(No Model.) 2 Sheets—Sheet 1.

C. W. CORNELL.

SIGNAL BOX.

No. 568,335. Patented Sept. 29, 1896.

Fig. 1.

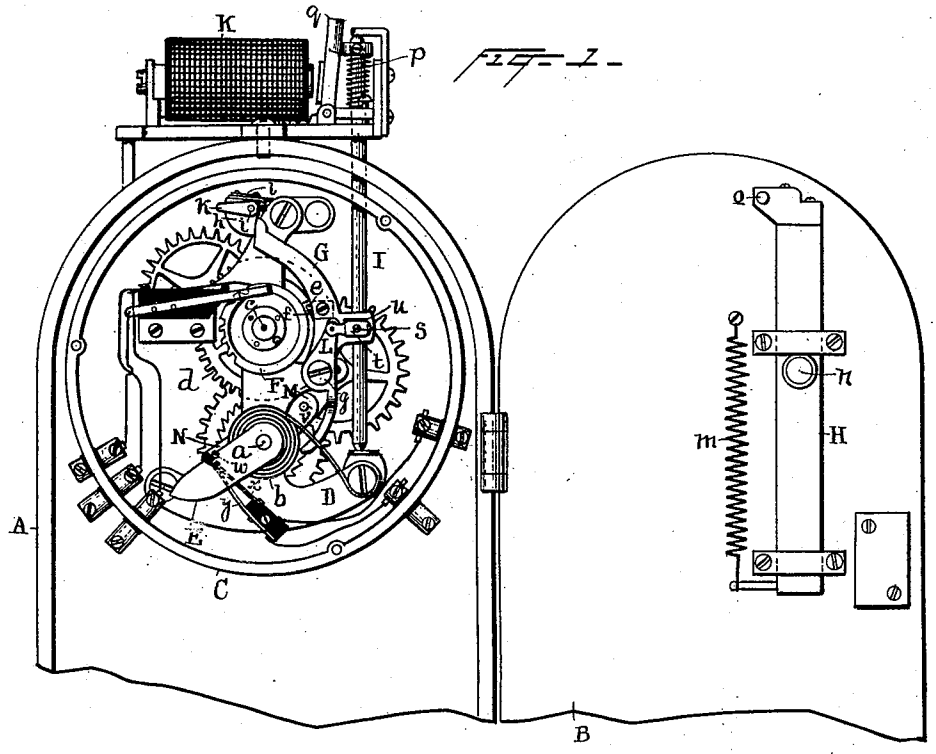

Fig. 2.

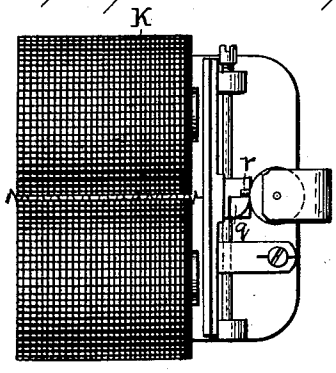

Fig. 3.

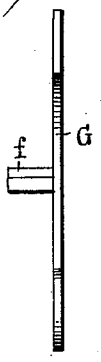

Fig. 4.

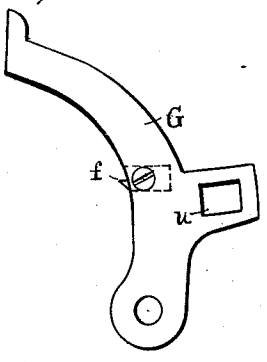

Fig. 5.

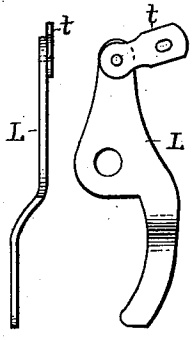

Fig. 6.

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(No Model.) 2 Sheets—Sheet 2.

C. W. CORNELL.

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Fig. 7.

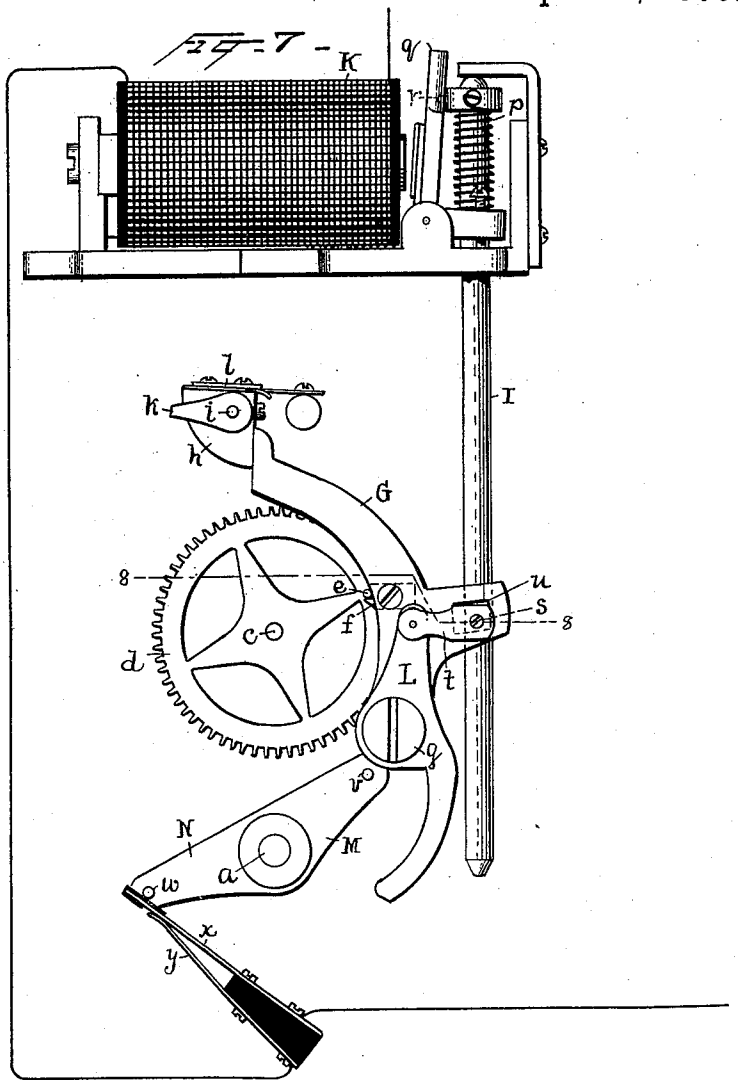
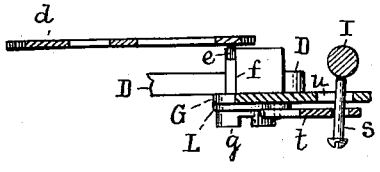


Fig. 8.



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UNITED STATES PATENT OFFICE.

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SIGNAL-BOX.

SPECIFICATION forming part of Letters Patent No. 568,335, dated September 29, 1896.

Application filed December 5, 1895. Serial No. 571,114. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. CORNELL, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Signal-Boxes, of which the following is a specification.

The object I have in view is to produce a device for permitting the operation from a distance of a normally-unwound signal-box by what is known as the "auxiliary system," which device shall be simple in construction, effective in operation, can be readily applied to boxes already in use, and will meet all the requirements of the situation.

The invention consists in the several contrivances and combinations of parts pointed out by the claims.

In carrying out the invention I pivot upon the frame carrying the wheel-movement of the box a lever provided with a stop engaging a pin carried by a wheel upon the break-wheel shaft. The engagement of the pin and stop arrests the movement of the wheel-work, so that the winding-lever can be moved to wind up the operating-spring and released without starting the wheel-movement. The winding-lever must be moved and set in the wound-up position, in order to enable the box to be operated by the auxiliary circuit. To enable it to be operated by the ordinary pull, when the winding-lever is so set, the pull-slide is provided with a pin engaging a finger on a turning shaft, which shaft carries a releasing-dog bearing against the extended end of the stop-lever and moving the stop-lever to release the wheel-work when the dog is turned, as it is by the movement of the pull-slide. If the winding-lever is not set for the operation of the box by the auxiliary circuit, the pull-slide moves both the winding-lever and the releasing-dog, (the former slightly in advance of the latter,) so that the winding-lever is moved and the wheel-movement released by the single downward movement of the pull-slide. To release the box by the auxiliary magnet, a turning spindle is employed, carrying a spiral spring which turns it in the direction to move the locking-lever and release the wheel-work, which turning movement is prevented by the retraction of an auxiliary magnet mounted upon the box. When the circuit to this magnet is closed and its armature is attracted, the releasing-shaft is freed from the armature and is turned by the spring, moving the locking-lever within the box and releasing the wheel-movement. To restore the parts to the locking position, there is mounted upon the winding-shaft an arm having a pin engaging a restoring-lever on the return movement of the winding-shaft, which restoring-lever is connected both with the locking-lever and with the auxiliary turning shaft, and moves them both back into the normal position. This restoring-lever is connected by a link with a pin on the auxiliary shaft, which pin passes through a slot on the locking-lever, so as to provide for lost motion between the auxiliary shaft and the locking-lever, thereby enabling the locking-lever to be released by the dog, which is operated by the pull-slide, independently of the auxiliary magnet. The winding-shaft is also provided with another arm, which, when the shaft is turned to the wound-up position of the spring, pushes together two contacts in the auxiliary circuit and closes that circuit, so that an indication will be furnished at the auxiliary box as to whether the signal-box is set for operation by the auxiliary circuit.

In the accompanying drawings, forming a part hereof, Figure 1 is an elevation of the signal-box with the door thrown open. Fig. 2 is a top view of the auxiliary magnet. Figs. 3 and 4 are edge and side views of the locking-lever. Figs. 5 and 6 are edge and side views of the restoring-lever. Fig. 7 is a view, full size, of the devices embodying the improvement, shown separated from other parts for clearness of illustration; and Fig. 8 is a cross-section on the line 8 8 of Fig. 7.

A is the shell of the signal-box, and B is the door. Within the shell A is the cylindrical box C, carrying the signaling mechanism. Below the box C the shell contains the tap-bell, lightning-arrester, Morse key, cut-out, and switch, which are usual in boxes of this character, but which are not shown. The wheel-work is supported by a frame D within the box C. This wheel-work includes a winding-shaft *a*, having a normally-unwound spring *b*, connected permanently at one end

to the winding-shaft and at the other end to the frame. The winding-shaft *a* has the usual winding-arm E, secured to its end. As will be understood, the winding-shaft is connected by a pawl and ratchet with a train of wheels whose movement is controlled by an escapement, said train including the break-wheel shaft *c*, carrying the break-wheel F, with which coöperate the contact-springs, as will be well understood. The wheel *d* on the break-wheel shaft is provided with a pin *e*, which engages with a stop *f* on the locking-lever G. This locking-lever is pivoted by the screw *g* to the frame D and is normally swung inwardly toward the break-wheel, bringing the stop *f* in the path of movement of the pin *e* and arresting the wheel-work. The locking-lever G is extended above the stop *f* and projects inwardly over the break-wheel, its end engaging with a releasing-dog *h*, carried by a shaft *i*, from which projects a finger *k*. This finger projects horizontally, as illustrated in Figs. 1 and 7, and the shaft *i* is maintained in this position by a flat plate-spring *l*, which rests upon the flat upper surface of the dog *h* and turns the shaft back to the normal position after it has been turned away from that position and has been released.

H is the pull-slide, which is pulled downwardly, as usual, by a hook (not shown) projecting through the cover B on its outer side and is lifted by spring *m*. The pull-slide has the usual pin *n*, which engages with the winding-lever, and at its upper end it is provided with another pin, *o*, for engaging with the finger *k*. By pulling the slide H downwardly the pin *o*, engaging the finger *k*, will turn the dog *h*, which will push the upper end of the locking-lever G outwardly, disengaging the stop *f* from the pin *e* and releasing the wheel-work. If the winding-lever is not already depressed, this downward movement of the pull-slide will also cause the pin *n* to engage the winding-arm E and wind up the driving-spring *b*.

I is the auxiliary turning shaft, which projects through the top of the outside shell A and into the box C. At its upper end the shaft I is provided with a spiral spring *p*, which turns the shaft in one direction when the shaft is released.

K is the auxiliary magnet, which is mounted upon the top of the shell A. Its armature-lever is provided with a shoulder *q*, engaging a tooth *r* on the head of the shaft I and preventing the turning of the shaft by the spring *p* when the armature of the auxiliary magnet is retracted.

Within the box C the auxiliary shaft I is provided with a pin *s*, projecting radially therefrom and engaging at its outer end a link *t*, projecting from the restoring-lever L, which lever is also pivoted upon the screw *g*, as is the locking-lever G. The pin *s*, in passing from the shaft K to the link *t*, passes through a slot *u*, formed in a rearward projection of the locking-lever G. The winding-shaft *a* is provided with an arm M, having at its end a pin *v*, which engages with the restoring-lever L as the winding-shaft is turned forward by the driving-spring *b*, throwing the lower end of the restoring-lever outwardly and its upper end inwardly, with the effect of first turning the auxiliary shaft I against the tension of the spiral spring *p* until that shaft is locked by the auxiliary magnet, and then by its further movement causing the pin *s* to engage with the inner end of the slot *u* and push the locking-lever G inwardly, bringing the stop *f* into the path of movement of the pin *e* and stopping the wheel-work. The winding movement of the winding-shaft *a*, which is effected by forcing downwardly the arm E, first releases the restoring-lever L. This permits the auxiliary shaft I to be turned backwardly by its spring *p* until arrested by the engagement of the tooth *r* with the shoulder *q*. The tooth *r* engages the shoulder *q* before the pin *s* reaches the outer end of the slot *u*. This places the parts in such position that if the auxiliary apparatus is not in use and the box is being pulled by the manipulation of the pull-hook the locking-lever G can be pushed outwardly by the releasing-dog *h* without necessitating the unlocking of the auxiliary shaft I, the slot *u* being long enough to permit this movement. When, however, the box is set to be worked by the auxiliary magnet, which is done by forcing down the winding-arm E, then the closing of the auxiliary circuit will cause the auxiliary magnet to attract its armature, releasing the shaft I, which, being still further turned by the spiral spring *p*, will cause the pin *s* to engage the outer end of the slot *u* and throw the locking-lever G outwardly. The winding-shaft is provided with another arm, N, projecting on the opposite side of the shaft from the arm M and provided with a pin *w*, which, when the winding-arm is moved downwardly to wind up the driving-spring, forces together two contacts *x y*, located in the auxiliary circuit, thereby closing the auxiliary circuit and furnishing an indication, in the manner well understood, at the auxiliary boxes of the fact that the signal-box is properly set to be worked by the auxiliary circuit.

What I claim is—

1. In a signal-box, the combination with a normally-unwound signaling mechanism, of a device for locking the wheelwork, connections therewith for releasing the wheelwork both by the box-pull and by an auxiliary magnet, and contacts by which the circuit of the auxiliary magnet is opened, which contacts are closed by the winding movement of the driving-spring, substantially as set forth.

2. In a signal-box, the combination with a normally-unwound signaling mechanism, of a device for locking the wheelwork, connections therewith for releasing the wheelwork both by the box-pull and by an auxiliary magnet, contacts by which the circuit of the

auxiliary magnet is opened or closed, and an arm carried by the winding-shaft for engaging and closing said contacts when the box is wound, and for releasing and opening said contacts when the box commences to run, whereby the auxiliary magnet can be energized only when the box is wound, substantially as set forth.

3. In a signal-box, the combination with the signal mechanism, of a locking-lever carrying a stop for stopping the wheel-train, a dog for actuating said locking-lever, a trip-shaft normally locked by the armature of the auxiliary magnet but actuated when said magnet is energized, a restoring-lever moved by the wheelwork, and a common connection between said locking and restoring levers and said trip-shaft, substantially as set forth.

4. In a signal-box, the combination with the signal mechanism, of a locking-lever carrying a stop for stopping the wheel-train, a dog for actuating said locking-lever, a spring-actuated trip-shaft normally locked by the armature of the auxiliary magnet but released when said magnet is energized, a restoring-lever moved by the wheelwork, and a common connection between said locking and restoring levers and said trip-shaft, substantially as set forth.

5. In a signal-box, the combination with the signal mechanism, of a locking-lever carrying a stop for stopping the wheel-train, a dog for actuating said locking-lever, a trip-shaft normally locked by the armature of the auxiliary magnet but actuated when said magnet is energized, a restoring-lever moved by the wheelwork, and a pin connecting said restoring-lever with the trip-shaft, said pin passing through a slot in the locking-lever, substantially as set forth.

6. In a signal-box, the combination with the signal mechanism, of a stop for stopping the wheelwork, an auxiliary magnet, a shaft turned in one direction by a spring and locked against movement by the auxiliary magnet, and a connection between the stop and said turning shaft for releasing the wheelwork when the turning shaft is released and is turned by its spring, substantially as set forth.

7. In a signal-box, the combination with the wheelwork, of a stop for locking the same, an auxiliary magnet, a shaft turned in one direction by a spring and held from turning by the auxiliary magnet, a connection from said shaft with said stop for releasing the wheelwork when said shaft is released, and a restoring-lever moved by the wheelwork for restoring said stop and turning said shaft back into the locked position, substantially as set forth.

8. In a signal-box, the combination with the wheelwork, of the locking-lever G, the restoring-lever L, the shaft I controlled by the auxiliary magnet, the pin *s*, link *t*, slot *u*, and the releasing-dog *h* operated by the box-pull, substantially as set forth.

This specification signed and witnessed this 2d day of December, 1895.

CHARLES W. CORNELL.

Witnesses:
S. O. EDMONDS,
JOHN R. TAYLOR.