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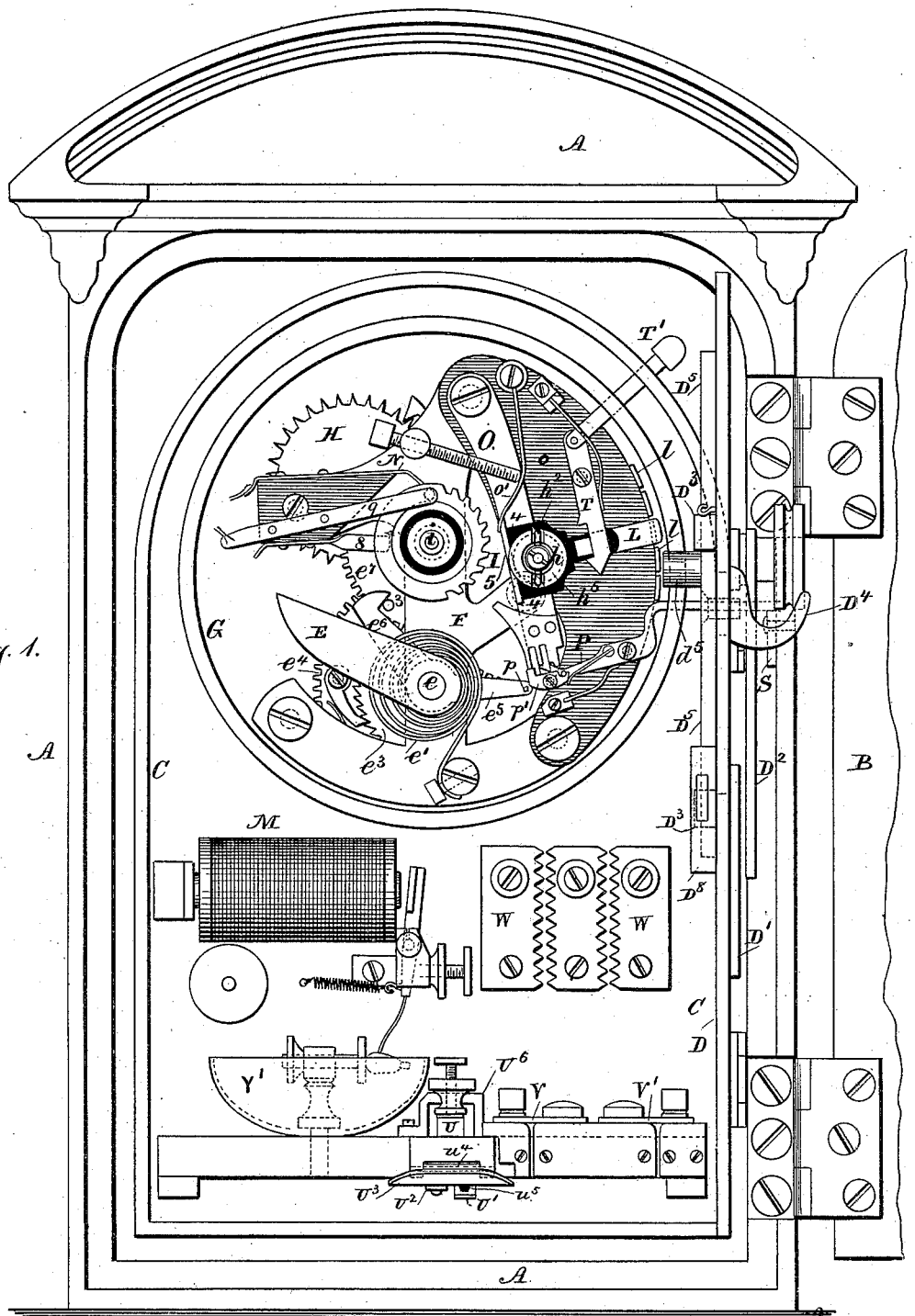
J. E. SMITH.

SIGNAL CALL TELEGRAPH BOX.

No. 343,738. Patented June 15, 1886.

Fig. 1.



Witnesses
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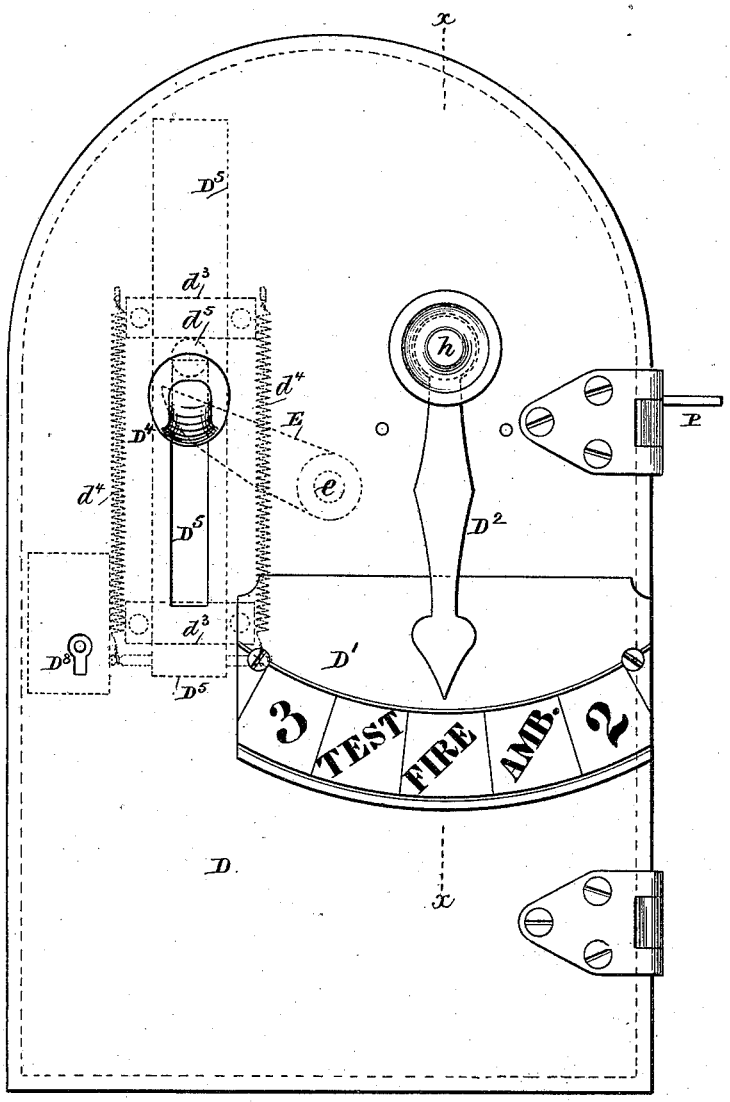
SIGNAL CALL TELEGRAPH BOX.

No. 343,738. Patented June 15, 1886.

Fig. 2.



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J. E. SMITH.

SIGNAL CALL TELEGRAPH BOX.

No. 343,738. Patented June 15, 1886.

Fig 3

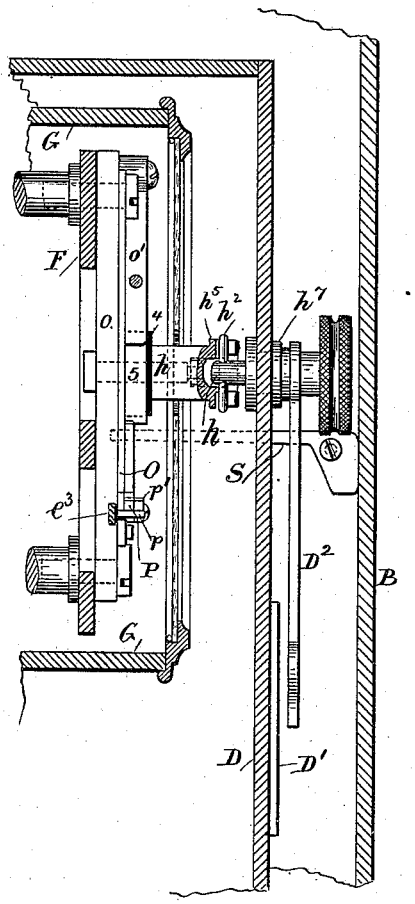


Fig. 5.

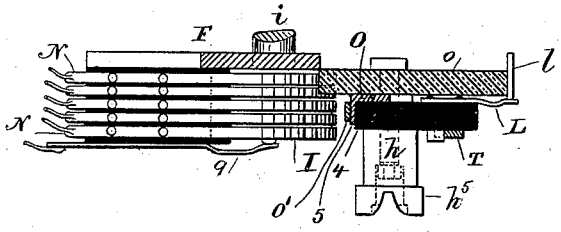
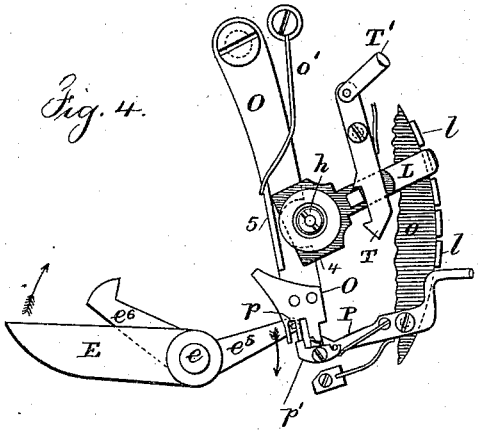


Fig. 4.



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5 Sheets—Sheet 4.

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SIGNAL CALL TELEGRAPH BOX.

No. 343,738. Patented June 15, 1886.

Fig. 7.

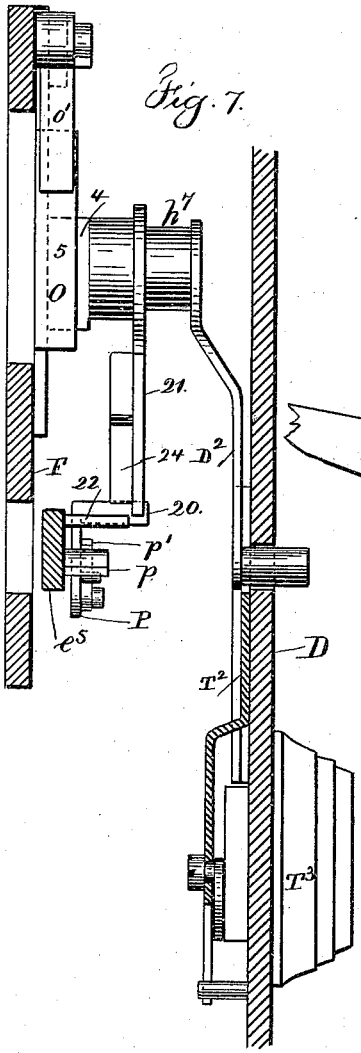


Fig. 8

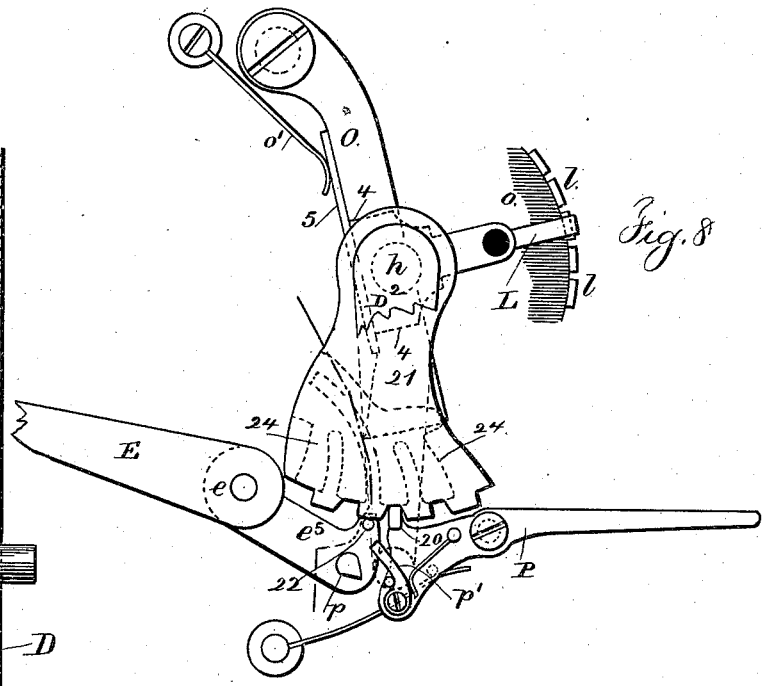
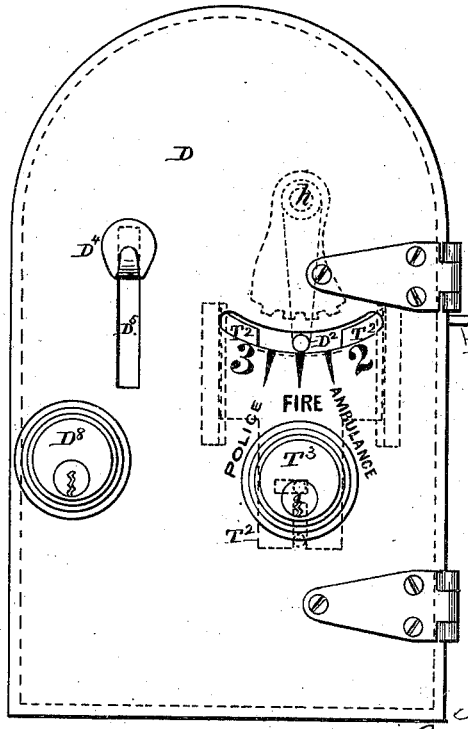


Fig. 6



Witnesses

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SIGNAL CALL TELEGRAPH BOX.

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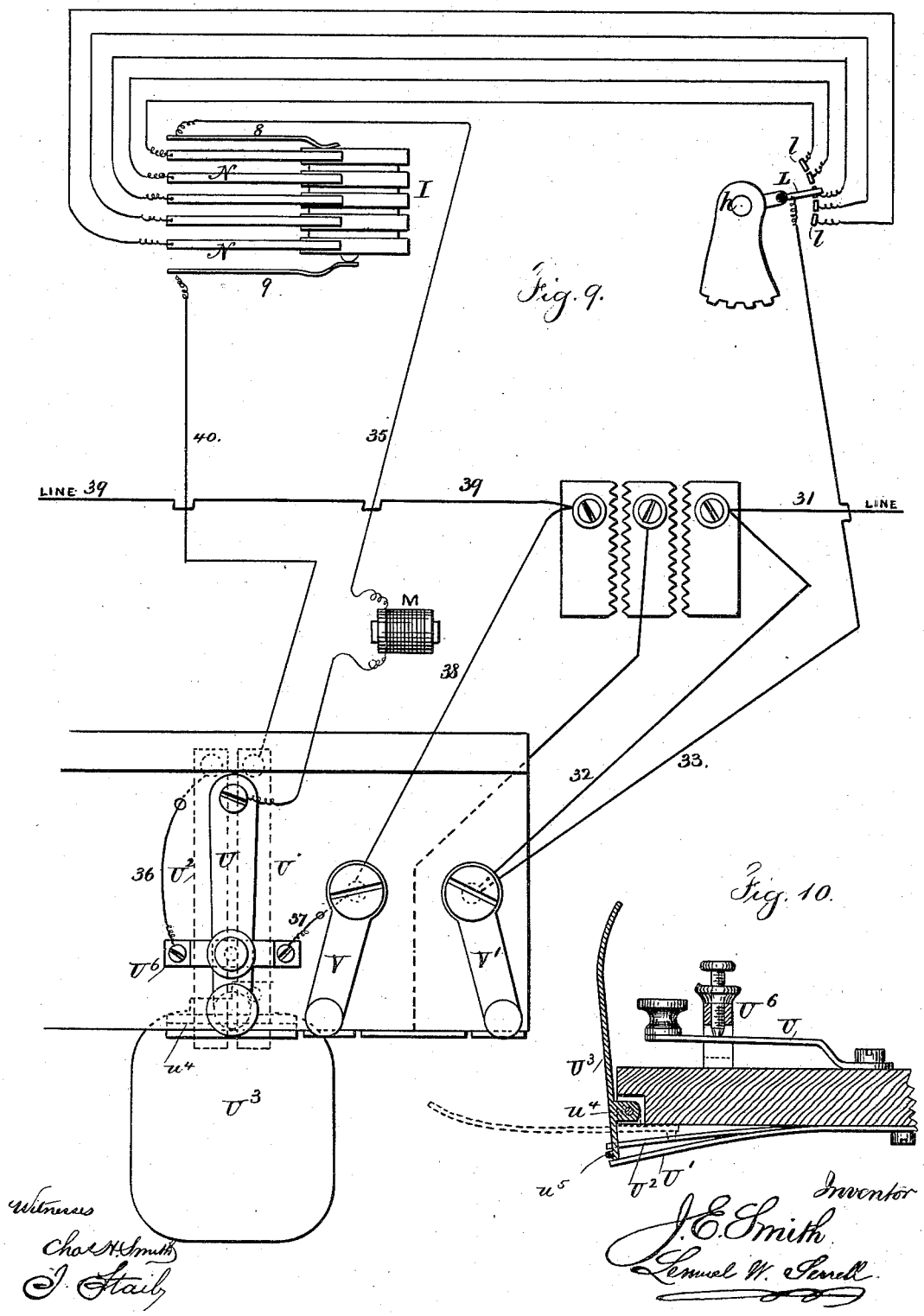

Fig. 9.

Fig. 10.

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UNITED STATES PATENT OFFICE.

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

SIGNAL-CALL TELEGRAPH-BOX.

SPECIFICATION forming part of Letters Patent No. 343,738, dated June 15, 1886.

Application filed November 21, 1885. Serial No. 183,499. (No model.)

To all whom it may concern:

Be it known that I, JOHN ELLIOTT SMITH, of the city and State of New York, have invented an Improvement in Signal-Call Telegraph-Boxes, of which the following is a specification.

In fire-alarm-telegraph signal-boxes there has been a revolving circuit-wheel acted upon by a spring and an arm to transmit to the central station or to the several engine-houses the electric pulsations for giving the signal corresponding to the number of the station or box from which the signal is sent, and the said box has also been adapted to the transmission of a second or third call for additional assistance.

My present invention is made for facilitating the transmission automatically of certain specific signals additional to that of the regular alarm—such as for summoning additional force as found necessary, or for the police or ambulance service. Under all circumstances the instrument returns automatically, after any signal has been sent, to the ordinary fire-alarm signal, so that no mistake can possibly arise in using the box in the hurried manner often occuring at fires, because after every signal the instrument sets itself to the fire-signal in readiness to transmit when next used the regular fire-signal, instead of sending out any of the other signals that may have previously been used.

In the drawings, Figure 1 is an elevation showing the box containing the mechanism, and inclosed in another or outside box for protection, with both doors open. Fig. 2 is a similar view of the inner box with this door closed. Fig. 3 is a section near the line *x x*, Fig. 2. Fig. 4 is a detached view of the winding-arm, stop, and the levers acting with the same. Fig. 5 is a detached plan view of the circuit wheels and springs and the movable contact-arm. Fig. 6 is an elevation in smaller size of a modification of the inner door and parts connected with the same for simplifying the limiting mechanism of the signal-box. Fig. 7 is a side view of the arm and limiting mechanism used in connection with the door shown in Fig. 6. Fig. 8 is an elevation of the levers and pawls employed in connection with the circuit-changing switch. Fig. 9 is a diagram representing the circuit-connections; and Fig. 10 is a section of the finger-key, shield, and the base supporting the same.

The metal case inclosing the fire-alarm signal-box is of any desired character. Preferably the sides, bottom, and top are cast in one piece, as at A, with a back set in and attached to this frame. The door B is hinged to the case and provided with a suitable lock, and with the ordinary marks and numbers on the outside. Within this case A is a metal box, C, having a hinged swinging door, D, secured by a lock, D^6, and within this box are the circuit connections and mechanism hereinafter described.

Upon the face of the inner door, D, there is a dial or indicator, D′, and upon this will be usually marked the different signals that can be sent from said box—such, for instance, as the word "Fire," which is central on the dial, the word "Test," and "Amb." or "Ambulance," one at each side of the word "Fire," and the numbers 2 and 3 on the extremes of the dial indicating second and third calls and for additional assistance. In some cases the word "Police" will be used, as in Fig. 6, in place of "Test." There is an indicator, D^2, in the form of an arm extending out from an axis or shaft that passes through the door D, as in Fig. 3, and is provided with a cross-pin, h^2, that turns the switch-axis, hereinafter described, or else the arm D^2 is upon the switch-axis, as in Figs. 6, 7, 8, and the end of the arm passes through a segmental slot in the door D.

Projecting from the front of the door D is a pull-hook, D^4, that passes through a slot in the door, and is attached to a slide, D^5, in bearings d^3 upon the inner face of the door, and the springs d^4 act to raise the slide and hook after they have been pulled down. The roller d^5 upon the slide D^5 acts upon a winding-arm, E, that is located in front of the works and attached to one end of the shaft *e*. This shaft *e* passes through the frames F, that are preferably within a circular case, G, having a glass front for more perfectly protecting the mechanism, said glass being perforated for the passage of the shaft *e* of the winding-arm, and for the switch-axis *h*.

Upon the shaft *e* there is a mainspring, *e′*, which is partially wound up when the winding-arm E is acted upon by the pull-hook D^4; and upon this shaft *e* there is also a ratchet-wheel, e^3, firmly fixed, and a gear-wheel, e^4,

loose upon the shaft, but provided with a spring-pawl to connect it with the ratchet-wheel e^3. This wheel e^4 gears into a pinion upon a shaft, *i*, receiving the circuit-wheels hereinafter described, and the gear-wheels and pinions give motion to the escapement-wheel H, that vibrates a rocker or fly to regulate the speed of movement, as usual. The parts are proportioned in such a manner that the shaft *i* of the circuit-wheels I makes one revolution for each tooth of the ratchet-wheel e^3; hence if the winding-arm E is moved to take up two ratchet-teeth, the shaft *i* and circuit-wheels I will be revolved twice, &c. I find it convenient to move the winding-arm E sufficient to take up six ratchet-teeth in sending out the fire-alarm, and to take up two teeth in sending out each of the other signals, and upon the axis *e* of the winding-arm E there is a fixed arm, e^6, having a hook at the end, and upon the wheel e^7 there is a stop-pin, 3, so that the shaft *i* and circuit-wheels I will be held in a positive position after each rotation.

Upon the switch-hub *h* there is an arm or switch, L, the end of which is adapted to travel over contact-blocks *l*. These contact-blocks are in branch circuits from the main circuit, and with the fire-signals, heretofore spoken of, there will be five of the contact-blocks *l*, and there will be, also, five circuit-closing wheels I upon the shaft *i*, and five contact-springs N, one of which is in contact with each of the circuit-closing wheels I.

Upon reference to the diagram, Fig. 9, it will be seen that there are five branch circuits, the electric current passing from the line-wire to the switch-arm L, and to one of the five contact-blocks *l*, and from these to the spring N, with which it is connected by a wire, and from the spring through the circuit-closing wheel I to the line or ground and to the distant station, or by the circuit connections hereinafter described.

As before mentioned, it is preferable to rotate the circuit-wheels I six times in sending the fire-alarm signal; but in sending a signal for calling an increase of force—such as a second or third alarm or other signals—it is preferable only to revolve the circuit-closing wheels I twice. During the first revolution of said circuit-closing wheels a number or signal is indicated to show what is wanted—such, for instance, as an ambulance or additional assistance—and the second revolution of the circuit-closing wheels must indicate the number of the box or station from which the call is sent. To effect these operations automatically is one object of my present invention.

Upon the switch-axis *h* there is a cam-block, 4, that acts against a flange or projection, 5, upon the stop-lever O, which is pivoted upon an insulating-block, *o*, and provided with a spring, *o'*, by which the flange 5 of the lever O is constantly pressed toward the cam-block 4 on the switch-axis, and at the lower end of the stop-lever is a tooth that is caught and held by one of the teeth upon the swinging pawl P.

Upon the axis *e* of the winding-arm there is a third arm, e^5, with a pin, *p*, at the end that passes close against the outer end of the pawl P, and the position of the parts is such that when the winding-arm E is moved one tooth of the ratchet-wheel e^3 the pin *p* passes just above the outer end of this pawl P, there being a secondary spring-pawl, *p'*, at the end of the main pawl P, to allow the pin *p* of the arm e^3 to pass by, and this secondary pawl *p'* springs back to place, so that the pin *p* of the arm e^5 upon the return motion (as the gearing revolves) acts upon the pawl P to move it downwardly and disconnect the teeth of the same from the tooth at the end of the stop-lever O, thereby liberating this lever, and allowing the flange 5 of this spring-stop lever O to turn the switch L into its normal position.

At the lower end of the stop-lever O there are two slots of such a length that when the stop-lever O is swung by the turning of the switch L by the indicator the pin *p* upon the arm e^5 will pass into one of these slots, and the winding-arm E will thereby be limited in its downward motion, so that when the pull-hook D^4 is drawn down after the indicator has been moved in either direction, the pin *p*, passing into one of the slots in the stop-lever O, will allow the winding-arm E to be turned only enough to take up two teeth of the ratchet-wheel e^3, instead of taking up six teeth, as is the case when the indicator D^2 stands in the normal position at "Fire" and the stop-lever O is not moved. If the indicator is moved either way, the cam-block 4 swings this stop-lever O to bring either the first or second slot at its end into line with the pin *p*, according to the distance that the indicator is moved, and in so doing the spring-pawl P, by its first or second tooth, holds the stop-lever O in the position to which it may have been moved, and in turning the indicator the switch-hub and switch-arm are moved so that the end of the switch-arm rests upon the proper contact-block of the range of blocks *l*, the friction between the end of the switch-arm L and contact-block *l* holding the parts in position. When the pull hook D^4 is liberated, and the winding-axis *e* is turned by the action of the spring, the pin *p* is moved downwardly in the slot in the end of the stop-lever O, and shortly before the completion of the first revolution of the circuit-wheels I the pin *p* unlatches the pawl P, so that the spring-stop lever O is returned to its normal position and the switch hub and arm are partly rotated, and the switch changed to throw the current through the circuit-wheel, which indicates the number of the box or station. It will now be apparent that the indicator D^2 is to be moved to the desired position before drawing down the pull-hook D^4, and that when this pull-hook is drawn down the movement is limited by

the slotted end of the stop-lever O and the pin *p*, and that the first signal sent out by the first revolution of the circuit-wheels corresponds to the signal denoted by the indicator D^2, and that the circuit is changed automatically, so that the second rotation of the indicator-wheels gives the signal-box number. There are upon the edges of the circuit-wheels I sufficient blank spaces, near the end of the rotation, to prevent the signals being interfered with by the changing of the circuit from one contact-spring to the other. In this instrument the circuit-closing wheels are insulated from the shaft, but they are in metallic contact with each other, and there is a spring, 8, constantly bearing against one edge of the circuit-closing wheels, and the electric circuit passes through this spring 8. Besides this there is a projection on the outer circuit-closing wheel that comes into contact with the stationary spring 9 at the end of the revolution of the circuit-wheels, so that the circuit is closed through this spring 9, and the circuit-closing springs N, that are in contact with the edges of the wheels, do not necessarily form paths for the electric current when the instrument is at rest.

It may sometimes happen that the indicator is moved without drawing down the pull-hook, in which case the circuit might remain with the switch closed upon some other contact-block than the right one for the normal condition of the box. To prevent this, I unlatch the pawl P in the act of closing the outer door, B, such door acting against a foot-piece on the swinging lever S, (see Figs. 1 and 3,) the inner end of which lever S raises the tail of the pawl P and unlatches the same, so that the stop lever O, switch-hub, and switch are returned automatically to the normal position.

In the use of this call-box it is generally desirable to restrict the use of some of the signals to only authorized persons, while other of the signals could be manipulated in the usual manner in fire-alarm signals. To accomplish this, I make use of the limiting stop-lever T, acted upon by a spring and the push T', the outer end of which passes through the inner case, C, and can only be reached by the finger thrust in between the two cases; hence it is not likely to be noticed or tampered with by an unauthorized person. The side of this limiting stop-lever adjacent to the switch-arm is made with a notch, and upon the switch-arm L there is a block passing into said notch, and the length of the notch is such that it only allows the indicator to be turned to "Ambulance;" hence under ordinary circumstances only "Fire" and "Ambulance" signals can be sent from the box; but when the push-button T' is pressed in the limiting-lever T is swung aside out of the way of the stop on the switch-arm L, so that the indicator and switch can be turned to either of the other signals; but I prefer the peculiar construction for these parts hereinafter described, and shown in Figs. 6, 7, and 8. The outer end of the switch-hub *h* is made as a cylinder, h^5—that is, notched to receive the cross-pin h^2 on the hub h^7 of the indicator D^2—and in order to insure the proper passage of the cross-pin h^2 into the slots in the cylindrical switch-hub h^5, the outer ends of the slots are beveled or inclined, so that the indicator and its cross-pin will be brought to the proper position in the act of closing the inner door, D.

Upon reference to Figs. 6, 7, and 8 it will be apparent that the construction and operation of the parts therein shown correspond, generally, with those shown in Figs. 1, 2, 3, 4, and and 5; but the indicator-arm D^2 is inside of the door D, and there is a handle piece at the end projecting through a curved slot in the said door D.

The indicator-marks are upon the door D, adjacent to this curved slot, and the index on D^2 can be swung in the manner before described; but in place of using the stop-lever T to limit the motion of the switch L, I make use of the stop T^2 to limit the motion of the index-arm D^2 for the purpose before described. This stop T^2 is preferably in the form of a plate notched at its upper end and sliding in ways on the back of the door D, and this stop-plate T^2 is preferably moved by a lock, T^3, so that when the stop T^2 is raised by the lock the motion of the indicator D^2 is limited, and can only be moved from the position for "Fire" to "Ambulance" or "Police;" but when a key is inserted in the lock T^3 and the stops T^2 are drawn down the indicator D^2 can be swung to the position marked "2" or "3" for a second or third alarm. This stop-plate T^2 may be adjusted so as to restrict the use of any or all the signals by the controlling-key. This lock should be of the character usually known as the "Yale lock," in which the key can only be withdrawn when the lock is locked; hence the limiting stops T^2 are always in position when the signal-box is in its normal position.

The operation of the pull D^4, lever E, arm e^5, pin *p*, secondary pawl p', and pawl-lever P are the same as before described, with the exception that the block 20 takes the place of the teeth upon the end of the pawl P, and the arm 21, projecting from the switch-hub H, has in its end the notches for the block 20, and a pin, 22, upon the arm e^5 passes behind the plate 21, and is not limited in its movement when the pull D^4 and pull-lever E are acted upon to give the fire-alarm; but when the parts are acted upon for any other alarm this pin 22, passing in between ribs 24 at the back of the plate 21, limits the motion of the lever E, so that only two teeth are taken up by the pawl on the wheel e^3. In this manner the number of revolutions of the circuit-closing wheels I is determined as aforesaid; but this pin 22, remaining between the ribs 24, prevents the switch L being moved by any person handling the indicator D^2 until such times as the said pin 22 moves down below the lower ends of the said ribs 24.

I make use of a signaling-finger key, U, and beneath the same are the contact-springs U′ U^2, and there is a hinged metallic guard, U^3, in front of the key U, the same being hinged at u^4, and the lower end of the guard acting upon the springs U′ U^2 maintains a closed metallic circuit when the guard is turned up in front of the key; but when this guard is swung down into the position shown by dotted lines, Fig. 10, a non-conducting plug, U^5, in contact with U′, breaks the metallic circuit.

The switches V V′ are provided, as usual, and the lightning-protectors W are also inserted in the box.

Upon reference to Fig. 9 it will be seen that when the switches V V′ are brought together the line is completed, and the instrument is cut out. When the switches V V′ are in their normal position, the current comes through the line 31, wire 32, switch V′, and wire 33 to the switch L, and by one of the contact-blocks *l* and by its wire to the spring N and circuit-wheel I, and by the spring 8 and wire 35 to the key U and wire 37 to the switch V, and by the wire 38 to the line-wire 39. If, now, the circuit-wheels I are revolved, the current will be pulsated over the line by the making and breaking of contact between the circuit-wheel and the spring N, which is included in the circuit by the switch L, and in this manner the signals will be given upon the line, and the signals will be indicated upon the bell Y′ by the pulsations of the current in the electro-magnet M, to which the wire 35 is connected; but during the time that the signal box is not in use and the circuit-wheels I are quiescent the current will pass from the circuit-wheels by the spring 9 and wire 40 to the spring U′, shield U^3, spring U^2, wire 36, yoke U^6, and wire 37, switch V, and wire 38 to the line 39.

When it is desired to signal by the key U, the guard U^3 has to be turned down out of the way, and the circuit can be broken at the key U, the current passing through the wire 35, magnet M, yoke U^6, wire 37, switch V, wire 38, and line 39, and being broken by the key U at its contact with the screw passing through the yoke U^6; hence the party sending out a signal by the finger-key also acts upon the magnet M, and the signal is indicated upon the bell Y′, and this bell also serves for the reception of a signal from a distant station.

I claim as my invention—

1. The combination, with the winding-arm and the spring and gearing connected therewith, of two or more circuit-closing wheels and their springs, an indicator, and a switch closing the electric circuit through one of the springs and circuit-wheels, and a stop-lever and pawls, and a cam upon the hub of the switch to return the switch to the normal position, substantially as set forth.

2. The combination, with the winding-arms, spring, and gearing, of revolving circuit-wheels and their springs, a switch and contact blocks and cams, a spring stop-lever, O, acting against the cams, and a plate with one or more slots, a pawl to hold the stop-lever, and a pin and arm upon the winding-hub to form a stop that limits the movement of the winding-arm, and which unlatches the pawl from the stop-lever and allows the parts to be returned to their normal positions, substantially as specified.

3. The combination, in a signal-call telegraph-box, of a series of circuit-closing wheels and their springs, a switch to direct the electric current, a stop-lever moved by the switch, a pawl to hold the stop-lever, and a disconnecting lever acted upon by the door of the signal-box for insuring the return of the parts to their normal position when the door of the signal box is closed, substantially as set forth.

4. The combination, with the pull-hook and slide, of the winding arm, a spring and gearing, circuit-closing wheels and their springs, a switch and contact blocks, a stop-lever acted upon by the switch, a pawl to hold the parts, and a pin and arm upon the hub of the winding-arm for limiting the movement of the winding-arm and for unlatching the pawl and the parts held by it, substantially as set forth.

5. The combination, with the circuit-closing wheels and their springs, and the contact-blocks connected with such springs, of a switch and indicator-arm by which the switch is moved, and stops to determine the movement of the indicator-arm and a lock for moving and holding the said stop, substantially as specified.

6. The combination, with the circuit-closing wheels, contact-springs, contact-blocks, switch, and the circuit-connections, substantially as specified, of a finger-key, a movable guard to the same, and the circuit-changing springs U′ U^2, and the electro-magnetic bell, whereby the guard opens and closes a shunt between the circuit-springs and the electro-magnet, for the purposes substantially as set forth.

Signed by me this 17th day of November, A. D. 1885.

J. E. SMITH.

Witnesses:

GEO. T. PINCKNEY,

WILLIAM G. MOTT.