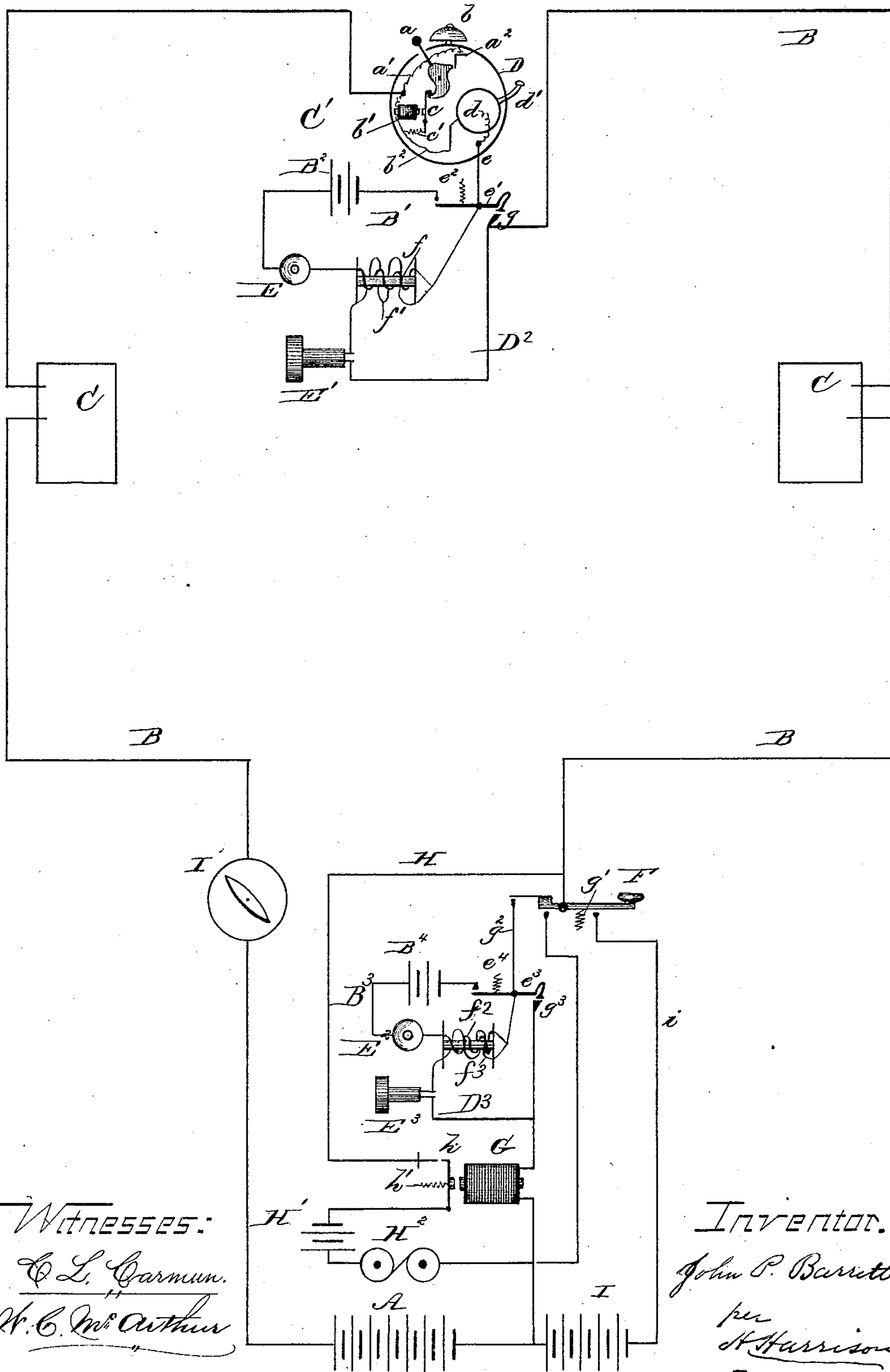


(No Model.)

J. P. BARRETT.
TELEPHONIC SYSTEM.

No. 284,594.

Patented Sept. 11, 1883.



UNITED STATES PATENT OFFICE.

JOHN P. BARRETT, OF CHICAGO, ILLINOIS.

TELEPHONIC SYSTEM.

SPECIFICATION forming part of Letters Patent No. 284,594, dated September 11, 1883.

Application filed October 9, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. BARRETT, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented an Improvement in Telephonic Systems, of which the following is a specification.

My invention has for its objects to facilitate the transmission of call and answer signals between outlying stations and a central telephone-office, and to enable stations of a telephonic system to be placed in and out of telephonic communication quickly and by means of simple apparatus.

With these objects in view the invention consists in certain novel combinations and arrangements of a main, local, and branch circuits, switching devices, and telephonic communicating apparatus, which will be hereinafter fully described, and pointed out in the appended claims.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the accompanying drawing, which shows a telephone system such as I describe.

A represents the main battery, located at the central office, and in a metallic circuit of main line marked B, in which I have indicated two stations, C C', and shown a third in detail at C'.

Each station C C' is provided with a box, D, containing an alarm mechanism, *d*, provided with an operating-lever, *d'*, and a spring-actuated hammer, *a*, pivoted within the box and adapted to strike an alarm upon a bell, *b*.

b' is an electro-magnet within the box D, and connected to the main line, as shown, and also to the alarm mechanism, by a wire, *b''*. This magnet is furnished with a hinged armature-trigger, *c*, which engages with the hammer *a*, when it is drawn back, and prevents its contact with the bell. The armature *c* is also provided with a spring, *c'*, which is just strong enough to overcome the normal attraction of the electro-magnet *b'* and keep them from contact.

a' represents a wire connecting the main line within the box D with a post, *a''*, with which the hammer *a* contacts when at rest, as will be presently understood.

The box D is connected by a wire, *e*, and switch-lever *e'* to the main line on one side

and directly to the main line on the other. This switch-lever *e'* is electrically connected at one end with the main line, and at the other end with a local circuit, B', containing a local battery, B², a transmitter, E, and the primary of an induction-coil, *f*, and connecting with the switch at its pivotal point. In connection with this primary coil *f*, I use a secondary coil, *f'*, connected by wire D², containing a receiver, E', with the main line, whereby a current over the local circuit B' will induce one through the secondary coil and receiver and off to the main line, as will be readily understood.

When not in use, the receiver E' hangs upon a bracket, *g*, under the outer end of the switch-lever *e'*, and while making the connection between the switch and the main line attached to said bracket the other end of the switch-lever is thrown down and breaks the connection of the local circuit, the receiver being short-circuited. When, however, the receiver is taken down for use, the connection between the switch-lever and bracket is broken, and the spring *e''* throws up the other end of the switch and makes the electrical connection of the local circuit, and places the receiver directly in the main line.

At the central office the line connects with a pivoted key, F, which is by a spring, *g'*, held in position to contact with the wire *g''* at one end, as shown. This wire connects with a switch-lever, *e''*, connecting with a bracket, *g''*, exactly, as already described, for the station C', and thence the line passes on through a relay, G, to the main battery A. The switch-lever *e''* is provided with a spring, *e'''*, and makes electrical connection at one end with the main line, and at the other end with a local circuit, B³, containing a local battery, B⁴, a transmitter, E², and the primary of an induction-coil, *f''*, and connecting with the switch at its pivotal point. In connection with the primary coil *f''* there is a secondary one, *f'''*, connected by wire D³, containing a receiver, E³, with the main line, whereby a current over the local circuit B³ will induce one through the secondary coil and receiver and off to the main line, as before described.

Above the key F connection is made to the main line by a local circuit, H, passing through the armature *h* of the relay G, which is held from contact with the relay and into contact with the branch circuit by a spring, *h'*, and

thence passes through a local battery, H' , then through a register, H^2 , and from this point passes on and makes connection with the key F , between its connection with the main line
5 and with the wire g^2 .

It will be seen that the register cannot be operated when the main line is broken at the key F , as in that case the circuit through the register is also broken, and when the main line
10 is closed at the key the magnet will attract the armature h and the register be operated, as this armature is attracted or released by the impulses of the main current. The other end of the key, when depressed, contacts with a
15 wire, i , passing to a battery, I , connected to the main battery A .

When the line is in its normal state, the current from the battery A passes over the line through the relay G , bracket g^3 , switch e^3 , wire
20 g^2 , key F , and line B , through the station-boxes, and back to the main battery through a galvanometer, I' . When the central office is to be called from a station, the hand-lever d' at said station is pulled down, thereby actuating the mechanism d to send a call, which
25 is received by means of the relay G at the central office.

The mechanism referred to above is an ordinary district-telegraph alarm-box of any of
30 the forms now in use—as, for instance, that patented to S. D. Field, No. 189,717, April 17, 1877.

The action of pulling down the lever d' throws back the hammer a through suitable
35 connecting mechanism, (not shown,) and engages it with the armature-lever c , the current from the main line passing through the mechanism d , wire b^2 , and magnet b' . The operator at the main office immediately depresses
40 the key F , breaking the connection first of the register-circuit H and then with the wire g^2 , connecting to the relay, and making the connection with the wire i , thereby throwing into the line the auxiliary battery I , the strength of
45 which, added to that of the main battery A , so intensifies the magnet b' at the station that the resistance of spring c' is overcome and the armature-trigger c drawn back, which releases the spring-hammer a to strike a blow upon the bell b
50 and notify the operator that his call is received. The register being operated by the making and breaking of the local circuit at the relay, it is necessary to break this circuit at the key during the sending of an answer-signal, in order
55 that the register may not be operated uselessly. The armature of the relay is always normally attracted and held, and thus breaks the register-circuit; but when the break in the main current through the relay-magnet occurs, the
60 armature springs off and makes connection in the register-circuit to record the call or message. The key F is made solid, with a spring upon its end, so bent as to still make the outer connection after the inner one is broken, thus
65 enabling one to break before the other. The operator at the station then takes down the receiver, thereby throwing his branch circuit

into the main line, and the operator at the central office having done the same and allowed the key F to resume its normal position,
70 the message is sent and received in the usual manner. As soon as the key F is released, the battery I is again cut out, the intensity of the magnet b' is lowered, the spring throws the armature off, and the current resumes its normal
75 course over the wire b^2 , spring c' , armature c , hammer a , post a^2 , and wire a' to the main line.

It will be observed that when the key F is depressed, the connection is broken first with
80 the circuit in which the register is situated and then with the local branch of the main office. This is to prevent the running off and wasting of the strip of paper on the register, which would occur if the breaking of the con-
85 nection should be reversed.

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

1. In a telephone-station apparatus, the combination, with a normally-closed main line, a
90 local circuit including the primary of the induction-coil of a transmitter arranged for connection with the main line, and a constantly-closed branch circuit including a re-
95 ceiver, of a switch-lever, and contacts adapted to be operated by the hanging of the receiver upon its support to break the local circuit, short-circuit the receiver, and shunt the main
100 circuit around it, and to be operated by the removal of the receiver to close the local circuit and include the receiver in the main circuit directly, substantially as described.

2. In the central-office apparatus of a telephone system, the combination, with the main
105 battery and normally-closed main line, an auxiliary battery normally out of circuit, and a local circuit, of the key and connections arranged to simultaneously add the auxiliary
110 battery to line and break the local circuit, substantially as described.

3. In the central-office apparatus of a telephone system, the combination, with the main
115 line and branch circuit including the relay, the local circuit including the register and a local battery, the armature of said relay arranged to make and break said local circuit, and the branch wire connected with one pole of a battery, the other pole of which is connected with the main line leading outward in
120 one direction, of the key arranged to, by a single movement, connect said battery and branch wire with the main line leading in the other direction, to break the local register-circuit, and after a slight interval to break the
125 branch circuit including the relay, substantially as described, and for the purpose set forth.

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

JOHN P. BARRETT.

Witnesses:

W. C. McARTHUR,
J. E. STEVENSON.