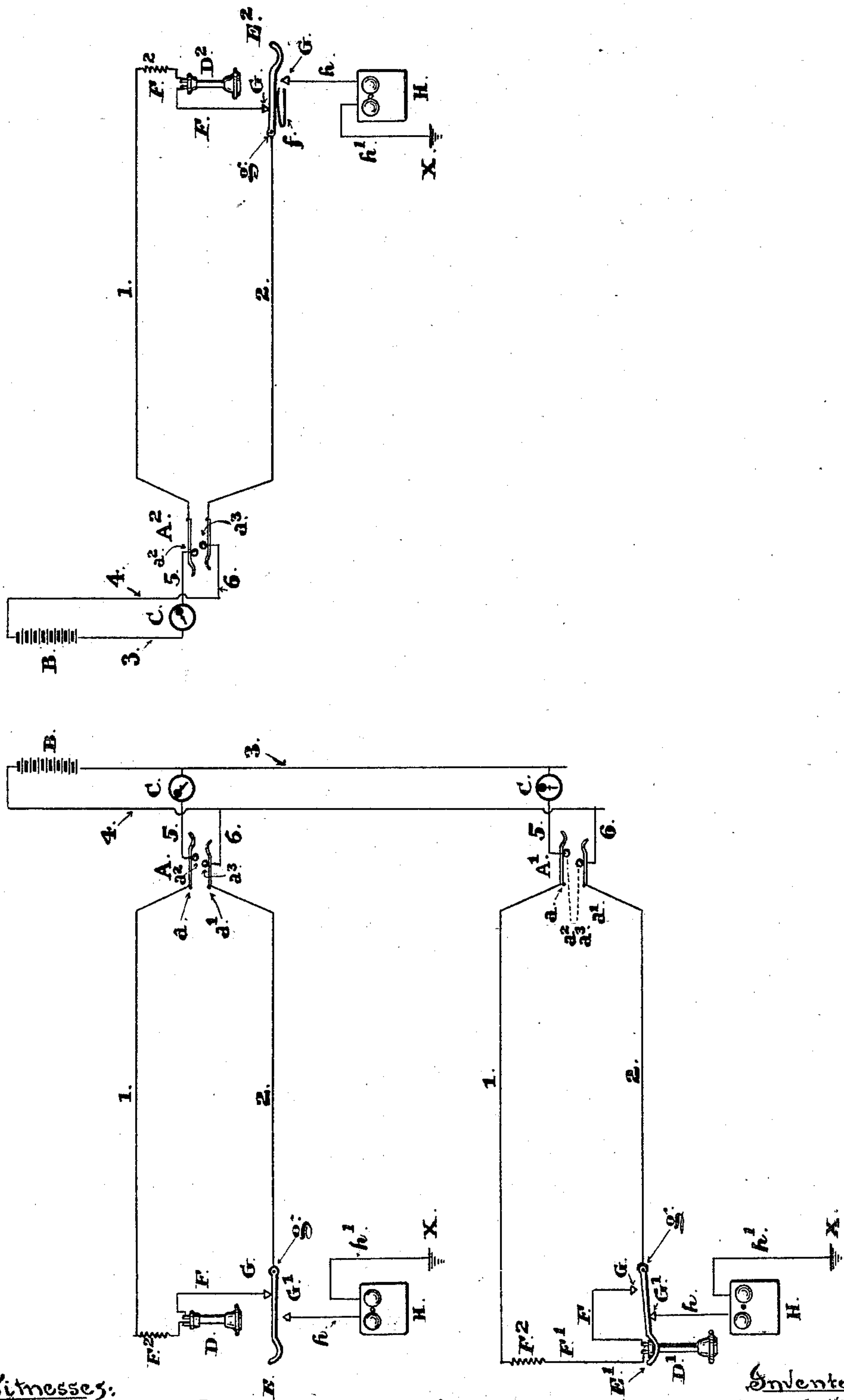


(No Model.)

J. I. SABIN & W. HAMPTON.
SIGNALING SYSTEM FOR TELEPHONE CIRCUITS.

No. 513,534.

Patented Jan. 30, 1894.



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UNITED STATES PATENT OFFICE.

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SIGNALING SYSTEM FOR TELEPHONE-CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 513,534, dated January 30, 1894.

Application filed August 18, 1893. Serial No. 483,480. (No model.)

To all whom it may concern:

Be it known that we, JOHN I. SABIN and WILLIAM HAMPTON, citizens of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Subscribers'-Station Signaling Systems for Telephone-Circuits, of which the following is a specification.

Our invention relates to improvements in signaling or "calling" the operator at a switching-station from the subscriber's-station in metallic circuit telephone systems.

The object of our improvement is to provide means or apparatus by which the subscriber operates an indicator, or visual signal, at the switching-station automatically by the act of removing his telephone from its hook; thereby dispensing entirely with the operation of "ringing-up" the station and saving the time consumed in securing the attention of the operator by means of the magneto-generator at the subscriber's telephone heretofore provided for the purpose.

Our invention is applicable more particularly to metallic circuits, and it consists, essentially of a signaling circuit at the station switch-board comprising a subscriber's calling-indicator, or visual signal, and a battery to which the indicator is permanently connected, in combination with a subscriber's metallic circuit composed of two wires open or separated at the subscriber's end, but connected at the switch-board to both sides of the calling-indicator circuit, and a shunt or short-circuit bridging the subscriber's circuit at his telephone, which shunt contains the subscriber's local transmitting and receiving circuit and his telephone-switch. These parts are so arranged and combined for operation that when the subscriber's telephone-switch is in its lowest position, that is, when his receiver is hung up, the shunt is broken and the calling-indicator circuit at the switching-station stands open, because the two wires of the main circuit are separated at the subscriber's end of the line; but as soon as the subscriber removes his telephone from its hook the shunt unites electrically the two wires of the subscriber's line, and consequently closes the circuit of the indicator-battery through the indicator. In connection

with this system of circuits we provide means of calling-up the subscriber from the switching-station, the same consisting in grounding one wire of the subscriber's line through his telephone-switch and his bell-signal; whereby the operator calls up the subscriber by throwing a battery at the switch-board upon the grounded wire of the subscriber's line in the usual way.

Our said invention is illustrated in the accompanying drawing to which reference is made in the following description by figures and letters.

The drawing illustrates the metallic circuits of three separate subscribers' lines and their connections at the station switch-board with individual calling-indicators.

A A' A² indicate the spring jack connections at the switch-board of three telephone circuits each circuit being composed of two line wires 1—2.

—B— is the battery of a local circuit at the switch-board, and —C— is a calling-indicator, or visual signal, for each subscriber's line placed in the circuit between the two sides of the battery; the wires of the battery circuit are indicated at —3—4. The connection of this indicator to the two sides of the battery —B— is made through a four-point jack in the switch-board the springs *a a'* of the jack forming the terminals of the line wires —1—2 and the points *a²—a³* of the jack being connected to the battery wires —3—4— by the wires —5—6. Thus the circuit from one side of the battery is through one wire —3— and its connection —5— to the point —*a²*— and through the spring —*a*— to one side of the subscriber's line; and from the other side of the battery through the wire —4— and its connection —6— to the point —*a³*— and through the spring —*a'*— to the other side of the line. The subscriber's indicator —C— is located in this circuit between one side of the battery and one of the points (—*a²* or *a³*—) of the spring-jack.

The two line wires —1—2— are permanently separated at the subscriber's end of the line, but at the switch-board they are closed upon the local indicator-circuit when the switching-plugs are out, and in that position of the springs —*a—a'* they are a part of the battery-circuit. By uniting the two wires

1—2— at the subscriber's telephone, therefore, the battery-circuit is closed, and the indicator —C— located in that circuit will be operated by the flow of the current over the line.

D—D'—D²— indicate the hand-telephones, and E—E'—E²— the switch-levers and hooks for the telephone in the three subscribers' circuits.

F—F'— are the wires of the subscriber's local transmitting and receiving circuit, and —F²— indicates the induction-coil of that circuit.

G— and —G'— are two anvils or "contacts" on opposite sides of the switch-lever; the upper one being set for contact with the lever when the weight of the telephone is removed from the hook and the lever is thrown up by its spring —f—, and the lower one —G'— having contact when the lever is held down by the weight of the telephone on its hook.

The wires —F—F'— of the local circuit are permanently connected to the upper contact —G— and to one line-wire of the subscriber's line, while the other wire of the line is attached to the switch-lever as indicated at —g—, so that the two wires of the line are closed by the shunt as soon as the switch-lever sets in contact with —G—. The metallic circuit is established for conversation, therefore, as soon as the hand-telephone is removed from its hook; and at the same time the battery —B— is thrown upon the calling-indicator at the switching-station. On the other hand, the indicator-battery circuit stands open through the line-wires and the indicator will not operate as long as the switch-lever rests in contact with the lower anvil —G'. To this contact —G'— the mechanism of the bell-signal is connected by the wire —h— and is grounded by the wire —h'—; so that the circuit of the line-wire which is permanently connected to the switch-lever is through the bell-signal to the "ground" —X—. The ordinary bell-signal can be used for the purpose; and in the position of the parts as before described, when the hand-telephone is on its hook and the metallic circuit stands open at the subscriber's end of the line, the operator is enabled to signal on one wire of the subscriber's line by throwing a battery upon that wire at the switch-board in the same manner as bell-signals are operated at the present time to call up the subscriber.

In the accompanying diagram the circuits of the subscribers —A— and —A²— are closed, and the battery is flowing through the indicators, because the line wires —1—2— are united by the subscriber's shunt; while the circuit of the subscriber —A'— is open and the indicator battery is off, because the hand-

telephone is on its hook and the two line-wires are separated.

One battery can be employed to operate any number of calling-indicators by connecting them to the wires of the battery-circuits as we have shown in the diagram.

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

1. Individual calling-indicators on a local battery circuit, in combination with subscribers' metallic circuits each composed of two line-wires connected to opposite sides of the said local circuit at the switch-board to form part of said local circuit, and means for uniting the two line-wires at the subscriber's telephone to close the battery upon the said indicators, substantially as described.

2. In a telephone-system, a subscriber's circuit composed of two line-wires normally separated at the subscriber's station, in combination with a calling-indicator circuit at the switching-station consisting of a battery and a calling-indicator in circuit with said battery through the subscriber's line and a shunt or short-circuit adapted to connect the two wires of the subscriber's line and close the circuit of the indicator, said shunt including the subscriber's hand-telephone and his telephone-switch, substantially as described, for operation as set forth.

3. In a telephone-system, the combination of a subscriber's circuit composed of two line-wires normally separated at the subscriber's station, a local circuit at the switching-station in which is included a calling-indicator and a battery, and four-point spring-jack connections at the switch-board by which the two wires of the subscriber's line are connected to and made a part of the said local circuit, a shunt or short circuit adapted to close the two sides of the subscriber's line, and a switch-lever having two anvils, or "contacts," to one of which said shunt is connected, and to the other of which is connected a bell-signal and a "ground," the lever of said switch being the subscriber's telephone-hook; whereby the circuit of the indicator-battery is closed through the indicators by the act of removing the telephone from its hook, and one side of the subscriber's line is "grounded" through the bell-signal when the telephone is hanging on its hook, as hereinbefore described, for operation as set forth.

In testimony that we claim the foregoing we have hereunto set our hands and seals.

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Witnesses:

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