

(No Model.)

2 Sheets—Sheet 1.

J. E. SMITH.
ELECTRIC CIRCUIT CONNECTION FOR SIGNALING OR
TELEPHONE BOXES.

No. 501,631.

Patented July 18, 1893.

Fig. 1.

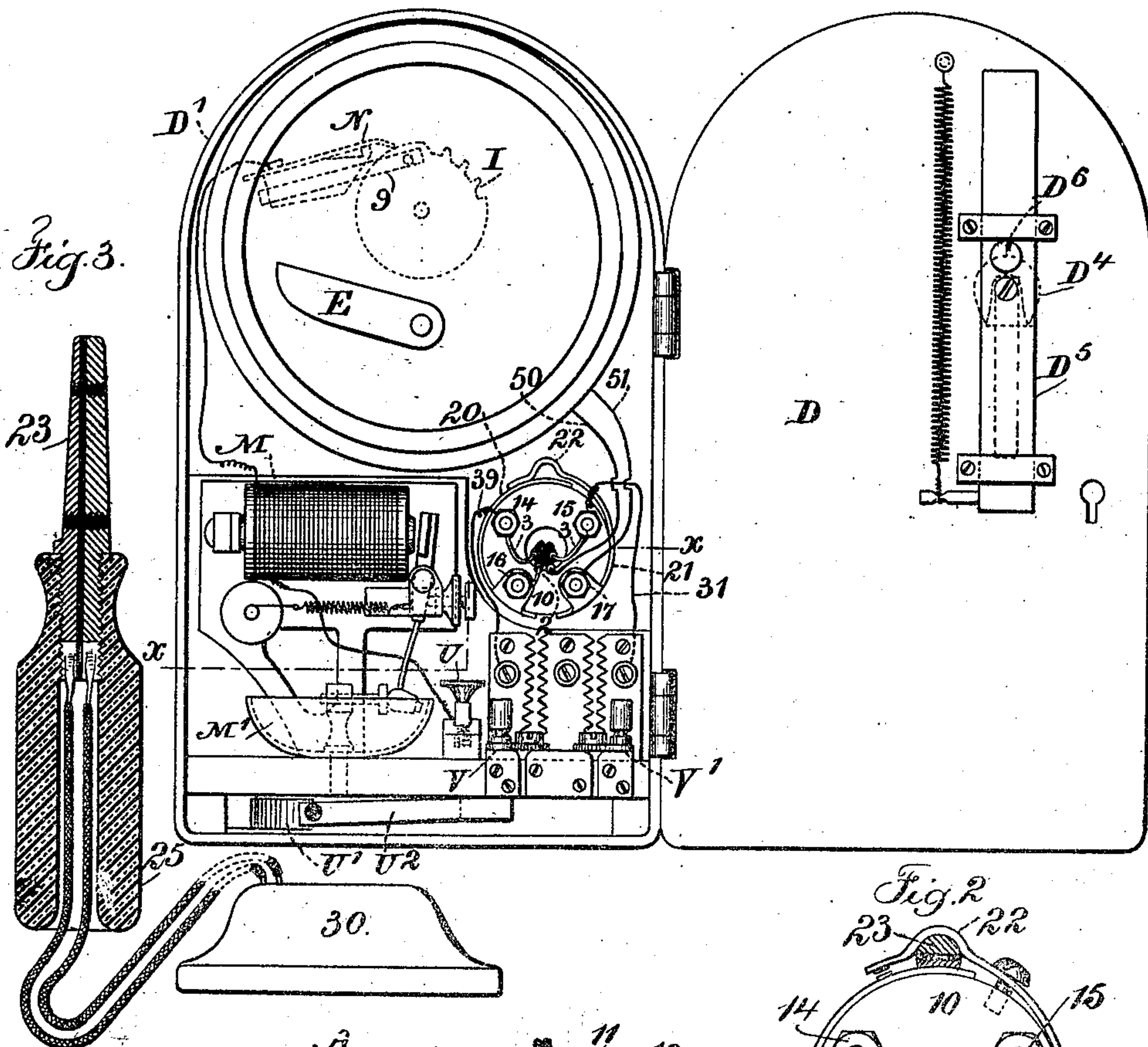
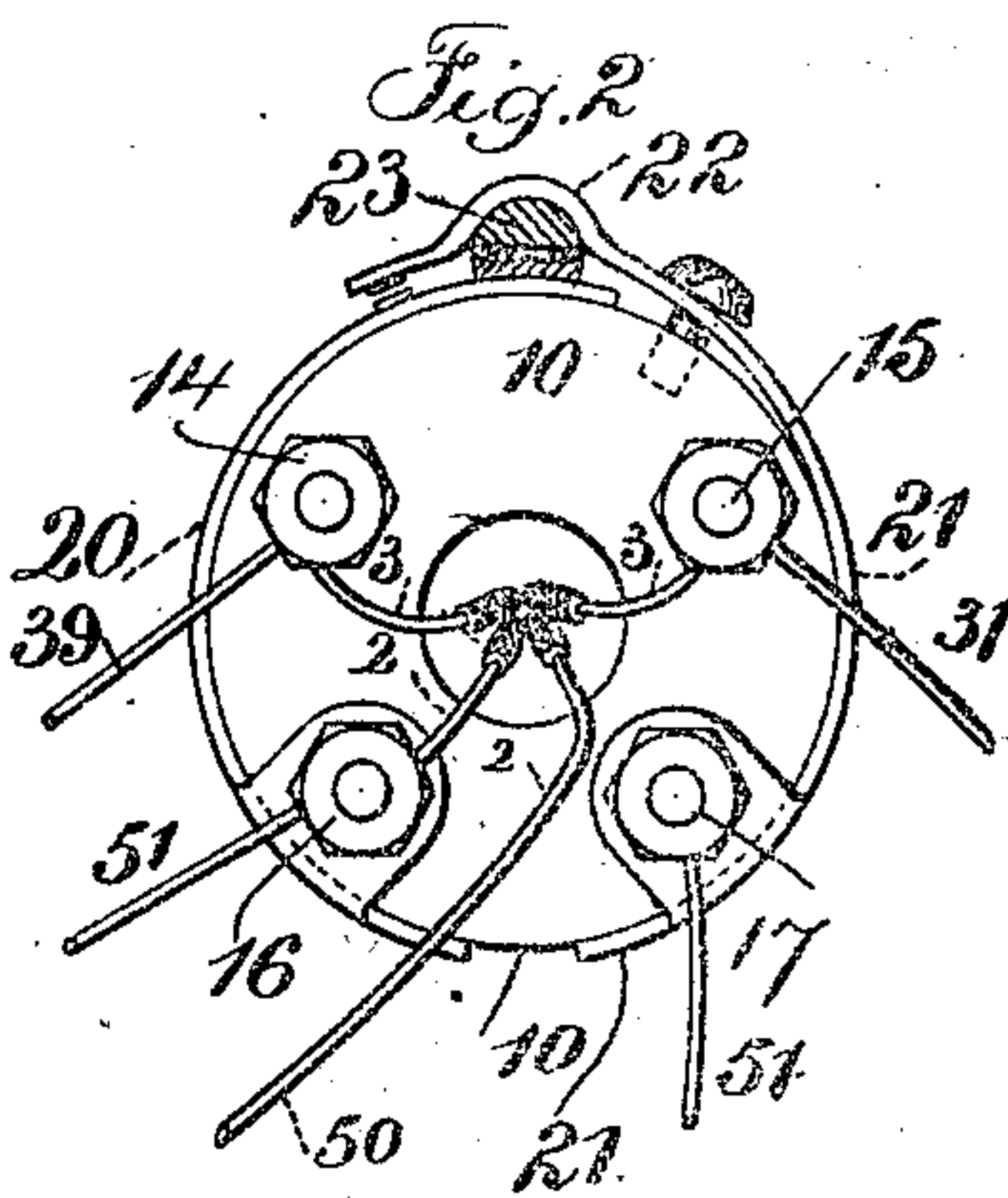
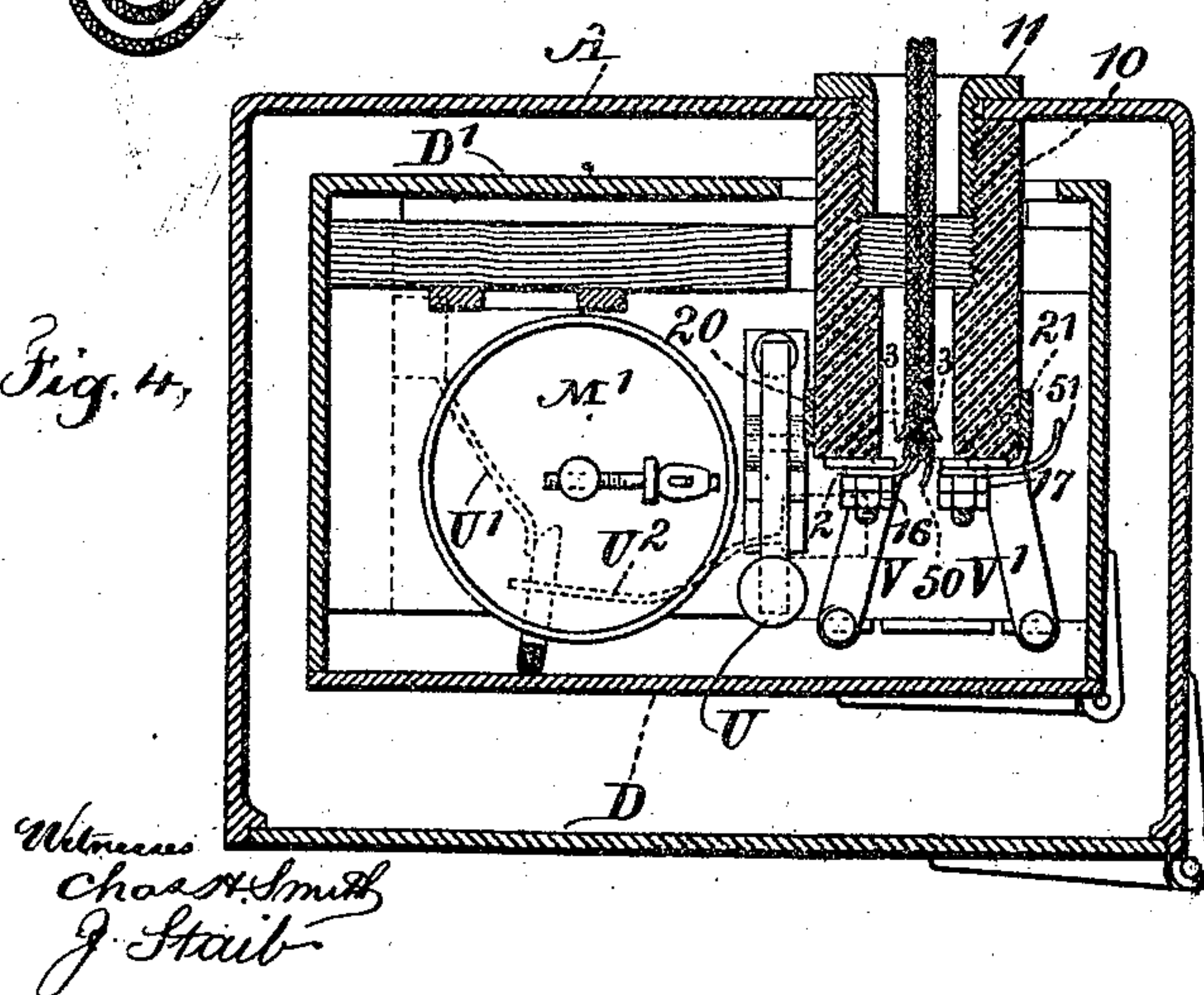


Fig. 4.



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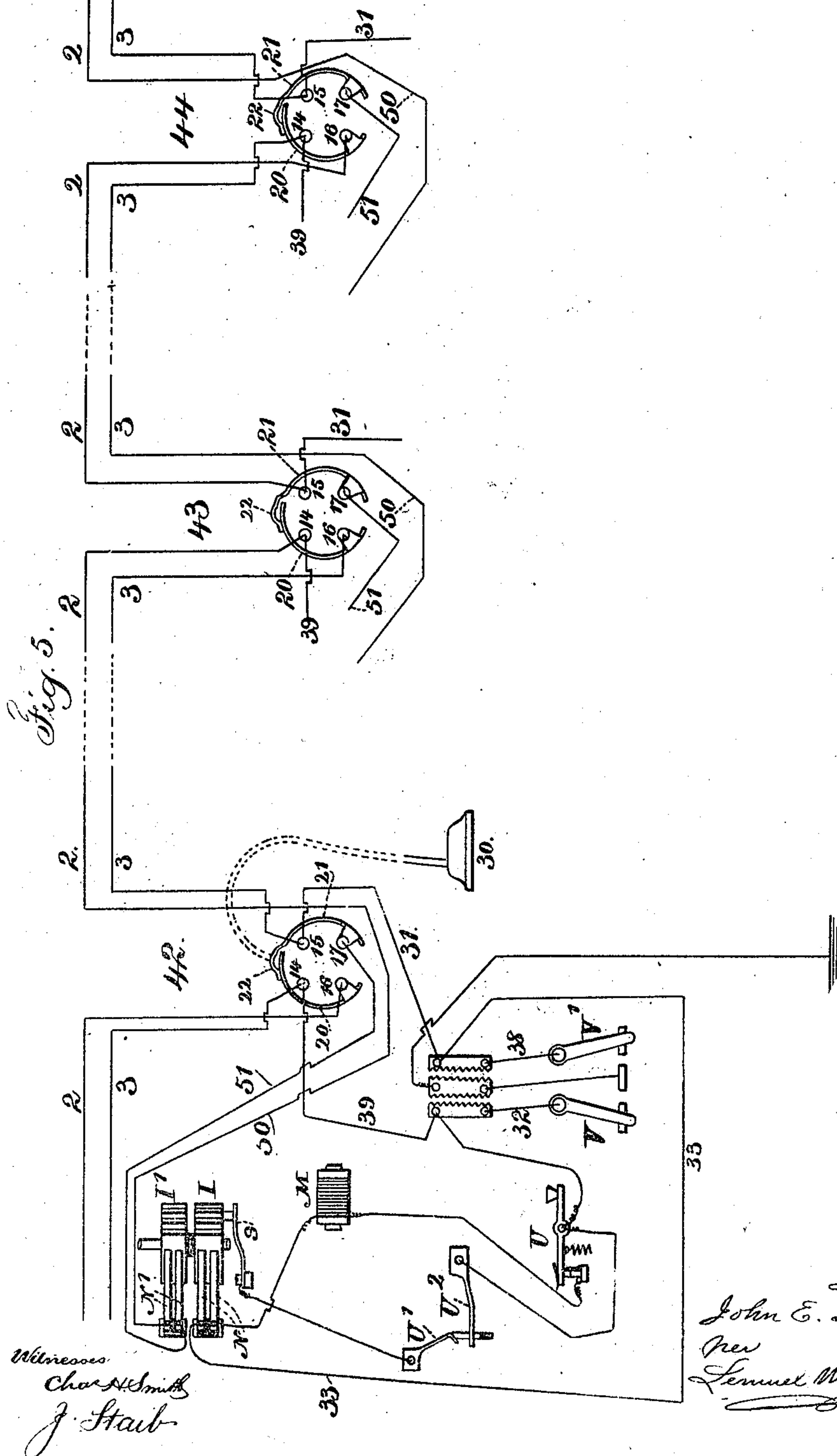
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2 Sheets—Sheet 2.

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JOHN ELLIOT SMITH, OF NEW YORK, N. Y.

ELECTRIC-CIRCUIT CONNECTION FOR SIGNALING OR TELEPHONE BOXES.

SPECIFICATION forming part of Letters Patent No. 501,631, dated July 18, 1893.

Application filed February 24, 1893. Serial No. 463,537. (No model.)

To all whom it may concern:

Be it known that I, JOHN ELLIOT SMITH, a citizen of the United States, residing in the city and State of New York, have invented an Improvement in Electric-Circuit Connections for Signaling or Telephone Boxes, of which the following is a specification.

In fire alarm systems, signal boxes have been located in different places, in order that calls may be sent to a central station to indicate the place of the fire, and a box adapted to this duty is represented in my Patent No. 343,738, granted June 15, 1886.

My present improvement relates especially to a peculiar circuit connection for telephones or other purposes and to the arrangement of the circuits whereby such telephonic or other circuits are not liable to be interfered with by the fire alarm signals; also to the circuit connections for transmitting alarms from a given box upon two separate and independent circuits, thus lessening the risk of loss of a signal from imperfect or broken circuits.

In the drawings, Figure 1 is an elevation of a signal box with the telephonic contact block, the door of the signal box being shown as open. Fig. 2 is an end view of such telephonic contact block in larger size and the plug in section. Fig. 3 is a section of the plug and elevation of a magneto telephone. Fig. 4 is a sectional plan at the line *x x* of Fig. 1, with the door of the signal box closed, and Fig. 5 is a diagram illustrative of the circuits.

The fire alarm signal box with which this improvement is used may be of any desired character. The box shown in my aforesaid Patent No. 343,738 is especially adapted to the present improvements, and I have represented portions thereof sufficient to illustrate the mode of use.

In the hinged door D of the box D' is a slot through which passes a hook D' connected to a slide D'' within the door with a stud or roller D''' that is caused to move the winding arm E and this winds up the spring and mechanism that gives motion to the circuit wheels I I', so as to transmit the signal whenever the hook D' is pulled down, and there is a finger key U and two switches V V' with their respective contact plates by which a ground connection can be made with either side of the line in case of a break in the metallic cir-

cuit. The bell M' of the electro-magnet M is rung by the circuit preserving finger key U and said electro-magnet is also adapted to receiving return signals. These parts are all substantially the same as in my aforesaid Letters Patent, except some of the circuit connections as hereinafter described and therefore do not require further description, and they are illustrative of any signal box with which my improvement is adapted to be used.

In electric circuits heretofore employed with fire alarm signals, the circuits are arranged to prevent if possible a confusion of signals, because if two boxes in the immediate vicinity of a fire were on the same metallic circuit, the signals might be mutilated in consequence of the two hooks being pulled simultaneously or nearly so. To avoid this it is usual to provide two or more metallic circuits in the same neighborhood and to connect the signal boxes into such circuits so that two boxes that are near each other are not on the same circuit. In the diagram Fig. 5, I have illustrated this feature of the circuit connections. Let 2 represent one metallic circuit and 3 a second metallic circuit. The primary portion of the signal box, say at station 42, will be connected in the circuit 3, and the primary portion of the next signal box, say 43, will be in the circuit 2, and a third or more distant box 44 will be in the circuit 3, and so on; hence the risk of two signal boxes on the same circuit being operated simultaneously or nearly so is reduced to a minimum. If now an effort were made to introduce a telephone or other instrument into either of the circuits, it might interfere with the call signal by the bell M' or the use of the finger key at the signal box. To avoid these difficulties I lead both circuits 2 and 3 to all the boxes in the circuits, and I use the circuit 3 for the primary call and the circuit 2 for the telephone or other signal at the box 42 and the circuit 2 for the primary call, and the circuit 3 for the telephone or other signal at the next box 43, and so on, thereby preventing the risk of the one interfering with the other, and I do not increase the number of the circuits to the signal boxes.

In carrying out this invention I provide a circuit block 10, of insulating material, and it is advantageously secured to the outer or in-

closing case A of the signal box by a tubular screw 11, as seen in Fig. 4, and by making this block 10 tubular I am enabled to lead the cable containing the wires of the two circuits through such block and the ends of the four wires are connected directly or immediately to the posts or binders 14, 15, 16, 17. From the binders 14, 15, the circuit wires 39, 31, lead to the posts for the wires 32 and 38, that pass to the switches V V', as in my said patent and the current passes from 39 to the circuit preserving key U, electro-magnet M and springs N on the circuit closing wheels I for sending out the fire alarm. In this case the metal rim of the circuit closing wheel I is insulated and both springs rest in their normal position on the metal, so that the circuit remains closed but it is broken by the notches of the wheel breaking contact with one or both springs. Hence a signal is sent out on the line at each revolution of the wheel I. The binding posts 16 and 17 are in metallic contact with the clips 20 and 21 that pass around the block 10 and lap upon each other, so that in the normal condition the circuit is closed through 20 and 21 and there is in the metal clip 21, an arch or bow, bent up at 22 forming an opening into which the plug 23 of the telephone or other instrument can be thrust. This plug 23 is of two metallic parts insulated from each other as seen in Fig. 3, and it is tapering and one side is nearly flat. The other side fits the arch or bow so that the plug cannot be introduced in the wrong way, and when thrust in the clips 20 and 21 are separated as seen in Fig. 2, and the circuit is thereby completed and closed through the telephone or other instrument 30. This instrument and the plug can be easily carried in the pocket of the fireman, so as to be used at any box wherever necessary. The circuit plug 23 is usually upon a tubular handle 25 through which the flexible conductors pass to the telephone, and it is advantageous to employ a magneto telephone that can be used as either a transmitter or receiver. When the plug 23 is withdrawn the circuit is closed automatically by the spring of the clip 21.

By the present improvement the fireman can use the finger key to call up the central station and the telephone being on another metallic circuit, will not interfere with the fire alarm signals; and the telephone can be used on one circuit, and the finger key and signaling apparatus on the other circuit may be manipulated in the usual way.

In the foregoing description the circuits are set forth as they would operate if one wire of the cable were connected directly to the post 16, but for the purposes stated I usually carry one of the circuit wires of the cable by the wire 50 within the box to one of the springs N' on the circuit wheel I' and use a second wire 51 from the other spring N' to the binding post 17, thus making 51, N', I' and 50 a part of the metallic circuit passing to the clip

21. This does not interfere with the action of the telephone because the circuit is normally closed between N' and I' when the instrument is at rest.

The circuit closing wheel I' is made with an insulated metallic rim, notched so that the circuit is broken as the wheel revolves by breaking contact with the springs at the notches. This wheel I' may be on the same arbor as the wheel I and revolve with it, and the notches may correspond in both wheels, or they may be different according to any prearranged code, or the wheel I' may be revolved by any suitable mechanism at the same time as the wheel I, or at a different speed. By this arrangement the wheel I will send out its signal (at signal box 42) on the circuit 3, and the wheel I' will simultaneously send out its signal upon the circuit 2; thus one fire alarm signal box will send out its signal to the main or central office over two separate and distinct metallic circuits without the risk of being mutilated, and should either circuit be injured or out of order, the signal sent would be understood at the main office regardless of which circuit the pulsations may come over, thus reducing the risk of error or failure to a minimum.

The signal sent out by the wheel I may properly be termed the primary signal, as all the other parts of the signaling apparatus are in the circuits leading thereto, and the signal sent out by the wheel I' becomes the secondary signal as it is in another circuit and no other parts of the signaling box are in that circuit, but as aforesaid the provision for inserting a telephone is in that circuit.

I remark that the spring 9 rests on a stud in the metallic rim of the wheel I, and the springs U' and U² are pressed together when the door of the signaling box is closed. Hence there are two routes for the primary signaling current through the box when the door is closed, and when the hook is pulled down and the winding arm is moved, the circuit is broken through 9, U' and U² by the pin on I separating from 9 before the pulsations are given by the springs N through 33, N, I, M, U and 39, and the bell in the box is rung by the electro-magnet M, as well as the signal being sent to the central station.

When the door is opened to give access to the finger key U, the circuit to 9 is broken by the separation of the springs U', U² and the manipulation of such key U gives the signals by breaking such circuit; the telephone, however, is often the most convenient, rapid and reliable as a means for communicating with the central station, especially under the excitement incident to a fire.

In the present improvement the two metallic circuits are complete without any grounds. One of them has the usual circuit breaking wheel and finger key, and the other has the telephone as well as the second wheel. When the signals are sent by the wheels over the two independent metallic routes one

or the other is nearly certain of correct record at the central station. This operation consumes but a moment. If the telephone is placed in the second circuit it can be used at the same time that the finger key and signal bell are used at the same box, but in the other or first circuit. Thus each box is capable of the fourfold operations of sending out two signals from the wheels over different circuits and of sending and receiving Morse or finger key signals at the same time that a telephone is in use without one interfering with the other.

I claim as my invention—

1. The combination with the fire alarm signal boxes and the signaling devices and the two metallic circuits leading to the same, of a telephone instrument and circuit connections at each signal box, substantially as specified, for introducing the telephone at one signal box into the metallic circuit that passes to the signaling devices at a distant signaling box, substantially as set forth.

2. The tubular circuit block adapted to be connected to the signal box in combination with the cable having the wires of the two metallic circuits, the binding posts for the wires, and a signaling apparatus in the box and connections to two of the binding posts, the clips 20 and 21 connected to the other binding posts and adapted to receive between them the connections for a telephonic instrument, substantially as set forth.

3. The tubular insulating circuit block for receiving the electric conductors, the spring clips 20, 21 around the block near one end and connected with the conductors for normally closing the circuit, there being a bow in one of the clips, a telephone or other instrument and a tapering two-part plug adapted to be inserted between the clips to separate them and close the circuit through the telephone or other instrument, substantially as set forth.

4. The combination in a signaling or fire alarm apparatus of signaling boxes, two independent metallic circuits leading through such boxes to the place where the signal is received, and two circuit breaking devices insulated from each other in each box, one in each independent circuit, and mechanism for actuating the circuit breakers for sending a primary signal over one metallic circuit by one circuit breaker and over the other circuit by the other circuit breaker, substantially as set forth.

5. The combination in a signaling or fire alarm apparatus of signal boxes, two independent closed electric circuits leading

through all of the boxes to the place where the signal is received, two circuit breaking devices in each box and mechanism for actuating the same, one of the circuit breaking devices sending a primary signal over one electric circuit and the other of such circuit breaking devices sending a secondary signal over the other electric circuit, and circuit closing clips and separable telephones or other instruments in the circuit of the secondary signal, substantially as set forth.

6. The combination in a signaling or fire alarm apparatus of two independent metallic electric circuits leading to the place where the signal is to be received, a signaling box and two circuit breaking springs and wheels insulated from each other and mechanism for simultaneously operating the same, one of such wheels acting to send a primary signal over one electric circuit and the other of such wheels acting to send a secondary signal over the other electric circuit, an electro-magnet for a bell and a circuit preserving finger key in the circuit of the primary signal, and a telephone in the circuit of the secondary signal, substantially as set forth.

7. The combination in a signaling or fire alarm apparatus of two independent metallic circuits leading to the place where the signal is to be received, a signaling box and two circuit breaking springs and wheels insulated from each other and mechanism for simultaneously operating the same, one of such wheels acting to send a primary signal over one electric circuit and the other of such wheels acting to send a secondary signal over the other electric circuit, and electro magnet for a bell and a normally closed finger key in the circuit of the primary signal, substantially as set forth.

8. The combination in a signaling or fire alarm apparatus of two independent metallic circuits leading to the place where the signal is to be received, a signaling box and two circuit breaking springs and wheels insulated from each other and mechanism for operating the same, one of such wheels acting to send a primary signal over one electric circuit and the other of such wheels acting to send a secondary signal over the other electric circuit and a second signaling instrument in the second circuit substantially as set forth.

Signed by me this 21st day of February, 1893.

JOHN ELLIOT SMITH.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.