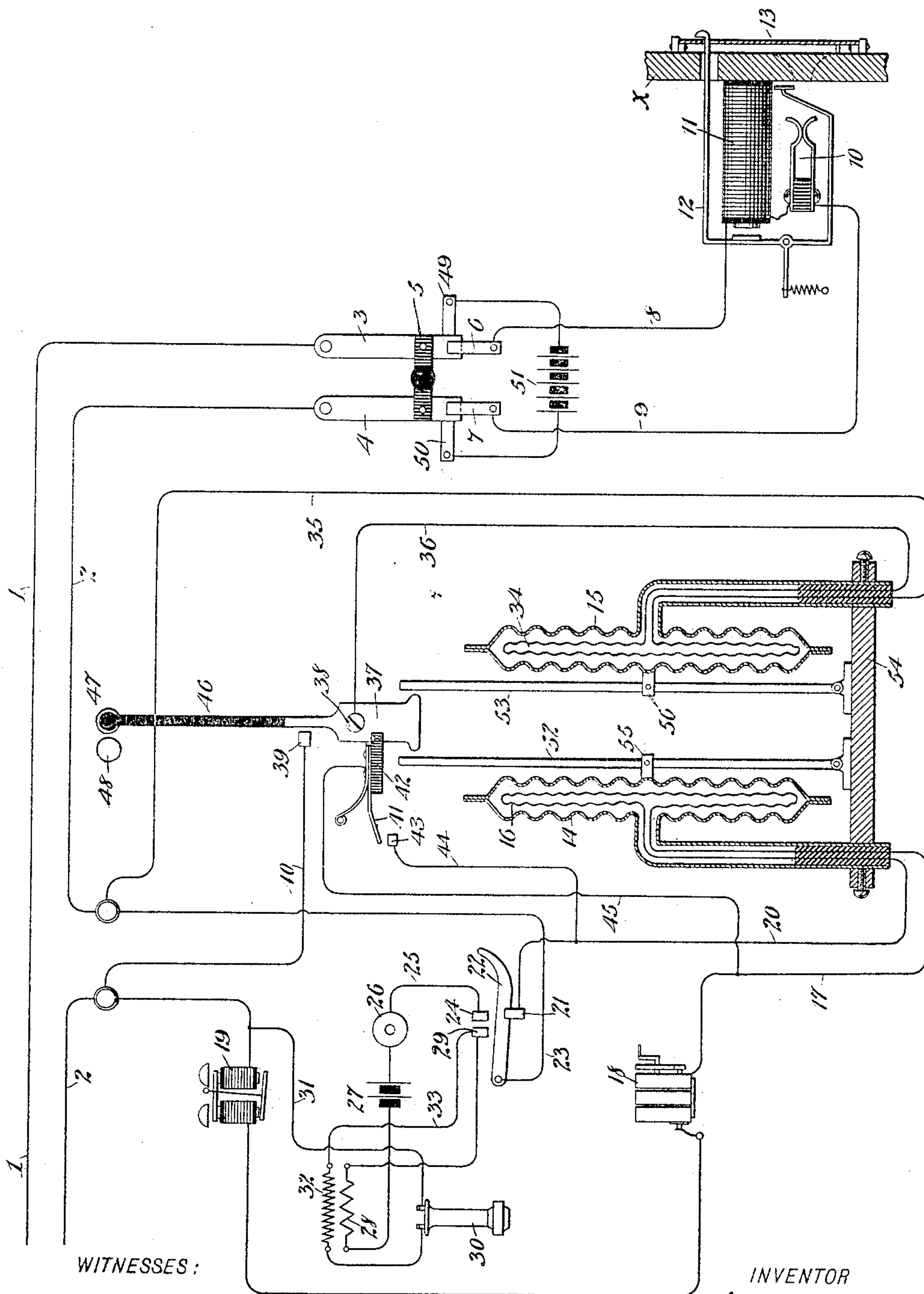


No. 801,778.

PATENTED OCT. 10, 1905.

C. E. EGAN.
TELEPHONE SYSTEM.
APPLICATION FILED SEPT. 26, 1899.



WITNESSES:

Edward Thorpe
C. R. Ferguson

INVENTOR
C. E. Egan
BY *Munn*
ATTORNEYS

UNITED STATES PATENT OFFICE.

CHARLES EDWARD EGAN, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE EGAN ELECTRIC AND TELEPHONE MANUFACTURING COMPANY, OF PETERSBURG, ILLINOIS, A CORPORATION OF ILLINOIS.

TELEPHONE SYSTEM.

No. 801,778.

Specification of Letters Patent.

Patented Oct. 10, 1905.

Application filed September 26, 1899. Serial No. 731,712.

To all whom it may concern:

Be it known that I, CHARLES EDWARD EGAN, of Chicago, Illinois, have invented a new and Improved Telephone System, of which the following is a full, clear, and exact description.

This invention relates to improvements in telephone systems in which a number of telephones are arranged on a single circuit; and the object is to provide a simple means whereby the operator at the central station may cut out the coil and bell circuits of all the intermediate telephones while conversation is held between two subscribers at the remote stations, thus reducing the resistance in the talking-circuit.

I will describe a telephone system embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure of drawing is a diagrammatic view of a portion of a telephone system, showing the jack and switch mechanism of the central station and a subscriber's telephone connected in accordance with my invention.

Referring to the drawing, 1 2 designate the main or line wires. These wires connect, respectively, with circuit-closers arranged at the central office and consisting of contacts 3 4, which for convenience in operation, as will be hereinafter described, are connected by a cross-piece 5 of insulating material. These contacts 3 and 4 normally engage the contacts 6 and 7, from which wires 8 and 9 extend through the spring-jack 10 and the electromagnet 11 on the switchboard. The armature 12 for the electromagnet 11 extends through an opening in the switchboard and normally engages with a drop 13, mounted to swing downward on the switchboard to disclose the number of a subscriber or a person calling central.

The line 1 2 is supposed to be a series party-line, and any one of the parties thereon may call central or any other party. The so-called "central" office, however, may well be, as it often is in practice, one of the subscribers' stations.

Arranged in the casing of each telephone or adjacent thereto are two heating-chambers 14 and 15, which consist of thin copper, pref-

erably corrugated, so that they can be easily expanded by heat to shift a shunt-switch. Arranged in the chamber 14 is a heating-coil 16, and one end of this coil has connection with a wire 17, leading to the main wire 2, and in this wire 17 is arranged the generator 18 and the ringer 19. The other end of the coil 16 connects by a wire 20 with the contact 21 in the telephone, which is normally engaged by the receiver-hook 22, and from the receiver-hook 22 a wire 23 leads to the main wire 2.

From the contact 24, adapted to be engaged by the receiver-hook when in its upper position, a wire 25 leads through the transmitter 26 to the battery 27, the primary 28 of the induction-coil, and thence to a contact 29, adapted to be engaged by the receiver-hook. The receiver is arranged in a circuit having connection through the wire 31 with the main-line wire 2, and in this receiver-circuit is the secondary 32 of the induction-coil, from which a wire 33 extends to the contact 29.

A heating-coil 34 in the chamber 15 is connected at one end through a wire 35 with the main-line wire 2, and the other end of said coil is connected by a wire 36 with a shunt-switch consisting of a metal plate 37, mounted to swing on a pivot 38 and adapted to engage with a contact 39, from which a wire 40 leads to the main-line wire 2. A contact 41 is mounted on a block 42, secured to the swinging circuit-controller 37, and this contact 41 is adapted to be engaged with a contact 43 under certain conditions, as will hereinafter appear. The contacts 41 and 43 are connected by shunt-wires 44 and 45 with the circuit containing the heating-coil 16.

The controller 37 has an upwardly-extended arm 46, designed to serve as an indicator to show the position of the switch 37—that is, when in one position the upper end of said arm will be seen through an opening 47 in the telephone-case and when in the other position it will be seen through an opening 48 in the telephone-case.

In operation when one subscriber desires to converse with another he turns the handle of the generator 18 of his telephone, which sends the current through the main wires, energizing the electromagnet 11 and causing the drop 13 to fall. The operator at the central sta-

tion upon receiving notice as to the subscriber with whom communication is desired places a connecting-plug in the spring-jack and in the usual manner, with a connection plug and cord, connects the two telephones. She then depresses the keys 3 and 4 against the contacts 49 and 50, respectively, which latter are connected in circuit with battery 51. The current from the battery passes to line 1, to return-line 2, and at each station except that calling by the following path: through ringer 19, generator 18, wire 17, to the heating-coil 16 in chamber 15, thence through wire 20, contact 21, hook 22, and wire 23 to line 2. The passage of the current through coil 16 at each station heats chamber 14, causing the same to expand, rocking lever or rod 52, which in turn comes into contact with and causes switch 37 to swing about its pivot. The movement of said switch to the left brings it against contact 39, and at the same time contacts 41 and 43 are brought together, thereby short-circuiting coil 16 and bringing coil 34 into line, the battery 51, however, being cut out before coil 34 is heated sufficiently to act. As the switch swings over in the manner just described its upper end 47 comes opposite the opening 48, thereby indicating to the subscriber at any station other than the one already in use that the line is busy. Furthermore, by reason of the switch making contact with 39 all others in the line excepting those in use and in which the hooks 22 are elevated are shunted, thereby reducing the resistance in the talking-circuit. Those in use will not be affected, because the hooks are up and coil 16 cut out. It is of course to be understood, as stated above, that the operator will maintain the battery 51 in circuit only long enough to heat coil 16 and cause the shifting of the parts as noted. When the subscribers are through conversing and it is desired to restore the line and all the telephones thereon to their normal condition, the operator will again throw in the battery 51, and inasmuch as coil 34 is in circuit therewith the chamber 15 will expand and the switch 37 will swing back to the position shown in the drawing, thereby breaking contact between 41 and 43, and 39 and the switch. The line will then be in condition for the repetition of the above operations when a further call is made. All

stations except those calling or called, which may have their receivers off the hooks, are shunted. The coil 34 does not throw back the switch, because the current is cut off. Current would pass through coil 16 of the calling-station after all had hung up, but continuing would pass through coil 34 and restore the switch.

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

1. In a telephone system, a telephone-circuit, telephones arranged in the circuit, heating-coils arranged in the circuit, chambers having corrugated diaphragms adapted to be expanded by air heated by the coils, and a circuit-controller for each telephone, the said controller being operated in one direction by one corrugated diaphragm, and in the other direction by the other corrugated diaphragm, substantially as specified.

2. The combination with a telephone, of a circuit-controller comprising a metal plate adapted to form part of the circuit, chambers arranged in the circuit and having corrugated expansive inner walls, swinging rods having connection with said walls, a circuit-controller adapted to be operated by said rods, heating-coils in the chambers, and means at a central office for controlling the heating-coils, substantially as specified.

3. In a telephone system, two opposite chambers having expansive corrugated inner walls, heating-coils in said chambers, the said heating-coils being located in shunt-circuits from the main line, and means under control at a main office for controlling the current passing through the heating-coils, substantially as specified.

4. The combination with a telephone, of a circuit-controller comprising a swinging plate, means, comprising heating-coils, for causing movements of said controller, and a circuit-closer carried by the controller for directing a portion of the current through one of the coils, should the other coil become overheated, substantially as specified.

CHARLES EDWARD EGAN.

Witnesses:

F. G. BATTLE,
H. P. MARKHAM.