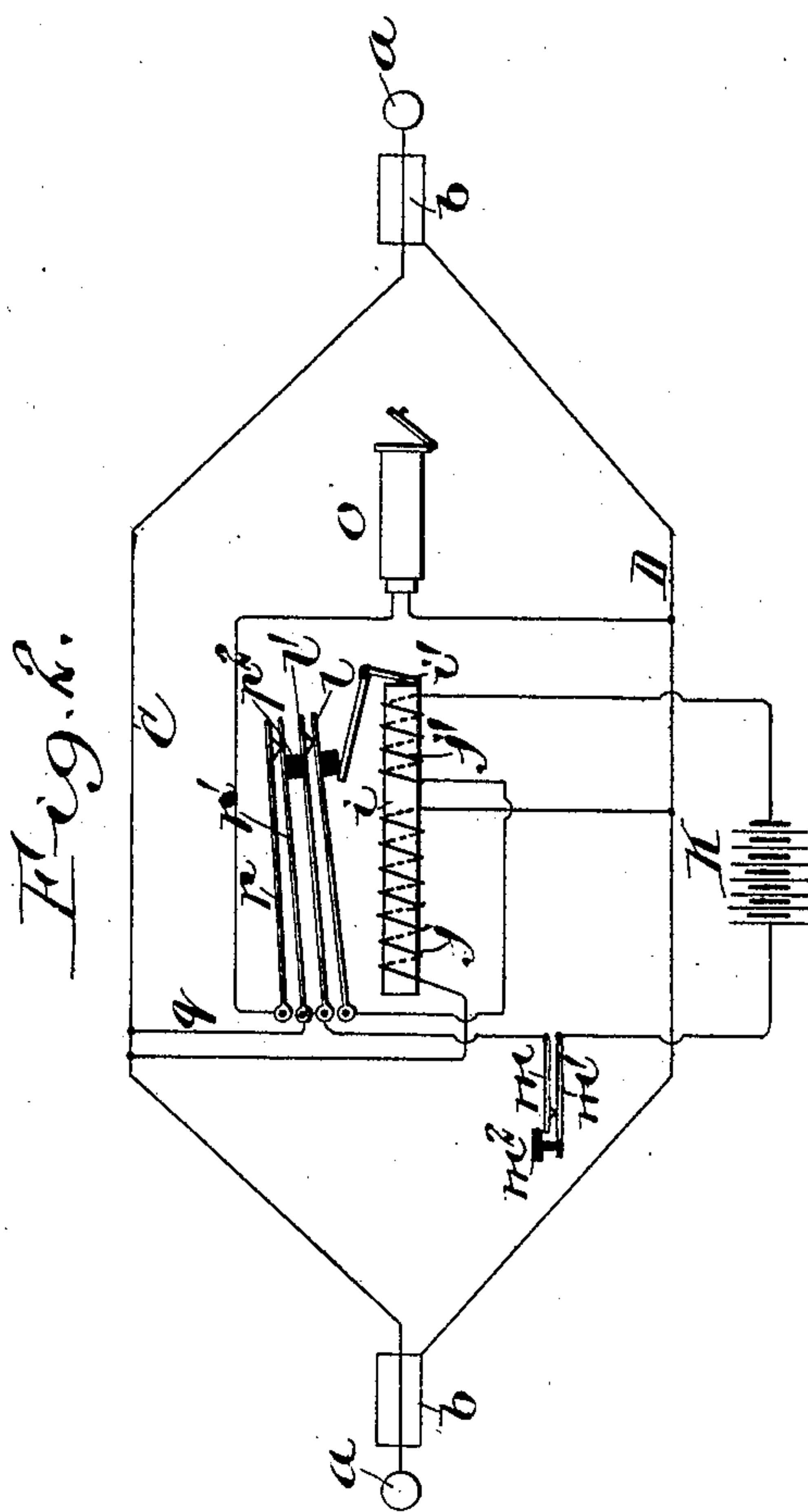
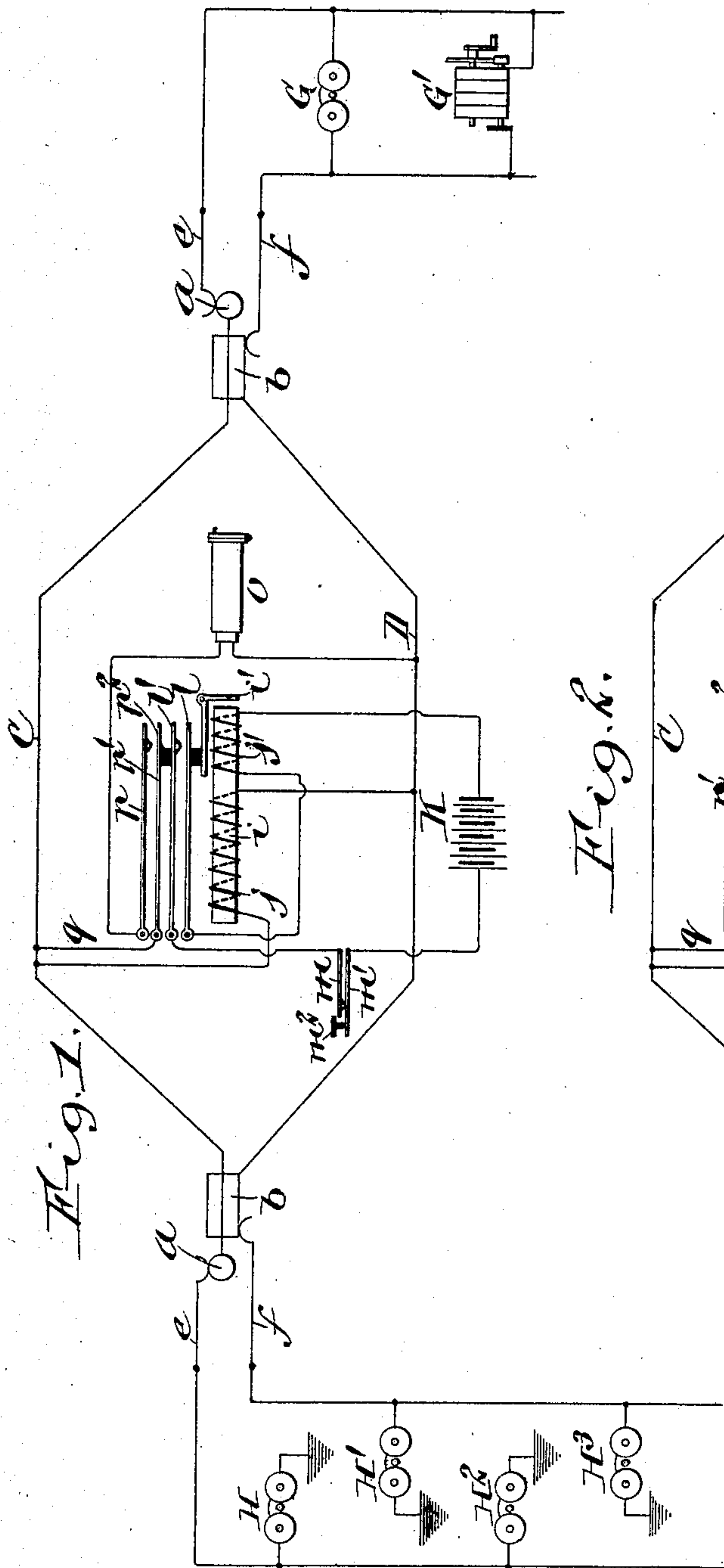


K. WEMAN & T. S. HEMENWAY.
 CLEAR-OUT SYSTEM FOR TELEPHONE SWITCHBOARDS.
 APPLICATION FILED MAY 29, 1908.

919,409.

Patented Apr. 27, 1909.

2 SHEETS—SHEET 1.



Witnesses:-
 Richard Sommer.
 Gustav W. Hora

Inventors
 Klas Weman,
 Thomas S. Hemenway,
 by Seyer & Popp
 Attorneys

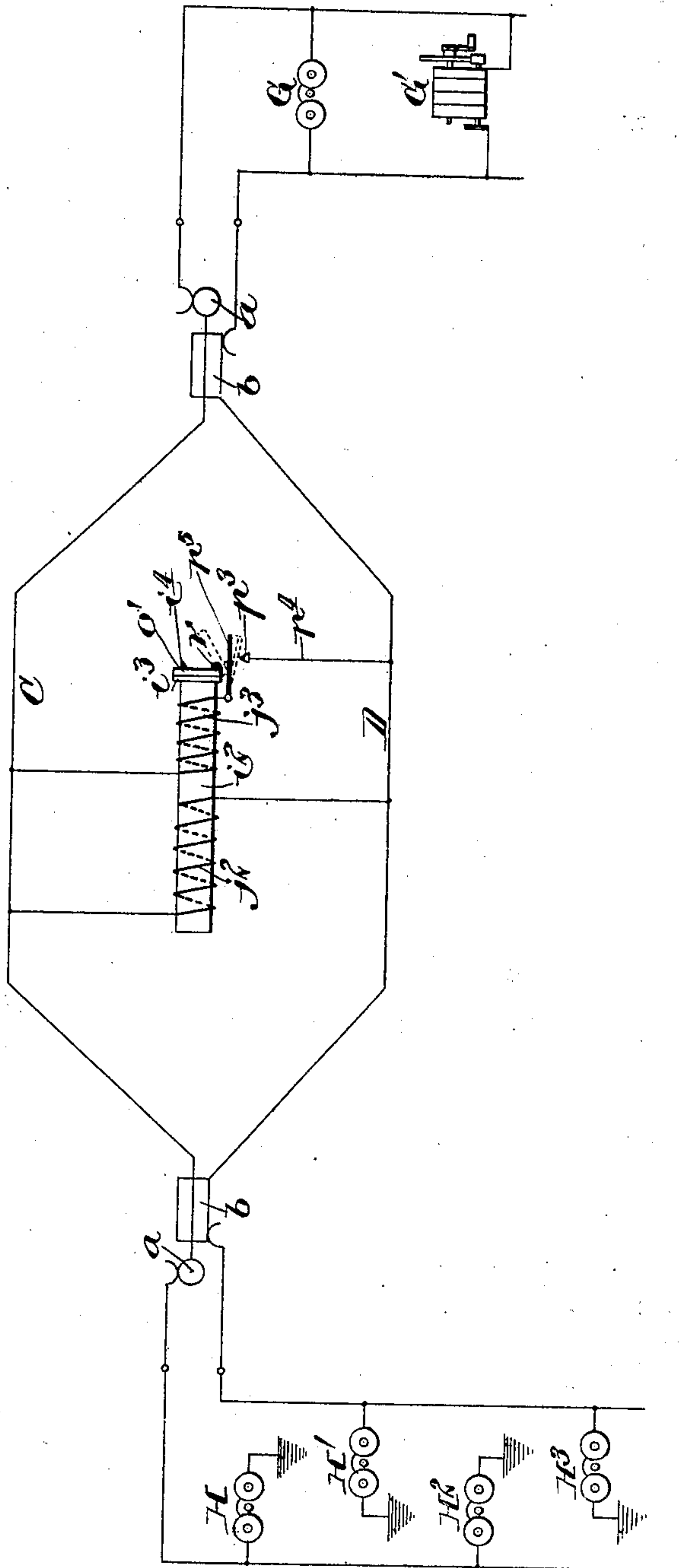
K. WEMAN & T. S. HEMENWAY.
 CLEAR-OUT SYSTEM FOR TELEPHONE SWITCHBOARDS.
 APPLICATION FILED MAY 29, 1908.

919,409.

Patented Apr. 27, 1909.

2 SHEETS—SHEET 2.

Fig. 3.



Witnesses:-
 Richard Soumer.
 Gustav W. Hora.

Inventors
 Klas Weman,
 Thomas S. Hemenway,
 by Geyer & Popp
 Attorneys.

UNITED STATES PATENT OFFICE

KLAS WEMAN AND THOMAS S. HEMENWAY, OF BUFFALO, NEW YORK.

CLEAR-OUT SYSTEM FOR TELEPHONE-SWITCHBOARDS.

No. 919,409.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed May 29, 1908. Serial No. 435,624.

To all whom it may concern:

Be it known that we, KLAS WEMAN and THOMAS S. HEMENWAY, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Clear-Out Systems for Telephone-Switchboards, of which the following is a specification.

This invention relates more particularly to the clear-out systems of magneto telephone switch boards.

It is well known that when an individual telephone line is connected through a cord circuit with a party line of a magneto telephone system, and disconnect signal is given for the individual line, it is difficult to prevent the ringers of the other parties on the party line from ringing, thus necessarily calling those parties. Difficulty has also been experienced in obtaining an absolutely reliable clear-out signal by which the operator may know when the connected subscribers desire to be disconnected. It also frequently occurs that when two subscribers are connected and the resistance across the line is very low, the clear-out signal fails to operate, rendering it impossible for the subscribers to attract the attention of the operator.

It is the object of our invention to provide a simple and efficient clear-out system which overcomes the above objections.

In the accompanying drawings consisting of 2 sheets: Figure 1 is a diagrammatic view of a switch board embodying the invention, associated with such parts of an individual-telephone line and a party line as are necessary for a clear understanding of the improvement, the parts of the clear-out system being shown in their normal position. Fig. 2 is a similar view showing the position of the parts when a clear-out signal is given. Fig. 3 is a view similar to Fig. 1, showing a modified construction of the invention.

Similar letters of reference indicate corresponding parts in the several figures.

a and *b* indicate the tips and sleeves, respectively, of the plugs of the customary cord circuits, the tips being connected by the cord conductor *C* and the sleeves by the cord conductors *D*.

e and *f* indicate respectively the springs of the jacks with which the tips and sleeves of the plugs make contact.

G indicates the ringer and *G*¹ the gener-

ator of an individual telephone line, and *H*, *H*¹, *H*² and *H*³ the ringers of a four-party line, these two lines being connected through the cord circuit, in a common manner.

Referring to the embodiment of the invention illustrated in Figs 1 and 2, *i* indicates the core of an electro magnet or relay and *i*¹ its armature, the relay being preferably iron armored to give it a high self-induction. The relay has two separate coils or windings *j*, *j*¹ on different portions of its core, one of relatively high resistance. The high-resistance winding *j* is connected across the cord circuit or conductors, its ends being connected to the tip and sleeve sides of the conductors respectively, as shown. The other winding *j*¹ of the relay is included in a local or supplemental circuit containing a suitable source of current, such as a battery *K*, which is connected in series with said winding. This supplemental circuit is normally open between terminal contacts or springs *l*, *l*¹ forming an automatic switch which is controlled by the armature of the relay. For this purpose, said springs are preferably parallel with each other and with the relay core and their free ends are arranged opposite the upper arm of the armature, so that they are disconnected in the normal position of the armature shown in Fig. 1, while when the armature is attracted it moves the switch spring *l* against the companion spring *l*¹, closing said battery circuit, as shown in Fig. 2. This circuit also contains a suitable interrupting device which may be operated automatically or by hand, the device shown in the drawings consisting of a pair of normally-connected contact-springs *m*, *m*¹, the lower one of which has a key or push button *m*² for opening said circuit. *o* is a clear-out signal device, preferably consisting of a clear-out drop, as shown. The coil of this drop is wound to a low resistance compared with that of the high-resistance winding *j* of the relay. One end of its coil is connected directly to the side *D* of the cord circuit, while its other end is connected to a contact-spring *p* preferably arranged parallel to the contact-spring *l* and cooperating with a similar spring *p*¹ arranged between the springs *l*¹ and *p* and connected with the other conductor *C* of the cord circuit by a branch *q*. Normally, the winding of the clear-out drop is open and not con-

connected across the cord circuit, as shown in Fig. 1. The free ends of the intermediate springs l^1 and p^1 are connected by an insulator p^2 , and the four switch springs l , l^1 , p and p^1 , are arranged in such close proximity to one another that when the spring l is moved into contact with the spring l^1 by the attraction of the relay-armature, the spring p^1 is at the same time moved into contact with the spring p , thus closing the circuit through the battery K and also connecting the clear-out drop o across the cord-circuit.

It will be understood from the foregoing, that the only shunt across the cord circuit when subscribers are talking, is the high inductive resistance j .

When a clear-out signal is given by turning the crank of the generator G^1 , current impulses are sent over the line through the cord circuit and the high-resistance winding j of the relay, exciting the latter. The first impulse will attract the armature of the relay and close the switch-spring l against the spring l^1 , causing a battery current to flow through the other winding j^1 of the relay and keeping the armature in its attracted position. At the same time, the switch-springs p , p^1 are closed, thus connecting the winding of the clear-out drop across the cord circuit. It is evident that as the resistance of the clear-out drop is lower than that of the high-resistance winding j of the relay, the greater part of the current from the generator G^1 will pass through the drop in preference to flowing through said high-resistance winding or the ringers H , H^1 , H^2 , H^3 which have a comparatively high resistance. The ringers therefore do not receive sufficient current to operate them and remain inactive as long as the contacts p and p^1 are closed. It will also be seen that as the clear-out drop receives a relatively heavy portion of the generator current, it will be positive in operation, thus reliably notifying the operator that the subscribers wish to be disconnected. The relay-armature will remain attracted until the supplemental or battery circuit is opened, which in the construction shown in the drawings is accomplished by depressing the key m^2 . The armature thereupon returns to normal position, allowing the switch-contacts l , l^1 , p , p^1 to open and restoring the cord-circuit to its normal condition.

We do not wish to be limited to the particular embodiment of the invention herein shown and described, as the same may be variously modified without departing from its scope and spirit. For example, Fig. 3 shows a modification in which the clear-out drop is combined with the relay or electro magnet, and the local battery circuit and winding j^1 of the first-described construction

are dispensed with. In this arrangement, electro magnet is provided on one portion of its core i^2 with a high-resistance coil or winding j^2 permanently connected across the cord circuit and corresponding to the winding j of the construction previously described; and on another portion of its core with a relatively low-resistance signal-coil or winding j^3 adapted to be connected across the cord circuit and corresponding to the coil of the clear-out drop o . i^3 indicates the armature and o^1 a drop shutter hinged adjacent to the armature and engaged by the usual hook or catch i^4 thereof, so that when the armature is attracted to the magnet-core the shutter is released and allowed to drop. p^3 indicates a contact forming a terminal of a branch-conductor p^4 connected to one side of the cord-circuit, and p^5 is a normally open-switch-spring connected to one end of the signal coil j^3 and interposed between said contact and the bottom of the shutter and adapted to be closed against said contact by the shutter when the latter drops. For this purpose, the shutter may be provided with a roller r which engages said contact spring. In this modified arrangement, when the connected subscribers have finished the conversation and one of them operates the generator to give the clear-out signal, the current flows through the high-resistance winding j^2 of the electro magnet, thus attracting the armature and releasing the shutter. The latter, falling upon the switchspring p^5 closes it against the contact p^3 , thereby connecting the low-resistance signal-coil j^3 across the cord circuit. This low-resistance absorbs the greater part of the current in the same manner as does the signal-coil of the construction first described, thus preventing the ringers on the line from receiving sufficient current to operate them. The fallen-shutter may be restored by hand or otherwise, thus opening the switch spring p^5 and restoring the cord-circuit to its normal condition.

We claim as our invention;—

1. In a clear-out system for telephone switch-boards, the combination of a cord-circuit, an electro magnet having a coil of comparatively high resistance connected across the cord circuit, a signal-coil of lower resistance than the first-named coil adapted to be connected across the cord-circuit, and a switch controlled by said magnet for connecting said signal-coil across the cord-circuit substantially as set forth.

2. In a clear-out system for telephone switch-boards, the combination of a cord-circuit, an electro magnet having a coil of comparatively high resistance connected across the cord circuit, a signal-coil of lower resistance than the first-named coil adapted to be connected across the cord circuit, an armature cooperating with said magnet,

and a switch controlled by said armature for connecting said signal coil across the cord circuit, substantially as set forth.

3. In a clear-out system for telephone switch-boards, the combination of a cord-circuit, a relay having separate windings, one of which is connected across the cord circuit, a supplemental circuit including the other relay-winding, a source of current and a switch controlled by the relay, a clear-out signal device having a coil adapted to be connected across the cord-circuit, and a switch controlling said signal device and controlled by said relay, substantially as set forth.

4. In a clear-out system for telephone switch-boards, the combination of a cord-circuit, a relay having separate windings, one of which is connected across the cord-circuit, a supplemental circuit including the other relay-winding, a source of current and a switch controlled by the relay, a clear-out signal device having a coil adapted to be connected across the cord circuit, said coil being of lower resistance than the relay winding connected across the cord-circuit, and a switch controlling said signal device and controlled by the relay, substantially as set forth.

5. In a clear-out system for telephone switch-boards, the combination of a cord-circuit, a relay having separate windings, one of which is connected across the cord-circuit, a supplemental circuit including the other relay-winding, a source of current and a switch controlled by the relay, a clear-out signal device having a coil adapted to be connected across the cord-circuit, said coil being of lower resistance than the relay winding connected across the cord-circuit, a switch controlling said signal device and controlled by the relay, and means for interrupting said supplemental circuit, substantially as set forth.

6. In a clear-out system for telephone switch-boards, the combination of a cord-circuit, a relay having separate windings one of which is connected across the cord-circuit, a normally-open supplemental circuit including a source of current, the other

winding of the relay and a switch controlled by the armature of the relay, a clear-out drop having a coil adapted to be connected across the cord-circuit and of lower resistance than the relay-winding connected across the cord-circuit, and a normally-open switch included in one of the branches connecting the clear-out drop with the cord-circuit and also controlled by said armature, substantially as set forth.

7. In a clear-out system for telephone switch-boards, the combination of a cord-circuit, a relay having separate windings, one of which is connected across the cord-circuit, a supplemental circuit including the other winding of the relay, a source of current, and switch contacts arranged adjacent to the armature of the relay to be closed thereby, and a clear-out drop having a coil adapted to be connected across the cord-circuit, one of the branches of said drop-coil containing switch-contacts arranged adjacent to the first-named switch-contacts to be closed by the same, substantially as set forth.

8. The combination of an individual telephone line having a ringer and a generator, a party-line having ringers, a cord-circuit for connecting said lines, a relay having separate windings, one of which is connected across the cord circuit, a normally-open supplemental circuit including the other relay-winding, a source of current and a switch controlled by the relay-armature, a clear-out signal-device having a coil adapted to be connected across the cord-circuit and of lower resistance than the relay winding connected across the cord-circuit, and a switch-controlling the connection of said signal coil across the cord-circuit and controlled by the relay-armature, substantially as set forth.

Witness my hand this 26th day of May, 1908.

KLAS WEMAN.

THOMAS S. HEMENWAY.

Witnesses:

H. R. DILKS,

GUSTAF CORVIN.