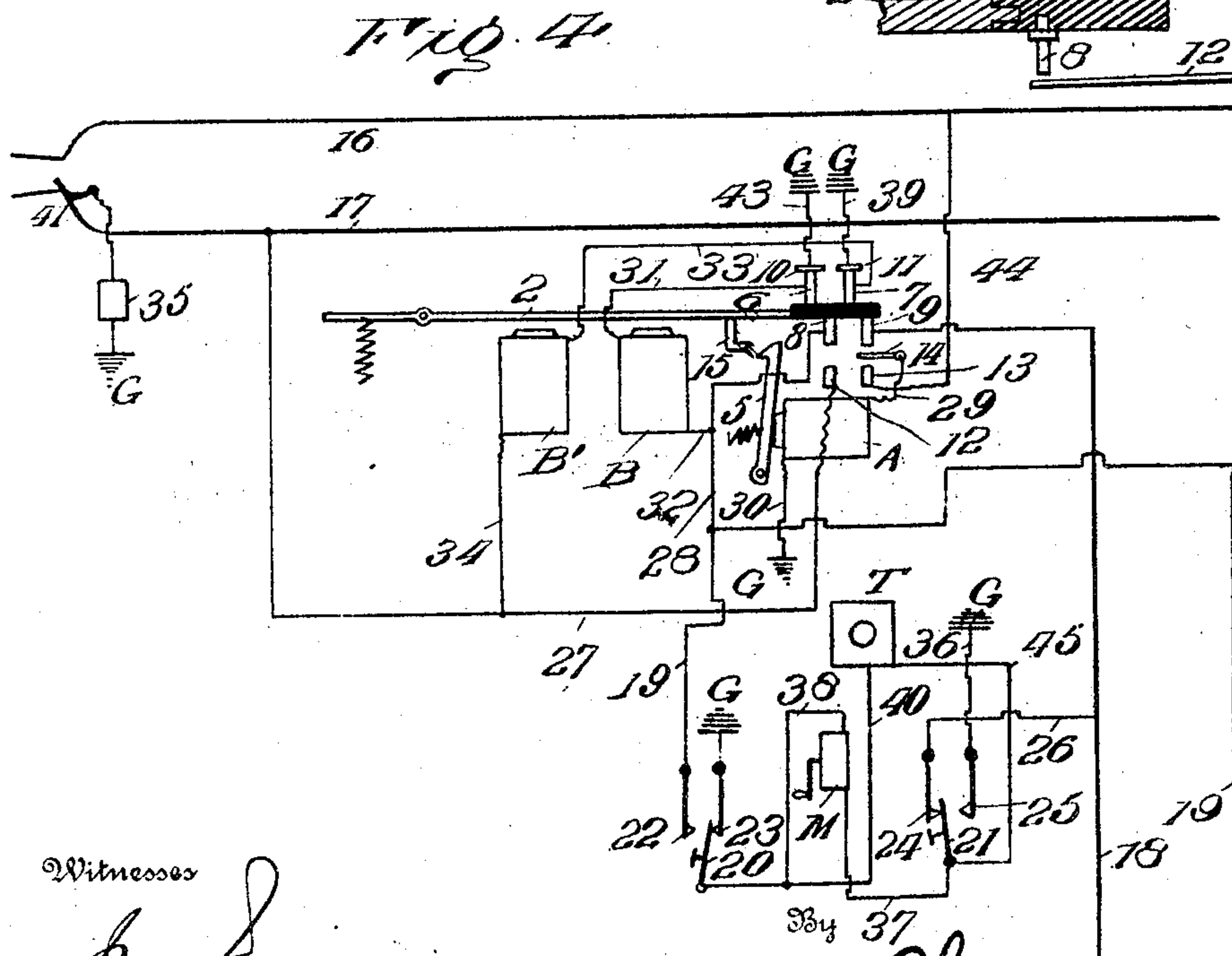
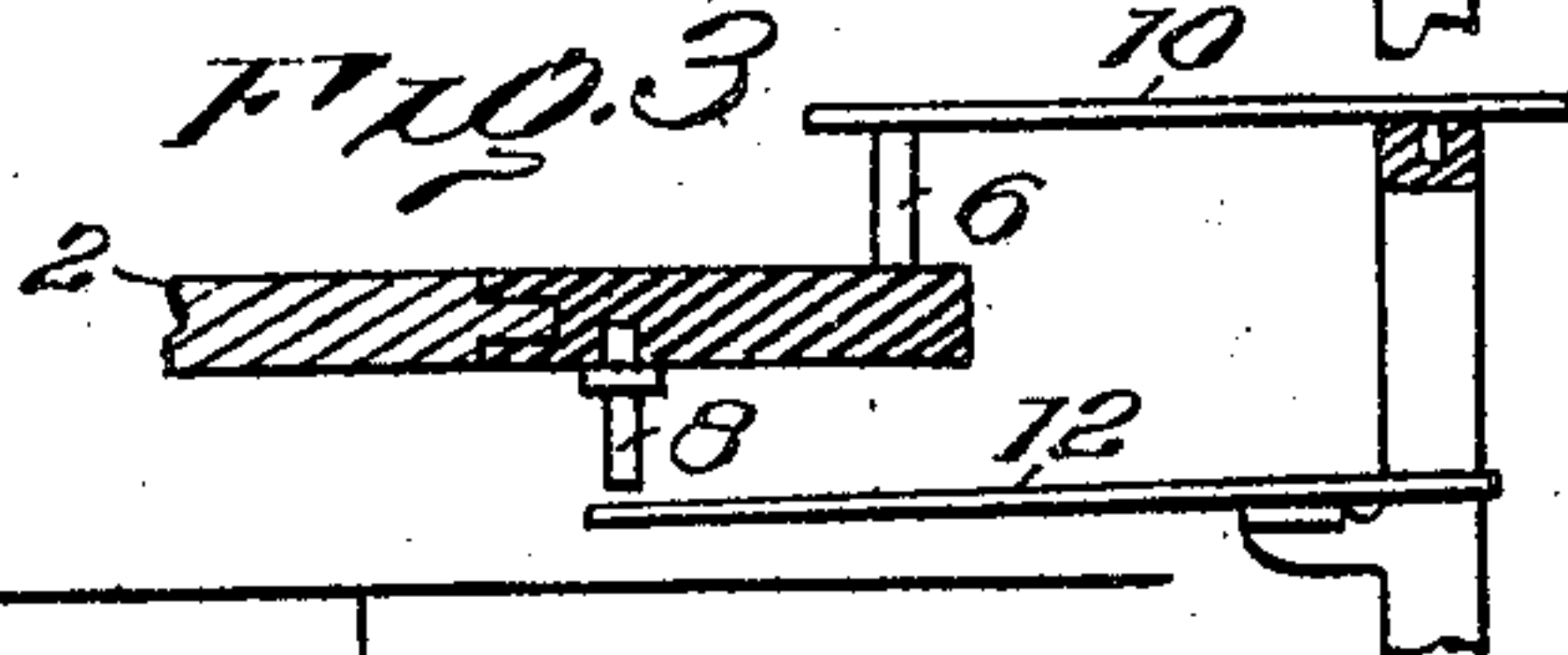
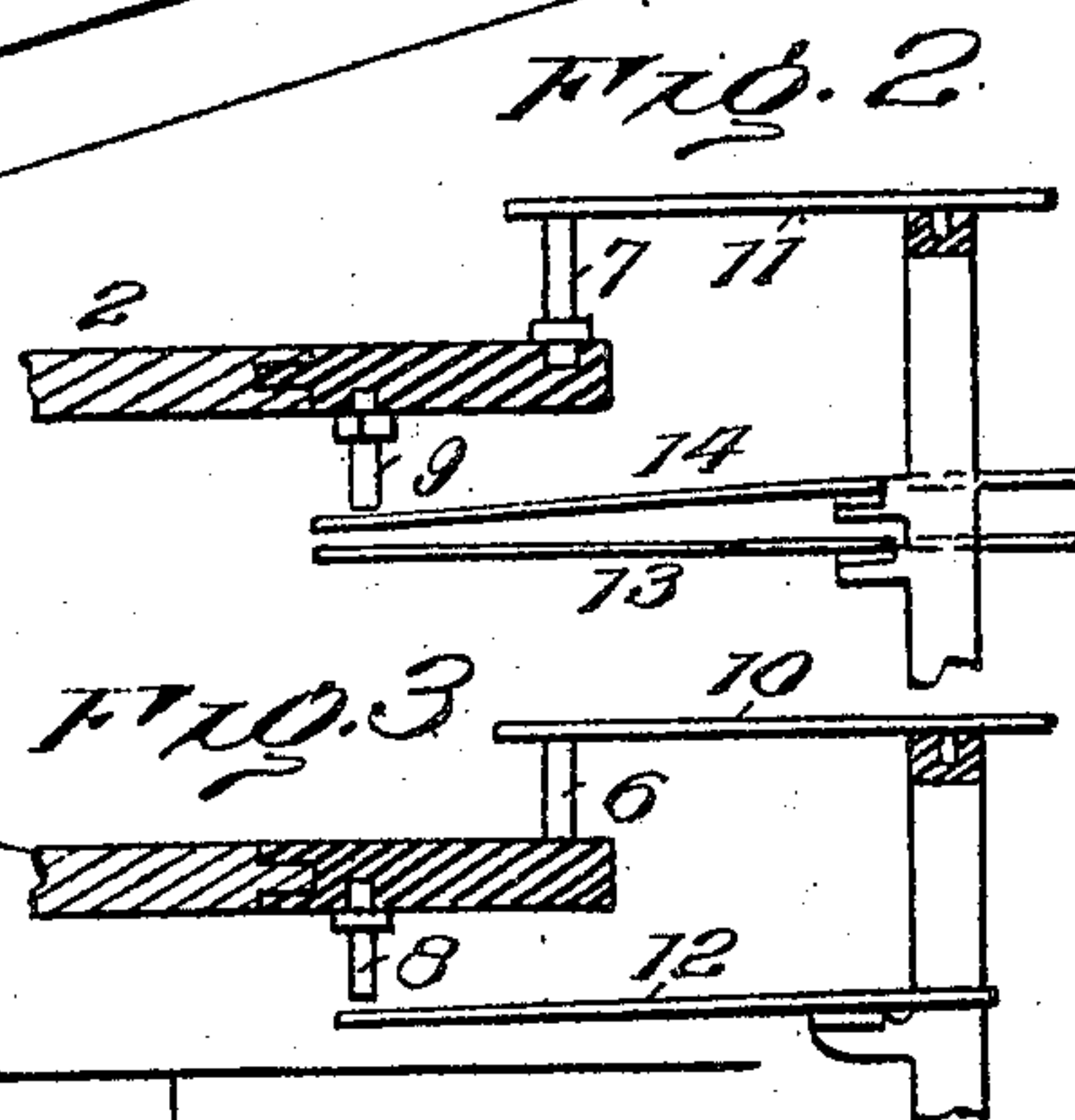
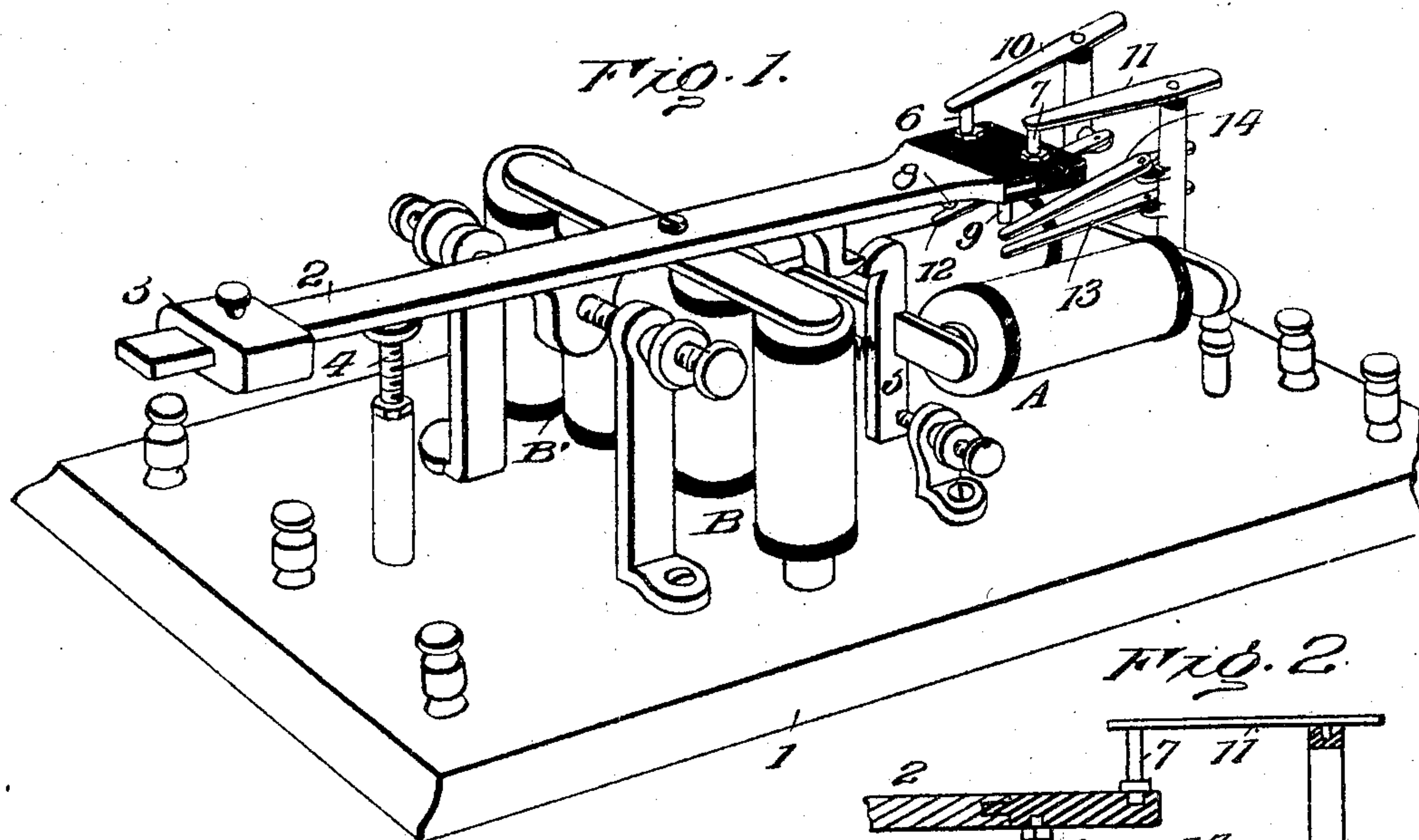


No. 798,035.

PATENTED AUG. 22, 1905.

C. R. & D. R. GREEN.
TELEPHONE SYSTEM.
APPLICATION FILED DEC. 20, 1904.

3 SHEETS—SHEET 1.



Witnesses

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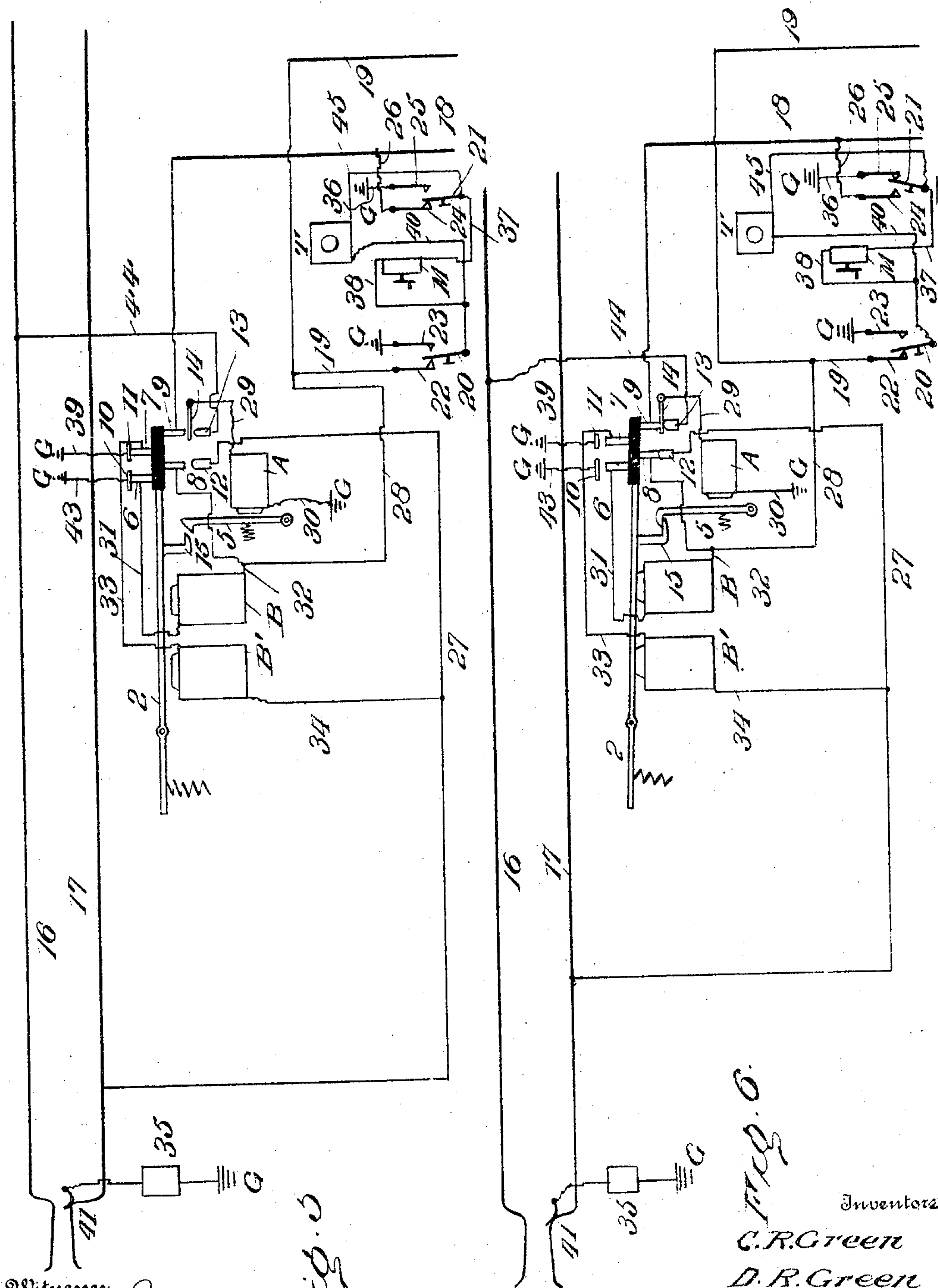
Phonography

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3 SHEETS—SHEET 2.



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Fig. 3

34

Fig. 4

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3 SHEETS—SHEET 3.

FIG. 7.

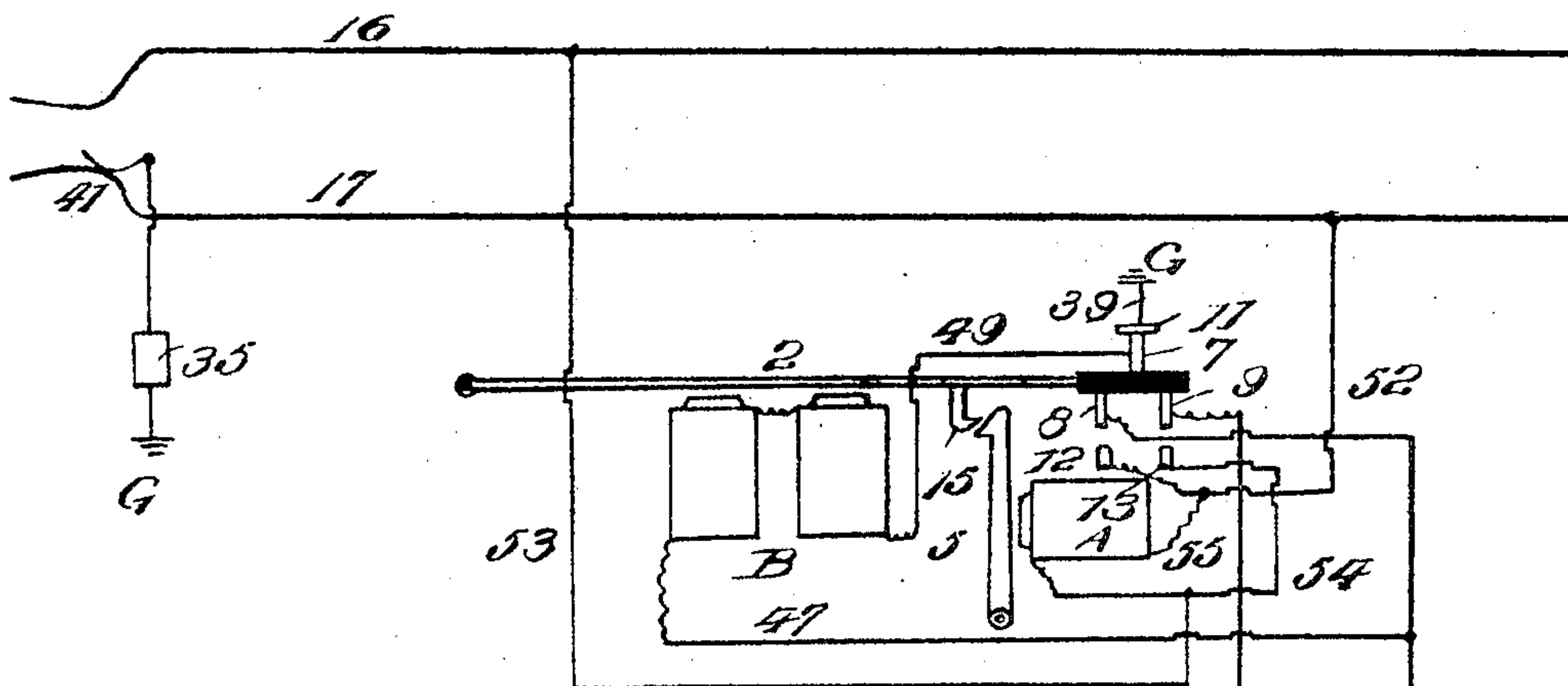
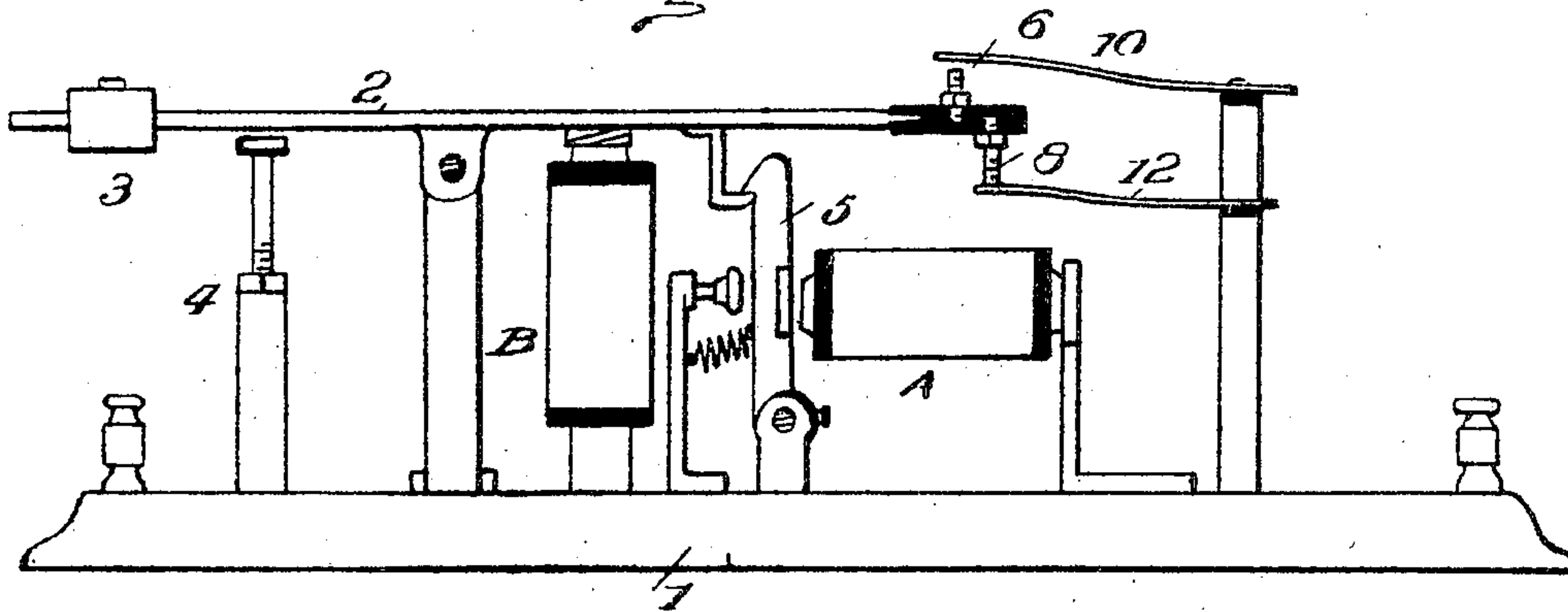
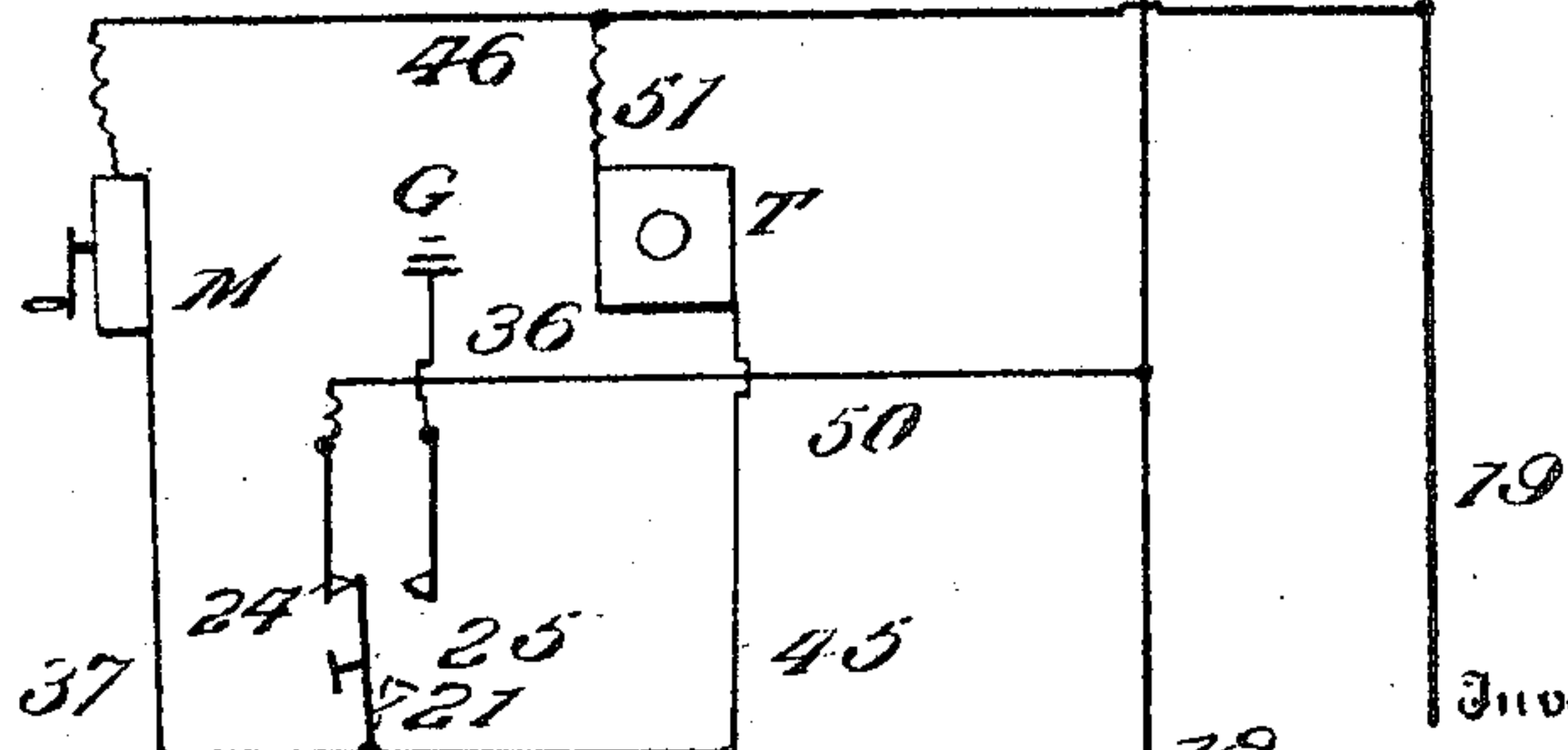


FIG. 8.



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UNITED STATES PATENT OFFICE.

CALVIN R. GREEN AND DAVID R. GREEN, OF RISINGSUN, INDIANA.

TELEPHONE SYSTEM.

No. 798,035.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed December 20, 1904. Serial No. 237,695.

To all whom it may concern:

Be it known that we, CALVIN R. GREEN and DAVID R. GREEN, citizens of the United States, residing at Risingsun, in the county of Ohio and State of Indiana, have invented certain new and useful Improvements in Telephone Systems, of which the following is a specification.

This invention is primarily designed for telephone systems of rural districts or party-lines containing a limited number of subscribers, whereby any subscriber may call central or exchange to be placed in communication with a party in another circuit or on the main line or for any other purpose, and whereby central may cut any one of a number of party-lines into circuit and call any subscriber thereof to establish communication between parties desiring to talk.

The invention consists of an instrument arranged at the juncture of a party-line with the main line and embodying elements, such as automatic switches, whereby either any subscriber of the party-line or central may establish communication between the main line and the said party-line and interrupt said circuit at will. The instrument embodies an electric-controlled switch and two sets of electromagnets, one set of magnets when energized serving to establish the connection between the two circuits, the party and main lines, and the other set of magnets when energized acting to interrupt or break the said connection.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still some of the preferred embodiments are shown in the accompanying drawings, in which—

Figure 1 is a perspective view of an instrument embodying the invention. Fig. 2 is a detail view of the end of the switch-lever carrying the electrically-insulated contacts and showing the cooperating contacts. Fig. 3 is a view similar to Fig. 2 of a modification. Fig. 4 is a diagrammatic view showing the circuits at the instant the main and party circuits are returned to normal position. Fig. 5

is a diagrammatic view showing the parts in normal position. Fig. 6 is a diagram similar to Fig. 5, showing the talking-circuit established. Fig. 7 is a modification, the instrument embodying only one set of cut-in electromagnets, whereby any subscriber on a party-line may establish communication with the main or trunk line. Fig. 8 is a diagram of the circuits established as a result of the form of instrument shown in Fig. 7.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The instrument comprises a base 1, upon which the operating parts are mounted. The base 1 may be a support of any type, such as commonly provided in electrical apparatus, and may be open or housed, as desired. An electromagnet A is arranged upon the base 1 and is adapted to be included in the circuit for returning the parts to normal position. A second electromagnet B is likewise mounted upon the base 1 and is included in the circuit by means of which the switch-lever 2 is actuated to establish communication between the party-line and the main or trunk line. The electromagnet B is included in the circuit controlled by any subscriber on the party-line. A companion electromagnet B', located upon the base 1, is included in the circuit under control of central or exchange, whereby the party-line may be brought into circuit when central desires to call up any subscriber thereon. The electromagnets A, B, and B' may be of any construction commonly employed in electrical apparatus. The electromagnets B and B' are arranged so as to actuate the switch-lever 2 when energized. The switch-lever 2 is counterbalanced in any accustomed way, either by spring or weight, the latter being indicated at 3 in Fig. 1 and adjustable on said lever. An adjustable stop 4 cooperates with the switch-lever 2 to properly position the same with reference to the cooperating electric contacts. A lock-lever 5 is adapted to hold the switch-lever in position when the talking-circuit is established, as indicated most clearly in Fig. 6. The lock-lever 5 is controlled by the electromagnet A, which when energized moves said lock-lever so as to release the switch-lever 2 and permit it to assume a normal position. The switch-lever 2 is provided with electric contacts 6, 7, 8, and 9, which are electrically insulated from one another. Other contacts are dis-

posed with reference to those carried by the switch-lever for coöperation therewith and are indicated at 10, 11, 12, and 13. A movable contact 14 normally occupies a position between the contacts 9 and 13 without making electrical connection with either. The lock-lever 5 is adapted to engage with the switch-lever 2 in any manner. As shown, a hook 15 projects from the switch-lever to engage with a stop of said lock-lever, the parts being so related that upon movement of the switch-lever toward the electromagnets B and B' the hook 15 will automatically lock with the lever 5.

The main or trunk line is represented by the wires 16 and 17 and the party-line by the wires 18 and 19. The party-line may contain any number of subscribers, the telephone apparatus of each subscriber being of ordinary construction and arrangement, whereby the subscribers may talk among themselves without interfering with the main or trunk line. At the juncture of the main and party lines is arranged an instrument embodying the invention, whereby any subscriber on a party-line may call central or exchange, so as to be placed in communication with any person on another party-line or included in the main line and whereby central may call any subscriber on a party-line. Each subscriber on a party-line is provided with a magneto M, telephone T, and switch 20 and 21. The switch 20 coöperates with two contacts 22 and 23 and the switch 21 with two contacts 24 and 25. The contacts 23 and 25 are grounded, whereas the contact 24 is in electrical connection with the line-wire 18 by means of the wire or connection 26. The contact 22 is in electrical connection with the wire 28 by means of a wire or connection 19. The wire 27 is in connection at one end with the contact 12 and at the opposite end with the wire 17. The wire 19 is electrically connected to the contact 8 through the wire 28, and the wire 18 makes electrical connection with the contact 9. A wire 44 connects the contact 13 with the line-wire 16. One end of the helix of electromagnet A is connected by wire 29 with the movable contact 14, and the opposite end of said helix is grounded through wire 30. One end of the helix of electromagnet B is connected by wire 31 with the contact 6, and the opposite end of said helix is connected by wires 32 and 28 with the contact 8 and with the wire 19. The helix of electromagnet B' has one end connected by wire 33 with the contact 7 and its opposite end connected by wire 34 with the wire 27. At central or exchange the wire 17 is grounded through a drop or indicator 35, which is cut out of circuit when the wires 16 and 17 are electrically connected by the usual switch-plug.

Under normal conditions the circuits appear as indicated in the diagrams 4 and 5, with the exception that in Fig. 4 the switch 20 should

be in electrical connection with the contact 22, as indicated in Fig. 5, thereby enabling the subscribers of the party-line to talk among themselves without interrupting the main or trunk line. Should any subscriber desire to call central or exchange, the switch 21 is operated to make electrical connection with the contact 25, thereby establishing the following circuit: From the ground through wire 36 to contact 25, thence through switch 21, wire 37, magneto M, wire 38, switch 20, contact 22, wires 19, 28, and 32, electromagnet B, wire 31, contacts 6 and 10, and wire 43 to ground, thereby energizing electromagnet B and attracting switch-lever 2, which breaks the circuit by separating the contacts 6 and 10 and establishes new circuits by bringing the contacts 8 and 12 and 9, 14, and 13 into connection. When the switch-lever 2 is attracted, it is held in the new position by means of the lock-lever 5, as shown most clearly in Fig. 6. This cuts the party-line in circuit with the main or trunk line, the circuit being substantially as shown in Fig. 5 and as follows: Starting at the telephone T, through wire 40 to switch 20, contact 22, wires 19 and 28, contacts 8 and 12, wires 27 and 17, through the drop or indicator 35 to ground, thereby notifying central that a party-line has been thrown into circuit with the main line. Upon electrically connecting the wires 16 and 17 at central the circuit through the drop or indicator 35 is interrupted, and starting at central the talking-circuit continues through wires 16 and 44, through contacts 13, 14, and 9, wires 18 and 26, contact 24, switch 21, and wire 45, back to telephone T. When it is required to restore the main and party lines to normal position, the subscriber operates switch 20 to make electrical connection with the contact 23 and operates magneto M. The circuit is as follows: From ground through contact 23, switch 20, wire 38, magneto M, wire 37, switch 21, contact 24, wires 26 and 18, contacts 9 and 14, wire 29, electromagnet A, wire 30 to ground. The electromagnet A being energized attracts the lock-lever 5 and releases the switch 2, which returns to normal position by its counterbalance. In the event of central or exchange requiring to call up a subscriber on a party-line a current is sent out and the circuit is as follows: Along wire 17, through wires 27 and 34, electromagnet B', wire 33, contacts 7 and 11, and wire 39 to ground. Electromagnet B' being energized attracts the switch-lever 2 in the manner aforesaid, and the same being held by the lock-lever 5 the talking-circuit is established and is as herein described. Should central desire to cut the party-line out of circuit, a current is sent out on the line-wire 16, the circuit being as follows: From wire 16, through wire 44, contacts 13 and 14, to wire 29, electromagnet A, and wire 30 to ground. Electromagnet A being energized attracts lock-lever

5 and releases the switch-lever 2, which returns to normal position.

In the modification shown in Figs. 7 and 8 the electromagnet B' and coöperating parts are dispensed with. Hence central or exchange is prevented from automatic cutting the party-line into circuit, an operator being required at the junction to effect this operation either by pressing a button, operating a switch, or manipulating mechanism to effect the desired result. This form of instrument does not prevent any subscriber of a party-line automatically cutting said line into circuit with the main or trunk line. Should a subscriber desire to call central, the switch 21 is operated to make electrical connection with the contact 25, as indicated by the dotted lines in Fig. 8, and the magneto M is operated. The circuit thus established is as follows: From the ground through wire 36 to contact 25, switch 21, wire 37, magneto M, wires 46, 19, and 47, electromagnet B, wire 49, contacts 7 and 11, and wire 39 to ground. Electromagnet B being energized attracts switch-lever 2 and breaks the circuit by separating the contacts 7 and 11. The talking-circuit thus established is as follows: Beginning at telephone T, through wires 51, 46, and 19, contacts 8 and 12, wires 52 and 17, through drop or indicator 35 to ground. Central being apprised of a call connects the wires 17 and 16, thereby breaking the circuit through the indicator or drop at 41, the talking-circuit being continued as follows: Through wires 16, 53, and 54, contacts 13 and 9, wires 18 and 50, contact 24, switch 21, and wire 45 back to telephone T. Should central elect to cut the party-line out of circuit, a current is sent through wire 16, thence through wires 53 and 54, electromagnet A, and wires 55, 52, and 17, back to central, thereby energizing electromagnet A and attracting lever 5 and releasing switch-lever 2, which, under the influence of its counterbalance, returns to normal position. Should the subscriber interrupt the communication between the main and party line circuits, a current is sent over the following circuit through magneto M. This circuit is as follows: Beginning at magneto M, through wires 46 and 19, contacts 8 and 12, wire 55, electromagnet A, wire 54, contacts 13 and 9, wires 18 and 50, contact 24, switch 21, and wire 37, back to magneto M. Electromagnet A being thus energized effects release of the switch-lever 2 in the manner stated.

Having thus described the invention, what is claimed as new is—

1. In a system of telephoning, main and party or branch lines, a switch-lever, contacts movable with said switch-lever and having connection with, respectively, the main and party lines, other contacts coöperating with the movable contacts and having connection with, respectively, the ground and the main

line, an electromagnet for controlling the switch-lever for establishing communication between the main and party lines, means for locking said switch-lever in its moved position, and a second electromagnet for effecting a release of said switch-lever to permit it to return to a normal position for interrupting communication between the main and party line circuits when required, substantially as set forth.

2. In a telephone system, and in combination with independent lines such as a main and a party or branch lines, a switch-lever, electric contacts carried by and movable with said switch-lever and having connection with, respectively, the main and party lines, other contacts coöperating therewith and in electrical connection with, respectively, the ground and the main line, an electric controller for said switch-lever for establishing communication between said independent circuits, and at the same time cutting itself out of circuit, means for holding the switch-lever in its moved position, and a circuit to admit of effecting a release of the switch-lever and automatic return of the parts to normal position.

3. In a telephone system, independent lines such as a main and a party or branch lines, a switch-lever at the junction of said lines, electric contacts carried by said switch-lever and having connection with, respectively, the main and party lines, other contacts coöperating with the contacts carried by said switch-lever and in connection with, respectively, the ground and the main line, an electric circuit for actuating the switch-lever to bring the main and party lines into circuit and simultaneously interrupting said electric circuit, means for automatically engaging with and holding the switch-lever in its moved position, and an electrical circuit for effecting release of said switch-lever and adapted to be operated from either central or the party using the line.

4. In a telephone system, a main and party line, circuits, a switch-lever, coöperating electric contacts, independent circuits for actuating said switch-lever to establish communication between the main and party lines, one circuit being under control of central and the other under control of any subscriber on the line, means for holding said switch-lever in its moved position, and an electric releasing-circuit for freeing said switch-lever and admitting of the parts returning to normal position, said circuit being under control of either central or a subscriber on the party-line.

In testimony whereof we affix our signatures in presence of two witnesses.

CALVIN R. GREEN. [L. S.]
DAVID R. GREEN. [L. S.]

Witnesses:

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GEORGE G. WATT.