

No. 673,344.

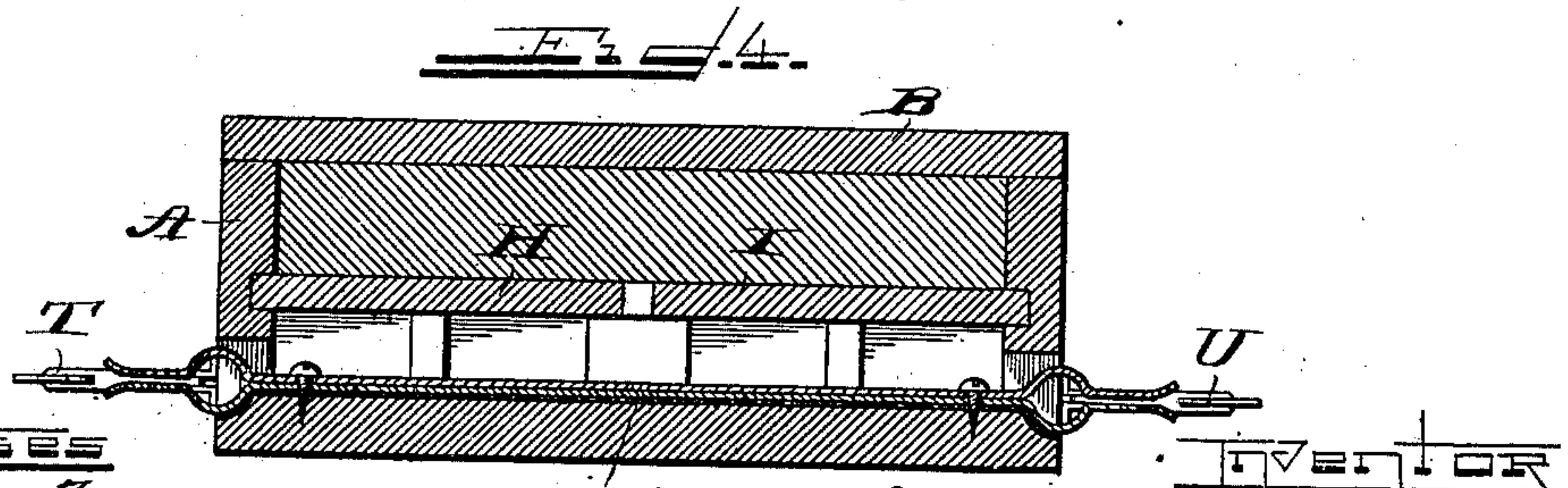
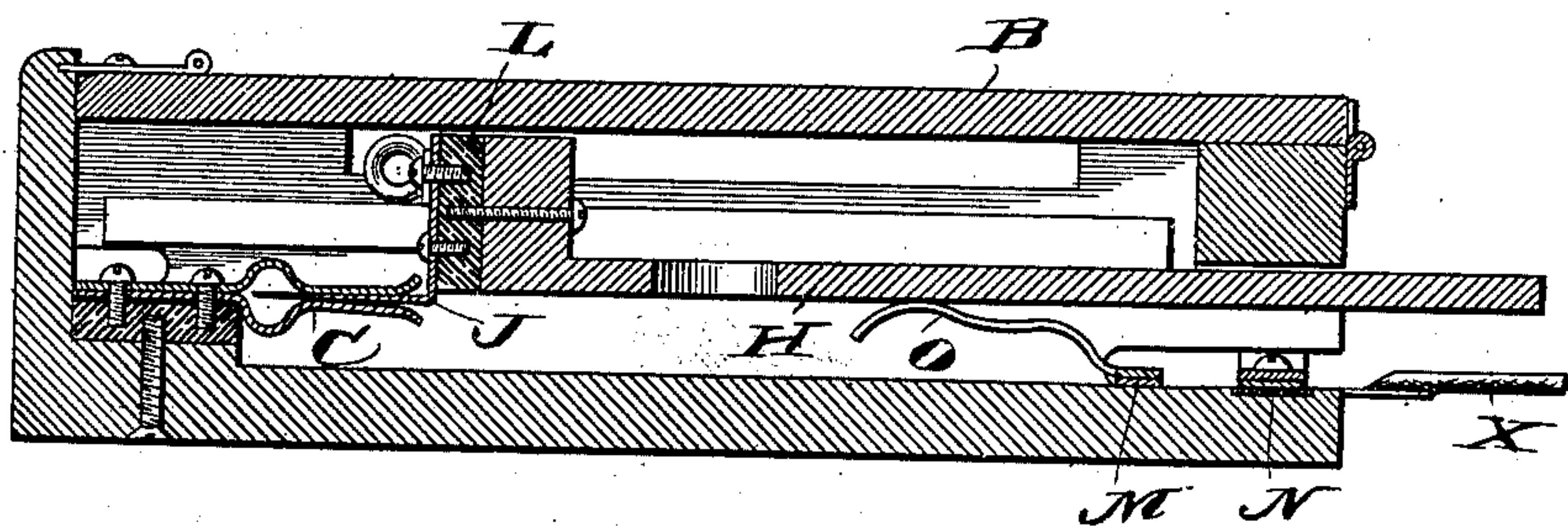
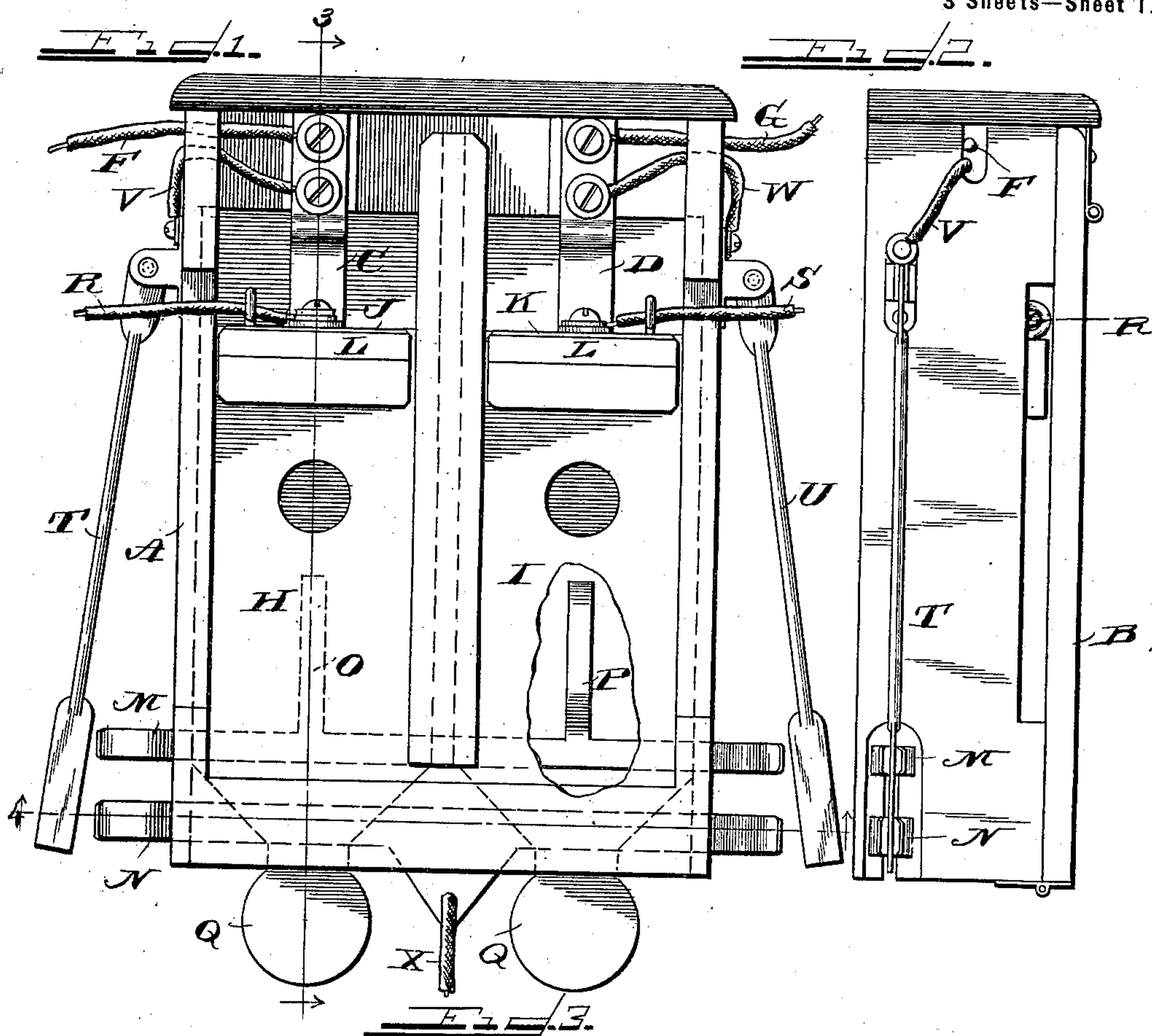
Patented Apr. 30, 1901.

P. J. WENDELL.
TELEPHONE SWITCH AND CUT-OUT.

(No Model.)

(Application filed Apr. 18, 1900.)

3 Sheets—Sheet 1.



Witnesses
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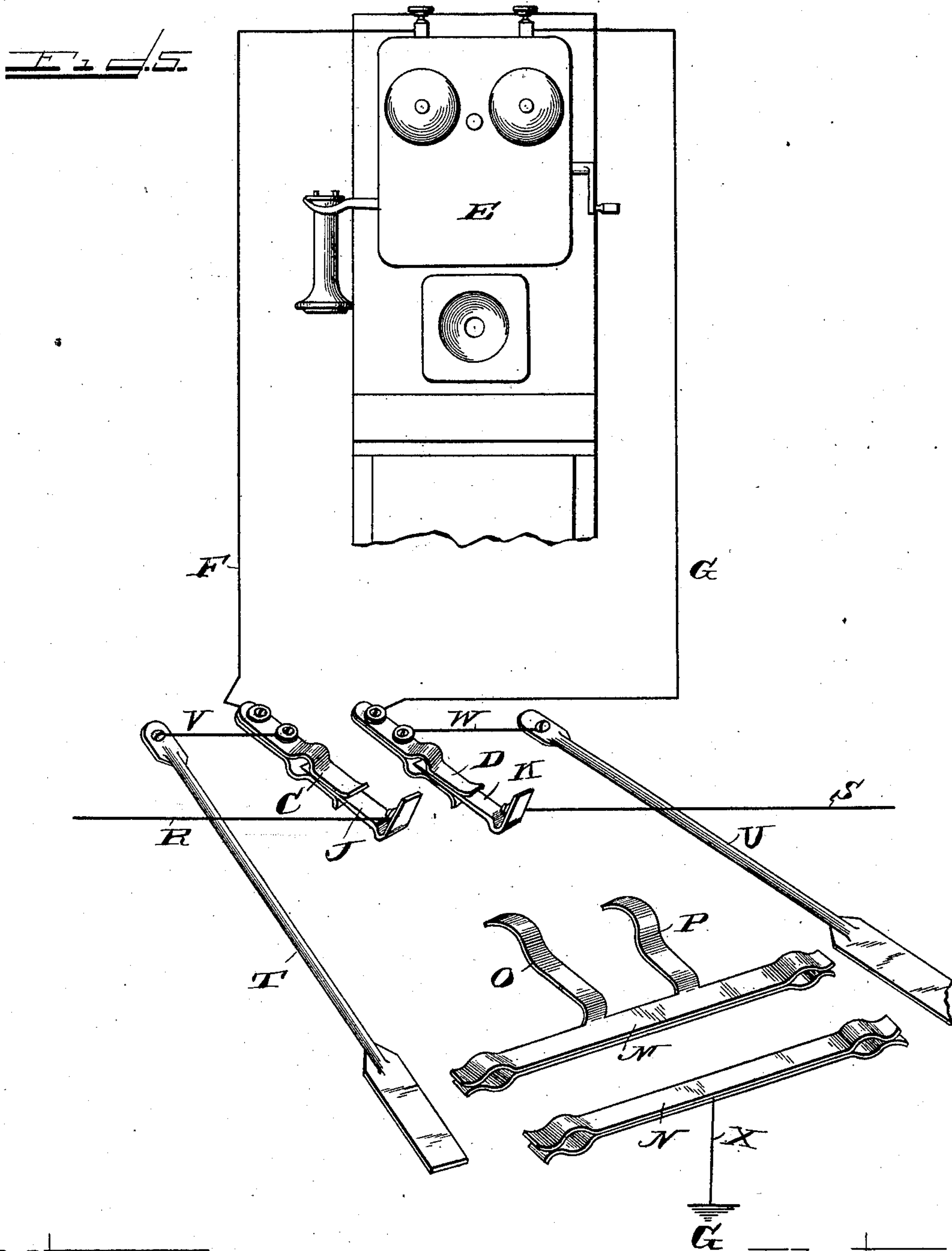
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3 Sheets—Sheet 2.



WITNESSES
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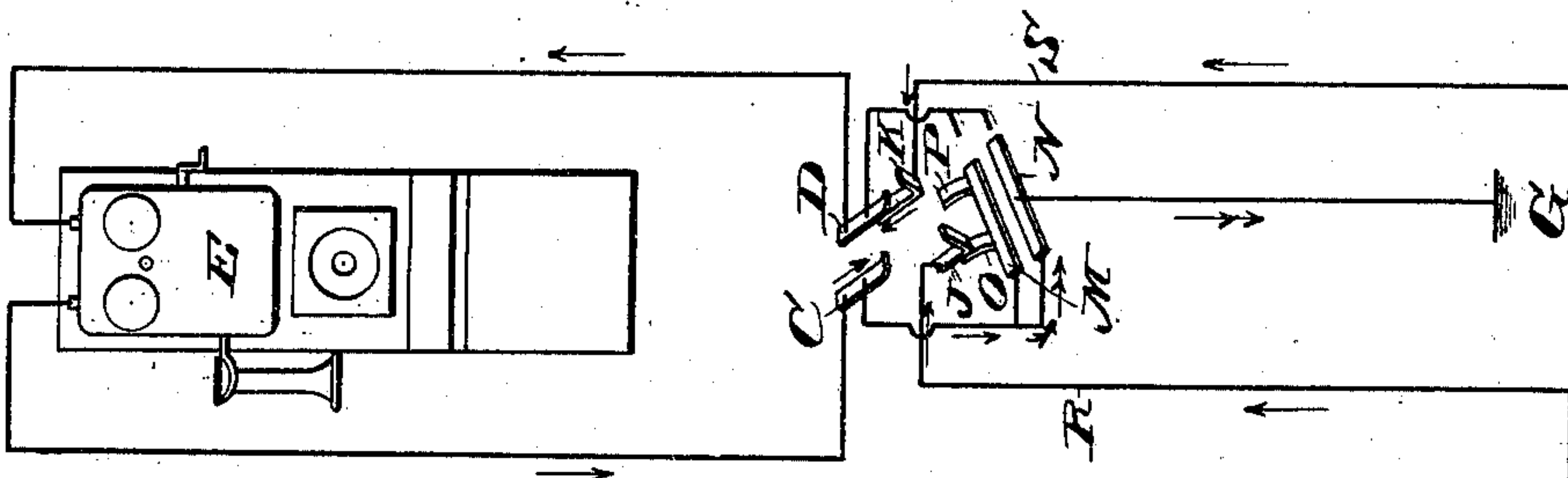
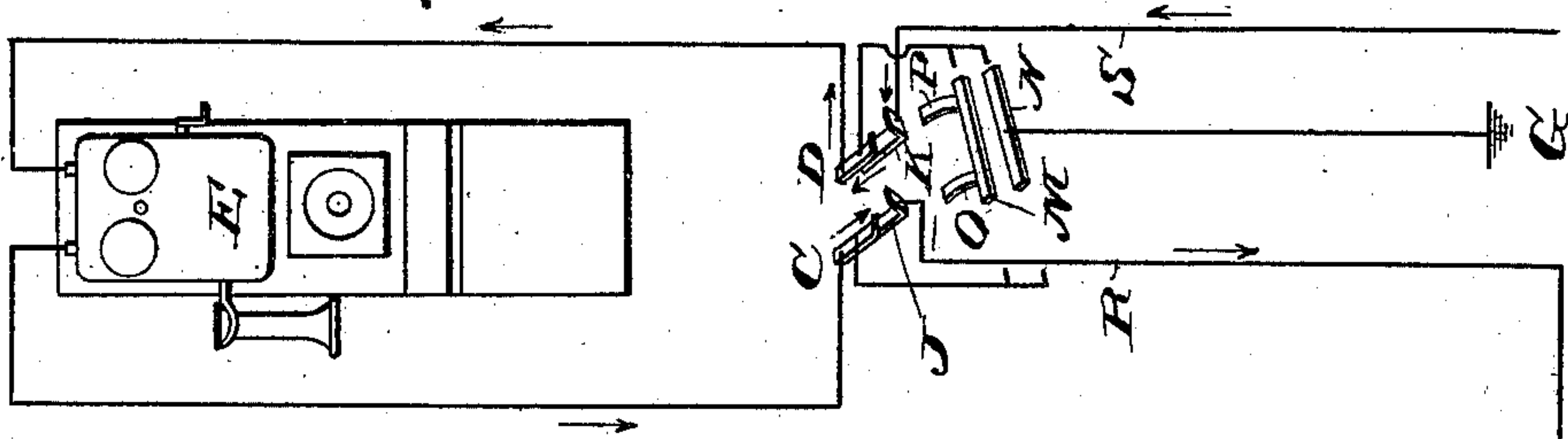
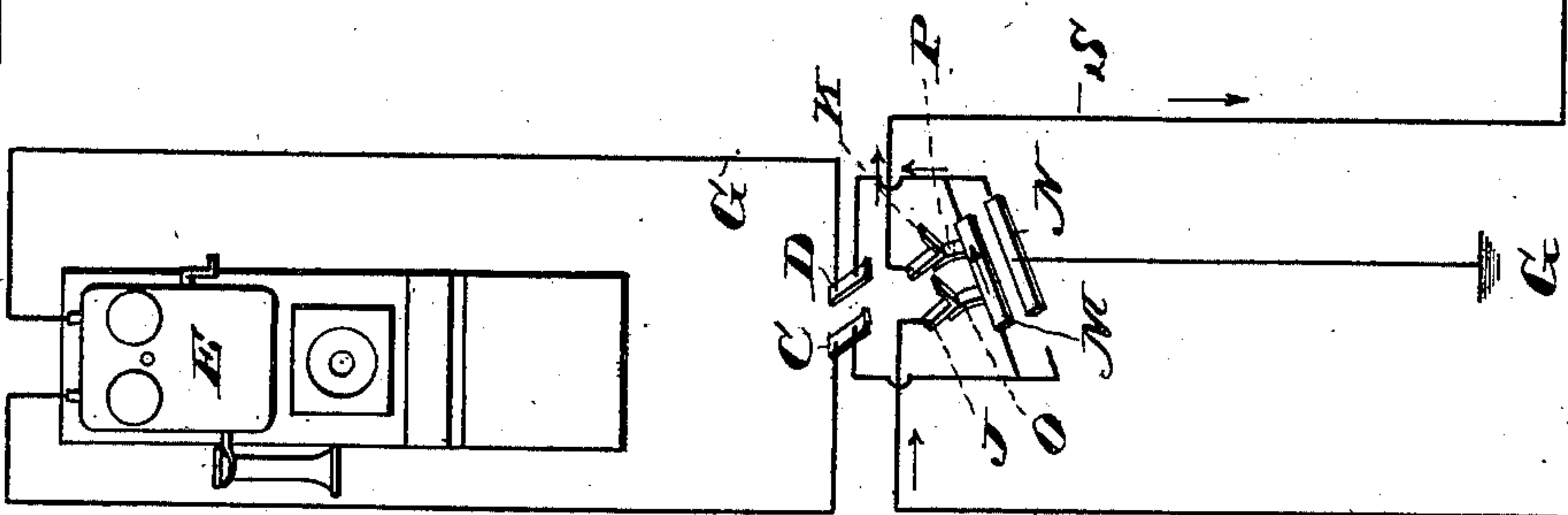


Fig. 3



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UNITED STATES PATENT OFFICE.

PETER J. WENDELL, OF OPHEIM, ILLINOIS.

TELEPHONE SWITCH AND CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 673,344, dated April 30, 1901.

Application filed April 18, 1900. Serial No. 13,345. (No model.)

To all whom it may concern:

Be it known that I, PETER J. WENDELL, a citizen of the United States, residing at Opheim, in the county of Henry and State of Illinois, have invented certain new and useful Improvements in Telephone Switches and Cut-Outs, of which the following is a specification.

This invention relates to improvements in telephone switches and cut-outs of the kind that are adapted for use either at a telephone-exchange or in connection with a single instrument; but the principal use for which my invention is especially adapted is in connection with the telephones of a grounded circuit where the telephones are connected in series in a single line between the ground connections, such as are commonly employed in different sections of the country to connect two villages or towns and the intermediate farm-houses, in which the telephones are connected in series in the line, so that each subscriber may talk to every other one in the line. In connection with such systems there is generally private ownership of both the lines and the telephones, and each subscriber must take care of his own instrument and repair the same or have it repaired when out of order, and a frequent source of damage to the instruments is lightning, which may strike the wire at different points and burn out or disable the instrument so as to occasion considerable expense in repairing the same.

The primary object of my invention is a switch and cut-out for use in such systems, whereby a telephone in the circuit may be completely cut out of the circuit and the circuit be shunted past the telephone without interrupting the work of the other telephones in the circuit, or the telephone may be cut out from either direction while kept in circuit with all the instruments in the line in the opposite direction, and this too without destroying the operativeness of the portion of the circuit from which it is cut out. This and such other objects as may hereinafter appear are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 is a front view of an instrument embodying my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a section on the line 3 3 looking in the direction indicated by the

arrows, but with the instrument turned on its back. Fig. 4 is a transverse vertical section on the line 4 4 of Fig. 1 looking in the direction indicated by the arrows. Fig. 5 is a diagrammatic view showing the parts of the instrument separated from their casing and connected in the line and with a telephone, and Fig. 6 is another diagram showing a portion of a series line with different telephones differently connected.

Similar letters of reference indicate the same parts in the several figures of the drawings.

Referring by letter to the accompanying drawings, A indicates a casing, preferably of wood and of any suitable shape or dimensions, provided with a removable hinged cover B, which is shown as swung down in Fig. 1 to expose the interior thereof. Within the casing, near the upper end thereof, is a pair of contacts C and D, each of which is connected with the telephone E—say the contact C by the wire F and the contact D by the wire G. Within the box and arranged side by side are two slides H and I, said slides being also preferably composed of wood and carrying at their upper ends contact-points in the shape of tongues J and K, which are mounted upon insulating-blocks L, secured to the slides and in such position as to engage the contacts C and D whenever the slide is pushed up to its highest position in the casing, as shown in Figs. 1, 2, and 3, the contacts C and D being preferably in the shape of spring-jaws also secured to insulating-blocks attached to the casing. Within the casing, near the lower end thereof, are two metallic bus-bars M and N, insulated from the casing and from each other, the upper bus-bar being provided with a pair of spring-tongues O and P, which press against the back of the slides when the latter are in their elevated positions, but which make electrical contact with the tongues J when the slides are drawn down to their lowest position, the slides being provided with handles Q, projecting below and outside of the casing for convenience of manipulation thereof and to avoid the necessity for opening the door of the casing. To the contact J is connected one of the line-wires R and to the other contact-point K is connected the other line-wire S.

Preferably on the outside of the box or casing A, at each side thereof, are pivotally secured to a metal bracket a pair of switch-bars T and U, which are adapted to connect electrically the two bus-bars M and N, such bus-bars being preferably in the form of spring-jaws at their ends, between which the blades on the ends of the switch-bars will be pressed to make good contact. The pivot-block of the switch-bar T is connected by the wire V with the contact C, while the pivot-block of the switch-bar U is connected by the wire W with the contact D. The lower bus-bar N is provided at its center or at any point with an extension projecting outside of the casing, with which is connected a wire X, leading to the ground.

We now have the complete instrument, which is adapted for use in connection with any telephone and which should be placed on the outside of the house at some convenient point, so that the line-wires for the circuit will never enter the house, the wires F and G leading from the instrument into the house to the telephone, wherever it may be located, so that all possible danger of injury to the telephone or to the house will be avoided in the event of lightning striking the line-wire at any point if the instrument is properly adjusted to shunt or cut out the telephone. Assuming now a single telephone in a house and the instrument shown in Figs. 1 to 4 outside of the house, with the parts in the position shown in the drawings, it will be seen that the telephone is in circuit ready for talking in either direction from the instrument, as the current will come in from the line on one of the wires—say the wire R—and thence through the contacts J and C, the wire F, to and through the telephone, and back by the wire G to the contacts D and K, and then out on the line-wire S at the opposite side. If now both of the slides be drawn down to their lowest positions until the contacts J and K engage the spring-tongues O and P upon the bus-bar N, then the telephone connected with this particular instrument will be entirely cut out of the line-circuit; but the circuit will not be broken, for it will now be established through the line-wire R, contacts J and O, bus-bar N, contacts P and K, and out on the line-wire S. It will of course be understood that in both of the positions of the slide just described the switch-bars T and U will be out of contact with the bus-bars N and M. If now it should be storming in either direction in which the line leads from this instrument and it is desired to avoid the danger of the lightning striking the line-wire near the storm-center and traveling back to this telephone, this may be accomplished without cutting the instrument out from use in the section of the line running in the opposite direction. Assuming now the storm to be off to the left with reference to the instrument in the drawings, then by drawing the slide H down to its

lowest position and moving the switch-bar T so as to connect the bus-bars N and M the telephone with which this instrument is connected will be cut out from the section of line running to the left of the instrument, which section will be grounded, while at the same time it will be in circuit and usable with the section on the line to the right of the instrument. With the parts in this position the circuit to the right will be traced through the line S, contacts K and D, wire G, through the telephone, back through wire F to contact C, thence through wire V and switch-bar T to bus-bar N, and thence through wire X to ground. The circuit from the left will come in through line-wire R, contact J to contact O, bus-bar M, switch-bar T, bus-bar N, and wire X to ground. Of course by reversing the positions of the slides and switch-bars the opposite conditions may be obtained—that is, the line to the left may be open for communication and the line to the right grounded and cut out from the telephone with which this instrument is connected.

The diagram Fig. 6 clearly illustrates the conditions in a portion of the circuit containing three telephones in the line under the conditions just described of a storm to the left of the center instrument, while it is clear to the right, the middle instrument being the one assumed in the description. Thus the instrument to the right is so adjusted that the telephone to the right is in the line-circuit, which may be readily traced by the reference-letters thereon corresponding to those on Fig. 1, while the instrument to the left is so adjusted that the telephone to the left, which is in the storm district, is completely cut out of the line-circuit, but the circuit is not grounded or broken at this instrument. The middle instrument is so adjusted that the middle telephone is shown as in circuit with the telephone to the right and all the other telephones in the line to the right, while cut out from the line to the left, although the line to the left is grounded and the telephones therein that are still in the line may hence be used. If, however, the slides were drawn down only part way, so that the contacts J and K thereon or on either of them were out of engagement with both the contacts C and O or the contacts D and P, then the entire line would be “dead” or the section corresponding to the slide in such mid-position would be dead, because there would be no ground in the line, and the line would remain dead until a ground was established at some other instrument, when communication would only be possible between the telephones included between the grounded instruments. Hence it is always desirable to have the slides moved to one extreme position or the other.

I have indicated by arrows in Fig. 6 the direction of the current on the line under the conditions therein shown.

It is obvious that where it is desired the instrument shall have but one capability—to wit, that of shunting or cutting out the telephone with which it is connected—the
 5 two slides H and I may be rigidly connected together, so as to move together, or a single slide may be substituted therefor. It is also obvious that where the instrument is to be used in connection with a telephone-ex-
 10 change or where a number of telephones are employed in connection therewith it is only necessary to duplicate the slides and lengthen the bus-bars to enable the cut-out of any one or all of the telephones, as the operator may
 15 desire. So, also, may any suitable form of switch be employed in place of the bars T and U, or any other form of devices suitable for the purpose may be substituted for those shown and described; but as cheapness and simplic-
 20 ity are essential to the commercial value of an instrument of this kind I prefer the devices herein shown and described, which I have used practically with entire satisfaction.

The importance of such an instrument in
 25 connection with the small country circuits is very great, and the necessity therefor is apparent when it is understood that in a single storm between fifteen and thirty telephones have been burned out in a single cir-
 30 cuit to my knowledge, costing all the way from three dollars to six dollars per instrument to repair the same, which expense falls upon each individual owner and user, besides which must be borne in mind the great
 35 inconvenience and loss of time which results from the loss of use of the instrument while it is being repaired, which in many cases necessitates the telephone being sent to some large city. With my invention, however, all
 40 of these difficulties are obviated and the telephone is absolutely insured against harm during the worst of storms, as well as the house being protected by my instrument being located on the outside thereof, which prevents
 45 the lightning from entering the house and causing damage by fire.

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

50 1. The combination with a plurality of telephones and a line-wire common to all of them, of means for grounding the line-wire on one

side of a given telephone, means for completing the circuit through said telephone and the line-wire on the other side thereof, 55 and means shunting the telephone and connecting the line-wires on opposite sides thereof, substantially as described.

2. The combination with a telephone and the line-wire thereof, of a switch and cut-out 60 in circuit therewith, comprising the independent movable contacts, a pair of bus-bars, one of which has a ground connection and switches adapted to connect said bus-bars 65 with each other and with the telephone, said movable contacts being connected respectively with the line-wires and adapted to connect the line with either the telephone or the ungrounded bus-bar, substantially as de-
 70 scribed.

3. The combination with a telephone and the line-wire thereof, of a switch and cut-out in circuit therewith, comprising a casing, a pair of stationary contacts therein insulated therefrom and connected respectively with 75 the telephone, a bus-bar having a pair of stationary contacts in line with the first-mentioned contacts, and a pair of movable contacts connected respectively with the line-wires and adapted to alternately engage either 80 pair of stationary contacts, substantially as described.

4. The combination with a telephone and the line-wire thereof, of a switch and cut-out in circuit therewith, comprising a casing, a 85 pair of stationary contacts therein insulated therefrom and connected respectively with the telephone, an insulated bus-bar having a pair of stationary contacts in line with the first-mentioned contacts, a second insulated 90 bus-bar having a ground connection, a pair of switch-bars connected respectively with the first-mentioned pair of contacts and adapted to connect the two bus-bars, a pair of independent slides carrying insulated con- 95 tacts respectively connected with the line-wires and adapted to engage one of the two pairs of stationary contacts, substantially as described.

PETER J. WENDELL.

Witnesses:

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 J. F. COX.