

No. 626,629.

Patented June 6, 1899.

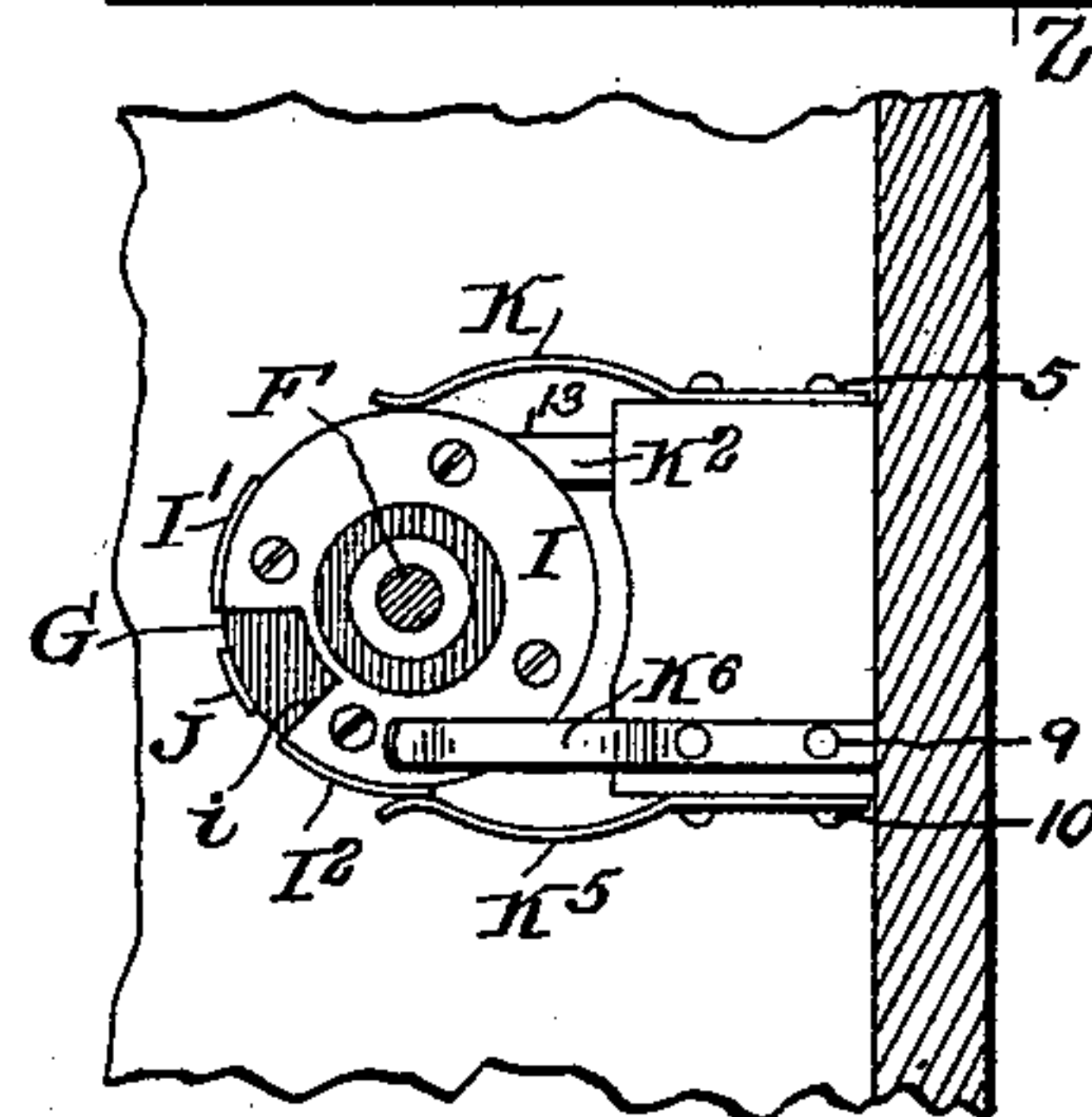
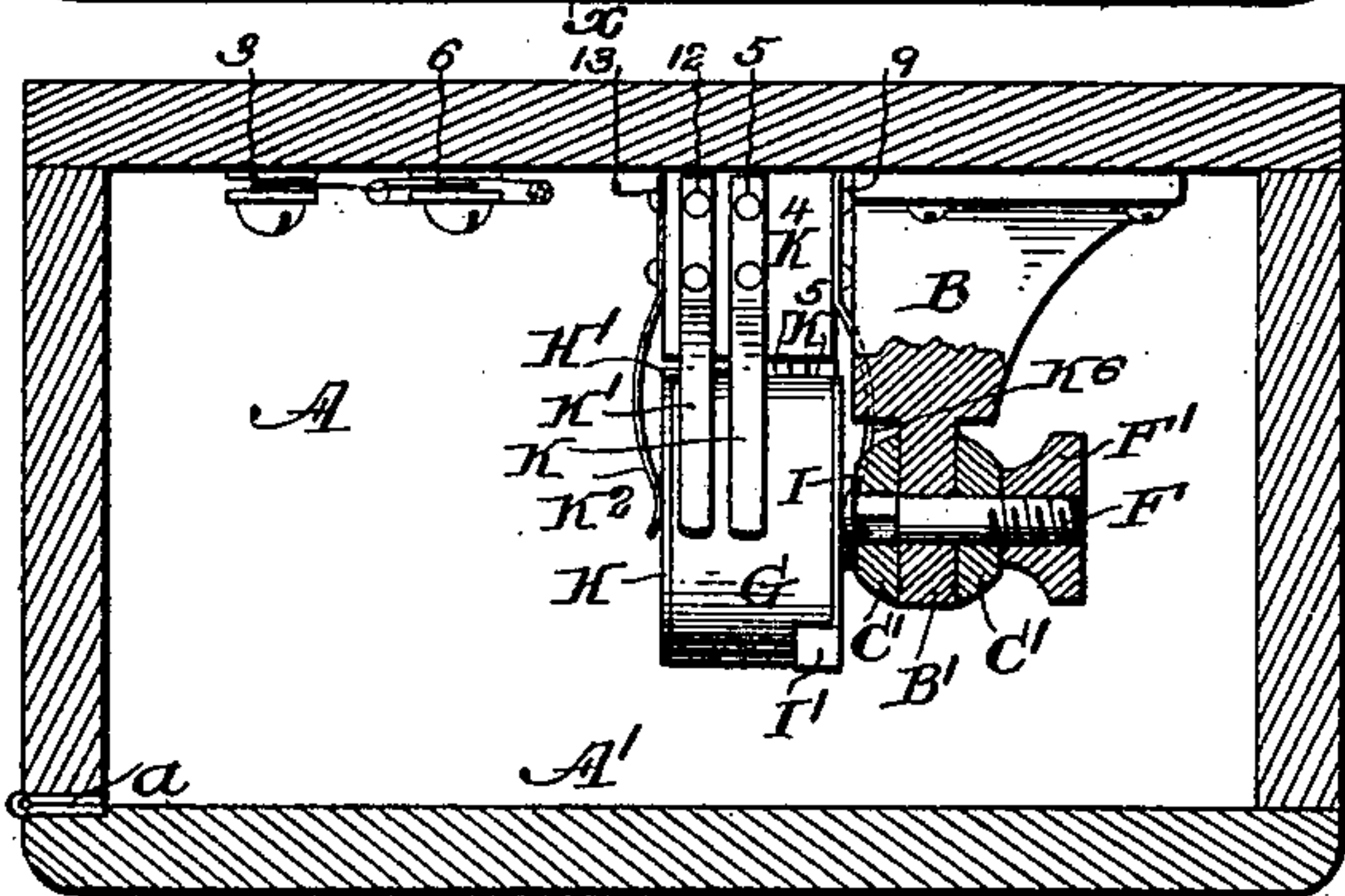
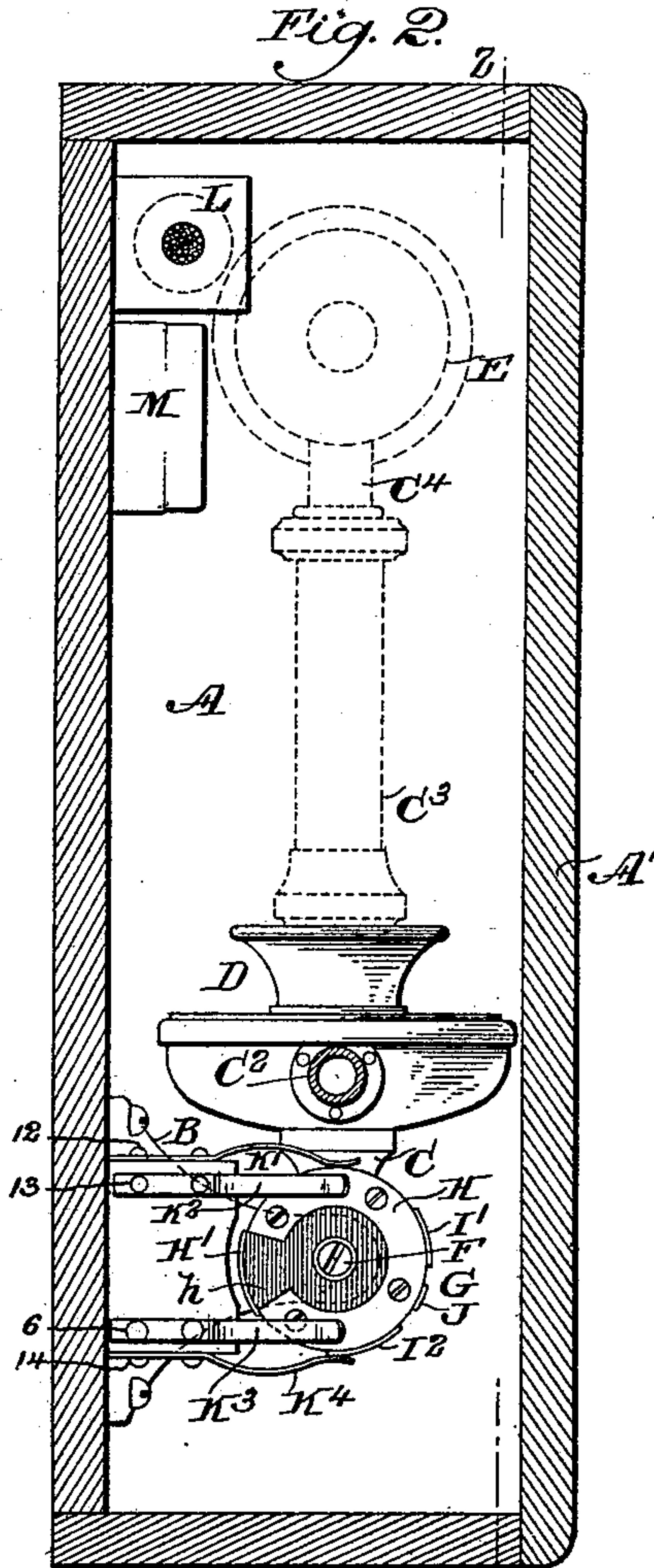
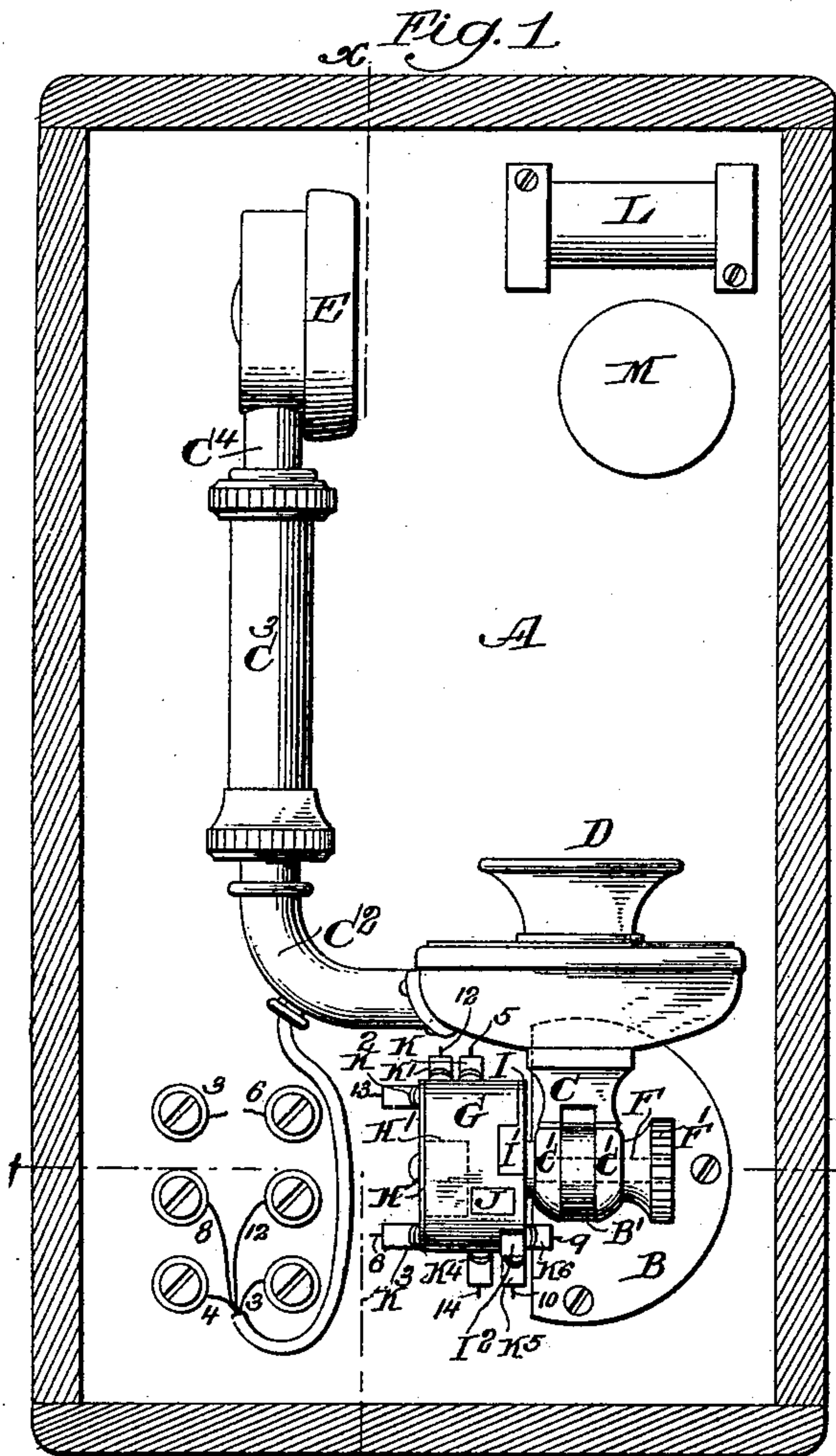
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TELEPHONE.

(Application filed Apr. 13, 1897.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses.

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Fig. 3.

Fig. 4.

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Fig. 5.

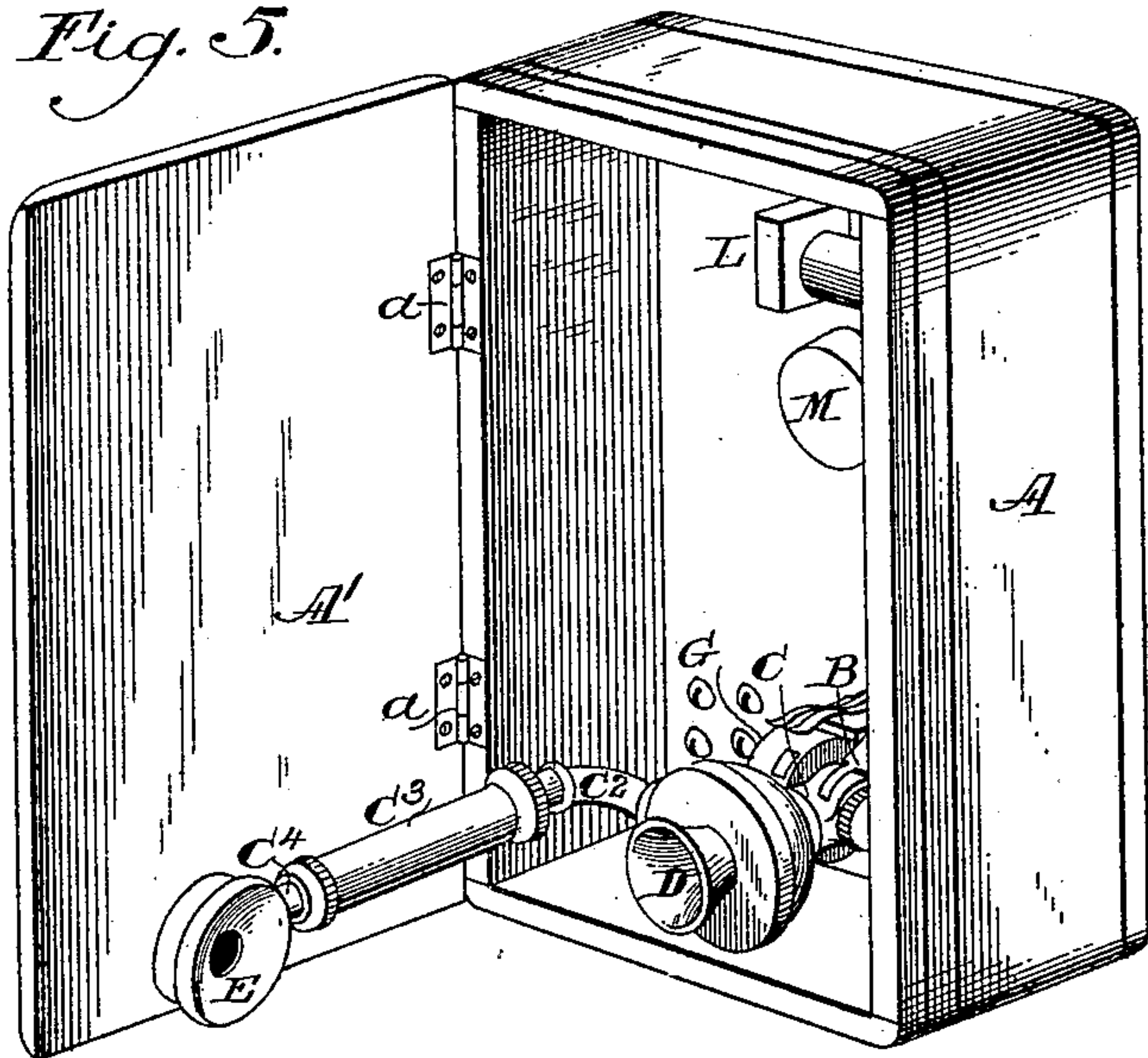
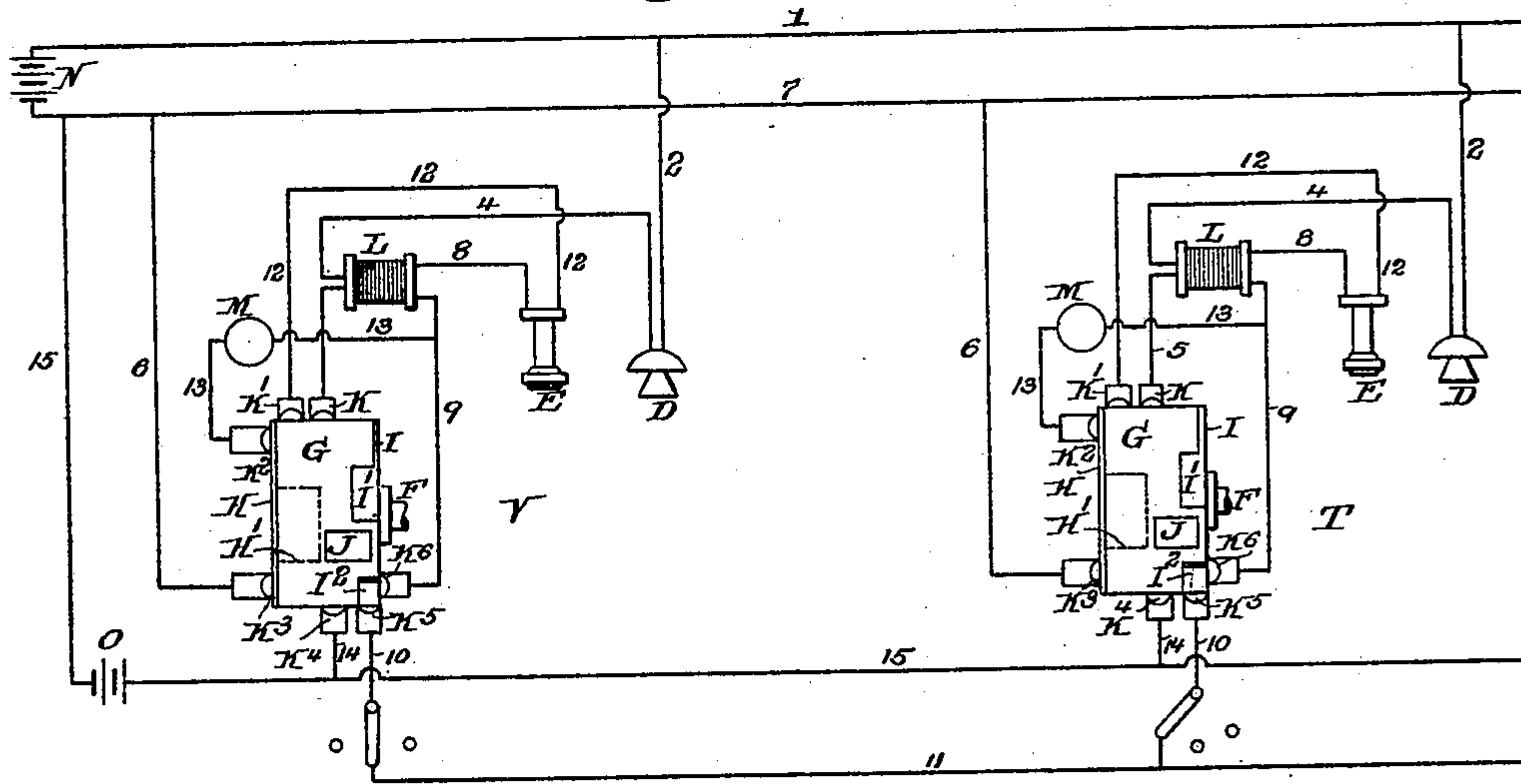


Fig. 6.



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Fig. 7.

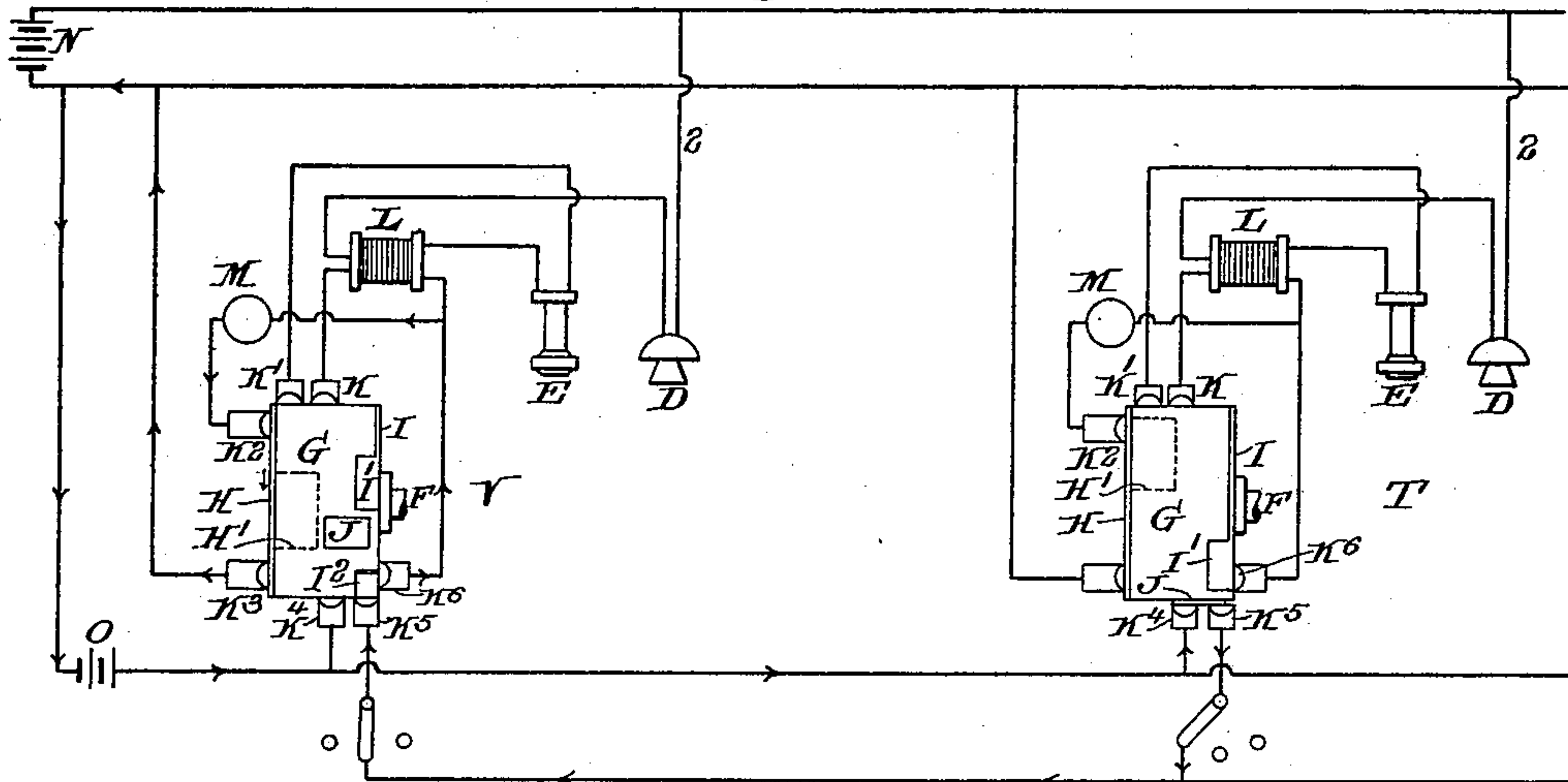
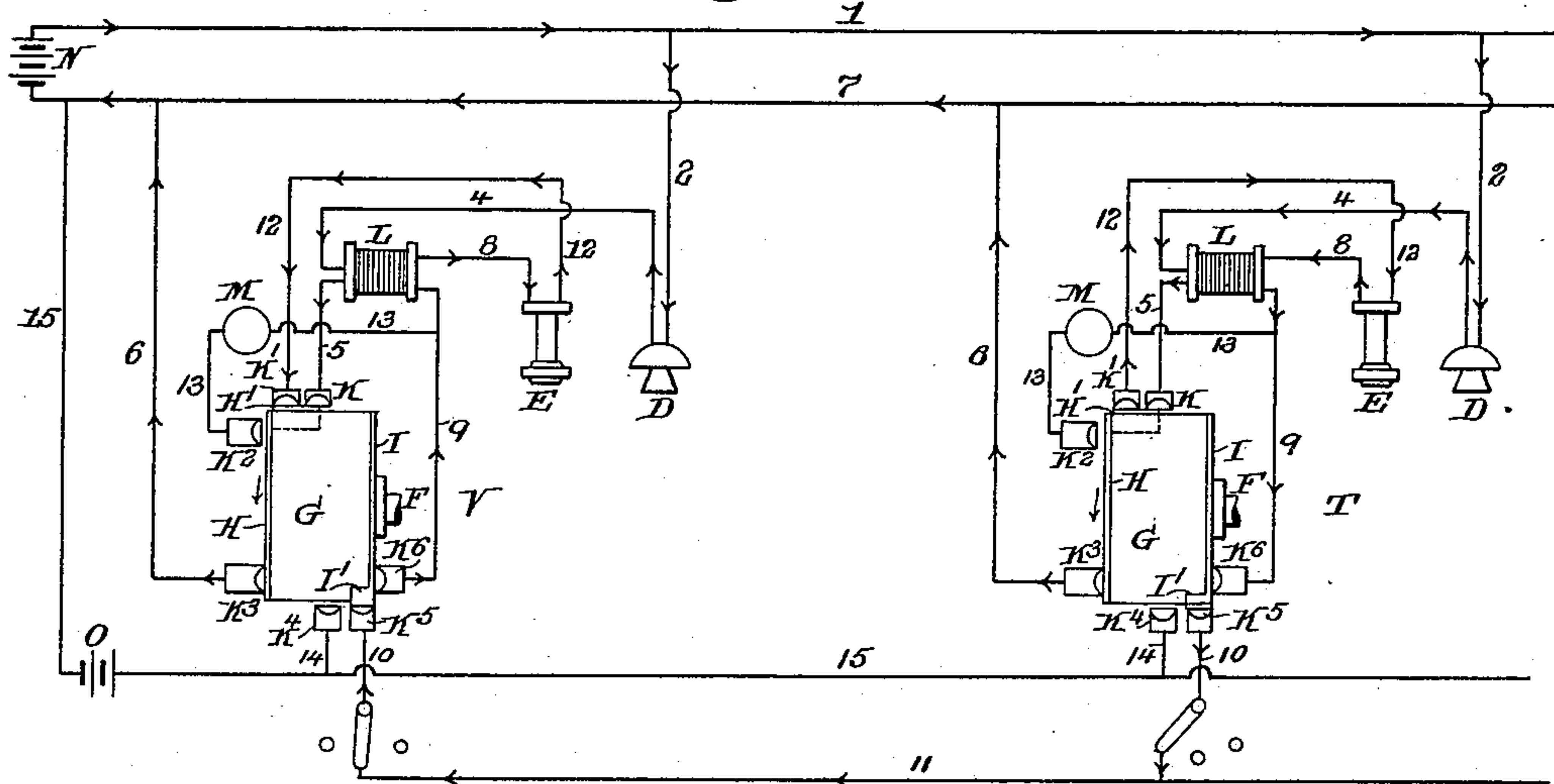


Fig. 8.



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UNITED STATES PATENT OFFICE.

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TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 626,629, dated June 6, 1899.

Application filed April 13, 1897. Serial No. 631,971. (No model.)

To all whom it may concern:

Be it known that we, GEORGE F. PAYNE and ALBERT K. KELLER, citizens of the United States of America, residing in the city and county of Philadelphia, in the State of Penn-
sylvania, have invented a certain new and useful Improvement in Telephones, of which the following is a true and exact description, reference being had to the accompanying
drawings, which form a part thereof.

Our invention relates to improvements in the construction and mode of operation of telephones, and particularly of switches used in connection with a telephone system, our object being to combine with a telephone instrument or instruments and with a telephone and call circuits a system of rotative switches moving with the telephone, which has also a rotative movement from a point of rest to a point of use and so that by simply turning the telephone instrument upon a pivot it will close and open the various circuits at the proper time.

The nature of our improvements will be best understood as described in connection with the drawings, in which they are illustrated, and in which—

Figure 1 is a front view of a box or case containing our arrangement of telephone and switches, taken as on the section-line $z z$ of Fig. 2. Fig. 2 is a side elevation taken on the section-line $x x$ of Fig. 1. Fig. 3 is a transverse section taken on the section-line $y y$ of Fig. 1. Fig. 4 is a side elevation of the switching-drum and its connections, taken on the opposite side to that shown in Fig. 2. Fig. 5 is a perspective view of the case and telephone, the telephone being turned outward in position for use. Figs. 6, 7, and 8 are diagrammatic representations of two telephone-stations, showing the operation of our device. Thus Fig. 6 represents the condition of the circuits when both telephones are turned up in position of rest, Fig. 7 represents the condition of the circuits when the one telephone—that in station T—is turned to position to call the telephone in the station V, and Fig. 8 represents the condition of the circuits when the telephones in stations T and V are both turned out of the case in position for use.

Of course it will be understood that while we show the two stations our invention is adapted for use on any telephone system by the intervention of the usual switchboard or analogous device.

A indicates the casing, which, as shown, is a rectangular box having a door A', hinged at a .

B is a standard secured within the casing, having a perforated flat side extension B'.

C is a support for the telephone instruments, slotted so as to have arms C', between which the extension B' can be passed, while a pin F will pivot the standard B and the support C together. The desired amount of friction to insure that the support C will remain in whatever position it may be placed is secured by a nut F', screwing on a threaded end of the pivot-pin F, and, as shown, the other end of the pivot-pin F is secured so as to make a positive engagement with one arm C' of the support C, and the drum G, to be hereinafter described, is firmly secured to the pin F. As shown, the support C sustains both the transmitter D and the receiver E, the bent tubular arm C² extending from the receiver, upon which is placed a sleeve C³, within which sleeve also fits the tubular arm C⁴ of the receiver. This arrangement permits the adjustment of the receiver to different distances from the transmitter, thus adapting the instrument to the use of different operators; but while we prefer to secure both the transmitter and receiver together and to the same support C, it will be obvious that either may be secured to the pivot-support C, while the other may be independently supported, and where in the claims we refer to the telephone as an element of the combinations designated we wish to be understood as including the pivoted arrangement of either a receiver or transmitter, or both.

G is a drum, of vulcanite or other non-conducting surfaces, secured, as already stated, to the pivot-pin F, and, as shown, we place upon one side of this drum a plate H, cut away at one place, as indicated at h , while upon the other side of the drum we place a plate I, also cut away at one portion, as indicated at i . Connected with one edge of the

plate H and extending over the face of the drum is a metallic plate H', and connected with the edge of the plate I and also extending over the face of the drum are the metallic plates I' and I², while secured upon the face of the drum, but not in contact with either plate H or I, is a metallic plate J.

K and K' are spring-contacts connecting, respectively, with the wires 5 and 12, to be hereinafter described, and so situated with respect to the face of the drum G that they will simultaneously make contact with the plate H' when the drum is rotated to a position to bring the said plate beneath them.

K² and K³ are spring-contacts connected with the wires 13 and 6 and both resting against the side of the drum in position to make contact with the plate H, said plate being cut away at *h* in such wise as to interrupt the contact which the spring K² makes with the plate in one position to which the drum is rotatable—viz., that in which the drum and the telephone instrument are turned in the construction indicated in the drawings to a position at about ninety degrees to that in which the parts are represented in Figs. 1 to 4.

K⁴ and K⁵ are spring-contacts connected with the wires 14 and 10, so placed with respect to each other that when the telephone and drum are turned to the position of about forty-five degrees to that shown in Figs. 1 to 4 they will both contact with the metallic plate J, the plates I² and I' being so disposed and arranged on the drum that in the position indicated in Figs. 1 to 4 the spring-contact K⁵ will be in contact with the plate I², while a turning down of the telephone and drum to the extent of about ninety degrees will bring the contact K⁴ into contact with the plate I'. The seventh spring-contact, that indicated at K⁶ and which is connected with the wire 9, is so placed as to rest against the plate I, the recess *i* in said plate being so arranged as to interrupt the contact between the spring K⁶ and the plate I at the point in the movement of the drum when the plate J is in contact with the springs K⁴ and K⁵.

L indicates an induction-coil, and M a call-bell.

Referring to the diagrams, 1 and 7 indicate the line-wires connecting with the main source of electrical energy, (indicated at N.)

O indicates a call-battery situated in the line 15; but it will be understood that in place of such a battery any generator or series of generators adapted to give either a constant or intermittent current to actuate the call device may be used.

Referring again to the diagrams, we have indicated in each one two telephone-stations, (marked, respectively, T and V,) each connecting with the line-wires 1 and 7, respectively, through wires 2 and 6. As shown, the wires 2 pass to the transmitter D, and thence continue as wire 4 through the primary coil of an induction-coil L, passing thence through wire to the spring-contact K.

The telephone-circuit of which these wires form part is open so long as the contact K rests upon the non-conducting surface of the drum G; but when the drum is turned to a position which brings the plate H' into contact with the spring K through plate H', plate H, spring K³, and wire 6 to the line-wire 7. This position of the drum is shown in Fig. 8 of the drawings. The induced or secondary current incident to the closing of the primary circuit passes through wire 9 to spring-contact K⁶ and thence to plate I and plate I', which when the drum is turned to the position to close the primary circuit is in contact with spring K⁵, through which and line 10 the current passes to the line 11, and thence to line 10 of the other station, which, the drum G being in the same position as the first station, communicates through spring K⁵ and plates I' and I with spring K⁶, and thence through wires 9 and 8 with the receiver E, the circuit being continued through line 12, the spring K', plates H and H', spring K³, wire 6, wire 7, wire 6 of the other station, spring K³, plates H and H', spring K', and wire 12 to the receiver E of the first station. It will be noticed that in the position indicated in Fig. 8 the spring K² is out of contact with the plate H, resting against the face of the drum at *h*, while the spring K⁴ also rests against the non-conducting face of the drum, and it will also be noticed that in the position of rest—that indicated in Figs. 1 to 4 and Fig. 6 of the diagrams—the spring-contacts K and K' and the spring-contact K⁴ rest against the non-conducting surface of the drum, while the springs K² and K³ are both in contact with plate H, and the spring K⁵ is in contact with plate I², and the spring K⁶ in contact with plate I. By turning the drum to about forty-five degrees—that is, a position intermediate between that indicated in Figs. 1 to 4 and that indicated in Fig. 5—the drum in station T (see Fig. 7) is turned to a position in which the spring-contacts K⁴ and K⁵ rest against the metallic plate J. This couples the battery-wire 15 with the wire 11 through the wires 14 and 10, and the drum in station V, remaining in the position indicated in Fig. 6, the current passes from wire 11 through wire 10, spring K⁵, plates I² and I, wire 9 to wire 13, ringing the bell or actuating any other signal connected with said line and passing thence to spring K² and through plate H to spring K³, and thence through line 6 to the line-wire 7. It is thus clear that the movement of the telephone and drum in station T will ring the bell or operate the signal in station V. The operator in station V will then draw down his telephone, turning the drum to the position shown in Fig. 8, and the operator in station T also drawing down the telephone to operative position the two stations will be placed in communication.

From the above description it will be seen that we have shown the usual telephone-circuit, distant-call circuit, and local-call cir-

cuit, each local-call circuit of one station being a part of the distant-call circuit of the other station. Both the distant and local call circuits may in some cases be dispensed with, and of course in such case the corresponding switches upon the rotating drum may also be dispensed with and only those switches which open and close the telephone-circuit employed. Again, it is sometimes desirable to equip one station so that another station or stations may be called by it, but without providing for a call to the first station. In this case the local-call circuit can be omitted and the corresponding switches also omitted.

It will be observed that when the telephone instruments are turned into position to be used, and by reason of the switch connections the circuits are simultaneously put into condition for use, the movable support, with the transmitter and receiver, will project from the box. This renders it impossible for the user to inadvertently leave the circuit in such a condition that the station could not be called, for unless he is sufficiently careless to leave the entire box open he is forced to restore the circuits. The support carrying the instruments must be turned up within the box before the door can be closed, and of course in being so turned up the switch is likewise turned without any particular thought being given to it by the user.

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

1. A telephone-substation apparatus comprising the following instrumentalities: a casing, a fixed support permanently secured upon the casing, a movable support, a receiver and transmitter carried upon said movable support in the proper relative positions which they should occupy when in use, a pivotal connection between the fixed and movable supports, an insulated drum or cylinder secured to the movable support and having its axis coincident with the axis of the pivotal con-

nection, one or more conducting-segments secured upon the periphery of the cylinder, and fixed contact-springs forming terminals for the telephone-circuits, carried upon the fixed support and having their extremities resting upon the surface of the cylinder, substantially as described.

2. A telephone-substation apparatus comprising in combination a box or casing having a door, a fixed support within the box or casing, a movable support carrying a transmitter and receiver and pivotally secured at one end upon the fixed support so that it will swing in a plane substantially perpendicular to the plane of the door when the latter is closed, a switch-cylinder carrying contacts and secured upon the movable support to be turned as it turns, and fixed terminal springs for the telephone-circuits resting upon said cylinder, whereby when the instruments are turned into a position for use the proper circuits will be automatically completed, but the movable support must be turned to properly alter said circuits before the box-door can be closed, substantially as described.

3. A telephone-substation apparatus comprising in combination a box or casing having a door, a fixed support within said casing, a movable support carrying a receiver and transmitter and pivoted at one extremity to said fixed support, a rotary switch connected to the movable support to be actuated in its motion and thereby change the telephone-circuits, the movable support being adapted to project forwardly and without the box or casing when turned into the position of use, and when in such position constituting an impediment to the closure of the box-door, substantially as described.

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