

1 represents what I term a "call-board"—that is, a board to which the calls are primarily sent and in the leads to which from each station a "drop" or other annunciator may be inserted to call the attention of the operator. The "distributing-board"—that is, the

board from which the call is sent to the station desired to be connected to a station which has called up through the call-board—is similar to the call-board, but preferably contains a greater number of plugs. It is obvious that each outlying station must have a plug-switch in both a call-board and a distributing-board in order to allow of any station being connected with any other.

Since one operator cannot attend to all the plugs or lines in one switchboard, the call-boards are divided into sections, each consisting of a suitable number of plugs to be easily taken care of by one operator. Several of these sections of the call-board may be placed opposite one distributing-board, and the latter may be duplicated until there is room for all the sections of the call-board. This arrangement does not differ from those in the well-known central-station practice of the present day. The call and distributing boards may be placed in the same vertical frame; but this is not essential, as they may be placed according to choice and convenience.

My improved connecting or switch boards are especially applicable to be used with the so-called "central-energy" telephone systems or those where a closed circuit is maintained to each telephone-station when the same is not in use, although they may be adapted to be used with other systems.

2 and 3 are contact-plates which are located at the limit of the outward movement of the plug 4 and are connected, respectively, with the poles of a common main battery 44. The plugs and terminals are arranged on the boards in regular polygonal figures and preferably in vertical and horizontal lines, forming squares, as in switchboards now in use, there also being but a single terminal for each line in a one panel or board.

The plug 4 is preferably of non-conducting material and is surrounded by the semicylindrical halves of the plug-socket 5 and 6, to each of which is connected one of the leads from a telephone-station. The plug 4 has an extension 7, which passes through an opening in the fixed plate 8 and is adapted, in connection

tion with the parts 5 and 6 of the plug-socket, to form a guide for the plug 4. A spring 9, interposed between the plate 8 and the bottom of the plug 4, acts to return the plug to its normal or inoperative position.

10 is a longitudinal contact carried by the plug 4, which is adapted to form an electrical connection between the parts 3 and 6 when the plug is in its normal or inoperative position.

11 is a fixed plate of conductive material and is located adjacent the ends of the plug-sockets, so that when the plug is depressed the contact 10 will make electrical connection between the same and the part 6, as shown in Fig. 3.

12 is a contact carried by the plug 4, which is always in contact with the part 5 of the plug-socket and connects said part 5 with the part 2 when the plug is in its normal position.

13, 13, &c., are conductive plates or frames, so connected as to be operative in pairs, one plate of each pair being located in the call and distributing boards, respectively, and have slots 14 formed therein through which the plugs 4 are adapted to pass. These plates are insulated from each other and are carried by rollers 15 or other suitable antifriction devices. They are held in their normal or inoperative positions by suitable springs 16. The plates 13 correspond to the cord connectors in the cord-circuit systems and are of a similar number—to wit, about ten per cent. of the number of stations connected to any one panel of a switchboard. The slots in the plates 13 are of sufficient length to allow either one of the pawls 18 or 17 to pass therethrough in either direction, according to whether a plate is in its operative or inoperative position. The pawls 18 and 17 have insulating-strips 20 and 19 upon one side thereof, respectively, so that in passing the plates 13 in one direction no electrical contacts are made therewith. The pawl 17 is held in its normal raised position by the spring-arm 21, and the pawl 18 is adapted to rest upon the spring-arm 22 by gravity when in its lower or inoperative position. 23 is a pin or projection carried by the pawl 18 and is adapted to contact with the upper edge of the pawl 17, so that when the pawl 17 is raised 18 will be depressed and when 18 is raised 17 will be depressed. These pawls 18 and 17 are pivoted upon a pin 24, which has electrical connection with the contact 12 by means of the wire 25.

When the plug 4 is depressed, the pawl 18 will engage the first plate which is not already in use to make a connection. This is due to the fact that the slots 14 are so located that when the plates 13 are moved by their magnets one end of the slot will come into alignment with the end of the pawl 18 and allow the same to pass without interruption. The pawl 18 will therefore engage the first plate which is not in use, and as the inward move-

ment of the plug 4 is continued the pawl 18 will be raised, thereby depressing and extending the pawl 17. At the same time the lower uninsulated side of the pawl 18 will contact with the plate and make a connection to energize a magnet 26 to draw the plate into its operative position. As the plate 13 is drawn over the plate at the opposite end of the slot passes over the end of the pawl 17, which has been depressed, thereby making a contact with the uninsulated part of the same, which maintains the action of the magnet 26 first energized, while at the same time the pawl 18 is allowed to drop into its original position, as illustrated in the upper part of Fig. 3. The magnet 26 is energized by the battery 27, the current passing through the armature 28, hereinafter to be more particularly described, contact 29, magnet 26, plate 13, pawl 17, wire 25, contact 12, and contact 5 to battery 27.

28 is an armature which is normally in contact with the point 29 and is retained in that position by the arm 30, which in the plates of the call-board is insulated, but in the distributing-board is electrically connected with the plate 13. A clearing-out magnet 31 acts upon the armature 28 to withdraw it from the point 29 when the arm 30 allows it to do so by reason of the movement of the plate 13. The magnets 31 are electrically connected in pairs corresponding to the pairs of plates in the call and distributing boards and not energized until both receivers are off their hooks at the calling and the called telephones. This is made possible from the fact that the leads 33 and 46 are connected to the parts 5 and 5 in each board, respectively, which will allow the current to pass through the contacts 12, wires 25, pawls 17, plates 13, magnets 26, and magnets 31. In the distributing-switchboards the arms 30 contact with points 35 when the plates are attracted by the magnets. These points 35 are connected to ground 36 through the batteries 37. 38 is a battery, each pole of which is connected with the plates 11 in the call and distributing boards, respectively.

Each telephone-station is provided with the usual contacts consisting of the points 39 and 40, which are adapted to be engaged by the receiver-hook lever 41, the point 40 being connected to ground 42 through the vibrating call-bell 43.

Operation: Supposing a call has been made from the station A, the plug 4 in the call-board is then depressed, thereby putting the pawl 17 in contact with the plate 13, which is attracted by the magnet 26, as above described. The operator at the call-board then ascertains from the subscriber at station A what other station he wishes to converse with and thereupon depresses the plug corresponding to that station in the distributing-board. When the plug 4 in the distributing-board is depressed, the disengaged plate 13, corresponding to the plate 13 just operated

in the call-board, is connected with the plug and its corresponding magnet 26 energized. The arm 30 then contacts with the point 35, thereby closing a circuit from battery 37 through ground 36, ground 42, bell 43, contact 40, lever 41, lead 46, part 5, contact 12, wire 25, pawl 17, plate 13 to arm 30, and contact 35. The bell at station B is therefore kept ringing until the call is answered and the receiver is lifted from its hook-lever 41. When this is done, both magnets 31 are energized and the armatures 28 withdrawn from the points 29. Both telephone instruments are then connected together through the battery 38 by a circuit passing through the plate 11 of the distributing-board, contact 10, part 6, lead 45, lead 46, part 5, contact 12, wire 25, pawl 17, plate 13, magnet 26, magnet 31, magnet 31 of the call-board, magnet 26, plate 13, pawl 17, wire 25, contact 12, part 5, leads 33 and 32, part 6, contact 10, plate 11 to battery 38. Both stations are therefore connected for talking and remain in that condition until one of the receivers is replaced on its hook, thereby breaking the circuit through both pairs of magnets 26 and 31, which returns the plates 13 and plugs 4 to their normal positions. When in their normal positions the plugs 4 connect the battery 44 with the leads from the stations through the parts 2, 12, 5, and 3, 10 and 6, thereby keeping the subscribers' lines 33 and 46 constantly energized when said lines are not in use. The stations, annunciators or calls, and the operators' telephones may be connected with the line-terminals in any well-known way which will be self-suggestive to one skilled in the art, and I have not shown the same, as they form no part of my invention, and their omission simplifies the description.

Changes may be made in the form and arrangement of parts without departing from the spirit and scope of my invention; but

What I claim, and desire to protect by Letters Patent of the United States, is—

1. In a telephone-switchboard, line-terminals, plugs for the terminals, movable contacts having portions adjacent each of said plugs and adapted to be connected with any one of said plugs, and means for preventing all but a single plug from engaging one of said contacts not in use.

2. In a telephone-switchboard, line-terminals, plugs for the terminals, movable plates having portions adjacent each of said plugs and adapted to be connected with any one of said plugs, and means for preventing all but a single plug from engaging one of said contacts not in use.

3. In a telephone-switchboard, line-terminals, plugs for the terminals permanently carried by the board, and arranged in polygonal figures, and longitudinally-movable contacts

having portions adjacent each of said plugs and adapted to be connected with any one of said plugs.

4. In a telephone-switchboard, line-terminals, plugs for said terminals permanently carried by the board and arranged in polygonal figures, and slidable contact-plates having portions adjacent each of said plugs and adapted to be connected with any one of said plugs.

5. In a telephone-switchboard, line-terminals, plugs for said terminals permanently carried by the board and arranged in polygonal figures, and slidable contact-plates, having openings therein adjacent each of said plugs and through which the latter are adapted to pass to connect any one of said plugs with any one of said plates.

6. In a telephone-switchboard, line-terminals, plugs for said terminals permanently carried by the board and arranged in polygonal figures, slidable contact-plates having openings therein adjacent each of said plugs and through which the latter are adapted to pass and means for connecting said plugs with said plates.

7. In a telephone-switchboard, line-terminals, plugs for said terminals, slidable contacts having portions adjacent each of said plugs and means carried by said plugs for engaging a contact not in use and for connecting the same to the terminals.

8. In a telephone-switchboard, line-terminals, plugs for said terminals, slidable contacts having portions adjacent each of said plugs, means carried by said plugs for engaging a contact not in use and for connecting the same to the terminals, and means for moving said contacts into operative position.

9. In a telephone-switchboard, line-terminals, plugs for said terminals, slidable contacts having portions adjacent each of said plugs and pawls carried by said plugs for engaging a contact not in use and for connecting the same to the terminals.

10. In a telephone-switchboard, terminal plugs, movable contact-plates having portions adjacent each of said plugs and pawls carried by said plugs adapted to pass through openings in said plates for engaging a contact not in use and for connecting the same to the terminals.

11. In a telephone-switchboard, line-terminals, a plug for each terminal, a series of conductive plates, a part of each plate being adjacent each terminal, automatic devices for each plug for engaging any one of said plates, means for operating said plates to connect said terminals electrically with other points.

12. In a telephone-switchboard, line-terminals therein, a plug for each terminal, a series of slidable conductive plates a part of each plate being adjacent each terminal, pawls carried by each plug for engaging any one of said plates, electromagnetic means for oper-

ating said plates, said electromagnetic means being controlled by said pawls to connect said terminals electrically with other points.

13. In a telephone-switchboard, plug-socket 5 for each line-terminal, a plug for each socket, pawls carried by each plug, a series of slidable conductive plates adapted to be engaged by any of said pawls, magnets controlled by said pawls for drawing said plates 10 into operative position so as to be permitted to engage the pawls of but one plug at a time to connect said terminals electrically with other points.

14. In a telephone-switchboard, plug-socket 15 for each line-terminal, a plug for each socket, pawls carried by each plug having parts thereof insulated, a series of slidable conductive plates adapted to be engaged by the uninsulated parts of any of said pawls, 20 magnets controlled by said pawls for drawing said plates into operative position and electromagnetic clearing-out devices also controlling said magnets.

15. In a telephone-switchboard, plug-socket 25 for each terminal, a plug for each socket, a fixed conductor having parts adjacent each of said plugs, a battery connected with said conductor, a slidable contact carried by each plug adapted to connect said conductor and 30 the plug-socket, pawls carried by each plug, a series of slidable conductive plates adapted to be engaged by any of said pawls, magnets controlled by said pawls for drawing said plates into operative position, and electro- 35 magnetic clearing-out devices also controlling said magnets.

16. In a telephone-switchboard, plug-socket 40 for each terminal, fixed contacts adjacent said plug-sockets, a battery connected between said contacts, a plug for each socket, a fixed conductor having parts adjacent each of said plugs, a battery connected with said conductor, slidable contacts carried by each plug 45 adapted to connect said conductor and said contact and also to connect the parts of said plug-sockets with said fixed contacts to energize the lines, pawls carried by said plugs, a series of slidable conductive plates adapted to be engaged by any of said pawls, magnets 50 controlled by said pawls for drawing said plates into operative position and electromagnetic clearing-out devices also controlling said magnets.

17. In a telephone-switchboard, plug-socket 55 for each line-terminal, a plug for each socket, pawls carried by each plug, a series of slidable conductive plates adapted to be engaged by any of said pawls, magnets controlled

by said pawls for drawing said plates into operative position, electromagnetic clearing-out 60 devices also controlling said magnets, and projections carried by each slidable plate adapted to render said clearing-out devices inoperative when said plates are in their inoperative 65 or normal positions.

18. In a telephone-switchboard, plugs, pivoted pawls, carried by said plugs and a series of movable contacts with any one of which 70 said pawls are adapted to engage according to the position of said contacts.

19. In a telephone-switchboard, plugs, two pivoted pawls projecting from each plug, a series of movable contacts with any one of 75 which one of said pawls is adapted to engage when in inoperative position and with which the other of said pawls is adapted to engage when in operative position and means for moving said contacts into operative position.

20. In a telephone-switchboard, plugs, two 80 pivoted pawls, projecting from each plug, a series of movable contacts, connections between said pawls in each plug for causing one pawl to engage any one of said contacts when in inoperative position and for causing the 85 other of said pawls to engage the same contact when in its operative position and means for moving said contacts into operative position.

21. In a telephone-switchboard, plugs, two 90 pawls carried by each plug, said pawls being pivoted on the same axis and one of said pawls having a projection adapted to engage the other to cause each to rotate with the other when moving in one direction longitudinally 95 of the plug, movable contacts adapted to be engaged by said pawls and means for moving said contacts.

22. In a telephone-switchboard, plugs, two 100 pawls carried by each plug said pawls being pivoted on the same axis and one of said pawls having a projection adapted to engage the other pawl to cause each to rotate with the other when moving in one direction longitudinally of the plug, a spring for holding 105 one of said pawls in position within the plug, movable contacts adapted to be engaged by said pawls, and means for moving said contacts.

In testimony whereof I have signed my name, in the presence of two witnesses, this 110 6th day of August, 1903.

ISIDOR KITSEE.

Witnesses:

LEWIS H. VAN DUSEN,
EDW. W. VAILL, Jr.