2 Sheets—Sheet 1.

L. B. FIRMAN.

DISTRICT TELEGRAPH SIGNAL-BOX.

No. 192,644. Patented July 3, 1877.

FIG. 1.

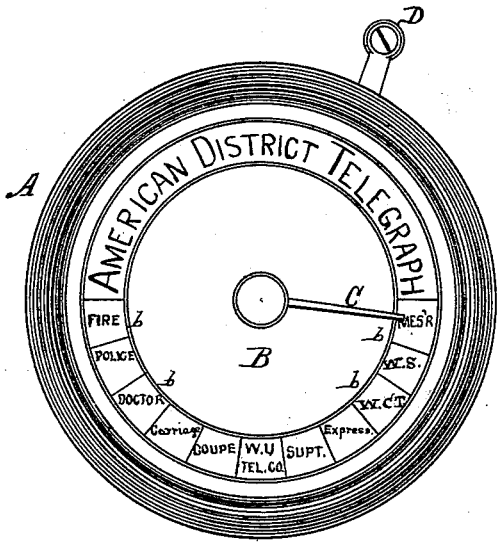
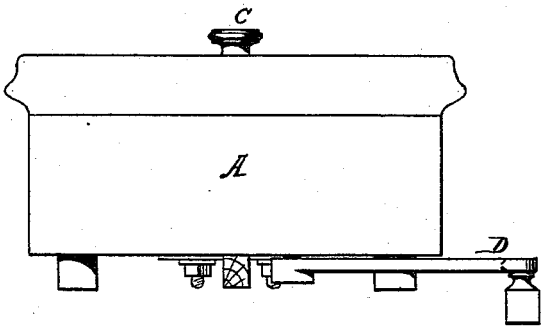


FIG. 3.



Witnesses
Forde R. Smith
Geo. H. Story

By

Leroy B. Firman Inventor

Munday & Evarts Attorneys

2 Sheets—Sheet 2.

L. B. FIRMAN.

DISTRICT TELEGRAPH SIGNAL-BOX.

No. 192,644. Patented July 3, 1877.

FIG. 2.

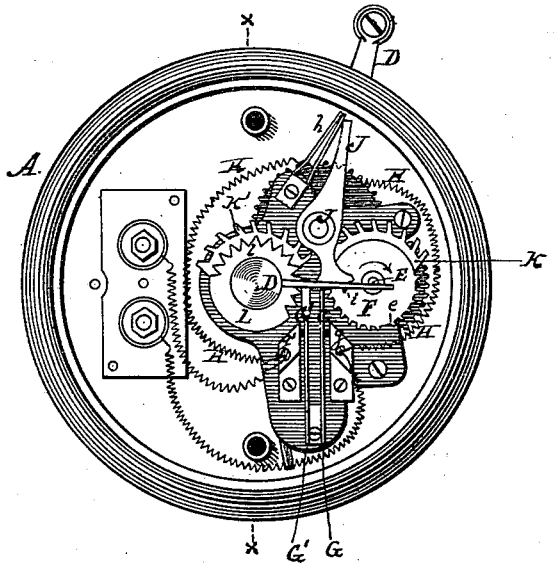
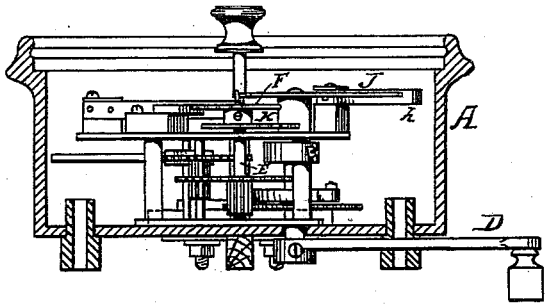


FIG. 4.



Witnesses
Forde R. Smith
Geo. H. Story

By

Leroy B. Firman Inventor

Munday & Evarts Attorneys

UNITED STATES PATENT OFFICE.

LEROY B. FIRMAN, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN DISTRICT-TELEGRAPH SIGNAL-BOXES.

Specification forming part of Letters Patent No. **192,644**, dated July 3, 1877; application filed April 13, 1877.

To all whom it may concern:

Be it known that I, LEROY B. FIRMAN, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Automatic Signaling Apparatus, of which the following is a specification:

In the accompanying drawings, which form a part of this specification, Figure 1 is a face view of the instrument, showing the dial and pointer. Fig. 2 is the view with the dial removed, bringing into sight a face view of the mechanism. Fig. 3 is a side view of the exterior of the apparatus; and Fig. 4 is a side view of the internal mechanism, the casing or exterior boxing being shown in section.

Similar letters of reference made use of in the several figures denote like parts wherever employed.

The apparatus is primarily designed to be used as one of a series of similar machines, distributed among numerous stations, all of which communicate with a central office, constituting a system such as is now in use in many cities, and known as the "district-telegraph system." Each station is designated by a number, and the apparatus is constructed to write that number as a "call," and subsequently to write any one of several signals, at the will of the operator.

In the drawing, A is the casing which incloses the mechanism. It is provided in front with a glass, and a dial, B, which latter is divided into a number of spaces, *b*, each of which denotes a different signal that may be sent to follow the call by setting the pointer C at the one desired, and thereafter pulling down the lever D, which winds up a spring, the recoil of which drives the train of clock-work by which the mechanism is operated, and at the same time returns the lever D to its first position.

With regard to the train of gear-wheels or clock-work wound up and set in motion as above suggested, I have only to say that it is similar to such mechanism as is generally employed in like places, and shall consider that the drawing is a sufficient description thereof.

The said clock-work drives a shaft, E, in the direction indicated by the arrow. This shaft carries the wheel F, upon the periphery of which is formed the teeth *e*, arranged in groups to constitute a call of the instrument, which is written upon the circuit by a spring-key, G, which sets like a pawl against the teeth, making and breaking circuit at *g*. In order to keep the circuit always closed for the benefit of other instruments, except when the instrument is actually sending a call or signal, a shunt-circuit, H, is provided, and which is kept closed at the spring-key *h* by the pressure of the arm J borne upon the same shaft as the lever D. When the lever is pulled down to start the mechanism this arm moves down with it, and, releasing its pressure upon the spring-key, breaks the shunt-circuit and puts the instrument in the line. This arm J serves also another purpose. Its lower part, below the shaft, extends down into a position to encounter a pin, *i*, upon the call-writing wheel F, serving to stop said wheel at a certain point. The operation is, briefly, as follows: The lever D is pulled down and the spring thereby wound up. This motion breaks the shunt-circuit, and by freeing the stop allows the call-writing wheel to revolve, impelled by the spring, which also returns the lever D again to its former position, which is reached in time to stop the wheel and close the shunt-circuit after a single revolution.

Upon the same shaft as said call-writing wheel is a segment, K, and a similar segment, K′, upon the shaft which carries the pointer C is arranged to be engaged thereby upon occasion.

Upon the shaft carrying the pointer and the second segment is a wheel, L, cut with a number of equal-spaced teeth, *l*, which are engaged by a spring-key, G′, so that each tooth in passing breaks the circuit at *g′*.

In the drawing, the pointer C is shown as being set at the signal "Messenger," and it will be seen that the segment K would not engage the segment K′ at this position, and that consequently the call would be sent without any signal following. It is understood that the call unaccompanied by other signal demands a messenger. Now, if the pointer shall be set at the next signal, W S, the segment K will be turned so that it will be engaged momentarily long enough to cause one tooth *l* to pass beneath the spring-key G′, causing one break in the circuit. So on for each space

through which the pointer may be moved up to the signal "Fire," which will cause ten equal-spaced impulses to follow the call.

Suitable stops, not shown, are provided, so that the pointer cannot be moved so far in either direction as to disarrange the mechanism.

Having thus described my invention, I claim—

1. The signal-mechanism, operated by suitable clock-work, provided with a writing-wheel constructed to give the call or number of the station, and another adjustable wheel, which stands still while the call is being written, and is engaged by the mechanism after the call has been sent, and is caused to turn through whatever space or number of teeth desired by setting the pointer, substantially as specified.

2. The combination of the call-writing wheel, upon the shaft of which is a cogged segment, and the signal-writing wheel, upon the shaft of which is another cogged segment, substantially as specified.

3. The signal-wheel, the dial, the pointer, the call-wheel, and gearing for operating the signal after the call is sent, combined, substantially as specified.

4. The signal-wheel, the call-wheel, and mechanism for operating the same in the manner described, combined with the circuit, the spring contact-fingers, and the automatic shunt, substantially as set forth.

5. The combination, with a call-writing wheel, of a signal-writing wheel, moved by the same power, when the latter is provided with a number of equal-spaced teeth, which write the signal desired by making a certain number of equal-spaced impulses, substantially as specified.

L. B. FIRMAN.

Witnesses:
JOHN W. MUNDAY,
EDW. S. EVARTS.