

G. FLOYD.

Fire-Alarm Signal-Box.

No. 159,401.

Patented Feb. 2, 1875.

FIG. 1.

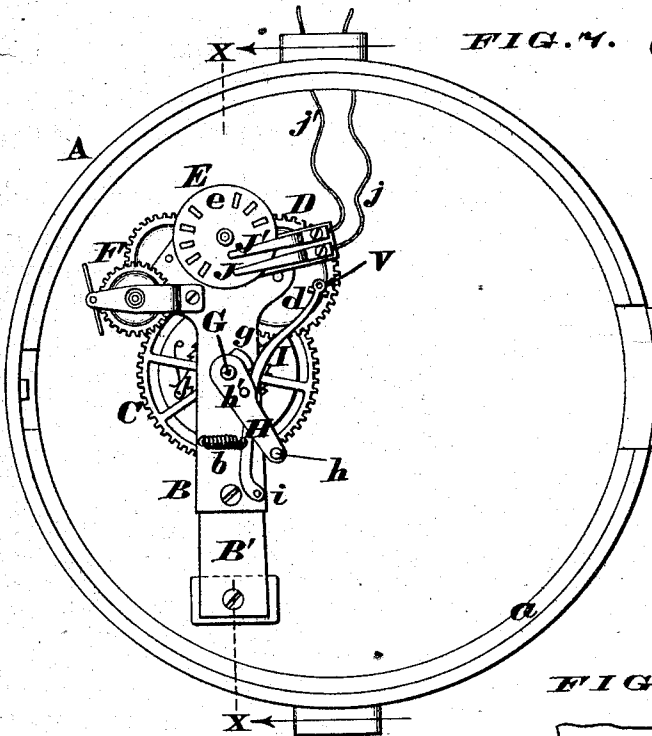


FIG. 4.

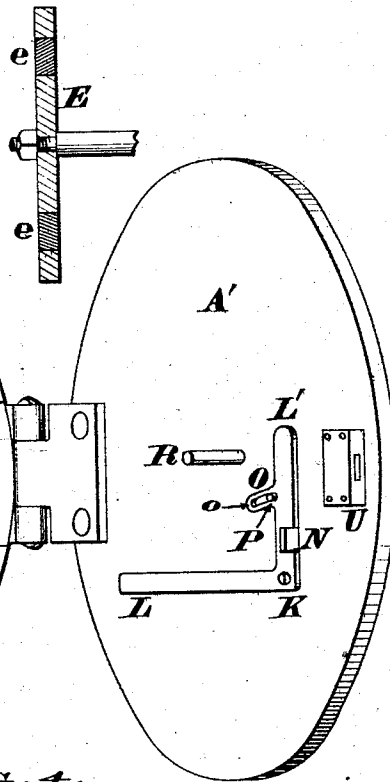


FIG. 4.

FIG. 2.

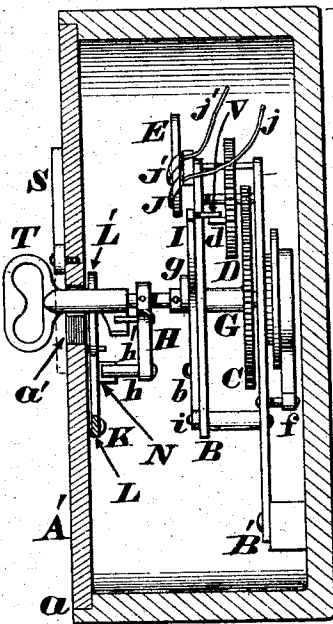


FIG. 3.

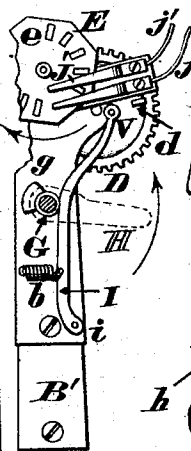


FIG. 5.

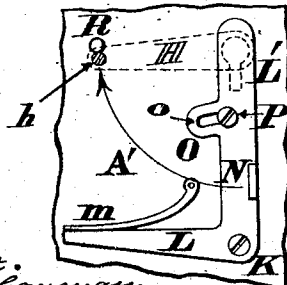
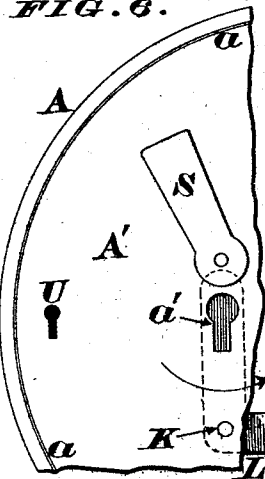


FIG. 6.



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UNITED STATES PATENT OFFICE.

GEORGE FLOYD, OF CINCINNATI, OHIO.

IMPROVEMENT IN FIRE-ALARM SIGNAL-BOXES.

Specification forming part of Letters Patent No. **159,401**, dated February 2, 1875; application filed November 21, 1874.

To all whom it may concern:

Be it known that I, GEORGE FLOYD, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Fire-Alarm Signal-Boxes, of which the following is a specification:

The first part of my invention relates to a signal-box, whose peculiar construction enables an alarm of fire to be "turned in" more promptly and with greater facility than can be done with the usual form of boxes in general use. The second part of my invention comprises a novel arrangement of devices for preventing a second or interfering alarm being transmitted before the first one has been completely registered or struck on the bells.

In the accompanying drawings, Figure 1 is a front elevation of a fire-alarm signal-box embodying my improvements, the door of the box being opened and the various operative parts represented in their normal positions. Fig. 2 is a vertical section through the box at the lines *x x*, the view being taken in the direction indicated by arrows in Fig. 1. Fig. 3 represents the stop movement of the signal mechanism in its unlocked condition, the arbor of the clock-work being shown in section. Fig. 4 is a diagram, showing a portion of the inner side of the box-door with the guard shifted aside from the key-hole, so as to admit the key. Fig. 5 is a similar diagram, but with the guard in its normal condition, thereby closing the key-hole of the signal-box. Fig. 6 shows a portion of the front of the box with the door closed, the outer scutcheon of the key-hole being swung aside, and the inner guard being represented in the position it assumes while an alarm of fire is being transmitted; and Fig. 7 is a vertical section through the signal or circuit wheel of the box. Of the above illustrations, Figs. 4, 5, 6, and 7 are drawn on an enlarged scale.

The circular and rabbeted box *A a*, together with the hinged lid or door *A'* being substantially the same as shown in the patent issued to me May 21, 1872, needs no further description in this specification. Secured within the box *A* are two plates, *B B'*, that afford journal-bearings for the master-wheel *C*, stop-wheel *D*, signal or circuit wheel *E*, and a train of clock-work, *F*, for communicating motion from

said master-wheel *C* to the circuit-wheel *E*. The clock-work *F*, together with its actuating-spring *f*, may be of the represented or any other approved form, as no claim is made for this part of the apparatus; but in constructing the box any desired number of gear-wheels may be employed, according to the number of revolutions it is desired to impart from the wheel *C* to the one *E*. The master-wheel *C* is keyed fast upon an arbor, *G*, which projects forward toward the door *A'* without coming in contact with the same, and this arbor has secured to it, between said door and plate *B*, an arm, *H*, that carries at its outer end a horizontally-projecting pin, *h*. This arm is furthermore furnished with a stump, *h'*, for a purpose that will presently appear. Attached to the arbor *G* is a cam-plate or eccentric, *g*, that operates a brake, *I*, the latter being pivoted to plate *B* at *i*. The upper or free end of this brake carries a rearward projection or pin, *V*, that is adapted, at the proper moment, to engage over a lug or flange, *d*, which projects from the outer face of stop-wheel *D*. A spring, *b*, serves to retract the brake *I* as soon as it is liberated from the pressure of cam *g*. The preferred form of circuit or signal wheel *E* consists of a flat plate of metal, provided with fillings *e* of india-rubber or other suitable non-conductor, said fillings being embedded in the wheel in such a manner as to transmit any appropriate number or combination of numbers whenever said wheel is rotated. These fillings are flush with the outer or exposed face of the signal-wheel, as more clearly shown in Fig. 7. This signal-plate need not of necessity be circular, but it may have a square, hexagonal, octagonal, or other shape. *J J'* are the customary platinum fingers that communicate with the signal-plate, and said fingers have attached to them the wires *j j'*. Pivoted to the inner side of the door *A'*, as at *K*, is a bell-crank composed of a horizontal arm, *L*, and an upright one, *L'*, which latter constitutes the inner guard for the key-hole *a'* of said door.

The horizontal arm *L* may be sufficiently heavy to maintain the arm *L'* in an erect position, except when it is intentionally swung aside; or said arm *L* can be loaded at *M*, for the purpose of preserving the bell-crank in its

normal position. Instead of the weight M, a spring, *m*, as shown in Fig. 5, may be employed for depressing the arm L. Projecting rearwardly from the arm L' is a lug or flange, N, which is adapted at the proper moment to be struck by pin *h* of arm H. The arm L' has a laterally-projecting limb, O, which is slotted at *o*, said slot being concentric with pivot K of the bell-crank. This slot is traversed by a pin, P, which serves as a stop to limit the vibration of arm L', either to the right or left. Projecting rearwardly from door A' is a stop, R, that prevents the arm H being turned too far to the right when the signaling mechanism is first put in motion. S is a scutcheon on the outside of door A', for the purpose of preventing the entrance of dust, soot, and other obstructions through the key-hole *a'*. T is the key wherewith an alarm of fire is turned in. U is a lock for maintaining the door A' in its closed condition, the key for said lock being in the custody of the superintendent of the telegraph apparatus.

The operation of my improved mechanism is as follows: When in its normal condition, the door A' is closed and securely locked, the scutcheon S swung over the key-hole *a'*, and the pin *h* of arm H pressed against the flange N. This pressure of pin *h* against flange N is sufficient to turn the bell-crank L L' upon its pivot K, thereby swinging the arm L' to the left, and causing it to uncover the key-hole *a'*, as shown in Fig. 4, and to afford a free passage for the insertion of the key for the purpose of alarm. In this normal condition of the apparatus, the pin V of brake I engages over flange or rib *d* of stop-wheel D, thereby preventing any rotation of the clock-work F, said brake being maintained in this locked position by the eccentric *g*, as shown in Fig. 1.

To transmit an alarm of fire, the scutcheon S is first swung aside, and the key T inserted in the hole *a'*, the barrel of the key fitting over the end of arbor G, which latter is exactly in line with said key-hole, as seen in Fig. 2.

The key T is then turned to the right, as indicated by arrow in Fig. 6, which act causes the bit of said key to come in contact with the stump *h'*, and the continued rotation of the key brings the pin *h* in contact with stop R, and thus prevents any further movement of arm H, as shown in Fig. 5.

As soon as the attendant finds he can move the key no farther, he then turns it in an opposite direction, or to the left, so as to withdraw it from the key-hole, and the moment he withdraws it the preponderating weight of arm L causes the bell-crank to vibrate on its pivot K, thereby swinging the other arm, L', to the right, and closing the key-hole *a'* on the inside of the door, as represented in Fig. 5.

In thus turning the arm H around to stop R, the arbor G is caused to make about one-fourth of a revolution, which movement not only imparts a sufficient tension to the coiled spring *f*, but also turns the eccentric *g* far

enough to throw it out of contact with the brake I. The spring *b* instantly retracts the brake I, so as to shift its pin V aside from off the projection *d* of stop-wheel D, as seen in Fig. 3. This retraction of said brake unlocks the clock-work or gearing F, and leaves the latter at liberty to be propelled by the uncoiling of spring *f*. The clock-work being thus set in motion, the circuit-wheel E is rotated three, four, or five times, according to the number of wheels in the train F, and such revolution of said circuit-plate transmits the alarm from the box to the central station in the usual manner, or else sounds the alarm directly upon the bells, where the automatic system is employed.

Before the circuit-plate E has completed its prescribed revolutions, the arbor G, with its attached eccentric *g*, will be brought into such a position as to cause said cam to press against the brake I, and restore the same to its normal condition. In this position of the brake, the stop-wheel D, and with it the entire clock-work C F, will be instantly arrested as soon as said wheel D, has made one entire revolution, which act completes the transmission of an alarm. This stoppage of the wheel D is effected by its rib flange or projection *d* being brought in contact with the pins V of retaining-brake I, as shown in Fig. 1.

All of the operative parts are now in precisely the same positions they were in previous to the insertion of the key in the door of the box, and the apparatus is ready for transmitting another alarm in the manner just described.

It will be noticed that the signal apparatus contained within the box is operated simply with a removable key, and without being compelled to unlock a door, as must be done with all alarm-boxes now in use. By thus obviating the necessity of opening a door much valuable time is saved at the very beginning of a conflagration, when the services of the firemen are the most efficient, as it is well known that the old-fashioned doors are frequently very difficult to open, and especially so in winter, when they are covered with snow and ice. The doors of these boxes not only freeze up in winter, but they are liable to become firmly seated from various other causes—as, for example, when houses to which the boxes are attached are being painted, the workmen frequently paint over the box. As soon as the paint dries the door is cemented tightly to the box, thereby rendering it impossible to gain access to the signaling mechanism until the door is forcibly opened with cold-chisels or other implements.

When the door is thus cemented to the box the operator frequently breaks the key and injures the lock in his ineffectual attempts to open the door, so as to turn in an alarm.

Another advantage peculiar to my box is seen in the arrangement of devices for preventing an interfering alarm being turned in before the first one has been fully transmitted.

In the old-fashioned crank-box there is noth-

ing to prevent the crank being turned repeatedly before the first alarm has been fully dispatched, and this objection is as true of the boxes that are operated by depressing a hook or catch with the finger, as the hook can be drawn down as often as the excited operator desires, and every time he does so the previous alarm is interfered with and an unintelligible series of signals results.

This most frequent and annoying occurrence is entirely obviated in my box by the vibrating guard *L'*, which instantly closes the key-hole *a'* as soon as the key is withdrawn, and does not again uncover said hole until the first round of signals has been completely transmitted. The key-hole being thus automatically closed during the transmission of the signals, it is evident the operator cannot again insert his key at all until the guard *L'* is again automatically removed, and, therefore, there is no possibility of a second alarm being sent until the first one is clearly out of the box.

The within-described circuit-wheel is also a very decided improvement over those now in use, and which consist of disks having arranged around their peripheries teeth or characters, which soon become choked up with dust, soot, &c., whose non-conducting properties render the apparatus inoperative during the first two or three revolutions of the wheel. This circuit-wheel, however, being a perfectly flat plate, and having the fingers in contact with its vertical face, and not with its periphery, can never fail to act with the utmost promptness and reliability.

It is evident the cover *A'* of the box (being

never opened except by the superintendent) need not be a hinged door, as shown in the drawing, but can consist of a simple plate or cap secured in position with screws or bolts, or made to occupy grooves in the sides and bottom of the box.

The external scutcheon, *S*, may be omitted as not essential to the operation of the box.

I claim as my invention—

1. The combination of master-wheel *C*, stop-wheel *D d*, arbor *G g*, arm *H h'*, brake *I i V*, spring *b*, and any suitable clock-work and circuit-wheel, when adapted to be set in motion with a key, *T*, or its equivalent device applied through an opening, *a'*, in the cap, cover, or door of the box, substantially as herein explained.

2. The guard-plate *L'*, pivoted to the inner side of the door or lid of a fire-alarm signal-box, and adapted to close the key-hole of the box, being operated and to unclosethe same by the return of the mechanism to its normal position, substantially as herein explained and illustrated.

3. The combination of arm *H h*, attached to arbor *G* of the signaling mechanism, projection *N*, and bell-crank *K L L'*, pivoted to the inner side of the box-door *A'*, for the purpose set forth.

In testimony of which invention I hereunto set my hand.

GEORGE FLOYD.

Attest:

GEO. H. KNIGHT,
JAMES H. LAYMAN.