

958,315.

3. SHEETS—SHEET 1.



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Patented May 17, 1910.

3 SHEETS—SHEET 2.

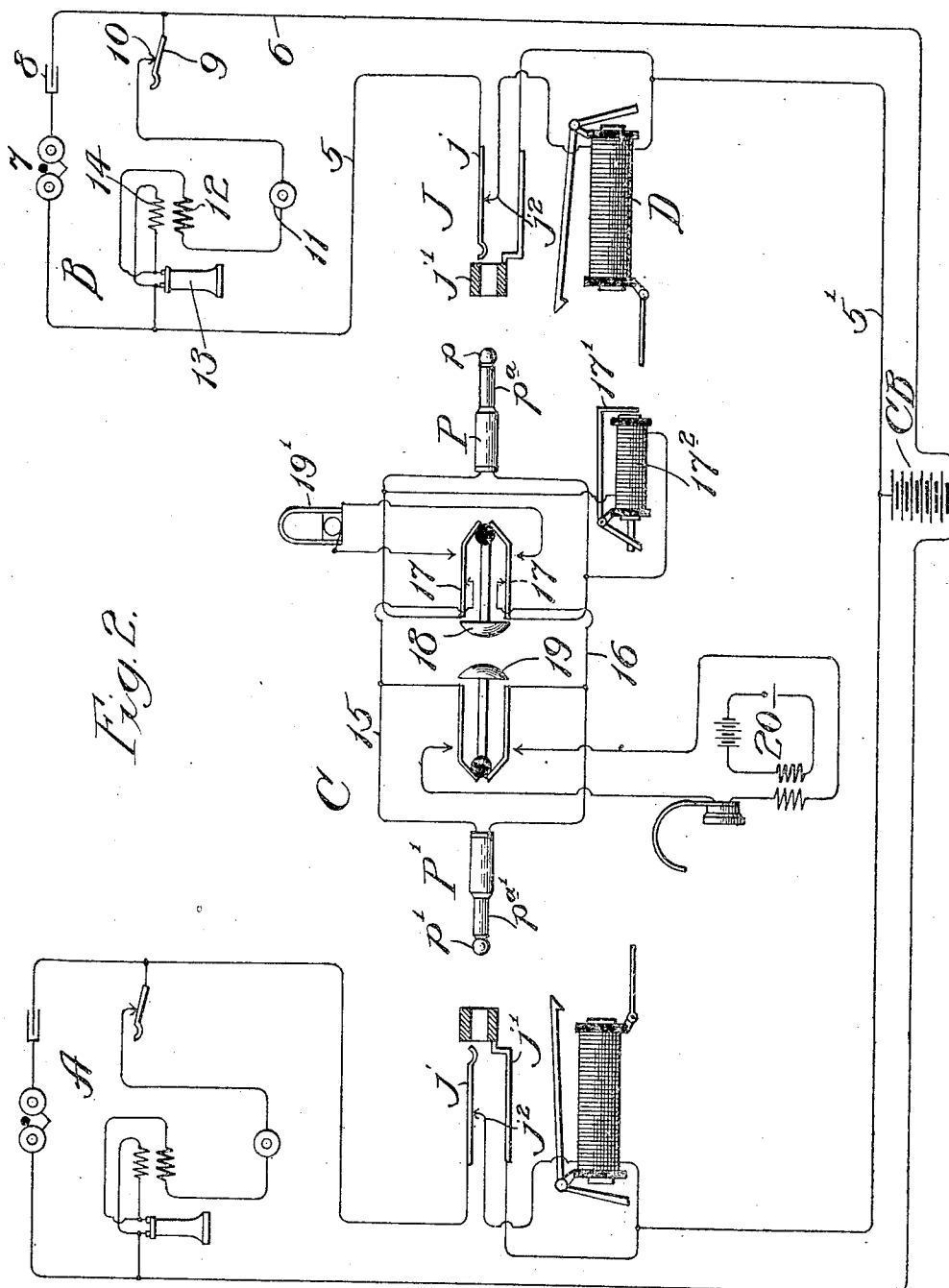


Fig. 2.

Witnesses:
 Chas. H. Bull
 Clyde Palmer

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3 SHEETS—SHEET 3.

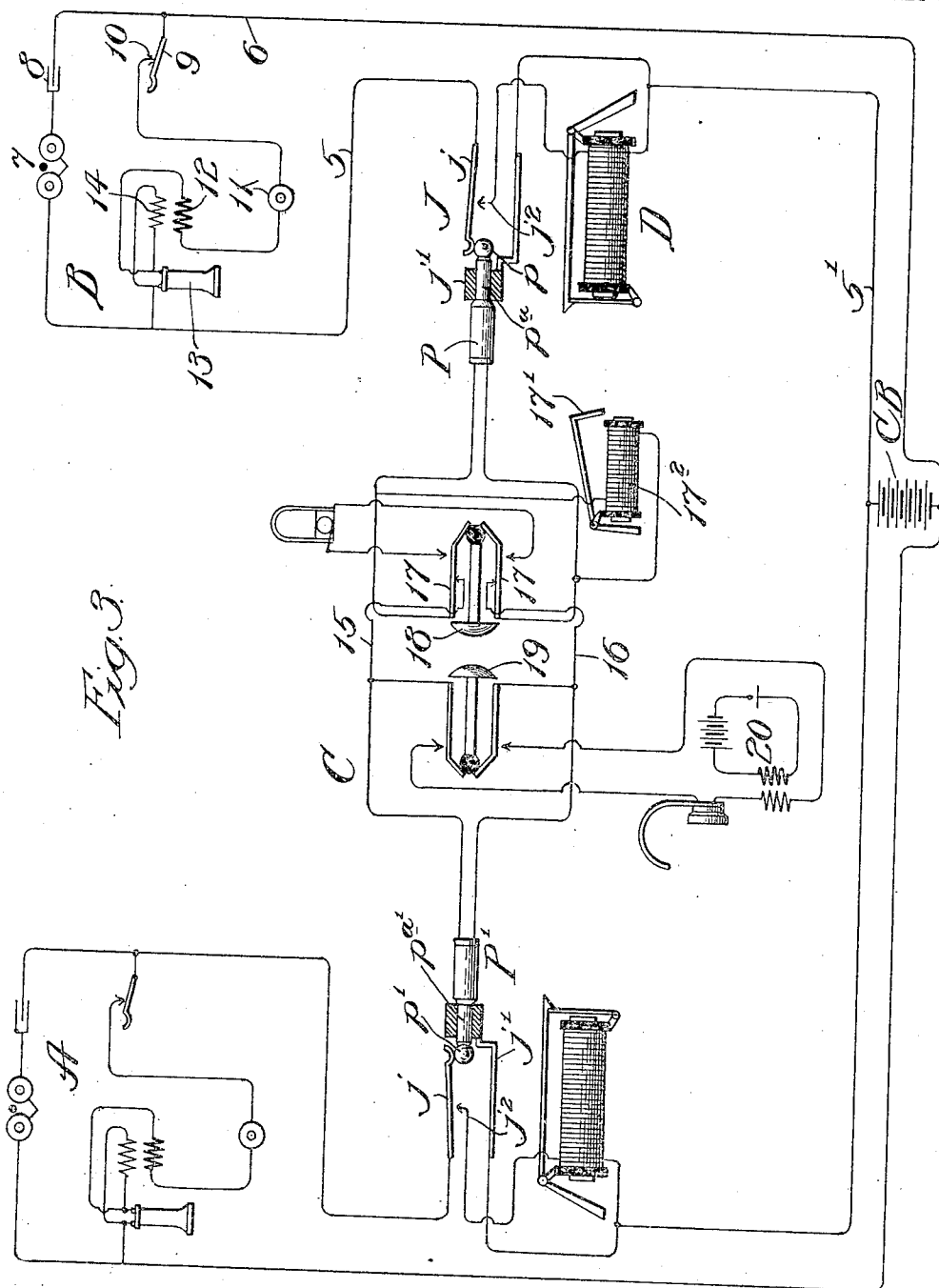


Fig. 3.

Witnesses:

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UNITED STATES PATENT OFFICE.

EARL C. RODMAN, OF WEST POINT, IOWA.

TELEPHONE SYSTEM.

958,315.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed December 28, 1908. Serial No. 469,667.

To all whom it may concern:

Be it known that I, EARL C. RODMAN, a citizen of the United States, residing at West Point, in the county of Lee and State of Iowa, have invented certain new and useful Improvements in Telephone Systems, of which the following is a specification.

My invention relates to improvements in telephone systems, and has for its general object to provide a system adapted for use in small exchanges, by means of simple apparatus, and a cheap, simple switch-board.

Another object of my invention is to provide a central energy system wherein the line is normally connected with a central battery, and the cord circuit is normally disconnected from the central battery; and further to provide a system wherein the connection of a cord with two lines breaks one leg of each line and establishes two closed loops, one local to the exchange and the other including both of the connected stations, said loops being bridged at one point by the common battery, and at another point by an inductive resistance, preferably constituting part of the clearing-out signal devices.

Other and further objects will become apparent to those skilled in the art from the following description taken in conjunction with the accompanying drawings, in which;

Figure 1 represents diagrammatically an embodiment of my invention with all parts in normal or idle position; Fig. 2 is a similar view showing the switch hooks raised and the line signals operated. Fig. 3 is a similar view showing the parts connected for communication between two subscribers. In the embodiment of my invention shown, A and B represent subscribers' stations, and C a central station equipment. The particular arrangement of apparatus at the subscribers' stations may be varied, but that which I show comprises at each station, a pair of line wires 5 and 6, bridged by a bell 7 and its condenser 8, and also by the instrument set comprising a switch hook 9 having an upper contact 10 connected with the transmitter 11, a repeating coil primary 12 and parallel connections including respectively a receiver 13 and the repeating coil secondary winding 14.

At the central station a jack J and drop D are provided, both connected only with the line 5. A tip contact j of the jack is

connected with what I will term the exterior section 5 of the line and the sleeve contact j' with the section 5' of the line local to the exchange, and the drop, constituting the line signal, is connected between the local section 5' of the line 5 and the contact j^2 with which the tip contact j normally contacts when the plug is removed from the jack. The central battery C B is bridged between the line leg 6 and the local section 5' of the other leg. The construction at the central station may likewise be varied in many particulars, but in general it comprises plugs P and P' having their tips p and p' respectively connected by one cord strand 15 and their sleeves p^a and p'^a connected by another cord strand 16, between which strands is bridged an impedance device 17², preferably in the form of a clearing out drop, the shutter 17' whereof is raised when the coil 17² is energized and dropped when the coil 17² is deenergized. Each leg of the cord circuit includes a switch, as at 17, controlled by a ringing key 18, which when depressed serves to open said switches and close the spring leaves thereof with contacts connected with the ringing generator, 19, to bridge the latter across the cord circuit on the side thereof toward the calling plug P; and a listening key 19 controls suitable contacts for bridging in an operator's set 20, of any suitable construction and arrangement.

In operation when a subscriber removes his receiver from the switch hook 9 the closure of the line circuit through the hook and its contact 10 completes the circuit from central battery C B through wire 6, the subscriber's set, exterior line wire 5, local section 5', jack contacts j and j^2 , drop D and local line section 5' back to the battery, so actuating the drop as shown in Fig. 2. Assuming such call to be registered by the subscriber A it will be seen that when the operator plugs in with answering plug P' the contacts j , j^2 are separated, and when the listening key 19 is depressed, the operator's set is cut into the line 5. When the desired call has been communicated to the operator and she plugs in with the calling plug P she may by depressing the ringing key 18 open the cord circuit and connect the ringing generator 19 into the leg 5 of the line of the called subscriber to actuate his bell 7. When the called subscriber responds the system is in the condition shown in Fig. 3, and two completely closed loops or circuits are estab-

lished, one local to the exchange including the local line sections 5', the two sleeve contacts j' of the jacks and the sleeve strand 16 of the cord; and the other, which I will
 5 term the talking loop including line wires 6, the two subscribers' instrument sets, the exterior sections 5 of the lines, the tip contacts of the jacks, and the tip strand 15 of the cord; the battery C B being bridged
 10 between one side of the talking loop and the loop local to the exchange, and an impedance device 17² being connected between the opposite side of the talking loop and the loop local to the exchange, so that the voice
 15 currents have an unimpeded path through the talking loop including the instrument sets at both exchanges, while the battery has parallel connections with the subscribers' sets through the common impedance de-
 20 vice. It will be observed that by this arrangement the cord circuit has no connection with the battery save through the lines when in use and may be of a very simple type, and that the entire equipment may be
 25 of simple and cheap construction from the installation standpoint. It will further be observed that the impedance device may operate as herein shown also as the clearing-out drop, its shutter standing in raised position as long as either subscriber retains
 30 his receiver off the hook, and falling as soon as both receivers are restored to their hooks and the connection of the impedance device with the battery cut off through both lines.
 35 What I claim is;

1. In a central energy telephone system, a central battery, subscribers' lines normally connected with said battery at the central station, an impedance device, and a cord

arranged when connecting two lines to es- 40
 tablish two loops metallicly complete, and substantially unimpeded one connecting the subscribers' stations in series, and the other local to the exchange, bridged at one point 45
 by the central battery and at another point by the impedance device.

2. In a central energy telephone system, a central battery, subscribers' lines normally connected with said battery each comprising two legs, bridged by the instrument set at 50
 the subscriber's station, and a central station equipment including cord strands arranged to respectively close two metallicly complete circuit loops respectively connected with opposite terminals of the 55
 battery, and one constituting a talking loop including both subscribers' stations in series, and an impedance device bridged across said cord strands at the side of the talking loop opposite the battery. 60

3. In a telephone system, a central battery, metallicly complete subscribers' lines between which said battery is directly bridged, a line signal normally in said circuit, a jack for opening one leg only of the 65
 line and cutting out the line signal, a cord circuit, comprising plugs and cord strands for connecting the tip contacts and sleeve contacts respectively, of the jacks, and an impedance device directly bridging said 70
 cord strands and normally disconnected from said battery.

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

EARL C. RODMAN.

Witnesses:

P. U. McDONNELL,
 O. T. WEBER.