(No Model.)

2 Sheets—Sheet 1.

W. J. GREEN.

TELEPHONE SYSTEM.

No. 249,611. Patented Nov. 15, 1881.

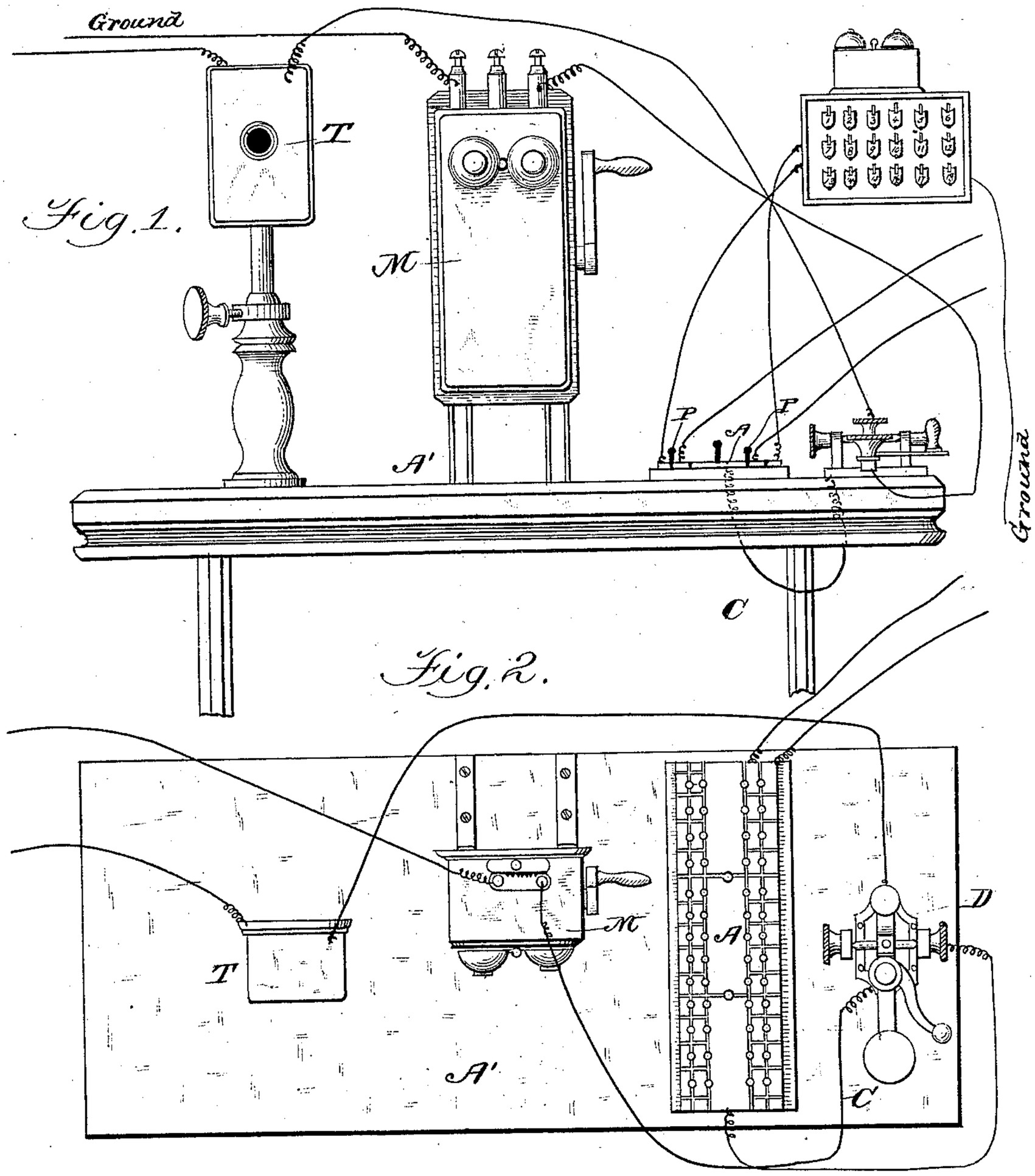
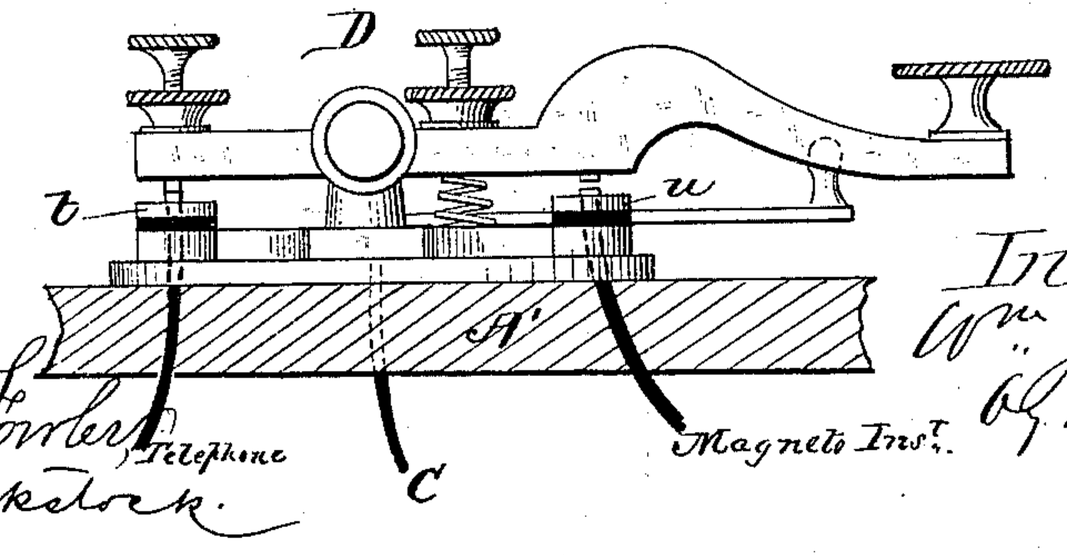


Fig. 1.

Fig. 2.

Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

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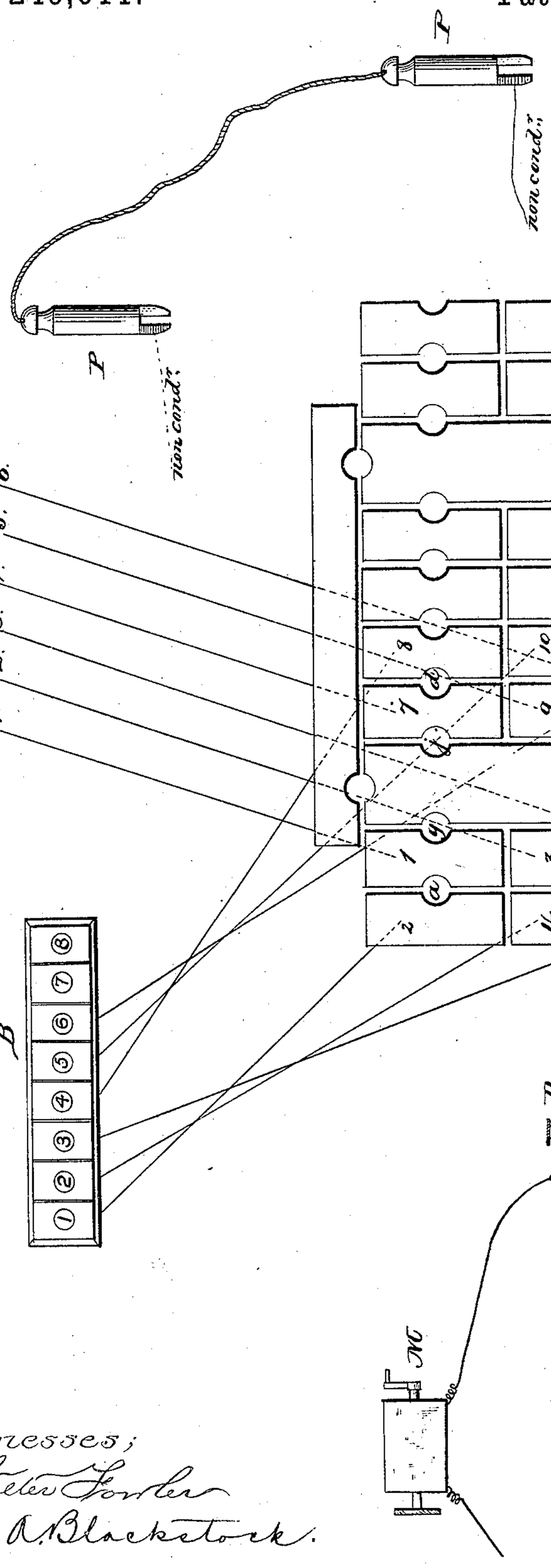

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UNITED STATES PATENT OFFICE.

WILLIAM J. GREEN, OF WASHINGTON, DISTRICT OF COLUMBIA.

TELEPHONE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 249,611, dated November 15, 1881.

Application filed April 26, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. GREEN, of Washington, in the District of Columbia, have invented a new and Improved Telephone System; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view of the invention in elevation; Fig. 2, a top view of the same; Fig. 3, a view of the signaling-key; Fig. 4, an enlarged plan view, illustrating the working of the system; Fig. 5, a view of a pair of the pegs with their flexible connections.

Similar letters of reference in the several figures denote the same parts.

The object of this invention is to improve the means for connecting, disconnecting, and otherwise operating a series of telephone-lines at a central station for the purpose of economizing time, labor, and expense, and increasing the convenience with which the operations of a central office can be carried on.

The invention consists in the new mechanical combinations hereinafter described and claimed.

In the drawings, A′ indicates a suitable table, upon which is arranged a long insulated metal plate or bar, A, capable of conducting electric currents. A series of short conducting bars or plates, 1 3 5 7 9 11, &c., are arranged on either side of the main plate A, but insulated from each other and from said main plate. A series of similar metal conducting-plates, 2 4 6 8 10 12, are arranged adjacent to the small plates first mentioned, so as to be readily put into electric connection therewith by means of suitable switches or pegs. The annunciator B is put in connection with the plates 2 4 6 8 10 12. The subscribers' lines are severally put in connection with the plates 1 3 5 7 9 11. The main plate A is connected by a suitable conductor, C, and switch D to the magneto-instrument M and to the telephone T, which are to be used by the operator at the central station. The instruments M and T, the annunciator, and the subscribers' lines are provided with ground-connections, as usual, and each of the subscribers' lines, as well as the central operator's line, C, has a battery of its own. Each or any number of the subscribers may use a magneto-machine instead of a battery for generating the current over his line, both arrangements operating equally well. Conducting-pegs P are employed to effect the electric connection of the different plates upon the table A′, said pegs being adapted to enter suitable sockets or holes, *a b c d e f g h i j k l*.

In the operation of this apparatus the conducting-pegs are normally arranged in the holes *a b c d e f*, but not in the other holes, and the switch D is arranged to put the telephone T in electric connection with the main plate A. In such case, when the subscriber calls—for example, the subscriber on line No. 3—the current upon line No. 3 comes in through plate No. 5, through which said line is connected, passes in through plug in hole *c* to plate No. 6, and then through the wire extending from that plate to the signal No. 3 of the annunciator, causing the annunciator to indicate to the central operator the line from which the call is made. Thereupon the operator changes the conducting-peg from the hole *c* to the hole *i*, thereby insulating No. 6 and putting plate No. 5 into electrical communication with the main plate A, and through said main plate with the telephone T. Inquiring through the telephone, he then learns from the subscriber that the latter desires to be put into communication with another subscriber—for example, on line No. 6—whereupon he moves the peg from the hole *i* back to the hole *c*, and then moves the peg from hole *f* to the hole *l*, thereby putting line No. 6 in electrical communication with the main plate A and insulating the latter from all lines save the one called. He then switches in his magneto-instrument and signals the number of the subscriber who is wanted on line No. 6, after which he puts the peg from hole *c* back to hole *i*. The two subscribers are thus put into direct communication with each other through their respective instruments and lines and through the common conductor A. If, now, while the lines of these two subscribers are in communication with each other, a call from another line is indicated by the annunciator, the central operator, first satisfying himself that the said two

subscribers have finished talking with each other, by listening at his own telephone, transfers the pegs from holes *i* and *l* back to holes *c* and *f*, so as to throw out the lines 3 and 6, and then puts the line on which the new call is made into connection with the main plate A, by transfer of the appropriate peg, after which he calls up the subscriber in the desired line, as before.

To enable two or more pairs of subscribers to hold communication with each other at the same time, it is only necessary to cut out the main plate and connect the pegs directly with each other. This I accomplish in a very simple manner by constructing one side of the pegs of conducting material and the other side of non-conducting material and connecting the two pegs by means of a flexible connection, as shown in Fig. 5. By inserting these pegs in the holes with their non-conducting sides bearing against the main plate, the said plate will be cut out, and the current, instead of passing through the pins and then through the main plate, will pass from one pin to the other through the flexible connection. The main plate, being thus cut out, is left entirely free, and any other two subscribers can be put into communication either through it by the employment of the ordinary pegs, or by another set of insulated pegs having flexible connections, and so on, any number of pairs of subscribers being allowed to communicate with each other at the same time. By simply turning the two-part pegs in their holes, so that the conducting half of each will be brought into contact with both the main plate and the small plate, the central operator, by listening at his telephone, is enabled to ascertain whether or not any pair of subscribers have finished communicating, and if they have to cut them out by transferring their pegs.

By the apparatus herein described the central operator is enabled to call up all the subscribers' lines or as many as he pleases at one and the same time, and to communicate with them all simultaneously. To accomplish this it is only necessary to connect each line-plate to the main plate A. When so connected any communication by him through the telephone T will be heard by all the subscribers who are connected to the main plate, and any words spoken through any one of the connected telephones will be heard by all the others. Of course, if two should undertake to speak at the same time, the sounds would be somewhat confused, but otherwise the connection is perfect.

The form of switch by which connection is made between the wire extending from the main plate to the magneto-instrument and to the central operator's telephone is immaterial, though I preferably employ for such purpose a telegraph-key, K, (shown in Fig. 3,) connecting the wire from the main plate to the center of the key, the telephone-wire to the insulated post *t* at the end with which the normally-depressed end of the key engages, and the wire of the magneto-instrument to the insulated post *u* at the other end. When the key is in normal position the telephone is in communication with the main plate A; but when it is desired to use the magneto-instrument to send a signal the key is depressed, whereupon the telephone is cut out and the magneto-instrument brought into effective connection with the wire leading to the plate A.

Instead of employing pins or pegs for effecting the connection between the various plates of the apparatus, any suitable form of connection may be employed—such, for instance, as ordinary pivoted switch-arms.

In an apparatus now in operation adapted to the control of twenty-five lines or circuits the various plates, switch, magneto-instrument, and telephone are all arranged upon a table no larger than an ordinary sewing-machine table, and the central operator is enabled to make the necessary connections and calls with great ease and celerity without leaving his seat.

The capacity of the apparatus can be increased indefinitely by connecting with the main plate A other main plates, A^2, each having the appropriate number of pairs of small plates arranged alongside it, as shown in Fig. 4.

While the form of the parts and their arrangement as herein shown has proved very convenient in actual practice, yet I do not limit the invention thereto, as the form and arrangement of the plates may be modified indefinitely, and yet produce the same practical results.

The main principle of the invention consists in bringing all the central terminals of the subscribers' lines to a central table or stand, at which the operator can sit, and there connecting to a set of exposed insulated plates provided with means for electrically connecting said plates in pairs and with a common conductor, by which any or all of them can be put into connection with the central operator's telephone and signaling-instrument.

I claim as my invention—

1. In a telephone system, the combination at a central station of a common conductor, a series of conductors with which a series of telephone-lines are connected, a second series of conductors connected to an annunciator, an annunciator, and a series of switches for connecting and disconnecting the annunciator-conductors with the line-conductors and the latter with the common conductor, substantially as described.

2. In a telephone system, the combination of the common conductor A with the line-plates 1 3 5, &c., the annunciator-plates 2 4 6, &c., the annunciator and its connections, the telephone-lines, and the pegs or switches for connecting or disconnecting, substantially as described.

3. The combination of the main conducting-plate and small plates alongside said main plate with pegs having one side of conducting material and the other side of non-conducting material, and the flexible connections between the pegs, whereby the main plate may be cut out entirely, or by simply turning the pegs brought in at any time by the central operator, substantially as described, for the purpose specified.

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