

(No Model.)

2 Sheets—Sheet 1.

L. H. McCULLOUGH.

CENTRAL OFFICE APPARATUS FOR FIRE ALARM TELEGRAPHS.

No. 329,186.

Patented Oct. 27, 1885.

Fig. 1

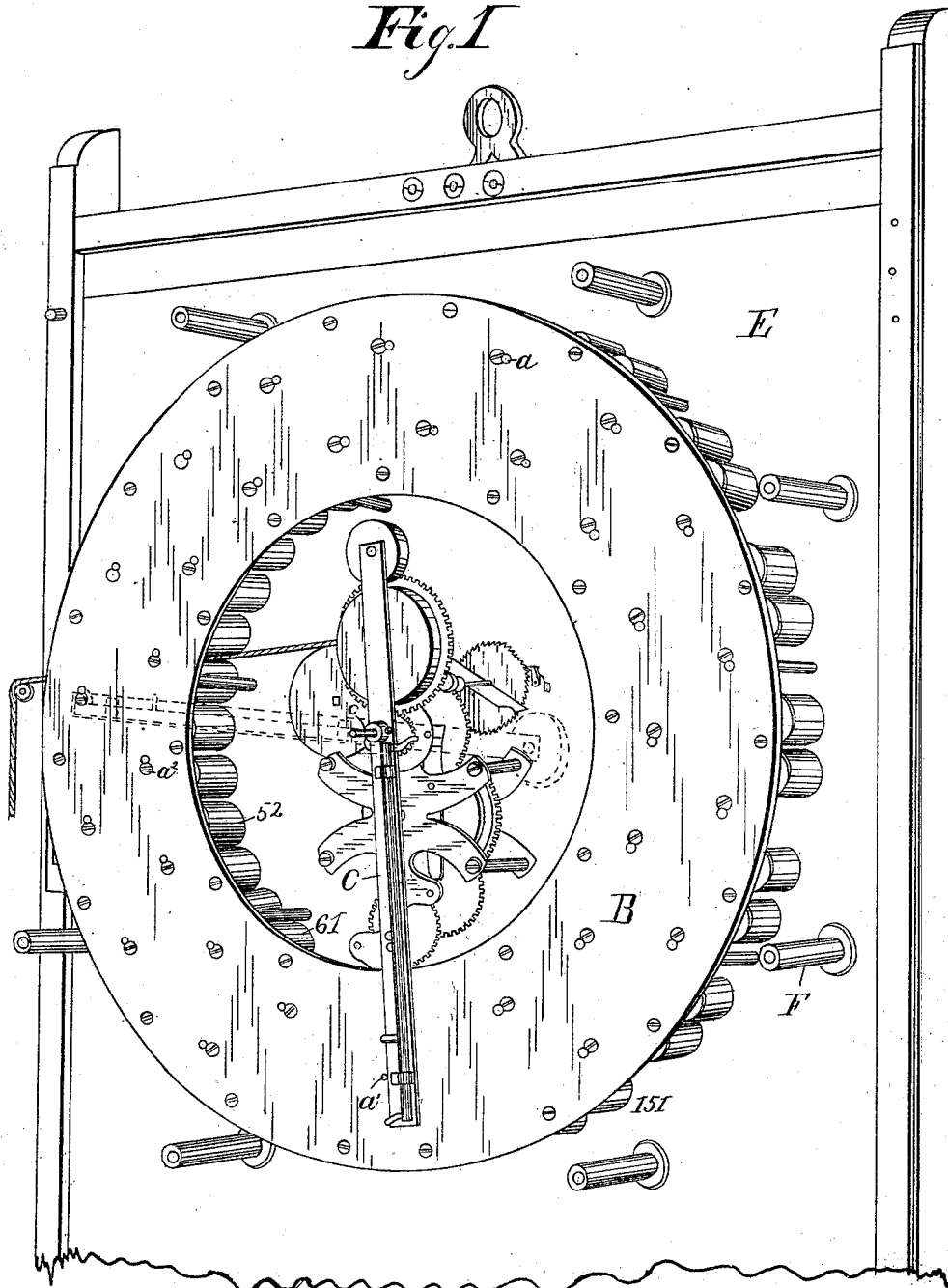


Fig. 6.



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2 Sheets—Sheet 2.

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No. 329,186.

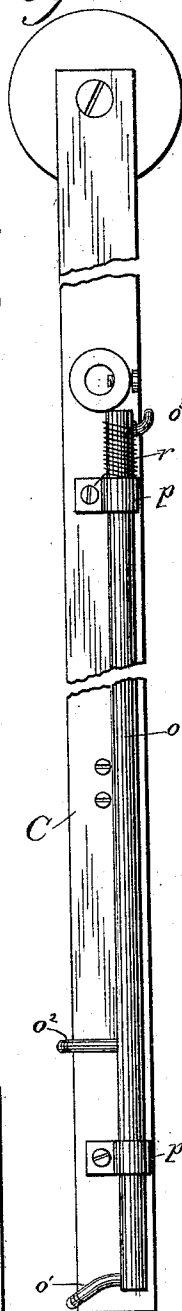
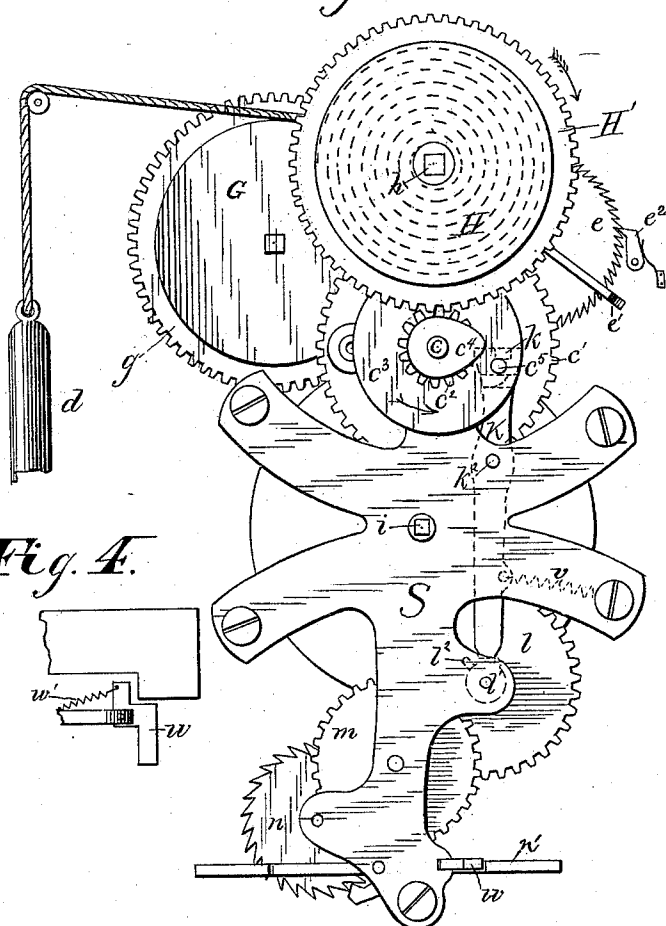
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Fig. 2.

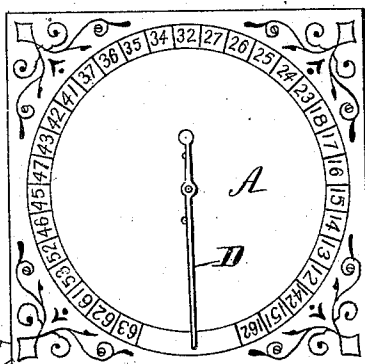
Fig. 3.

Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

LEWIS H. McCULLOUGH, OF RICHMOND, INDIANA.

CENTRAL-OFFICE APPARATUS FOR FIRE-ALARM TELEGRAPHS.

SPECIFICATION forming part of Letters Patent No. 329,186, dated October 27, 1885.

Application filed January 15, 1885. Serial No. 153,003. (No model.)

To all whom it may concern:

Be it known that I, LEWIS H. McCULLOUGH, a citizen of the United States, residing at Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Central-Office Apparatus for Fire-Alarm Telegraphs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in the central-office apparatus which I describe in my application numbered 139,683, filed August 5, 1884, and entitled a "non-interfering fire-telegraph system." In that application a central-office apparatus, called a "dial-box," was shown and described, the said dial-box having a dial in front and a spring-actuated hand adapted, when free, to travel about the dial-face. A series of magnets were arranged behind the dial, and a stop or detent on the armature of every magnet was made to lie in a slot in the dial, flush with the face thereof. The magnets were located in signal-circuits containing open-circuit signal-boxes, and all the circuits were made to pass through a common releasing-magnet, whose stop projected out beyond the dial-face to hold the hand normally at rest. On the closure of the circuit through any signal-box the releasing-magnet would be operated to remove its detent from before the hand, and the magnet in the particular circuit that was closed would bring its detent out into the path of the hand and stop it in a position where it would point to that number on the dial which corresponded to the number of the box rung in. The original circuit passed through the detent of the releasing-magnet and the hand or pointer, and also through the detent-arm of the box-magnet and a conducting-arm in contact therewith. After the operation of a signal-box, the original circuit was broken for all the boxes during the passage of the dial-hand, and was maintained open for all the boxes, except the one operated, by the hand removing the detent-arm of the magnet in that circuit away from the contact-arm above mentioned. No means were shown for restoring the armatures of the signal-circuit magnets, that being left to be done by hand,

and no provision was made for preventing the rebound of the hand from the detent thrown out by the signal-circuit magnet.

My present improvements consist of means for preventing such rebound, and means for pushing back the detent at the expiration of a predetermined time, together with means for stopping the time mechanism when the hand returns to its normal position.

The special features of my present invention will be clearly understood by reference to the accompanying drawings, in which the same letters refer to the same parts throughout.

Figure 1 is a perspective view of my central-office apparatus, the dial and outer pointer being removed. Fig. 2 is an elevation of the mechanism within the dial-box. Figs. 3, 4, and 6 are detail views, and Fig. 5 is an elevation of the dial and pointer.

In my present invention the detents *a* of the signal-circuit magnets do not lie flush with the face of the dial *A*, but with that of a cylindrical plate, *B*, behind the dial. The hand *C*, which corresponds to the dial-hand in my former application, travels in front of this plate *B*, and the outer hand, *D*, is merely a pointer, and serves no electrical functions. The signal-circuit magnets 63 62 61, &c., are arranged in two concentric rows behind the plate *B*, and the mechanism for operating the parts is located within the circle of these magnets in an easily-accessible position. The detents, like the magnets, are arranged in two concentric rows, the common center being the shaft of the traveling hand. The whole is supported upon a frame or back board, *E*, to which are secured the posts *F*, for attaching the dial-plate. To the bottom of the frame (not shown) are secured the binding-posts for making the proper connections with the magnets 63 62 61, &c. The hand *C* and the pointer *D* are both keyed to the shaft *c*, which is operated by the weight *d* on the drum *G* through the toothed wheel *g* and a pinion (not shown) on the said shaft. I may employ a spring, instead of a weight, to operate the hands *C* and *D*. The hand *C* is prevented from turning by the detent *a'*, which projects in front of the face of the plate *B*, and is connected with the retracted armature of a releasing-magnet common to all the box-circuits.

Now, it being understood that the operation of any box, as 47, will withdraw the detent a' of the releasing-magnet and thrust out that of the magnet in the circuit of the said box, that the hand C, when released, will travel, under the influence of the weight d , until it strikes against the detent of magnet 47, and that there-
 5 after the circuit is through the hand and the detent a of magnet 47, it is evident that some means must be provided for preventing the rebound of the hand C away from the detent; and it is also clear that it would be a matter of great convenience to have automatic means for pushing back the detent a after it has been
 15 out long enough for the box-signal to have been sent in. In connection with the latter contrivance there should be some means for stopping the time mechanism when the hand has traveled back to its original position, otherwise the spring of the said mechanism would be completely unwound every time a box was operated. For preventing the rebound I have on the shaft c a toothed wheel, e' , which en-
 25 gages with a pinion on the shaft of the ratchet e , the movements of this train of wheel-work being controlled by a fan, e' . By means of a spring-pressed dog, e'' , which engages with the teeth of the ratchet-wheel e , the backward movement of the gearing, and consequently the rebound of the hand C, is prevented.

I have also devised means, as follows, for pushing back any detent that may have stopped the hand C: A barrel, H, and a toothed wheel, H', are mounted on the shaft h . A spring at-
 35 tached at one end to the shaft and at the other to the barrel in the usual manner tends to move the wheel in the direction of the arrow. The wheel H' meshes with a pinion, c^2 , which, together with a disk, c^3 , and a cam, c^4 , is mounted loosely on the shaft c . These parts are normally prevented from turning on the said shaft by a pin, c^5 , on the disk c^3 , which engages with a stop, k , on the lever K. The winding-shaft of the time mechanism is i , and
 45 from it is operated, in a manner well understood, the train of gearing lmn . On the shaft of the wheel l is a sleeve, l' , from which projects a pin, l^2 , which revolves with the wheel. The lever K is pivoted at k^2 , and extends down, as shown, into the path of the pin l^2 . It is
 50 evident that the lever K will be tripped every time the pin l^2 makes a revolution. This allows the disk c^3 and the cam c^4 to make a quick rotation under the influence of their actuating-spring, after which the pin c^5 will be caught
 55 by the projection k^3 on the lever K, and be guided by the beveled surface of the latter into its normal position under the stop k . A spring, w , helps to draw the lever K back into
 60 position.

It will be remembered that the hand C is keyed to the shaft c , and it will presently be seen that the above-described rotation of the cam c^4 operates on devices connected with the hand to push back whichever stop is detain-
 65 ing the hand C. A rocking shaft or rod, o , having the three bent arms o' o^2 o^3 connected

therewith, is located in bearings pp on the outer face of the hand. The arm o' is bent so that the distance of its outer end from the shaft c is the same as that of the outer row of de-
 70 tents in the plate B, and it is so placed with respect to the hand C that when the latter is held by any one of the outer detents the end of the arm shall stand directly over the de-
 75 tent. The arm o^2 has a similar relation to the inner row of detents. Both arms are kept normally out of the range of the projected de-
 tents by means of the spring r . The third arm, o^3 , extends down into the range of the
 80 cam c^4 , whereby it is effected that the cam will strike against it in its rotation and rock the shaft c against the force-spring r . The ends of the arms o' o^2 are thus depressed, the stop which is holding the hand C thrust back, and
 85 the hand released. The time which it takes to repeat the longest fire-alarm signal four times (the usual number) is about two minutes. I time the mechanism so that the pin l^2 shall trip the lever K in about two minutes
 90 and ten seconds after the mechanism is released by the starting of the hand C. This time may, of course, be varied to suit the circumstances.

The stopping device acts mechanically upon
 95 the fan n' , and is actuated by the hand as it comes to rest against its stop a' . It consists of an angular piece, w , pivoted to the frame S of the mechanism, and provided with a spring, w' , which tends to hold it out of the
 100 way of the fan, as shown in Fig. 4. As the hand comes back to its place of rest, it strikes against the outer end of the piece w , and causes its short arm to pass under or over the fan and stop the train. In starting, the hand
 105 pushes back the piece w still farther, leaving it, when it has passed by, in the power of the spring w' , which brings it into the position shown in Fig. 4, where the fan is free to move.

It will be observed that in my present ap-
 110 plication the various detents do not rest in contact with conducting-arms, but with pins or screws a^2 in the plate B. It will also be noticed that they rest in slots large enough to allow of their being moved by the hand away
 115 from the said pins or screws.

Having now described my invention, what I claim, and desire to secure by Letters Pat-
 ent, is—

1. In a central-office apparatus for a signal-
 120 ing system, the combination, with a train of gearing, a hand operated thereby, and a stop or detent for the said hand, of a dog engaging with one of the gear-wheels, for preventing the rebound of the hand, substantially as de-
 125 scribed.

2. In a central-office apparatus for a signal-
 13 ing system, the combination, with a traveling hand and a stop or detent for the same, both the hand and the stop forming part of an electric signaling-circuit, of means for preventing the rebound of the hand when it strikes against the stop, substantially as described.

3. In a central-office apparatus for a signal-

ing system, the combination, with a train of gearing, a hand operated thereby, and a stop or detent for the said hand, both the hand and the stop forming part of an electric signaling-circuit, of a dog engaging with one of the gear-wheels for preventing the rebound of the hand, substantially as described.

4. In a central-office apparatus for a signaling system, the combination, with a motor and a hand operated thereby, of a stop or detent capable of being pushed out of the path of the hand, and automatic means for removing the detent after a predetermined time, substantially as set forth.

5. In a central-office apparatus for a signaling system, the combination, with a motor and a hand operated thereby, of a stop or detent capable of being pushed out of the path of the hand, and mechanism released by the starting of the hand, in combination with devices mounted thereon, whereby the detent is removed after a predetermined time, substantially as set forth.

6. In a central-office apparatus for a signaling system, the combination, with the hand C, the motor therefor, the detents of the rock-shaft o , having arms o' o^2 o^3 , and means for op-

erating the rock-shaft after a predetermined time to push back that one of the detents which may be in the path of the hand, substantially as set forth.

7. In a central-office apparatus for a signaling system, the combination, with the moving hand C and a detent, a , capable of being pushed out of the path thereof, the rock-shaft o , having an arm, o^3 , and a forward arm, as o^2 , the end of which rests, when the hand has been stopped, over the end of the detent, of the cam c^4 , pin c^5 , stop k on the lever K, and mechanism adapted to trip the lever K after a predetermined time, substantially as set forth.

8. In a central-office apparatus for a signaling system, the combination, with a moving hand, a detent therefor, and time mechanism for removing the detent, of means operated by the hand for stopping the time mechanism, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS H. McCULLOUGH.

Witnesses:

GEORGE H. STOCKBRIDGE,

JAS. T. HOWENSTEIN, Jr.