M. G. CRANE.

Signal Box for Fire Alarm Telegraphs.

No. 165,918. Patented July 27, 1875.

Fig. 1.

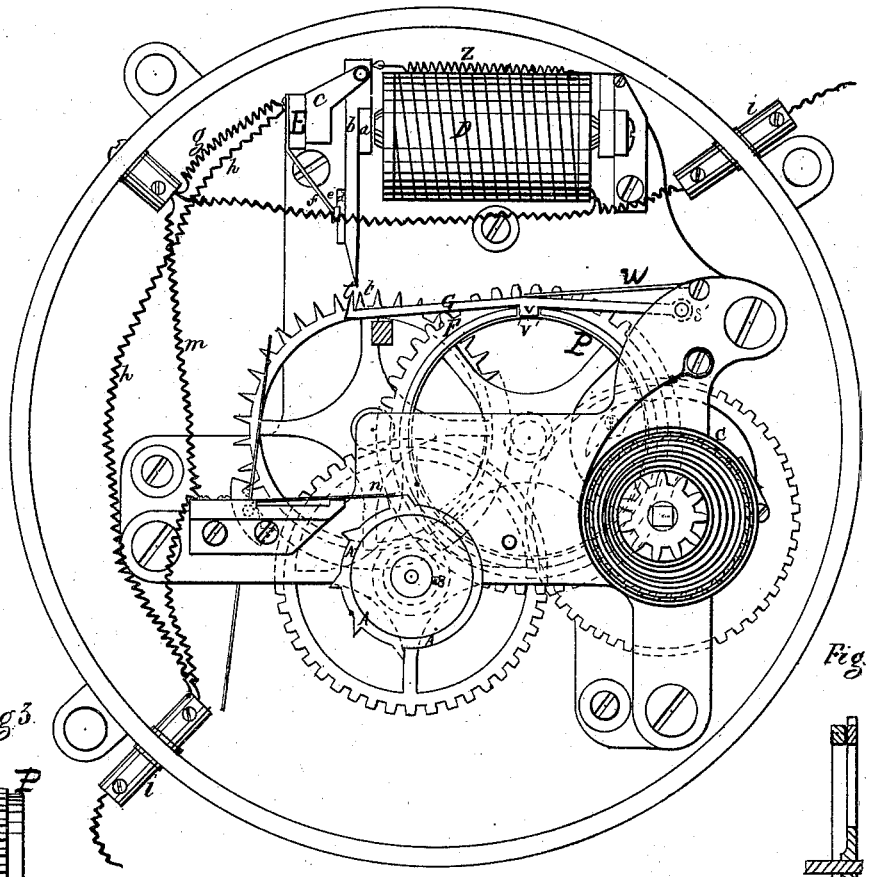


Fig. 3.

Fig. 4

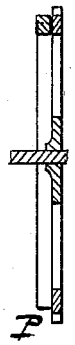
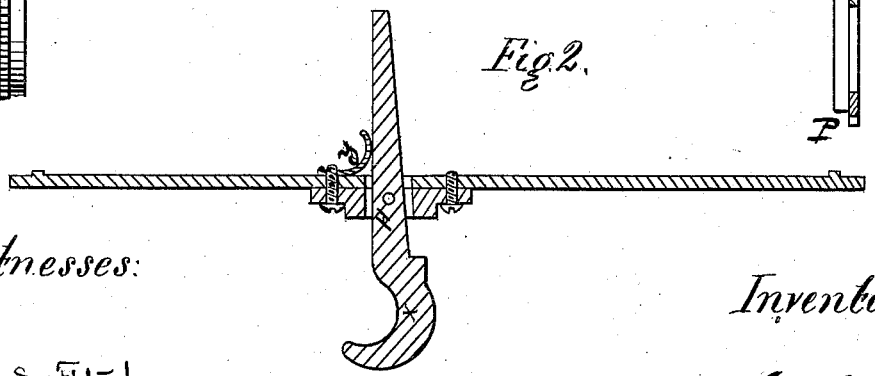


Fig. 2.



Witnesses:

A. S. Fitch

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UNITED STATES PATENT OFFICE.

MOSES G. CRANE, OF NEWTON, MASSACHUSETTS.

IMPROVEMENT IN SIGNAL-BOXES FOR FIRE-ALARM TELEGRAPHS.

Specification forming part of Letters Patent No. **165,918**, dated July 27, 1875; application filed July 9, 1875.

To all whom it may concern:

Be it known that I, MOSES G. CRANE, of Newton, county of Middlesex, in the State of Massachusetts, have invented an Improvement in Automatic Signal-Boxes for Electro-Magnetic Fire-Alarm Telegraphs, of which the following is a specification, reference being had to the accompanying drawings forming part of this specification.

Figure 1 is a front elevation of a signal-box embodying my invention. Fig. 2 is central sectional view of the cover of the said box, showing the lever employed to set the mechanism of the signal-box in motion to give a fire-signal. Figs. 3 and 4 are detailed views of the flanged gear-wheels F, one of the train of wheels by which the break-circuit wheels is actuated.

My invention is an improvement upon the signal-box for which Letters Patent of the United States, No. 113,649, were issued to John N. Gamewell on the 11th day of April, A. D. 1871. By reference to that patent it will be seen that the invention covered by the second claim therein is stated to consist of "the combination, with the armature of the magnet and the winding lever or crank of the signal-box, of a device whereby the armature is, by the movement of the lever, locked in the position it occupies when attracted to the magnet, if, at the moment when the lever is moved, the circuit is closed, and whereby it is locked away from the magnet, if, at the moment when the lever is moved, the circuit is broken, the wires of the circuit being so arranged that when the armature is attracted to the magnet the electric current passes necessarily over the break-circuit wheel, but when the armature is released from the magnet the electric current is transmitted by a shorter route, cutting the break-circuit wheel out of the circuit." The object of the invention is, as there stated, to "secure the orderly giving of signals by preventing the interfering of any signal-box with any other circuit."

My invention consists in the improved devices and combinations hereinafter described, differing from those described in the said patent for accomplishing substantially the same object.

The general construction and operation of the mechanism constituting the signal-box do not essentially differ from those described in the above-named patent. It will be necessary, therefore, to here describe particularly only my new devices and combinations, with a general reference to the remainder of the mechanism.

A is the break-circuit wheel, rotated by the stress of the mainspring C through the train of wheels shown in Fig. 1. D is the electro-magnet, the armature *a* of which is fixed upon the lever *b*, that is pivoted at its upper end in a bracket, *c*. Secured upon this lever is a plate, *d*, of rubber or other insulator, upon which is secured a metal piece, *e*. *f* denotes a metal finger fixed and insulated at one end upon the support E, with which is connected the circuit-wire *g*. The other end extends downward, and touches the plate *e* when the armature is swung away from its magnet, as seen in the drawing. There are two of these fingers, and with the other is connected the circuit-wire *h*. The circuit-wire is brought into the box through the binding-screw *i* and leaves it through the binding-screw *i'*. One wire, *m*, within the box runs from the binding-screw *i* to the magnet D in connection with metal finger *n*, that rests on the break-circuit wheel A, thus bringing the said wheel into the circuit. Another wire, *o*, avoiding the break-circuit-wheels, runs to the fingers *f*, over which the circuit is completed, when the metal plate *e* touches said fingers.

F, one of the gear-wheels of the train, has on its side face, at its periphery, a flange, *p*, seen more plainly in Figs. 3 and 4. G is a lever, pivoted at one end at *s*. Upon the opposite end is a hook or upward wedge-like projection, *t*. This lever rests upon the flange *p*, toward which it is pressed by a spring, *u*. Upon its under side is a lug, V, and in the flange *p* a notch, V', into which the lug falls when the wheel F is in position, where the lug and notch coincide. While the lug is in the said notch the wheel F is locked and cannot revolve. But by lifting the lever G, the lug being thereby disengaged from the notch, the wheel F will make, under the stress of the mainspring, a complete revolution, the lug resting meantime on the flange, and thereby maintain the lever in its raised position. The

wheels of the train may be so proportioned that the break-circuit wheel will make any number of revolutions while the wheel F is making one. If, when the lever is raised, the circuit is closed, and the armature *a* drawn to the magnet, the armature *b* will be swung to the right, and the hook *t* will be thrown up on the left side of the beveled end of the lever *b*, and lock the said lever in that position, separating the plate *e* from the fingers *f*, and breaking the circuit at that point. But if, when the lever G is raised, the circuit is open, and the lever *b*, by stress of the spring *z*, is thrown to the left, the hook *t* will be thrown up on the right side of the end of said lever and lock it in that position, with the circuit closed over the fingers *f*.

H is a lever pivoted in the cover I of the box, one arm, X, of which extends into the box, immediately under the hooked end of the lever G. The opposite end X′ of the lever H extends outward from the box-cover. The person giving an alarm depresses this end X′ of the said lever, and thereby throws up the lever G. As soon as the pressure is removed from X′ the spring Y throws down the end X and leaves the lever G free to fall back to its first position when the wheel F shall have made a revolution.

This box is intended to be used with a closed circuit, and the alarm to be given by breaking the circuit; and it is evident that the circuit being closed, and any one of a number of signal-boxes in such circuit being "pulled" or set in motion to give a signal, the upward movement of the lever G will lock the lever *b* in position to prevent connection between the fingers *f* and the plate *e*, thus locking the break-circuit wheel of such signaling-box in circuit until the signal is completed, but that in all other boxes in the circuit the corresponding armature levers will be swung away from the magnets and close the circuits over the corresponding fingers *f*, thus locking the break-circuit wheels of all of them out of circuit, so that if, while a signal is being given by one box, any other box in the circuit should be "pulled," no effect will be thereby produced and no interference with the signaling-box occasioned.

I do not claim as my invention the general mechanism of the box described, whereby non-interference between boxes in the same circuit is effected, limiting my claim to the following special devices, viz: The lever G with its lug V and hook *t*, the flange *p* on the wheel F, and the lever *b*, combined as described.

What I do claim, and desire to secure by Letters Patent, is—

1. In a fire-alarm signal-box the lever G, with its lug V and hook *t*, the flange *p* and its notches V′, the lever *b*, insulated plate *e*, and magnet D, all combined and operating as and for the purpose specified.

2. The combination of the lever H, the lever G, and the wheel F, whereby the said wheel is liberated and allowed to revolve under the stress of the motor C, as and for the purpose specified.

Witness my hand this 11th day of August, 1874.

MOSES G. CRANE.

Witnesses:
A. S. FITCH,
B. S. CLARK.