(No Model.) 2 Sheets—Sheet 1.

W. H. KIRNAN.

NON-INTERFERENCE FIRE ALARM SIGNAL BOX.

No. 447,074. Patented Feb. 24, 1891.

FIG. 1.

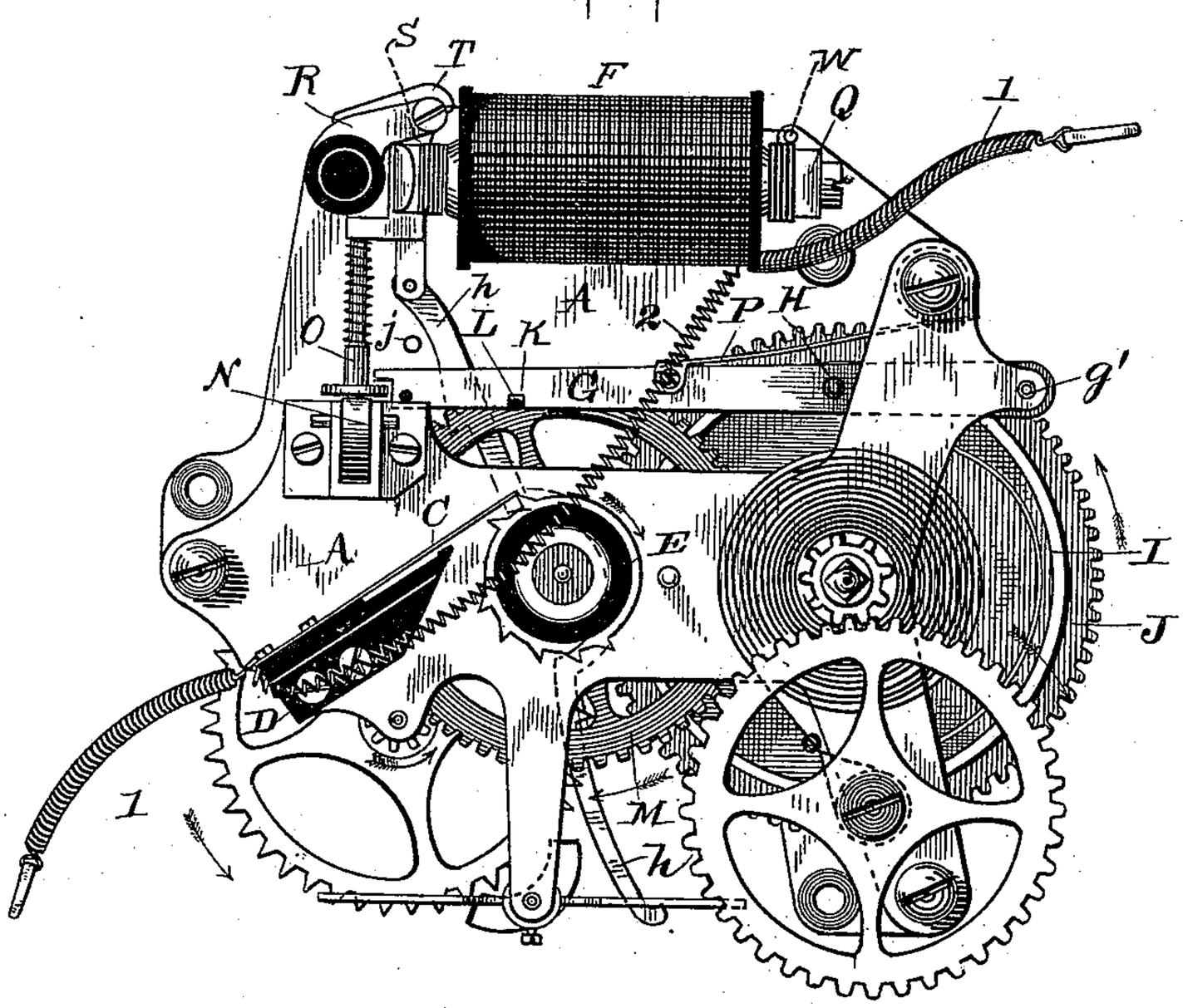

FIG. 2.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

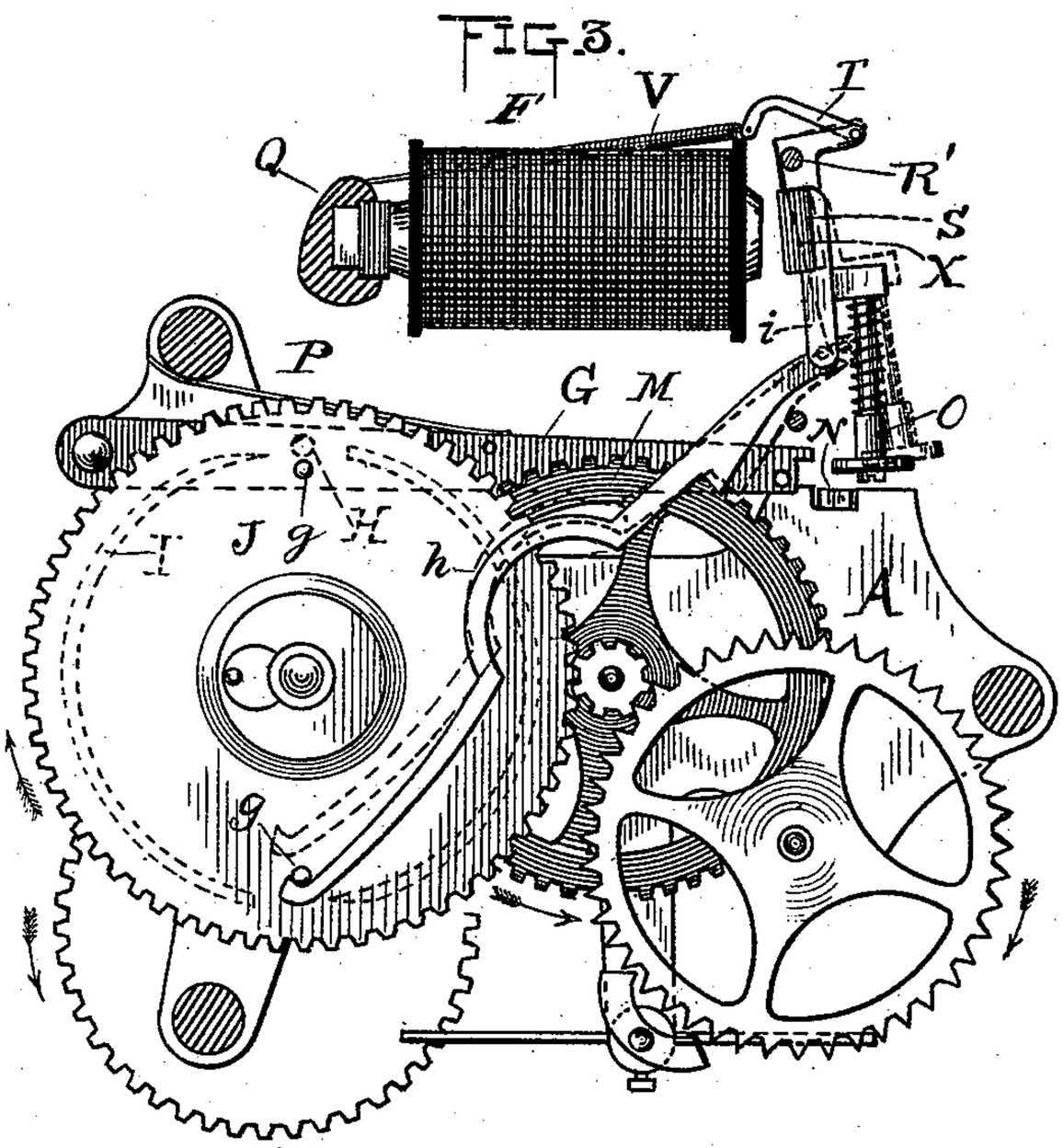
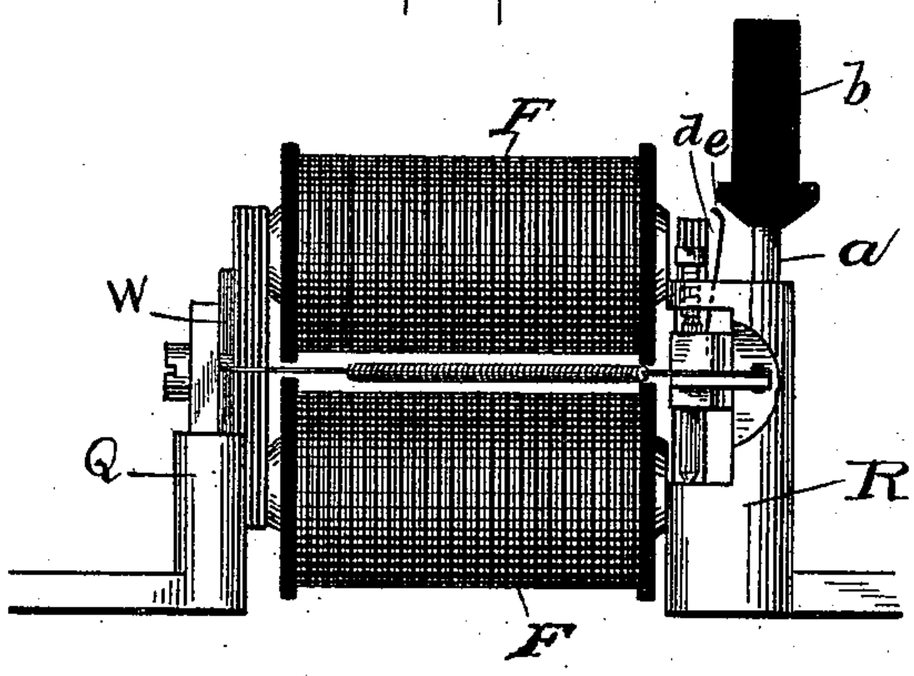


FIG. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM H. KIRNAN, OF BROOKLYN, ASSIGNOR TO THE GAMEWELL FIRE-ALARM TELEGRAPH COMPANY, OF NEW YORK, N. Y.

NON-INTERFERENCE FIRE-ALARM SIGNAL-BOX.

SPECIFICATION forming part of Letters Patent No. 447,074, dated February 24, 1891.

Application filed March 1, 1889. Serial No. 301,703. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. KIRNAN, of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Non-Interference Fire-Alarm Signal-Boxes, of which the following is a specification.

My invention relates to non-interfering fire-alarm telegraphs wherein a number of signal-boxes are placed in series in the same electric circuit and arranged so that an alarm-signal may be sent from any signal-box in the circuit to a common center or to any number of signal-stations in a circuit, and so that while a signal is being sent from any box in a circuit all other boxes in the same circuit will be disabled from sending a signal.

My invention consists in providing a non-interfering signal-box operated by a handle and provided with a device for preventing the operation of such handle during the transmission of a signal, such device being controlled by the magnet in the box with a resetting device operated by the signaling-motor for automatically resetting such disabling device into operative position at the close of the signal, so that another signal can be immediately transmitted without the necessity of performing any additional operation.

In the accompanying drawings, forming a part hereof, Figure 1 is a front elevation of the apparatus embodying my invention removed from its box. Fig. 2 is a side elevation of the apparatus of Fig. 1, viewed from the left, the box inclosing it being shown in section. Fig. 3 is a rear elevation with the back plate of the frame removed, and Fig. 4 is a top view of the magnet and armature and attached parts.

The motor for driving the signaling mechanism may be of any usual or desirable form. I have shown the ordinary clock-work mechanism for this purpose, the construction and operation of which will be readily understood from an examination of the drawings without further explanation. This mechanism, together with the signaling and other mechanism, is mounted on a frame A and the whole inclosed in a suitable box or case B. The signaling mechanism may be of any of the usual and well-known forms. As shown, it comprises the spring-fingers C, of which there are two, insulated from each other on the block D, mounted on the frame A, and the break-contact wheel E, mounted on a shaft driven by the motor. The main-line wire 1 is connected to one of the spring-fingers C. From the other finger C a wire 2 leads to the magnet F, from which proceeds the main-line wire to another box in the series. When the fingers C are in contact with the teeth on the break-contact wheel, of which there will be the number necessary to communicate the proper signal, the current will flow through the magnet without communicating any signal; but when and as often as the fingers C are out of contact with the break-contact wheel the current will cease to flow and a signal corresponding to the number of times contact is broken will be transmitted.

The mechanism for starting and stopping the motor may also be of any suitable form. I have shown a lever G, pivoted at one end to the frame A at g', as shown. A pin H is carried by this lever and rides on the flange I of the gear J. A notch K is formed on the lever, designed to drop over the pin L on the gear M of the clock-train and arrest its movement. A pivoted pull or handle N, projecting outward from the frame, bears against a sliding head O, which, when the pull is drawn downward, lifts against the end of the lever G and carries it up sufficiently to release its notch from the pin L. The pull N is so arranged that when the head O is out of its path of movement it will not strike the lever G to operate it. The clock-work is then free to operate and the transmission of the signal will be begun. To stop the clock-work after the signal is sent, the flange I on the gear J is cut away at a determined point, so that at the cessation of a signal the pin H of the lever will drop from the flange, the spring P, bearing on top of the lever, aiding this action, and thereby the notch K will descend and lock the pin L, and consequently the clock-work.

The magnet is preferably arranged to be in a horizontal position, being mounted on a

piece Q, projecting from the back plate of the frame A. On another piece R, projecting from the back plate of the frame A, parallel with the piece Q, the rock-shaft R′ is located. Upon this rock-shaft is mounted the armature-carrier S, which is provided with a pivoted arm T, extending rearwardly over the rock-shaft in the direction of the magnets. To the rear end of this arm is attached one end of the coiled spring V, the other end of which is connected to a pin W on the piece Q. By this arrangement of parts the tendency of the spring is to withdraw the armature X from the magnetic field of the magnet.

Upon the piece R of the frame is mounted a sliding pin *a*, having a head *b*. Between a shoulder on the pin *a* and the piece R is arranged a spring *c*, the tendency of which is to project and hold the head *b* a short distance beyond the end of the armature X. On the back of the armature is an outwardly-bent spring *d*, having an inclined lip *e*. The inner end of the head *b* is also slightly beveled off to correspond with the incline of the lip *e*. When the armature X is held up against the magnet, the spring *d* will be out of the path of movement of the head *b*, but when the armature is out of the magnetic field of magnet the spring *d* will be in the path of movement of the head *b*, and such is the amount of bend of the spring that it will be forced by the inward movement of the head toward the magnet sufficiently to carry the armature into its magnetic field. A projection *f* on the door of the box is located so as to come in contact with the head *b* when closing and push it inward to restore and hold the armature in the magnetic field of the magnet when the door is closed. It will be seen that by this construction when the door of a box is opened the projection *f* will be withdrawn from the head *b*, and the spring *c* will project said head beyond the spring *d* of the armature, thereby permitting a movement of the armature out of the magnetic field of the magnet. Now, if all the boxes in the circuit are idle the armature of every box will be retained by the attraction of the magnet in position, so that the head O will be in position to be lifted by the pull or handle N against lever G, and thereby release the motor to transmit a signal, and the opening of the door will not alter this position; but if a signal is being transmitted from any box in the series the circuit will be broken in all other boxes in the series, and the opening of the door of any one of them permitting the head O to be withdrawn from the path of the armature, the latter, being free from magnetic attraction and mechanically unobstructed, will be rocked away from the magnet by the force of the spring V, carrying with it in its rocking movement the head O out of the path of the pull N, thus providing for non-interference with the signal being transmitted.

I will now describe the means for automatically resetting the parts, which I do by automatically restoring the armature to the magnetic field of the magnet after a signal has been transmitted, whereby the head O is carried into position to move the lever G.

In Fig. 3 the means referred to are clearly illustrated. Upon the back of the gear J of the train are located one or more pins *g*, one of which will be brought into operative engagement with a lever *h* a short time previous to the notch K locking the train, and which will before the train is locked, but after the signal has been sent, cause the lever *h* to rock the armature into the magnetic field of the magnet. This lever *h* is pivoted on an arm *i* projecting downwardly from the armature, and is formed with bends, as shown, to avoid interfering with other parts of the apparatus. A pin *j*, projecting from the back of the frame A, serves to prevent this lever from falling into the perpendicular, and serves, also, as a fulcrum upon which it will turn when its free end is moved by the pin on the gear. The broken lines in Fig. 3 represent the position of the armature and connected parts while a signal is being sent and before the pin has acted on the lever *h* to restore the armature to the magnetic field of the magnet. The full lines represent the armature and connected parts in the position they are brought into by the action of the pin *g* on the lever. With the armature in this latter position the attraction of the magnet will be sufficiently strong to draw the armature to it, thereby bringing the head O between the end of lever G and pull or handle N, so that the mechanism will again be in position to transmit a signal. This resetting operation being performed automatically, the necessity of closing the door or of otherwise manipulating the parts to reset is obviated.

What I claim is—

1. In an electric signal-transmitter, the combination, with circuit making and breaking signaling mechanism, a motor for operating such mechanism, and a magnet in the signaling-circuit, of a handle for starting the motor, a mechanical disabling device for the starting-handle, an armature for said magnet, carrying and directly moving the disabling device, and a resetting device operated by the motor and moved thereby at the conclusion of a signal, substantially as set forth.

2. In an electric signal-transmitter, the combination, with circuit making and breaking signaling mechanism, a motor for operating the same, and a magnet in the signaling-circuit, of a detent for said motor, a handle for moving said detent to start the motor, a device intermediate between said detent and said handle, through which the handle acts upon the detent, an armature for said magnet, carrying and directly moving said intermediate device, and a resetting device operated by the motor and moved thereby at the end of a signal, substantially as set forth.

3. In an electric signal-transmitter, the combination, with circuit making and breaking

signaling mechanism, a motor for operating the same, a magnet in the signaling-circuit, and a movable armature for said magnet, of a detent for the motor, an intermediate piece carried by the armature in position to move said detent when the armature is in the field of the magnet, a handle for moving said intermediate piece, and a part carried by the armature and adapted to engage a moving part of the motor for restoring said piece to its intermediate position, substantially as set forth.

4. In an electric signal-transmitter, the combination, with circuit making and breaking signaling mechanism, a motor for operating the same, employing a revolving wheel, a magnet in the signaling-circuit, and a rocking armature for said magnet, of a handle for starting the motor, disabling mechanism for the starting device carried by the armature, and a pin on a wheel of the motor, arranged to engage said armature to restore said disabling device to operative position at the close of a signal, substantially as set forth.

5. In an electric signal-transmitter, the combination, with the rotary signal-wheel, the spring and train of gearing for operating said wheel, the magnet in the signaling-circuit, and the rocking armature for the said magnet, of the lever controlling the movement of said gearing, the handle for raising said lever, the pin carried by said armature and having a head adapted to come between said handle and said lever, the arm extending from said armature, and a pin on a wheel of the train, adapted tc engage said arm to restore the armature to the field of the magnet, substantially as set forth.

This specifiation signed and witnessed the 27th day of February, 1889.

WM. H. KIRNAN.

Witnesses:
D. H. DRISCOLL,
WILLIAM PELZER.