

Z. P. HOTCHKISS.

Electric Fire-Alarm Signal-Boxes.

No. 157,002.

Patented Nov. 17, 1874.

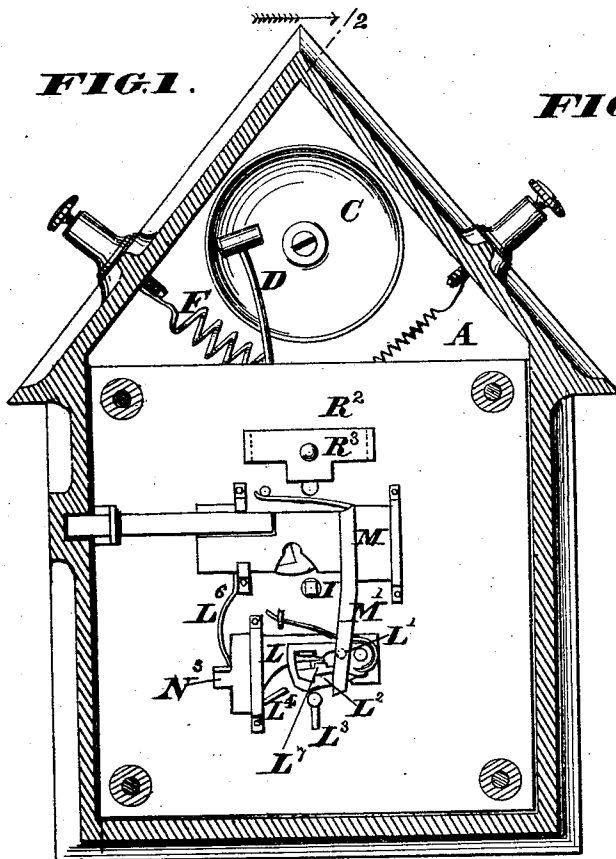


FIG. 2.

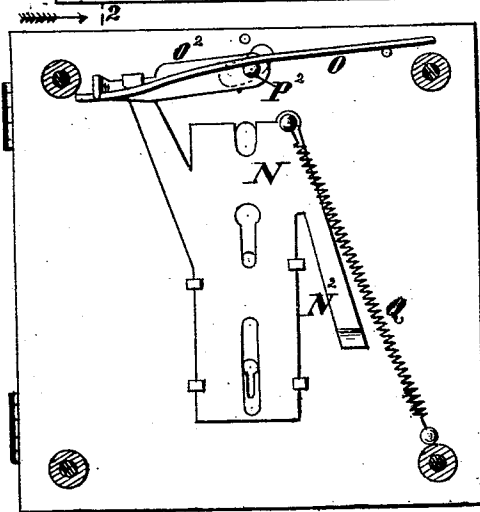
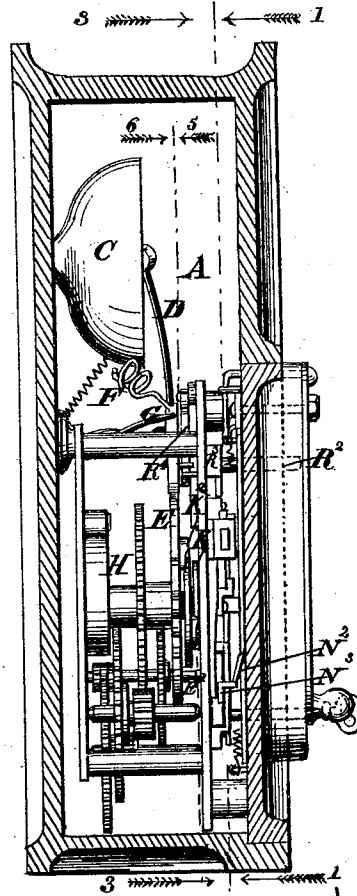


FIG. 3.

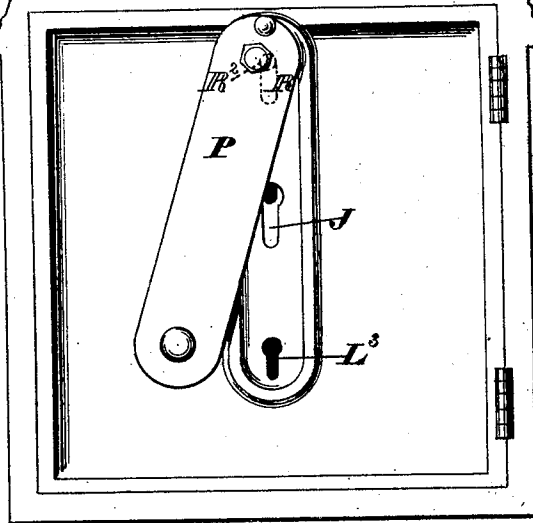


FIG. 4.

WITNESSES

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FIG. 5.

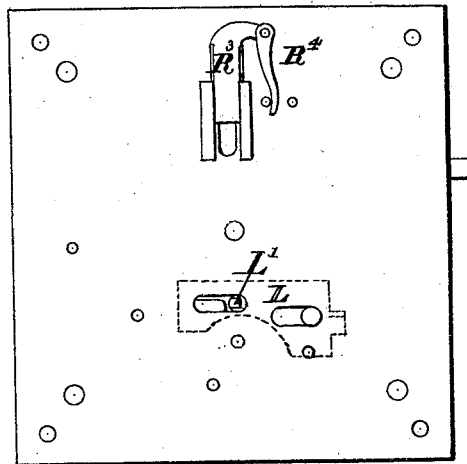
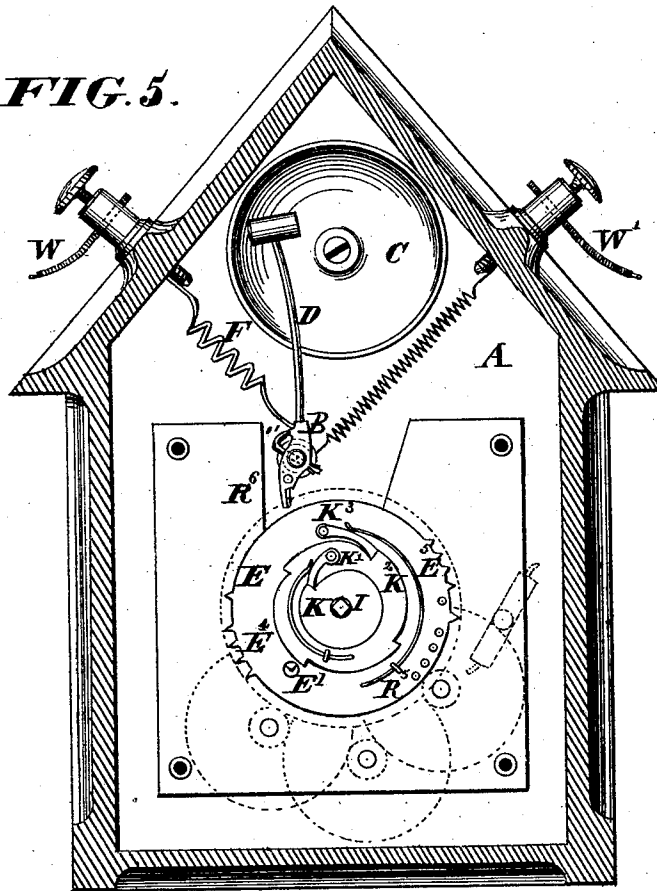


FIG. 6.

WITNESSES

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ZEROY P. HOTCHKISS, OF RICHMOND, INDIANA.

IMPROVEMENT IN ELECTRIC FIRE-ALARM SIGNAL-BOXES.

Specification forming part of Letters Patent No. **157,002**, dated November 17, 1874; application filed August 14, 1874.

To all whom it may concern:

Be it known that I, ZEROY P. HOTCHKISS, of Richmond, in the county of Wayne and State of Indiana, have invented an Improved Signal-Box for Fire-Alarm Telegraphs, of which the following is a specification:

My improved signal-box is secured by a lock, the key of which is intended to be placed in the hands of the chief engineer or other responsible public officer, a second key being issued to customers, by which key only an alarm can be given. The construction of the parts is such that after the alarm-key has once been introduced by a party desiring to turn in an alarm, it cannot be withdrawn until the proper functionary arrives with the key which opens the box, and rewinds and sets the alarm mechanism for future use. The invention further consists in combining, with a fire-alarm signal-box, a secondary alarm mechanism, which, after the introduction of the proper key by the party desiring to turn in an alarm, may be so operated as to communicate to the headquarters an alarm other than the fire-signal in addition to the district signal. The invention further relates to a device for securing the aforesaid special alarm mechanism, and restoring it to its operative condition when the alarm is rewound and reset. The invention further relates to a duplex ratchet-connection, by which the door-key is made to impart a winding movement to the alarm-spring when turning in one direction, and is permitted to turn freely in the other direction.

In the accompanying drawings, Figure 1 is a section on the line and looking in the direction indicated by the arrows 1 1, Fig. 2, of a signal-box illustrating my invention. Fig. 2 is a section on the line 2 2, Fig. 1. Fig. 3 is an inside view, as indicated by the arrows 3 3 in Fig. 2. Fig. 4 is a front view of the key-hole guard and door. Fig. 5 is a section at 5 5, Fig. 2. Fig. 6 is a section at 6, Fig. 2.

The box A may be hinged bodily to its back, or the board by which it is attached; or the door may be hinged to the box, as in the present illustration, to afford access to the interior. C is an alarm-bell, and D a hammer of ordinary construction, the latter being operated by a toothed wheel, E, and spring F, in customary manner, the teeth on the wheel E

being arranged to strike the number of the district. The bell which is thus applied to the district signal-box enables the party turning in the signal to tell that the apparatus is operating properly. The electric signal is produced by the breaking of the circuit between the heel of the hammer D and the electrical contact-surface G, the heel of the hammer being in electrical connection with the wire W, and the contact-surface G with the wire W', which are parts of the main line. The wheel E is driven by a helical or volute spring, H, which is wound by a key applied to the winding-square I, this being the same key that is employed to open the box-door. J is the key-hole through which it is introduced. The square I is attached to a ratchet-wheel, K, adapted, through the interposed pawl K¹, to impart a rotary movement to the ratchet-wheel K², when the key is turned in one direction, but permitting the key to turn freely in the other direction. The free end of the mainspring H is attached to the arbor of the ratchet-wheel K², and imparts its motion to the wheel E through the medium of a pawl, K³, in customary manner. The clock-movement by which the motion is regulated is of ordinary construction, and requires no further description. It is stopped and held while at rest by a lug, E¹, projecting from the face of the circuit-wheel E, resting against another lug, L¹, which projects inward from the bolt L of a lock, which is constructed with tumblers L², and operated by a key introduced through the key-hole L³, when an alarm is to be turned in, as hereinafter described. The bolt L of the lock carries also an arm or projection, L⁴, so formed and applied as to follow the bit of the key as it operates to retract the bolt of the lock, and prevent the retrograde movement of the key; its forward movement, beyond the necessary point to throw the bolt L, being prevented by an arm, M¹, projecting downward from the bolt M of the door-lock, which latter is operated by the bit of the key first referred to, the barrel of which is square and fits upon the winding-square I of the spring H. On the inside of the door is a sliding guard-plate, N, formed with an arm, N², which rests upon the projection N³ from the lock-bolt L, so as to secure the guard-plate N

in its upper position, which masks the key-hole J until the lock-bolt L is retracted. The guard-plate N is drawn upward by a spring, O, through the medium of an arm, O², catching under a hooked projection from the guard-plate N, resting on the spring O. The arm O² is keyed to a pin, P², attached to the external escutcheon-plate P, and either constituting the pivot of the said plate, or located near to the pivot thereof. The weaker spring Q acts to draw the guard-plate N downward when it is released from the spring O by the act of turning the external escutcheon-plate P aside to expose the key-holes. The construction and connection of the parts is such that the arm O² may at any time be withdrawn from the engaging hook of the guard-plate N by turning aside the escutcheon-plate P, as aforesaid, leaving the guard-plate N free to be drawn down by the weaker spring Q as soon as the retraction of the bolt L may release it. But as soon as the parts are all released and the lock L thrown forward, the guard-plate N will be drawn upward by the stronger spring O, causing its arm N² to spring into catch with the lug N³, so as to prevent the descent of the guard-plate until the lock-bolt L is again retracted. When the guard-plate is down it also exposes an upper slot, R, in the door, through which projects a stud, R², fixed to a slide, R³, which carries on the interior a pendent trigger, R⁴, adapted, when the slide is in its lowest position, to engage with pins R⁵, projecting laterally from the section-wheel E. The pendent trigger R⁴ also engages with a pin, R⁶, upon the heel of the hammer, so that when the slide R³ is depressed, the lateral pins R⁵ will, through the interposition of the pendent trigger R⁴ and pin R⁶, actuate the hammer D in the same manner as the customary radial teeth E⁴ E⁵ of the section-wheel. In the present illustration I have shown the pins R⁵ arranged to supplement one set, E⁵, of the radial teeth in such a manner as to produce, in connection therewith, a consecutive series of strokes, numbering 10 in the present illustration. It will hence appear that with teeth and pins arranged as in Fig. 5, if an alarm be turned in by the alarm-key through the medium of the lock L, and the slide R³ be not drawn down, the signal 4, 1, meaning forty-one, will be given, and repeated by the revolution of the section-wheel E. If, however, the slide R³ be drawn down immediately on turning in the signal, the result will be a signal ten, followed by 4, 1, constituting a call for police, or whatever the number 10 may be used to signify at station 41.

The hammer D is carried by an oscillating arm, B, which constitutes a lever for breaking and closing the circuit, as required. It is so arranged and applied that it is ready for instant use after the box is opened for communicating any desired signal, by operating it by hand.

The operation of my invention is as follows: The parts being in the positions shown in the

drawings, the section-wheel E, under pressure of its spring H, will bear, by the lug E¹, against the lug L¹ on the back of the lock-bolt L, tending to press the said lock-bolt back; but this is prevented by the tumblers L². If, now, it be desired to turn in an alarm, the proper key is introduced through the key-hole L³, and turned till the tumblers L² are brought in register with the stump on the lock-bolt L. The pressure of the spring H will now gradually slide the lock-bolt L backward, carrying the key with it, by the action of the projection L⁴, between which and the arm M¹ of the upper lock-bolt M the lower key is secured. The gradual retrograde movement of the lock-bolt L continues until the circular movement of the lug E¹ causes it to slip past the lug L¹ upon the lock-bolt L, and permits the latter to be drawn forward by its spring L⁶, when the tumblers L² again fall behind the stump on the lock-bolt, and a shoulder, L⁷, on the tumblers, engaging with the key-bit, prevents its retraction. The continued rotation of the section-wheel E then turns in the desired signal in the manner already described, the motion of the said wheel being arrested on the completion of the revolution by the contact of the lug E¹ on the said wheel with the lug L¹ on the back of the lock-bolt.

On the arrival of the proper officer to open the box, his key is applied to the square I, and throws back the lock-bolt M. This action rewinds the spring by the rotation of the square I. The retraction of the arm M¹ by the motion of the bolt M now releases the key from the lower lug, permitting the said key to be turned forward and withdrawn. The officer can then, after sending any signal he may desire by hand, reclose and lock the box, leaving it in readiness for future use.

It is manifest that by a transposition of the parts the winding of the spring H may be performed in the act of locking, instead of unlocking, the box, and I propose to so use the invention when preferred.

By another transposition of parts I locate the key-hole L³, by which the alarm-key is introduced, above, and the slide R³, for the police or other special signal, below. This arrangement is superior, in that it enables the key inserted in the upper hole L³ to hold the pivoted escutcheon-plate P in its deflected position while operating the police-alarm, instead of necessitating the holding of the escutcheon-plate by hand, as in the arrangement shown in the drawings.

The keys issued to customers for the purpose of turning in alarms are designated by numbers for registration, so that the parties holding them may be held responsible for their custody and use.

The following is claimed as new:

1. A combination of locks, one permitting, by the application of a suitable key, the turning in of an alarm, the said key being thereby fastened until released by the application of a key to the other lock.

2. The combination of the door-lock M and spring H with an arbor, I, common to both, and adapted to cause the rewinding of the spring in the act of locking or unlocking the door.

3. The sliding guard N, in combination with the spring O, for elevating it, and the cap-plate connection O² P², for retracting the said spring.

4. The combination of spring-catch N² and projection N³, for securing the guard-plate N in its uppermost position, substantially as set forth.

5. The slide R³ and trigger R⁴, in combina-

tion with a secondary series of pins or projections upon the section-wheel, for the purpose set forth.

6. In combination with the door-lock M, spring H, and arbor I, the double ratchet-plates K K², connected to impart a winding movement to the spring in one direction, and to permit the free movement of the key in the other direction.

ZEROY P. HOTCHKISS.

Witnesses:

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W. H. PEARCE.