(No Model.) 2 Sheets—Sheet 1.

C. G. ARMSTRONG.

DISTRICT TELEGRAPH ALARM BOX.

No. 418,778. Patented Jan. 7, 1890.

Fig. 2.

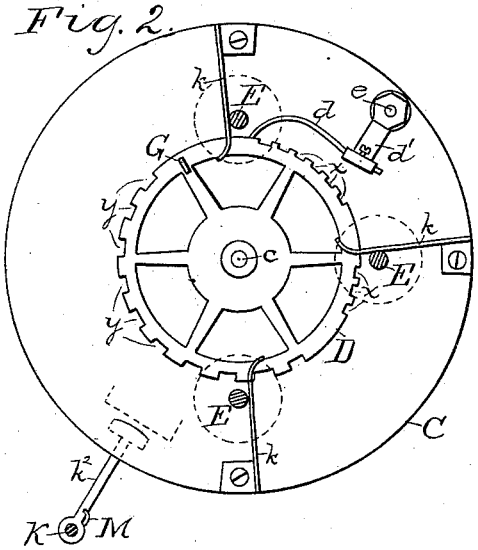


Fig. 1.

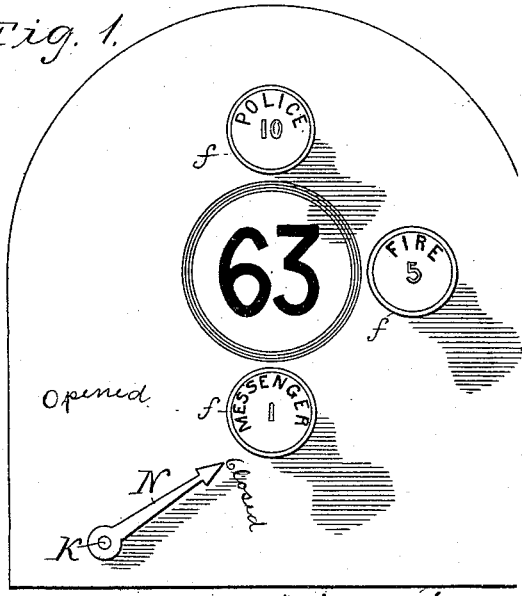
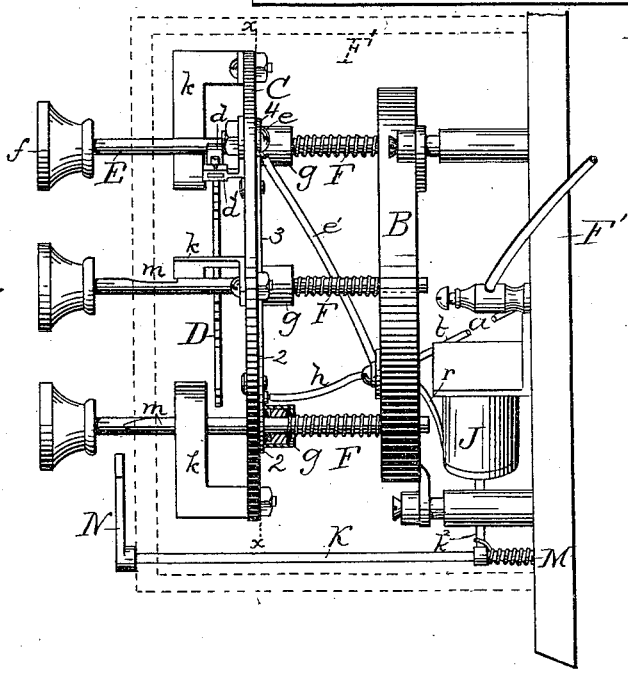


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

C. G. ARMSTRONG.

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Fig. 4.

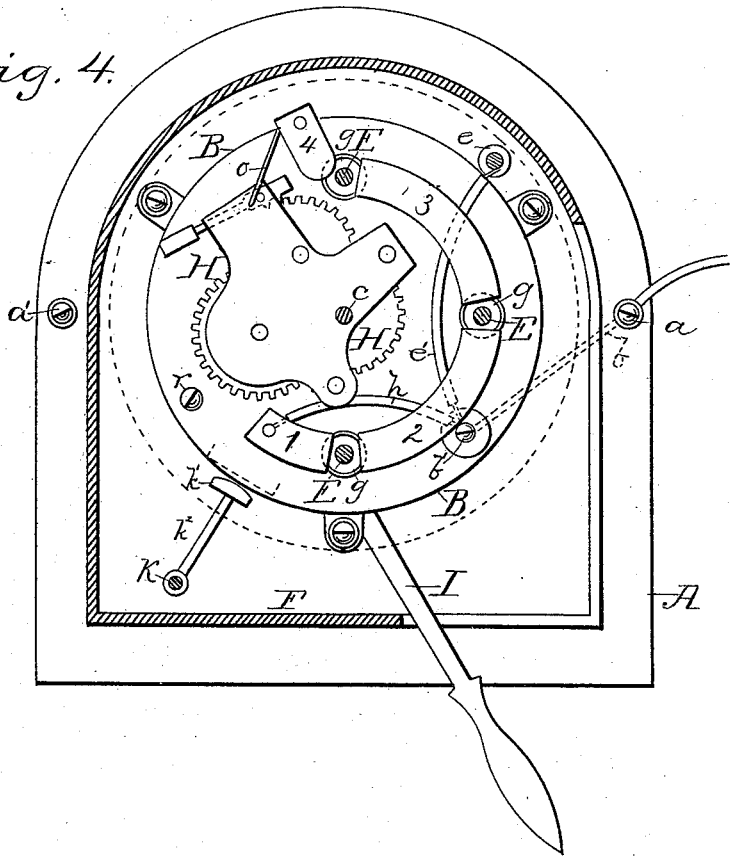
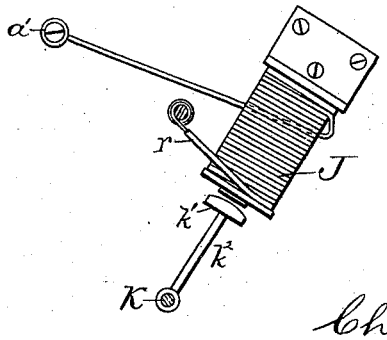


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES G. ARMSTRONG, OF ENGLEWOOD, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO HIMSELF, AND GEORGE A. HARMOUNT, OF CHICAGO, ILLINOIS.

DISTRICT-TELEGRAPH ALARM-BOX.

SPECIFICATION forming part of Letters Patent No. 418,778, dated January 7, 1890.

Application filed March 14, 1889. Serial No. 303,345. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. ARMSTRONG, of Englewood, Cook county, Illinois, have invented certain new and useful Improvements in District-Telegraph Boxes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Heretofore the construction of district-telegraph boxes has been such that users frequently make mistakes when signaling to the central station. This is largely due to the fact that in all of those boxes in extensive use a single indicator-hand is oscillated to point to one of a number of wants printed in consecutive order around the center of oscillation of said hand and within reach thereof. In the excitement generally attendant on the use of the boxes, especially by persons not expert in their use, the hand is turned to indicate the wrong want. I avoid all the difficulties by a well-appointed district-telegraph box which is simple in construction and easily operated and understood, substantially as hereinafter fully described, and as illustrated in the drawings, in which—

Figure 1 is a front view of my invention. Fig. 2 is a front view of the same with case removed. Fig. 3 is a side elevation thereof with the case removed. Fig. 4 is a transverse vertical section taken on line x x, Fig. 3; and Fig. 5 is a detail view showing a plan of the devices for actuating the return-signaling devices.

Referring to the drawings, A represents the board upon which my improved box is mounted, and by means of which it is secured to the wall, as desired. a represents the positive post, and a' the negative post, and B represents the circular metal frame, which is connected to said board A by screws perfectly insulated therefrom, but to which the negative wire r directly connects. The positive wire b leads to and forms a contact with the insulated screw b', passing through the metal frame B. From this screw b' a divided shunt-circuit is provided, which will be more fully referred to hereinafter. Placed and screwed in front of said frame B, about an inch and a half removed therefrom and concentric therewith, is a gutta-percha circular plate C, and journaled in a central opening in this plate and in the center of frame B is a spindle c, which has a commutator-wheel D on its outer end. On the periphery of this wheel D I make notches for breaking the circuit and ringing off both the number of the box and the number indicating the particular want desired. To establish the current through this commutator-wheel I provide a brush d, which just grazes the periphery of said wheel and does not touch when the notches pass under it. This brush is secured to a suitable arm d', which is connected to a suitable screw e passing through said plate, and one of the shunt-wires e' connects said screw with the screw b', as shown. Thus the current would pass from the positive post a (when unbroken) to screw b', to screw e, through the brush to the commutator-wheel, through the spindle of said wheel to the metal frame B, and off through the negative wire. Now the periphery of the wheel is provided with a suitable number of notches or recesses x to register the number of the box and a series of notches or recesses y to register the wants. The latter series of notches correspond in number to the number of wants registered by said box.

Supposing there were ten wants, and that "police" required ten notches, "fire" five notches, and "messenger" one notch, to call the "messenger" the brush should only pass one notch before the current was made continuous by deflecting it from the brush, to call "fire" the brush should pass five notches before the current was deflected, and to call "police" the entire ten notches should be passed. To deflect the current from the brush, so as to make it continuous after a certain number of notches have passed under the brush, I provide the push-bars E E E, which reciprocate in suitable openings in frame B and plate C, at right angles thereto, and which extend outward through the case F′ of the box. On the outer ends of the bars E are push-buttons f, which have suitably

impressed on their outer surfaces the particular want, by pushing on which the operator can signal to the central station.

In Fig. 2 of the drawings I have shown but three of these push-bars, and the buttons on their outer ends are marked, respectively, "Messenger 1," "Fire 5," and "Police 10." These bars are kept pushed out to the outward limit of their reciprocation by coil-springs F surrounding them, having their inner ends resting against frame B and their outer ends pushing outward against a gutta-percha collar g, secured to said bars at a point between frame B and plate C. The circumference of these collars is covered with a brass shell, the outer circumferential edges of which project beyond the adjacent edges of the collar. When these bars E are pushed outward to the outer limit of their movement, the edges of the brass covering of collars g bear outward against plates 1, 2, and 3 of a shunt-circuit secured to the inner surface of plate C and establish a circuit from screw e, through wire h, to plate 1, to the metal covering of the collar g of the push-bar entitled "Messenger," through plate 2, through the metal covering of the push-bar indicated by the word "Fire," through plate 3, through the collar of the push-bar indicated by the word "Police," and, finally, through a short plate 4 and a wire connection o from said plate direct to frame B or to the metal framework of the clock mechanism which actuates the commutator-wheel and connects plate C to frame B, as will hereinafter be more fully referred to. When one of the push-bars is pushed and held inward at the limit of its inward movement, the collar g thereof is removed from the circuit-plates 1 and 2, or 2 and 3, or 3 and 4, as the case may be, and opens the circuit, and thus directs the full force of the current from screw e through the brush. To hold these push-bars inward until the necessary number of recesses of the commutator-wheel have passed under the brush, I provide the leaf-spring catches k k k, which are suitably secured to the plate C, near the edge thereof, on a radial line with the bar they are used in connection with. They extend inward in a radial direction past said bars on a plane in front of the commutator-wheel and terminate at points within the circumference of said wheel. The bars have notches m in the surface adjacent to said spring-catches k, with the inner shoulder abrupt and at such points that when they are pushed inward to the limit of their inner movement the spring-catches k snap into said notches and hold the bars inward. To release the bar and permit its return to its normal position, there projects from the outer surfaces of the commutator a lug or finger G at such a distance from the center of said commutator that as it revolves it strikes the free end of the spring-catches and pushes them out of the notches m and leaves the push-bar free to return to its original position.

Now, the recesses in the periphery of the commutator-wheel are so placed with reference to finger G that when it strikes against the catch k of the push-bar indicated by the word "Messenger" one recess of the series y will have passed under the brush. When it strikes against the catch k of the next push-bar, indicated by the word "Fire," five recesses will have passed under the brush, and when it strikes against the catch of push-bar indicated by the word "Police" ten recesses shall have passed under the brush. Thus there will be recorded one ring, five rings, or ten rings at the central station, according to the push-bar pressed upon.

It is obvious that as many of the push-bars may be used as there are "wants" to be signaled for. They are arranged around the periphery of the commutator-wheel at such a distance and in such relation to the brush that the latter will cause the proper number of breaks in the circuit to take place as to register, by sound or other signal, the exact want which it is desired the particular push-bar under consideration to call.

The clock mechanism H, heretofore alluded to, is the same, or substantially the same, as that used in the several district alarm-telegraph boxes now in use, and I do not consider it necessary for the purposes of my invention to describe it further than to say that it is wound up every time it is desired to use my improved box by an oscillating lever I, and that it actuates the commutator-wheel just sufficient to complete one revolution.

It is oftentimes the case that users of telegraph boxes, either through carelessness or undue excitement, call for the wrong want. Now in all the telegraph-boxes in current use, after the wrong call is once made, it is difficult to be rectified. The only recourse the blunderer has is to make a second call for the right want, thus registering two wants and receiving personal answers that it would have been better to dispense with. I avoid this difficulty by simply revolving the push-bars on their axes. This action releases the bars from the hold of catches k, permits their return to their normal position, and prevents any call at the central station. Of course the wrongfully-depressed push-bar must be revolved before the recesses of series y begin to pass under the brush; otherwise a wrong signal would be recorded in either event.

A perfect system of district-telegraph alarm should have a central "ring-off" or some suitable signal whereby the user could know beyond doubt that his call had been received at the central station. I have accomplished this in a very simple manner, and at the same time overcome a great objection which heretofore has always existed to the district-alarm system. I refer to the confusion which ensues at the central station when two or more patrons use the system at the same time. Under such circumstances it is impossible for

the central operator to understand the signals, and a second and third signal even is sometimes necessary before he can comprehend.

My improvement consists of a helix or electro-magnet J, which is made by winding the wire between the metal frame B and the negative post a' or the wire b, between the positive post a' and insulated screw b', around the iron core. This electro-magnet is so located that an armature k', supported on the end of a projecting arm k^2 from a transverse spindle K, is magnetized when there is a current through the electro-magnet. The spindle is journaled so as to be free to oscillate in suitable bearings in the board A and case F′ of the box, and has a coil-spring M surrounding its inner end, one end of which is secured to said spindle and the other to the board whose function is to oscillate the spindle, so as to swing the armature k away from the magnet J when the current therethrough is broken. When the circuit through said magnet is re-established, it attracts the armature in front of it and oscillates spindle K.

On the outer end of spindle K, which projects through the case F′, there is a hand N, which, being fast to the spindle, oscillates therewith. Now whenever there is a break in the circuit the spring M causes the spindle to oscillate, so that the hand N points to the word "Open," and whenever the circuit is established the magnet attracts the armature and causes said spindle to oscillate, so that the hand points to the word "Closed."

Every time a recess in the commutator-wheel, either of a series x or y, passes under the brush the hand N makes a quick oscillation. Thus when a patron goes to his box and notices the hand N oscillating he will know that somebody else is using the line and that he is not to use it until it stops. After the patron has used the box the central operator breaks the circuit for about a half-minute, (more or less,) thus oscillating all the hands N of every box of the system to indicate "open," and holding it there for a short space of time.

The operation of my box is, it is believed, sufficiently described to dispense with further amplification.

What I claim as new is—

1. In a district-telegraph signal-box, the combination, with a revoluble commutator-wheel D, having a series of recesses in its periphery, of a brush d and the wires of a divided circuit, one of said wires being connected to the brush and the other of said wires consisting of several separate sections and suitable circuit-closers connecting said sections, which are normally disconnected from the commutator-wheel, but are engaged by the same in the course of its rotation.

2. The combination, in a district-telegraph signal-box, with a revoluble commutator-wheel D, having a series of recesses in its periphery for signaling, of a brush d, the wires of a divided circuit, one of said wires being connected to said brush and the other forming a shunt, and a push-bar E, connecting the sections of said shunt, which is normally disconnected from the commutator-wheel, but is engaged by the same during its revolution, said engagement taking place before or immediately after the recesses of said wheel have all passed beneath said brush.

3. The combination, in a district-telegraph signal-box, with a revoluble commutator-wheel D, having a series of recesses in its periphery for signaling, of a brush d, the wires of a divided circuit, one of which connects to said brush and the other of which forms a shunt-circuit, the reciprocating push-bars E, for opening and closing said shunt-circuit, having notches m in their outer ends, catches k, and fingers G, projecting from said commutator-wheel, as set forth.

4. The combination, in a district-telegraph signal-box, with a revoluble commutator-wheel D, having a series of recesses in its periphery for signaling, of a brush d, the wires of a divided circuit, one of which connects to said brush and the other of which forms a shunt-circuit, the reciprocating push-bars E, for opening and closing said shunt-circuit, coil-springs surrounding their inner ends, notches m in them near their outer ends, catches k, entering said notches when the said bars are pushed inward, and fingers G, projecting from said commutator-wheel, and when said wheel revolves pushing said catches out of said notches, as set forth.

5. The combination, in a district-telegraph signal-box, with a revoluble commutator-wheel D, having a series of recesses in its periphery for signaling, of a brush d, a divided circuit, one of the wires of which connects with the brush and the other of which forms a shunt-circuit consisting of independent plates which are arranged in segmental alignment on insulated material, and reciprocating push-bars E, moving at right angles between the ends of said plates, and when at the limit of their movement in one direction closing said shunt-circuit, and when moved in the opposite direction opening the same.

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FRANK D. THOMASON.