

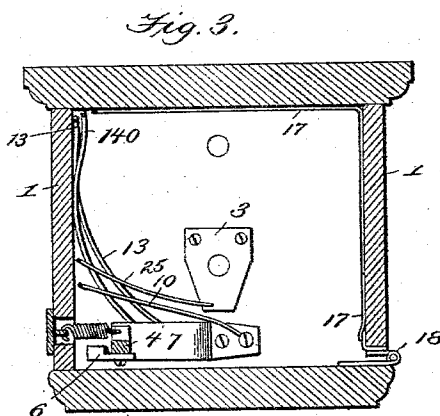
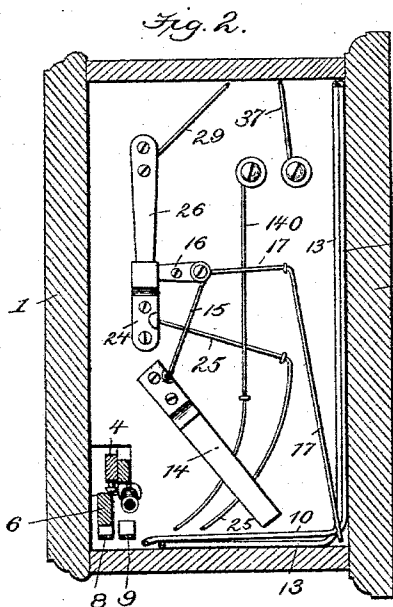
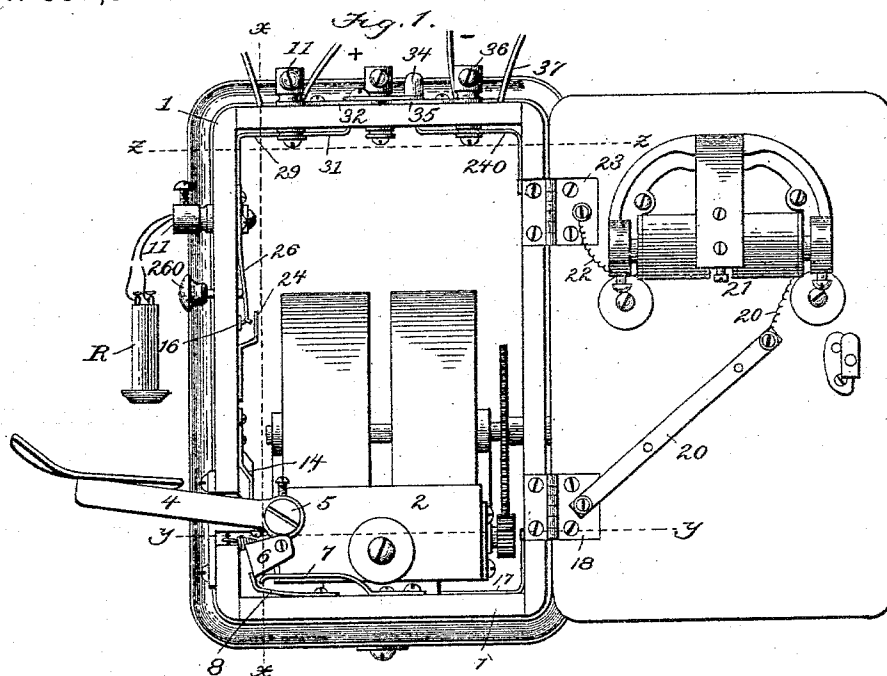
(No Model.)

3 Sheets—Sheet 1.

A. G. DAVIS.
TELEPHONE SWITCH.

No. 531,913.

Patented Jan. 1, 1895.



Witnesses

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Curtis Hammond

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Attorney

(No Model.)

3 Sheets—Sheet 2.

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Fig. 4.

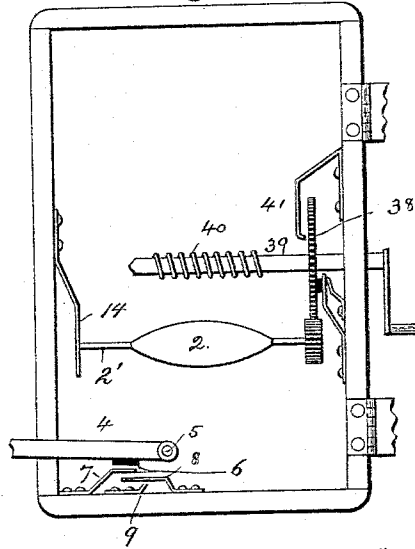


Fig. 5.

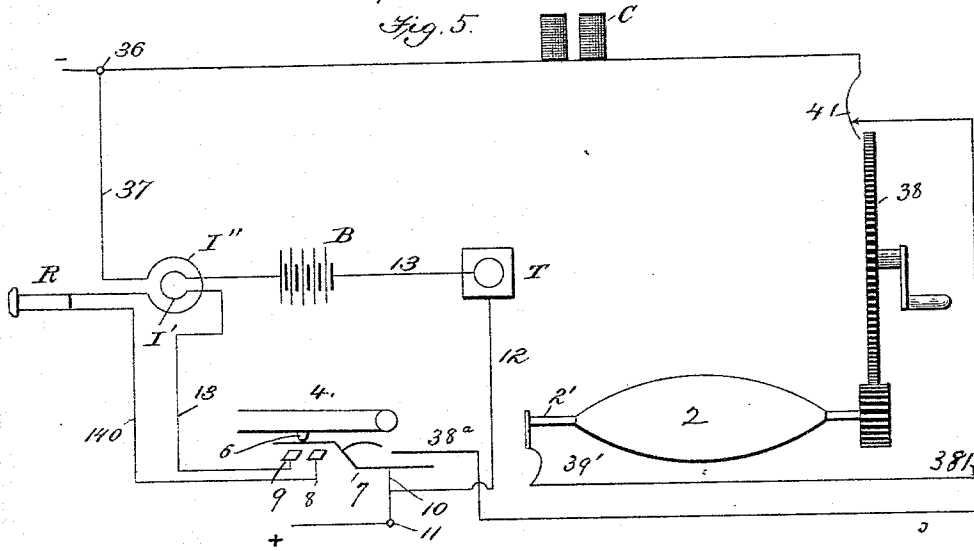
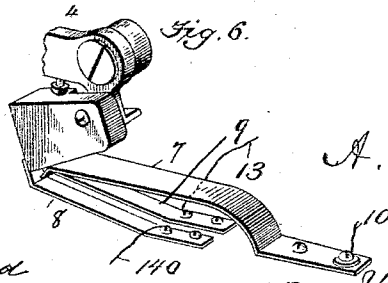


Fig. 6.



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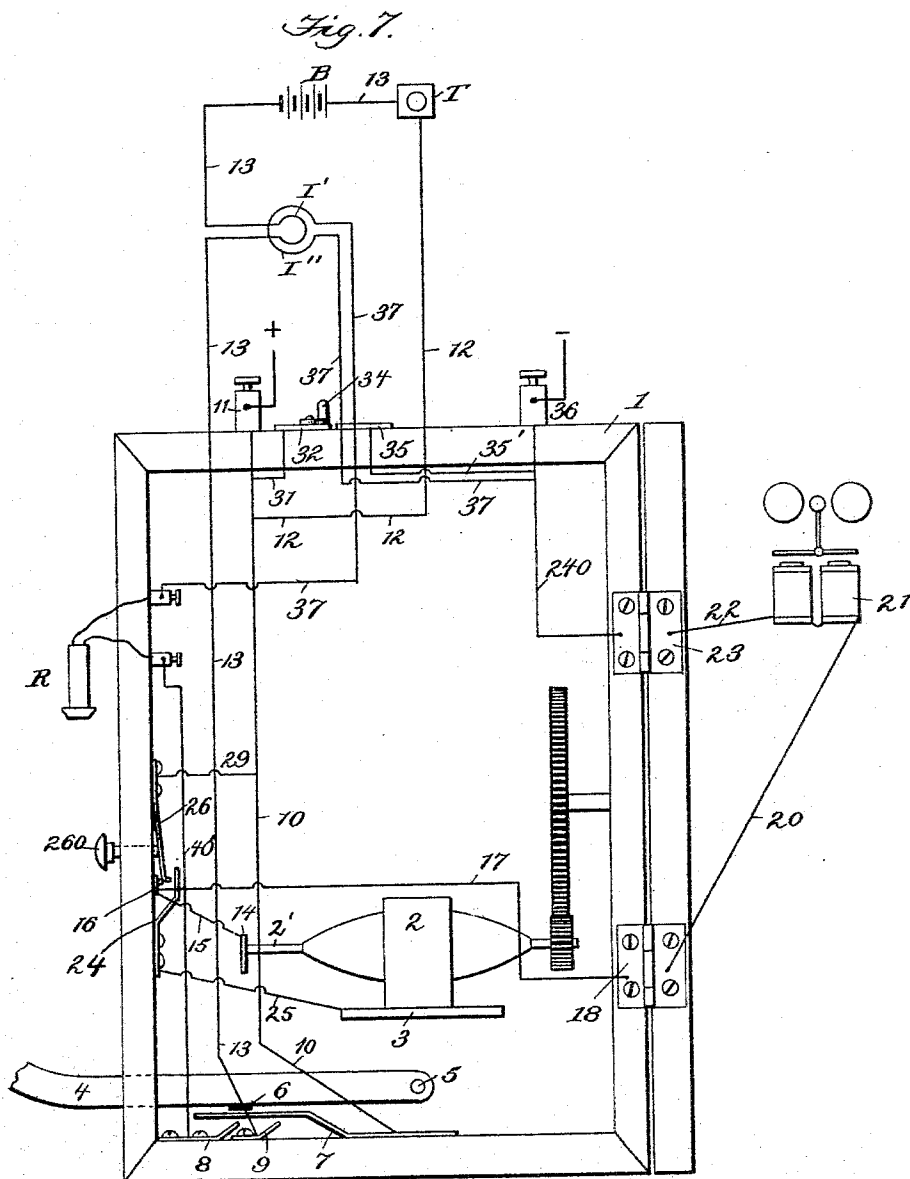
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3 Sheets—Sheet 3.

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WITNESSES:

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UNITED STATES PATENT OFFICE.

AUGUSTUS G. DAVIS, OF BALTIMORE, MARYLAND.

TELEPHONE-SWITCH.

SPECIFICATION forming part of Letters Patent No. 531,913, dated January 1, 1895.

Application filed November 23, 1893. Serial No. 491,762. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS G. DAVIS, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Telephone-Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in telephone switches, and it has for its object to provide for switching the telephonic instruments into the main circuit or to switch the call into said main circuit, the receiving instrument and the call switch being normally out of the main circuit or disconnected therefrom.

The above mentioned object is obtained by the means illustrated in the accompanying drawings, in which—

Figure 1 is a front view of an apparatus embodying my invention, the door of the box in which it is contained being open. Fig. 2 is a vertical section taken on the line X—X of Fig. 1. Fig. 3 is a horizontal section taken on the line Y—Y of Fig. 1, the magneto generator being removed. Fig. 4 is an elevation illustrating a different form of the invention. Fig. 5 is a diagram illustrating a modification of the system of wiring. Fig. 6 is a perspective view of one of the switch devices detached. Fig. 7 is a diagrammatic view illustrating the circuits of the apparatus illustrated in Fig. 1.

Referring to the drawings, 1 indicates a box or casing, such as is usually employed in connection with telephone instruments and in which is mounted the magneto generator 2. This generator rests upon and has electrical connection with a metallic plate 3 secured to the bottom of the box,—as shown in Fig. 3,—and the handle by which it is manipulated extends through one side of the casing. 4 indicates the lever by which both the local and the main circuits through the telephone instruments are opened and closed. It extends through a suitable opening in the side of the box 1, in convenient position to form a rest for the arm of a person holding the receiving instrument R, to his ear in po-

sition for use, and is pivoted in a suitable support, as at 5. It is provided with a block 6 of non-conducting material, which bears against a contact making and breaking device, which, as shown, consists of a spring 7 secured to the bottom of the box and having such electrical connections as to include it in both the local and the main circuits. The free or movable end of this spring sets over the free ends of two contact pieces 8 and 9, which constitute respectively terminals of the main and the local circuits. When the lever 4 is depressed the spring contact piece 7 is brought into engagement with the spring contacts 8 and 9 thus closing the local and the main circuits and putting the telephone instruments into proper connection to receive and transmit messages.

The switching device by means of which the magneto generator 2 is cut into and out of the branch circuit which includes the magnet 21 operating the call bell,—consists of a push button 260 extending through one of the walls of the box and arranged to operate a contact spring 26, which is so arranged as to bear upon one or the other of two contacts, 16 and 24,—which are respectively in connection with the branch of the main circuit containing the magnet 21, and the branch circuit containing the generator 2,—accordingly as the push button is in normal position or is pushed in.

The call mechanism and the receiving and transmitting instruments may be of any usual construction.

I will now trace the electrical connections, referring particularly to the diagrammatic figures of the drawings. It will be understood that the detailed wiring within the box may be changed or modified to suit the circumstances or convenience of the person setting up the same. I will first trace the local circuit which includes the transmitter T, the battery B and the primary I' of the induction coil. A conductor 10 connects the spring contact 7 with the binding post 11 into which comes one of the line wires,—say the positive wire,—and from this conductor 10 another conductor 12 branches, and leads to the transmitter T. The transmitter is connected by a conductor 13 with the battery B, the conduc-

tor continuing beyond the battery to the contact 9, and including in its course the primary coil I'. Upon the lever 4 being pressed, this local circuit is closed and may be traced as follows: from the battery along the conductor 13, through the coil I' and to the contact 9, thence through the spring contact 7 and the conductors 10 and 12 to the transmitter, and from the transmitter along the conductor 13 back to the battery.

The main circuit, which includes the receiving instrument R, and the secondary I'' of the induction coil, may be traced as follows: The positive wire entering at the binding post 11, is connected with the spring contact 7 by the conductor 10, as has been stated. The negative line wire enters at the binding post 36, from which the conductor 37, including the secondary coil I'' extends to the receiving instrument R. Another conductor 40' connects the receiving instrument R with the contact 8.

The main circuit is closed whenever the lever 4 is depressed and may be traced as follows: from the positive wire through the conductor 10 to the spring contact 7, thence to the contact 8, and through the conductor 40' to and through the receiving instrument, thence along the conductor 37, through the secondary coil I'' and to the negative line wire at the binding post 36.

The branch circuit through the call magnet 21 is as follows: The positive wire which enters at the binding post 11 is connected by the conductor 29 to the movable spring contact 26. This normally bears upon the contact piece 16 which is connected by the conductor 17 with one of the hinges 18 of the door, whence the circuit continues through the conductor 20 to the magnet 21, thence by the conductor 22 to the hinge 23 and thence by the conductor 240 to the negative line wire. The circuit is normally closed through this branch so that the telephone can be rung up at any time.

The branch circuit through the magneto generator is as follows: from the positive line wire through the conductor 29 or conductors 10 and 29, to the spring contact 26, where the circuit is normally broken, except when the push button 260 is pressed in. When so manipulated, the movable spring contact 26 leaves the contact 16 and engages with the contact 24, whence the circuit is continued through the conductor 25 to the metallic plate 3 upon which the generator is mounted. As is usual, one of the terminals of the armature coil is in electrical connection with this plate 3, while the other terminal is in connection with the armature shaft 2'. Against this shaft bears the contact spring 14 which is in permanent electrical connection with the call magnet 21, through the conductor 15 connecting the spring with the contact 16, whence the circuit takes the course already described passing along the

conductor, 17, hinge 18, and conductor 20 to the call magnet, and thence to the negative line wire by the circuit last before described.

It will be seen that, while the coil magnet is always in circuit, the magneto generator is normally cut out and is only put into circuit with the call magnet when the push button 260 is pressed in, causing the spring contact to leave the contact 16 and engage the contact 24.

The binding post 11 is connected by a conductor 31 with a plate 32 on the top of the box upon which is mounted a switch lever 34. A plate 35, similar to the plate 32, is secured to the top of the box contiguous to, but out of contact with, the plate 32, and these two plates may be put into electrical connection by means of the switch lever 34. The plate 35 is connected with the binding post 36 by a conductor 35'.

In the modification shown in Fig. 4 of the drawings, the push button is dispensed with, and the circuit through the call is closed by causing the main driving gear wheel of the magneto generator to bear against a contact point connected with one of the line conductors. To effect this the said gear wheel, which is indicated by the numeral 38 is mounted on a horizontal, longitudinally movable shaft 39, which is pressed normally outward by a spring 40, the shaft being provided with the usual crank at its outer end by which it may be turned. Opposite one side of the wheel is located a contact point 41 connected with one of the line wires as shown. When the shaft is pushed inward the wheel makes contact with said point establishing the call circuit through the line.

In the form of invention shown in Fig. 5 an auxiliary spring 38^a and the conductor 39' are employed for the purpose of cutting the call entirely out of circuit whenever the telephone is in use and the lever 4 depressed, the auxiliary spring 38^a being so arranged as to be engaged by the spring contact 7 when the latter is in its normal or raised position, but disengaged when the lever is depressed. Referring to this figure it will be seen that the main and local circuits through the telephone instruments are similar to those shown in Fig. 7, already described, and hence need not be again set forth in detail. When the instrument is to be called up the current passes from the line wire at the post 36 through the call magnet C, thence through the contact 41 to the wire at 381, and thence to the contact spring 38^a, which, being engaged by the spring 7, puts it into connection with the line wire at 11, and completes the circuit. When the user wishes to call up another station the wheel 38 of magneto machine 2 is pushed in so as to break the contact of the wire 381 with the spring 41 and establish a contact between it and the said wheel. The circuit may then be traced as follows: from the line wire at 36 through the

call magnet C to the contact 41, thence through the wheel 38 and the magneto machine 2 to the wire 39' which connects it with the wire at 381 leading to the contact 38^a whence the circuit follows the path last above described.

When it is desired to use the telephone, the lever 4 is depressed and so held,—by the arm of the user resting upon its projecting end if desired,—the telephone instruments being put into circuit so that messages can be sent and received.

When it is desired to call a distant station, the push button 260 is pressed inward and the armature of the magneto generator is rotated, causing the bells in the circuit to be rung. The instrument is normally in position to be called up, as has been pointed out.

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

1. The combination with the main line circuit and the local circuit, including respectively the receiving and transmitting instruments, a switch lever having an insulated block, a single contact spring against which the said block bears, the said spring having electrical connection with the main circuit, two contact springs with which the first mentioned spring may be brought to bear by pressure upon the lever, the conductors which terminate at such contacts and connect respect-

ively with the main and the local circuits, and means which normally hold the said lever in position to break the engagement of the said contact springs, substantially as specified.

2. The combination with the main line circuit, of a call magnet in a branch circuit, a magneto generator, a switch, two contacts with one of which the said switch is in normal engagement, which said contact is in circuit with the call magnet but not with the generator, the other of which contacts is in circuit with both the generator and the call magnet and with which the said contact spring may be made to engage whereby the generator is normally cut out of the call circuit but may be switched there-into at pleasure, substantially as specified.

3. The combination with the main line of a telephone circuit and the electro-generator and bell operating magnet, of the horizontal longitudinally movable shaft carrying the main driving gear wheel, the contact point against which said wheel may be brought to bear, and the connections whereby the generator and magnet are placed in the main line, substantially as specified.

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

AUGUSTUS G. DAVIS.

Witnesses:

WM. C. MCINTIRE,
CURTIS LAMMOND.