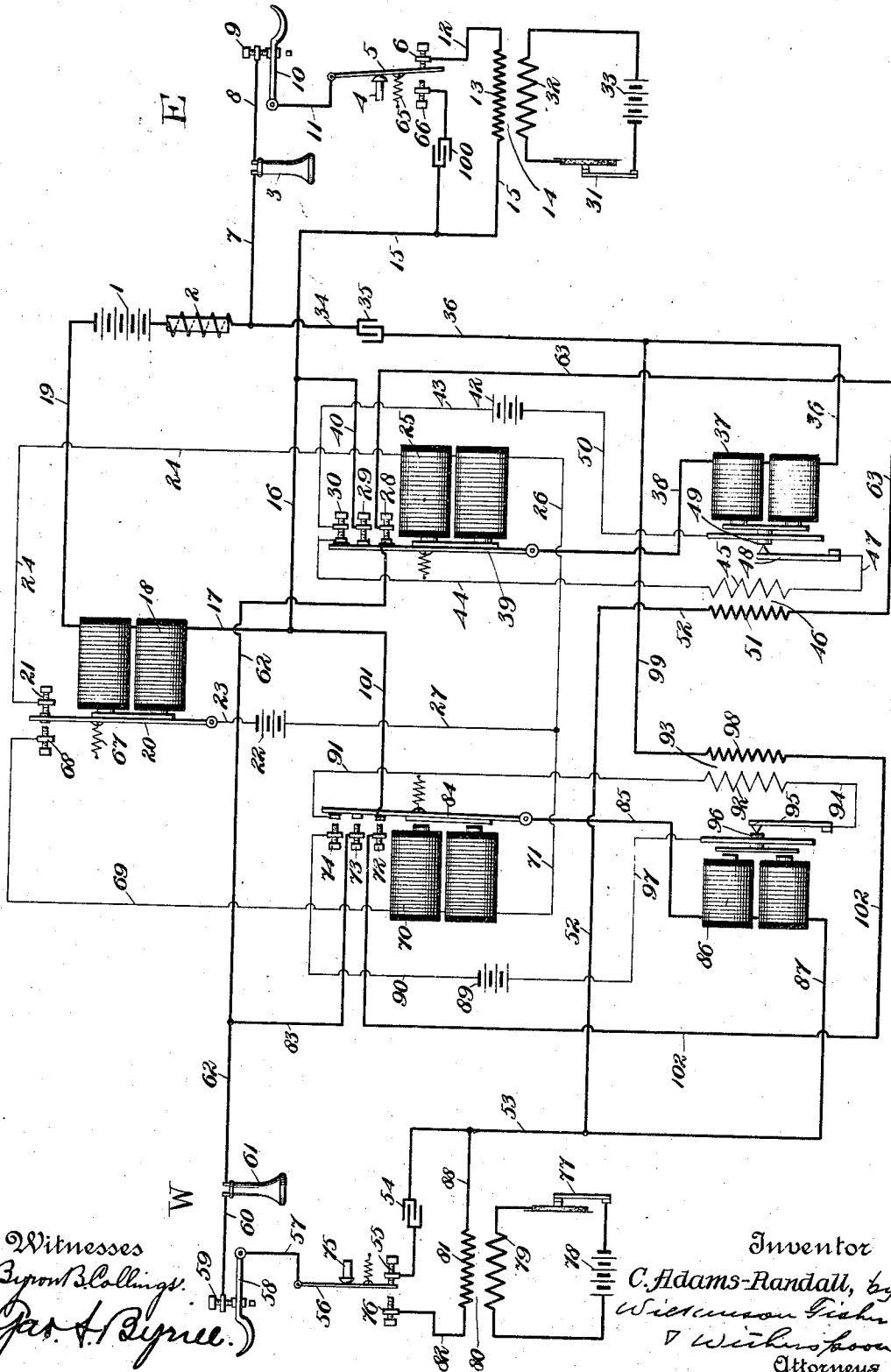


C. ADAMS-RANDALL.
 TELEPHONE REPEATING SYSTEM.
 APPLICATION FILED DEC. 20, 1910.

1,008,881.

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UNITED STATES PATENT OFFICE.

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TELEPHONE REPEATING SYSTEM.

1,008,881.

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To all whom it may concern:

Be it known that I, CHARLES ADAMS-RANDALL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Telephone Repeating Systems Controlled by Single Relay; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to electro-magnetic telephone repeating systems and has for its object to produce an apparatus of this nature which will be more efficient and simpler in construction than those heretofore proposed.

To these ends the invention consists in a plurality of independent sending and receiving main line circuits related to each other inductively by means of local circuits controlled by a single relay, and also in controllers governed by local circuits, which circuits are in turn also controlled by said single relay, all as will be more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification in which the figure is a diagrammatic illustration of a system arranged in accordance with my invention:—1 represents a main line battery; 2 an impedance coil, 3 a receiver, and 4 a push button.

Supposing an operator at an eastern station E wishes to talk to an operator at a western station W, he would first manually operate the push button 4 thereby closing contact between the lever 5 and the pin 6, which would permit current to flow from the battery 1 over the impedance 2, the wire 7, receiver 3, wire 8, contact 9, lever 10, wire 11, lever 5, contact 6, wire 12, secondary 13, of the induction coil 14, wire 15, wire 16, wire 17, through the coils of the main line relay 18 and wire 19 back to the battery 1. The passage of current through the relay 18 causes its armature 20 to contact with the pin 21 thereby permitting current to flow from the local battery 22 over the wire 23, said armature 20 contact 21, local wire 24, through the coils of the eastern controller 25, wire 26, and over the wire 27 back to the battery 22. The passage of

current through the controller 25 closes the contacts 28, 29 and 30. The operator at the eastern station E now talks into the transmitter 31 which causes varying currents to pass over the primary 32 of the induction coil 14 and back to the battery 33. These currents induce similar currents in the secondary 13 of said coil 14 which may be supposed to leave one end of said coil over the wire 12, contact 6, lever 5, wire 11, lever 10, contact 9, wire 8, through the receiver 3, wire 7, and wire 34 into the condenser 35. Similar currents will thereupon flow out of said condenser 35 over the eastern main line sending circuit 36 through the coils of the eastern repeater 37, eastern main line wire 38, armature 39 of the eastern controller 25, across the contact 29, wire 40, and wire 15 back to the other end of said secondary 13. The passage of currents through the eastern repeater 37 will permit current from the local battery 42 to pass over the local wire 43 across the contact 30, local wire 44 through the primary 45 of the eastern induction coil 46, wire 47, across the contacts 48, and 49, of the eastern repeater 37 and over the wire 50 back to the battery 42. The passage of currents through the primary 45 of the eastern induction coil 46 causes similar currents to be induced in the secondary 51 of said induction coil which may be supposed to leave one end of said coil over the western main line receiving circuit 52, wire 53, and into the condenser 54. Similar currents pass out of said condenser 54 across the contact 55 at the station W along the lever 56, wire 57, lever 58, contact 59, wire 60, receiver 61, wire 62, contact 28 at the eastern controller 25, and over the wire 63 back to the other end of said secondary 51. The passage of these last named currents through the receiver 61 of course, reproduces the original speech sent out from the station E at the station W.

Now, supposing it is desired to transmit speech from the western station W to the eastern station E, of course in such event the button 4 at E would be retracted through the operation of the spring 65 and contact would be made between the lever 5 and the pin 66, thereby breaking circuit from the battery 1 through said lever 5 and the contact 6. The breaking of this main battery circuit of course, deenergizes the main relay

18, and permits the spring 67 controlling its armature 20 to make the contact at the pin 68 thereby permitting current to flow from the battery 22 over the connections 23, 20 and 68, through the wire 69, the coils of the western controller 70, over the wire 71 and wire 27 back to the battery 22. The passage of current through the coils of the controller 70 closes the contacts 72, 73 and 74. The breaking of the main line circuit at the contacts 5 and 6 also deenergizes the eastern controller 25, and thereupon breaks circuit at the contacts 28, 29 and 30. The operator at the western station W now presses in the push button 75 thus closing circuit between the lever 56 and the contact 76. At the same time, he talks into the transmitter 77 and causes currents from the battery 78 to traverse the primary 79 of the induction coil 80, which in turn causes induced currents to leave one end of the secondary 81 over the wire 82, contact 76, lever 56, wire 57, lever 58, wire 60, receiver 61, western main line wire 62, wire 83, contact 73, armature 84, associated with the western controller 70, western main line sending circuit wire 85, coils of the western repeater 86, main line sending wire 87, wire 53, and wire 88, back to the other end of said secondary 81. The passage of current over this western main line sending circuit through the coils of the western repeater 86 permits current to flow from the local battery 89 over the local wire 90 through the contact 74, wire 91, through the primary 92 of the western induction coil 93, wire 94, across the contacts 95 and 96 of the western repeater and over the wire 97, back to the battery 89. The passage of current through the primary 92 induces currents in the secondary 98 of the induction coil 93, which may be supposed to pass from one end of said secondary over the eastern main line receiving wire 99, wire 36, into the condenser 35. Similar currents flow out of said condenser 35 over the wire 34, wire 7, through the receiver 3, at the eastern station E over the connections 8, 9, 10, 11, 5 and 66 into the condenser 100 out of said condenser over the wire 15, wire 16, wire 101 across the contact 72, and over the wire 102 back to the other end of the said secondary 98. The passage of currents through the receiver 3, of course, reproduces the speech originally sent out from the station W.

It will thus be seen that in this invention, I have provided a single main line battery 1, a single relay 18, in a main line circuit fed from said battery, and controlled by the push button 4. I also have provided a main line sending circuit including the condenser 35, the repeater 37 and the contact 29 of the controller 25. Further, there is disclosed a main line receiving circuit including the condenser 54, independent of the main line sending circuit, but adapted to receive mes-

sages from the sending circuit through a local circuit fed from the battery 42 and controlled by the repeater 37. This receiving circuit includes the coil 51, the wire 53, the condenser 54, the western receiver 61, and the contact 28 of the controller 25. It will also be observed that the controller 25 is in a local circuit controlled by the relay 18, and that the receiving circuit has associated therewith a controller 70 which is energized, however, only when said receiving circuit is being employed as a sending circuit. This controller 70 is likewise governed by the single relay 18. Said receiving circuit also has associated therewith a repeater 86 which is also energized when said receiving circuit is being employed as a sending circuit. Associated with said receiving circuit is likewise a local circuit fed from the battery 89 and governed by the controller 70, which local circuit has an inductive relation to the eastern main line circuit when it is employed as a receiving circuit. This case differs from my other copending application No. 598,343 filed December 20, 1910 and entitled "Telephone repeating systems" among other things, in that said copending application employs a relay in a local circuit instead of in the main circuit as does the present case, and in that the controller 19 of said copending application governs at its back stop 78 a local circuit through its relay 82, while no such construction is employed in the present case. The present case also differs from my other copending application, Serial No. 598,344 filed December 20, 1910, and entitled "Telephone repeating circuits" among other things, in that said second copending application employs two relays instead of a single relay as does the present case, and further that said relay is in a local circuit instead of being in a main line circuit, as has been disclosed above.

It is obvious that those skilled in the art may vary the arrangement of parts without departing from the spirit of my invention, and, therefore, I do not wish to be limited to the arrangements shown, except as may be required by the claims.

What I claim is:—

1. In a telephone repeating system, the combination of a main line sending circuit; a main line receiving circuit independent of said sending circuit; local circuits in inductive relation at different times with said receiving and sending circuits; repeaters in said main line circuits; controllers at different times governing said circuits; and a single relay in a main line circuit governing said controllers, substantially as described.

2. In a telephone repeating system, the combination of a main line sending circuit provided with a condenser; a main line receiving circuit independent of said sending circuit and also provided with a condenser;

local circuits inductively associated at different times with said main line circuits; repeaters controlling said local circuits; controllers governing said main line circuits; and a single relay governing said controllers, substantially as described.

3: In a telephone repeating system, the combination of a main line sending circuit provided with a condenser; a main line receiving circuit independent of said sending circuit and also provided with a condenser; local circuits inductively associated at different times with said main line circuits;

repeaters in said main line circuits controlling said local circuits; controllers governing said main line circuits; local circuits including said controllers; a single main line battery; and a single relay in a main line circuit fed from said battery governing said controllers, substantially as described.

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

CHARLES ADAMS-RANDALL.

Witnesses:

FREDERICK B. BLACKMAN,

JOHN J. CARROLL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."