

(No Model.)

3 Sheets—Sheet 1.

T. R. BRIMNER.
TELEPHONE AND RETURN CALL SYSTEM.

No. 545,402.

Patented Aug. 27, 1895.

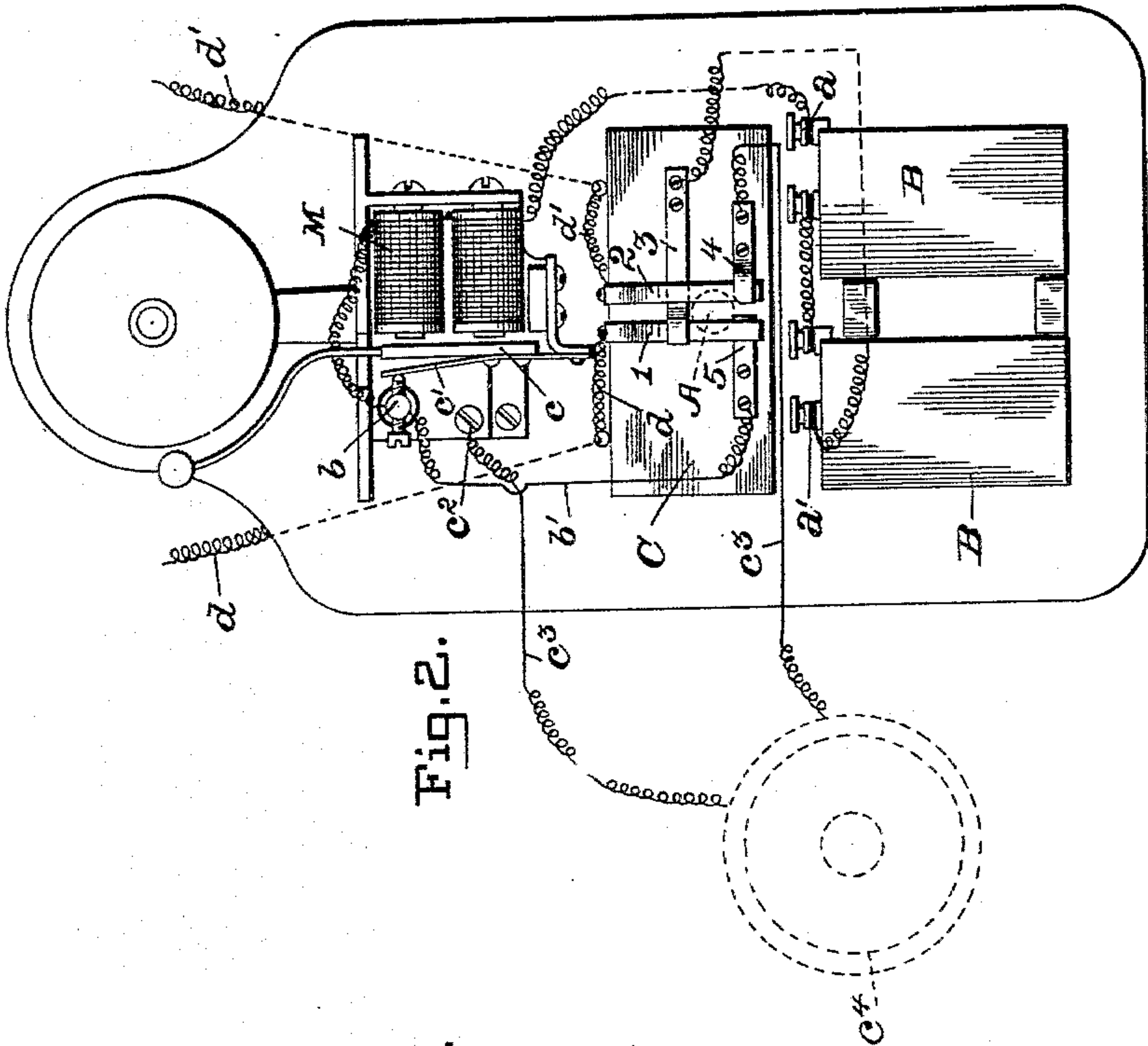


Fig. 1.

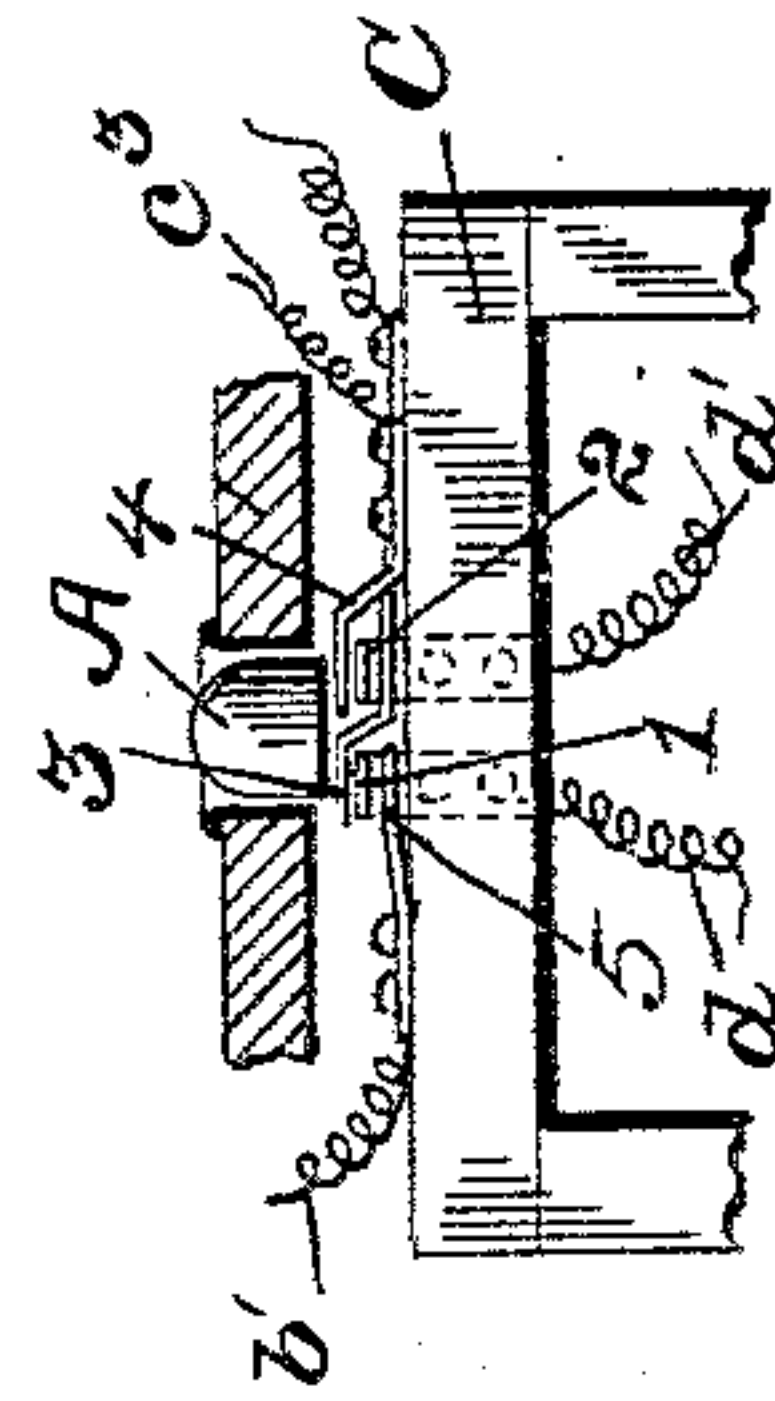


Fig. 2.

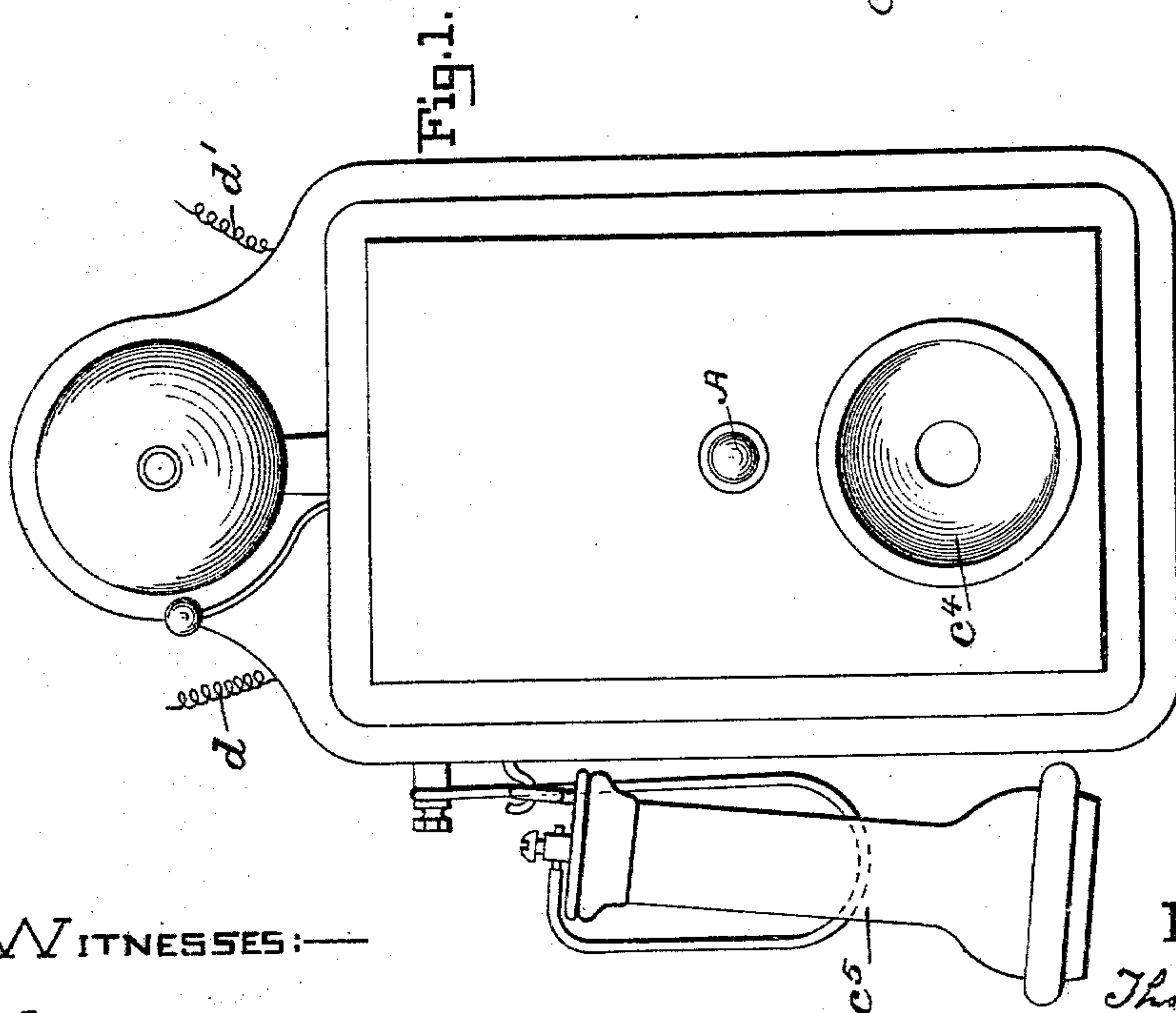


Fig. 3.

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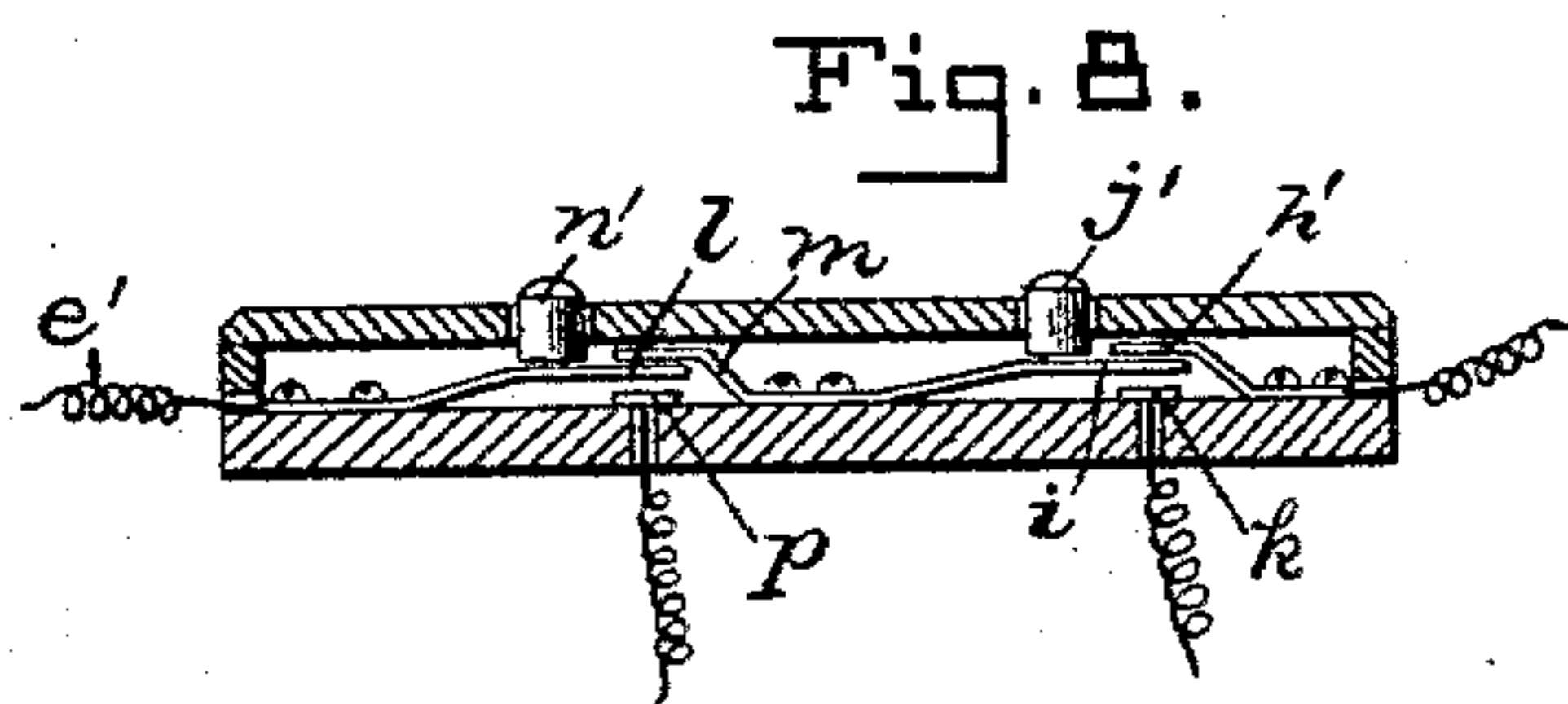
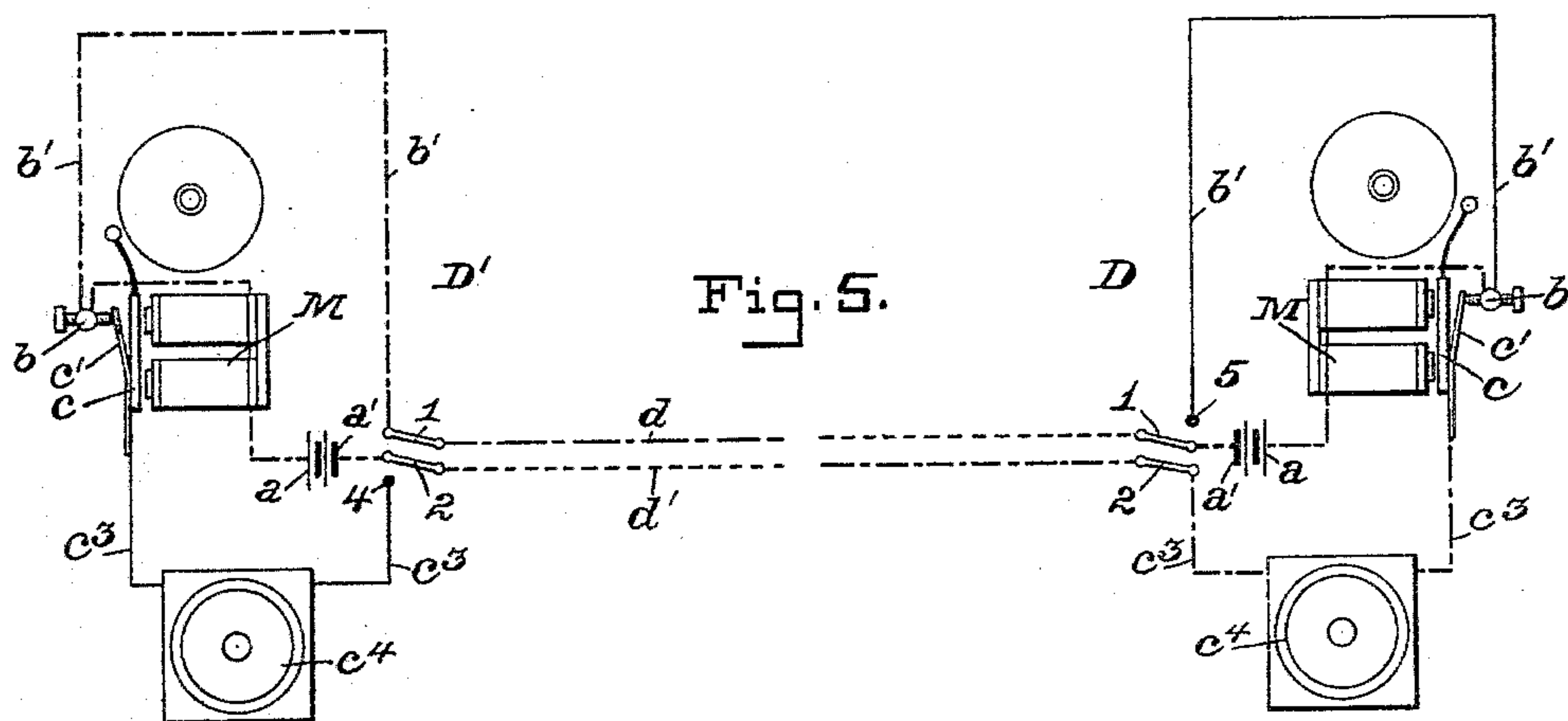
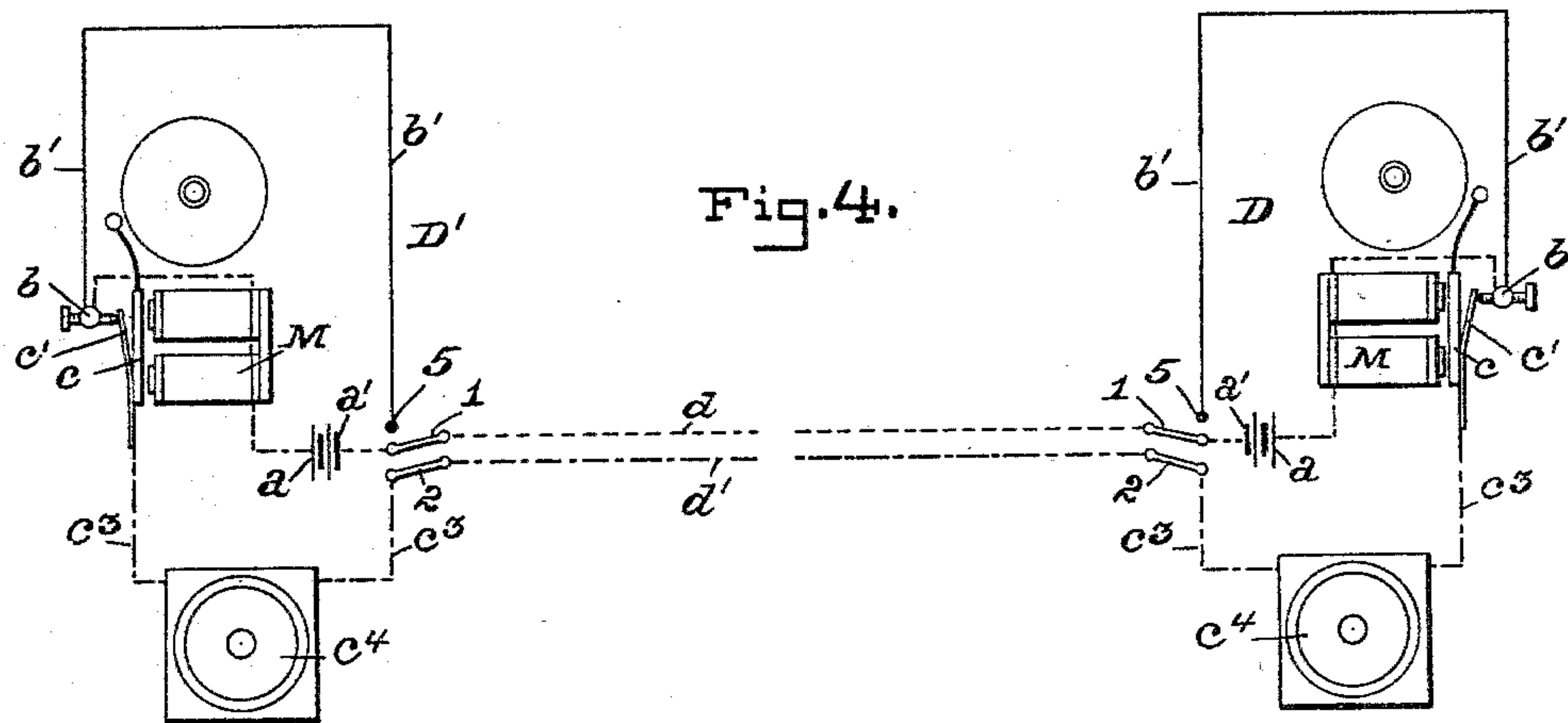
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Fig. 6.

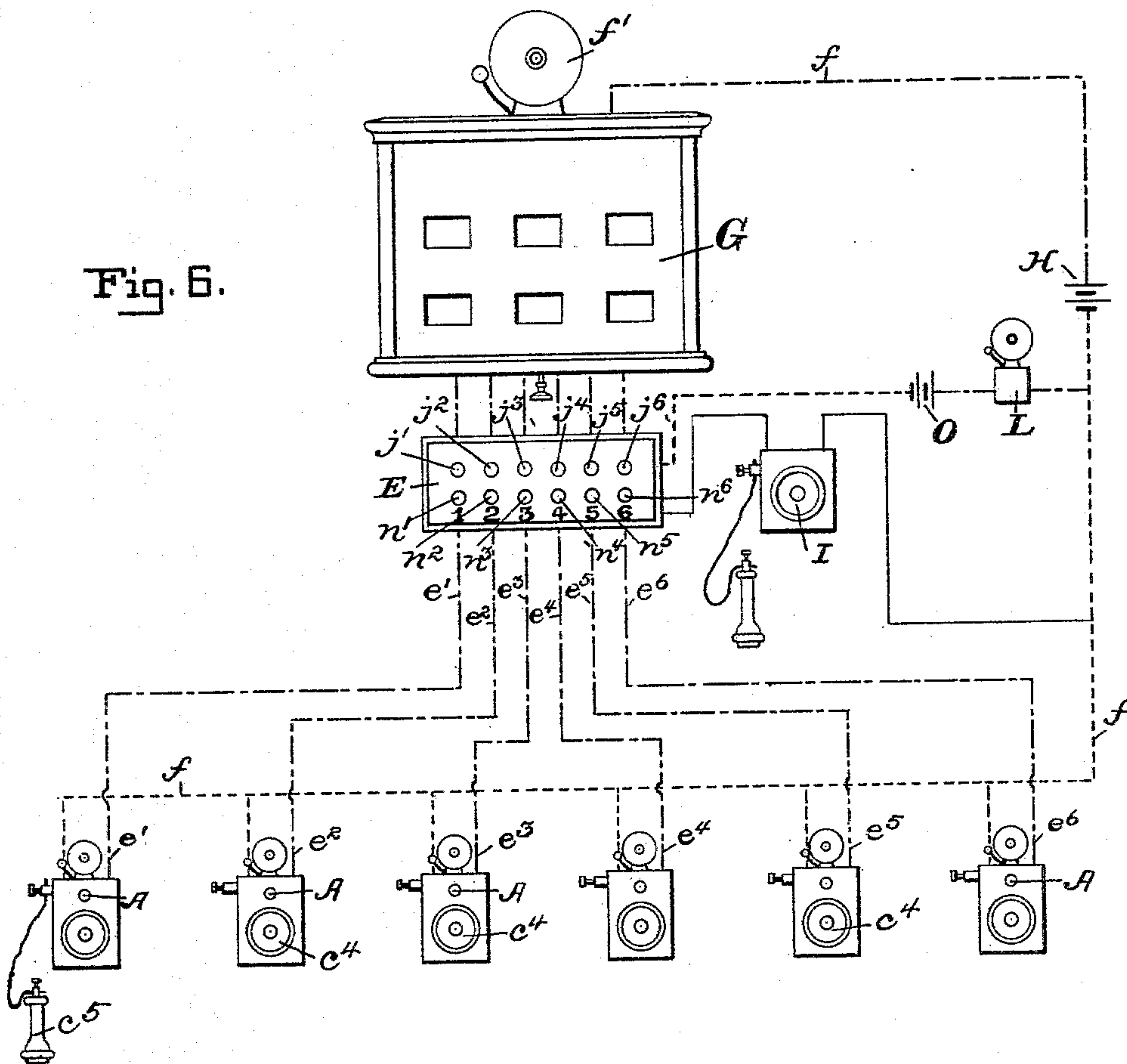
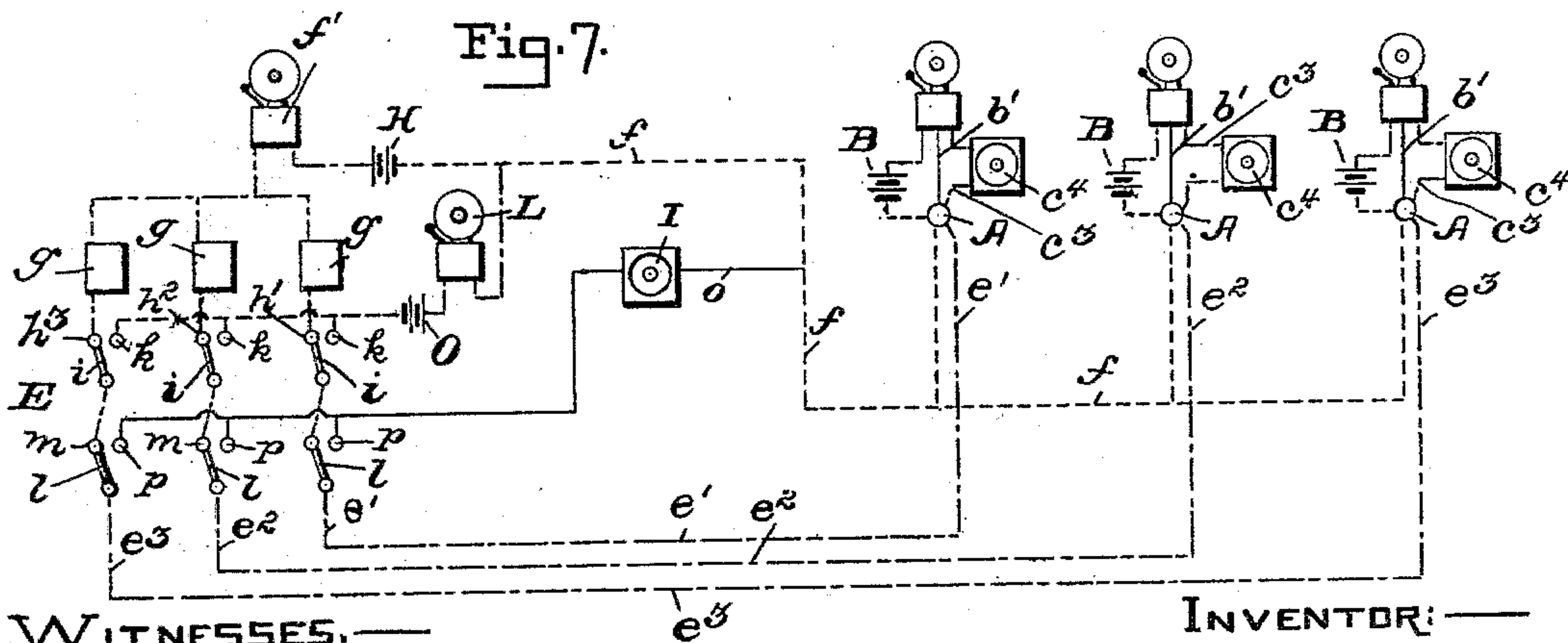


Fig. 7.



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UNITED STATES PATENT OFFICE.

THOMAS R. BRIMNER, OF BALTIMORE, MARYLAND, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE NORTH AMERICAN INTERIOR TELEPHONE COMPANY, OF BALTIMORE CITY.

TELEPHONE AND RETURN-CALL SYSTEM.

SPECIFICATION forming part of Letters Patent No. 545,402, dated August 27, 1895.

Application filed August 16, 1894. Serial No. 520,445. (No model.)

To all whom it may concern:

Be it known that I, THOMAS R. BRIMNER, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Telephone and Return-Call Systems, of which the following is a specification.

This invention relates to an improved telephone and return-call system combined with the ordinary annunciator, as the latter is used in hotels and other interiors.

The object of the invention is to provide for establishing a telephone and return-call between the office and rooms of a hotel without change in the wires of the annunciator-instrument of those leading from the office to the rooms. In this system each circuit, which comprises connections between any room and the office, has batteries connected normally in opposing polarity relatively to each other—that is, the positive pole of one battery is in connection with the positive pole of the other battery, and the negative pole with the negative pole. Thus normally the batteries are balanced and no current is produced. When one of these batteries has its pole connections reversed, which is here done by pressing a push-button, a current is produced by the combined electromotive forces of the two batteries.

In the accompanying drawings, Figure 1 shows a front view of the telephone and call-box placed in each room. Fig. 2 is a view of the same, the cover of the box being removed, showing the batteries, magnet, contact-plates, and the wiring thereof. Fig. 3 is a cross-section showing the bridge for carrying the contact-plates and the push-button engaging therewith. Fig. 4 shows a diagrammatic view of two call-boxes, telephones, and batteries connected up one with the other in opposing polarity and showing their normal relation. Fig. 5 is a view of the same parts seen in Fig. 4, but showing the pole connections of one of the batteries reversed and two call-boxes in operative relation, as when the compound push-button of one apparatus has been pressed and the signal is being sent. Fig. 6 shows a series of call-boxes and telephones connected with a central office. Fig. 7 shows

a system of three telephones connected with a central office, and illustrates the circuits and connections whereby the clerk at said central office can be called up while operating his switchboard, and whereby he can establish a talking-circuit with said call independent of all the other telephones. It also shows how a call from the central office may be made to any one of the telephones. Fig. 8 shows a vertical cross-section of the push-button board in the central office arranged and operated like two series of push-buttons, each button being capable of connecting up with two different circuits.

In the drawings the circuit connections are indicated by lines of three different characters, one being a continuous line, a second a broken line—all the dashes of which are of equal length—and a third a broken line composed of alternate long and short dashes. This method of illustration is resorted to for the purpose of distinguishing in the circuits the pole connections of the respective batteries.

By referring to the accompanying drawings, (see Figs. 1 and 2,) it will be seen that the apparatus in each room consists of a telephone-transmitter, a receiver, an automatic electric call-bell, battery with wire connections, and a compound push-button A. The call-bell of the apparatus in each room has two connections with the circuit, so that it may operate as a continuous vibrator bell or as a single-stroke bell, according to the flow of current through either connection. To accomplish this end each battery B of two apparatuses has a pole *a*, as—for instance, the negative—connected permanently through the electromagnet M with the contact-point *b* of the bell, which latter is insulated from the frame. This constitutes a portion of both the vibrator and single-stroke circuit connections of the bell. The contact-point *b*, referred to, has also a wire or connection *b'*, which leads to a contact-plate 5 of the compound push-button A, and forms the single-stroke connection of the bell. In the same circuit with the distant vibrating bell is a second bell at a point near the button pressed, arranged on a single-stroke connection—that is, having per-

manent or continuous connections with the circuit and giving a single-stroke only for each make of the circuit. The other or positive pole a' of the battery is connected to another contact-plate 3 of the compound push-button, and will be referred to later. The frame of the call-bell is in electrical contact (usual construction) with the bell-hammer armature c , and the make and break plate c' attached thereto. Leading from a suitable binding-post c^2 on the said frame and to a contact-plate 4 of the compound push-button is a wire or connection c^3 , which in its course takes into the circuit the telephone-receiver c^4 and transmitter c^5 of the ordinary type. This wire or connection c^3 forms a portion of the vibrator-circuit of the call-bell. As before stated, the vibrator or make and break plate c' is connected, through the receiver and transmitter, electrically with contact-point 4 of the compound push-button, and the single-stroke circuit of the bell from the insulated contact-point b is connected electrically with the contact-point 5 of the compound push-button. The contact-points 3, 4, and 5 referred to are each fixed permanently upon a bridge C, but are insulated from each other as indicated. The contact-springs 1 and 2 each have one end secured on the bridge and their free ends are directly under the push-button A, which projects through the box near the top. In Fig. 2 the push-button is indicated by a broken-line circle A. These contact-springs 1 and 2 form the terminals of the line-wires d and d' , respectively, and their arrangement is such that normally they are in contact only with the contact-plates 3 and 4, respectively; but when the button A is pushed the springs 1 and 2 are depressed, which first breaks their contact from plates 3 and 4 and then makes contact with plates 5 and 3, respectively. Thus it will be seen the normal pole connections of this battery are reversed.

When two apparatuses D D' located at different points (see Fig. 4) are connected up with one another the negative pole a of the battery, as before stated, is connected directly with the electromagnets and contact-point b of the local call-bell and apparatus D. The distant apparatus D' is likewise connected up with its negative pole a , connected with the electromagnets of its call-bell in the same manner. The other or positive pole a' of each of the two apparatus is connected directly with the contact-plate 3 of the compound push-button. The line-wires d and d' at the distant station, like those of the local station, are respectively connected with the contact-springs 1 and 2—that is, line-wire d connects the contact-springs 1 of both apparatus and line-wire d' connects the contact-springs 2 of both apparatus. Now, referring to the same diagram, Fig. 4, it will be seen that normally the local bell-circuit is made up from line-wire d , spring 1, contact-piece 3, positive side a' of the battery, negative side a of battery, magnet M of the bell, the contact-point b , cir-

cuit-breaker and frame of same and wire c^3 , to contact-piece 4 and contact-spring 2 to line-wire d' . The distant bell-circuit being connected up in the same manner, it will be seen that the negative pole a of the one battery opposes the same pole a of the other battery. The same being true of the positive poles a' , no flow of current is produced. In this condition, if the distant battery have its pole connections reversed, as in Fig. 5, by pressure on its compound push-button, a current is sent through the line and acts on the local bell as a vibrator. The vibrations of the local bell cuts up the current into an intermittent current, which acts on the single-stroke portion of the distant bell and causes it to vibrate in unison with the local bell as long as the push-button is kept pressed, showing that the signal is being properly transmitted. If when a button is pressed the local bell near that button rings it is proof positive that the distant bell rang also, for the local bell, having a "single-stroke" connection with its button, can only give a single stroke each time the circuit is closed by the vibration of the distant bell. Thus a person may know positively that his call was duly received at the distant bell. If the distant bell fails, from any cause, to ring, the fact is made evident by the failure of the local bell to vibrate. It will now be understood that if the compound push-button A of the local battery is pushed, the distant push-button being in normal position, the distant bell becomes the vibrator and the local bell the single stroke or repeating bell. Should the line become short-circuited from any cause when the compound push-button of both telephones are in their normal condition, then both bells will begin to ring, and so continue until the trouble has been remedied, for the reason that in the normal condition the vibrator-circuit is always complete.

The telephone receiver and transmitter may be wound with comparatively few turns of coarse wire where the line circuit is of small resistance (as in the case of a hotel) and connected in multiple with each other, preferably in the circuit between the vibrator of the bell and the spring-contact point 4; or telephones of the standard winding may be used, connected in series and arranged with an ordinary bell-switch, (two points,) to change by hand from signal-circuit to talking-circuit, and vice versa.

In Figs. 6 and 7 a series of telephones are shown connected up with a central office, in which case each call-box or telephone, like in the ordinary annunciator systems, is connected by an independent line-wire e' e^2 e^3 e^4 e^5 e^6 , with the push-button board E at the central office, and a second general wire f is connected by branches with all the telephones or call-boxes and then goes to the annunciator-bell f' in the office, which is connected in the circuits of all the annunciator-drops g encased by the annunciator-casing G. Each

annunciator-drop g is connected by a separate wire with a respective contact-piece h' h^2 h^3 , (see Figs. 7 and 8,) so placed that they normally make contact with spring-plates i , operated by push-buttons j' j^2 j^3 j^4 j^5 j^6 , corresponding to the different telephones and call-boxes in the line and connected therewith. Placed below the first series of spring contact-plates i , and to contact therewith, is a second series of contact-plates k , which will be referred to later. An electric battery H is placed in the office and is so connected in the annunciator call-bell circuit that its poles counterbalance all the other batteries along the line. The annunciator call-bell f' is only for calling the attention of the clerk to the annunciator when a person at one of the distant bells or telephones pushes the compound push-button A thereat. Placed below the first series of push-buttons j' j^2 , &c., are a second series of push-buttons n' n^2 , &c., for establishing the talking-circuit through a transmitter I in the office, which latter is normally out of the circuit. These push-buttons n' , &c., are in the line-wires e' e^2 , &c., between the respective telephones and the contact-plates i .

Connected with the line-wires e' e^2 e^3 , &c., are a series of spring contact-plates l l , which normally make contact with respective plates m , which are a continuation of the said spring contact-plates i . Below the spring-plates l of the lower push-button and to come into contact therewith, when the buttons n' n^2 , &c., are pushed, are a series of contact-plates P , connected with the transmitter in the office, from which a wire o leads to the general annunciator-wire f outside the call-bell f' . It will now be seen that if any one of the push-buttons n' n^2 , &c., is pushed a talking-circuit will be established with the respective telephone with which the contact spring-plate l of the button n' n^2 is connected.

Connected with the contact-plates k , before mentioned, of the respective push-buttons j' j^2 , &c., is an auxiliary call-bell L and battery O , the other sides of which are connected with the line or annunciator wire f . This circuit is provided in order that should the clerk wish to call up some predetermined telephone then he presses the respective button j' , &c., and establishes a circuit through the call-bell L and battery O and the desired telephone. The call-bell L in this case is connected up as a single-stroke bell, so as to respond to the vibrations of the distant call-bell. The clerk, after receiving a response to his call, releases the pressure on the button j' j^2 , &c., and then presses the corresponding button n' n^2 , &c., and establishes the talking-circuit. After the conversation is over, the clerk releases the pressure and thereby establishes the normal condition of the circuit.

The object in using an independent single-stroke bell L (see Figs. 6 and 7) in the office is to give notice to the clerk that his signal sent to a distant call-box is being transmit-

ted. By thus employing a separate bell L in the office to repeat the signal sent therefrom the bell f' of the annunciator is free to denote any signal that may happen at the same time to be sent to the office from a distant box.

The normal condition of the circuits in a general system is as follows: From one side of battery to local call-bell, thence to receiver and transmitter, to line, to annunciator-drops, to call-bell, to battery, thence along line back to local telephone and to battery.

When talking-circuit is complete, the circuit is as follows: From one side of battery to local call-bell, to receiver and transmitter, to line, to push-button board at office, to transmitter at office, and then back to line and back to battery.

When a person at any one of the several telephones desires to call up the office the button is pressed and a circuit is established as follows: From battery through call-bell, single-stroke contact-point, to line, to battery, to annunciator-drops, to push-button board, to line, to battery.

When the clerk at the office calls up a distant telephone call-box the circuit is as follows: From battery at office, to call-bell single stroke, to line, to battery at distant telephone, to vibrator call-bell, to receiver and transmitter, to line, to push-button board back to battery.

It is obvious that in some cases the bell-signal may be substituted by a visual signal.

It will be seen that by reversing the main battery (shown at H in Figs. 6 and 7) all the bells of the system may be rung simultaneously. This may be desirable in case of a fire, when it is wished to send an alarm to each room.

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

1. In a telephone and return call system for hotels and other interiors, the combination of a number of call-boxes, each box comprising a battery, bell and telephone-receiver and transmitter—said boxes being in the different rooms; a main battery, an annunciator, a push-button board, and a telephone receiver and transmitter all in the office; a circuit comprising two wires—one wire thereof having independent connection from a call-box in a room to the push-button board, annunciator, telephone receiver and transmitter and main battery in the office, and the other wire also having connection from the call-box in a room to a wire, f , which has a common electric connection with all the other call-boxes in the rooms and leads to the main battery in the office—the poles of said battery in the office being connected normally in opposing polarity relative to the poles of each of the batteries in the several call-boxes in the rooms so as to avoid the production of a current which will operate the annunciator or bells; and means for reversing the poles of either the main bat-

tery or any one of the call-box-batteries for the purpose of producing current to operate the call-bells of both the room and office instruments.

5 2. The combination of two batteries; two automatic electric call-bells; a circuit connecting said batteries in opposing polarity normally through the said call-bells; and two pole-reversing devices, one at each call-bell,
10 each arranged in the circuit and capable of making two different connections—one a vibrator stroke and the other a single stroke—between a call-bell and the circuit.

15 3. The combination of a circuit comprising two wires and including a source of electricity; two automatic electric call-bells in the said circuit; and means for making two different connections with each of the bells,—one a vibrating stroke connection in which the circuit
20 is automatically opened and closed by the action of the bell-hammer when a current is set up, and the other a single-stroke connection in which the circuit is permanent or contin-

uous—the bell giving a single-stroke only for each make of the circuit. 25

4. The combination of an automatic electric call-bell having one battery connection; two line wire terminals, 1, 2; a battery contact piece, 3; two call-bell contact pieces, 4, 5; and means for making contact between the one
30 line wire terminal and the battery contact piece, and the other line wire terminal with one of the call-bell contact pieces, 4, in the one case, or, in another case, for making contact between the last mentioned line wire
35 terminal and the battery contact piece and the first mentioned line wire terminal with the other call-bell contact piece, 5, for the purpose set forth.

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

THOMAS R. BRIMNER.

Witnesses:

STEPHEN S. CLARK,

GEO. Y. WISE.