

(No Model.)

2 Sheets—Sheet 1.

C. SELDEN.
DISTRICT TELEGRAPH BOX.

No. 473,024.

Patented Apr. 19, 1892.

Fig. 1,

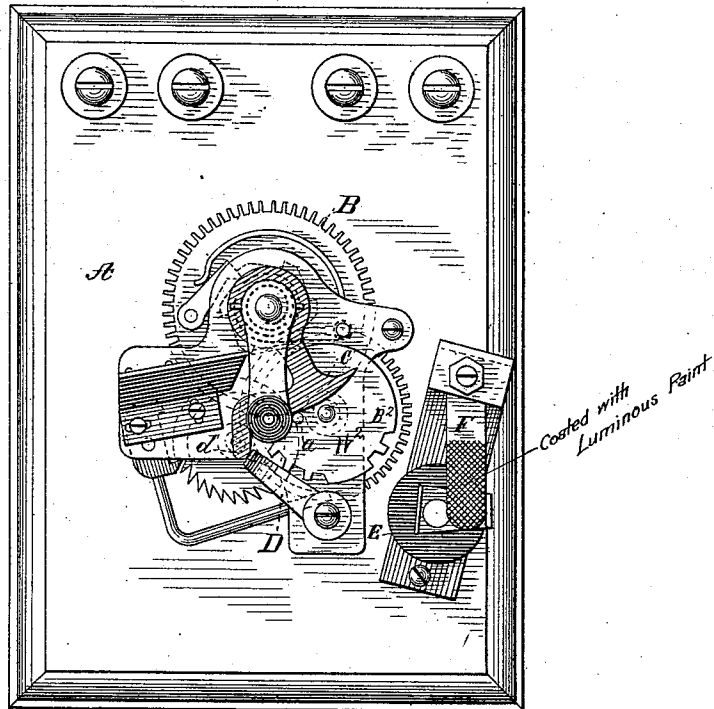
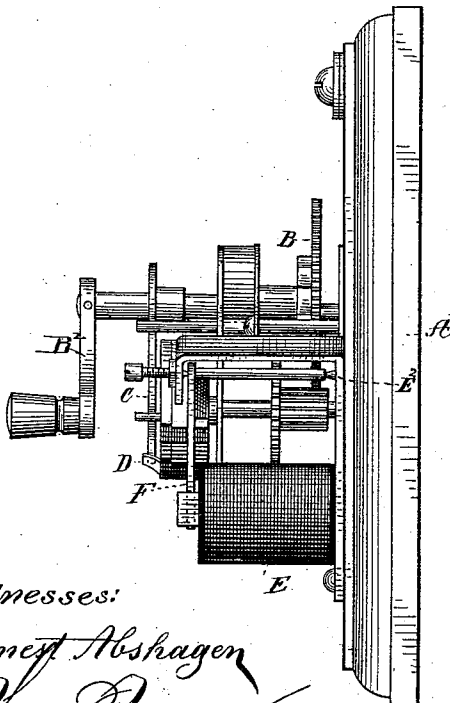


Fig. 2,



Witnesses:

Ernest Abshagen
Chas. Dorney

Inventor:

Chas. Selden

By his Attorney: *W. B. Townsend*

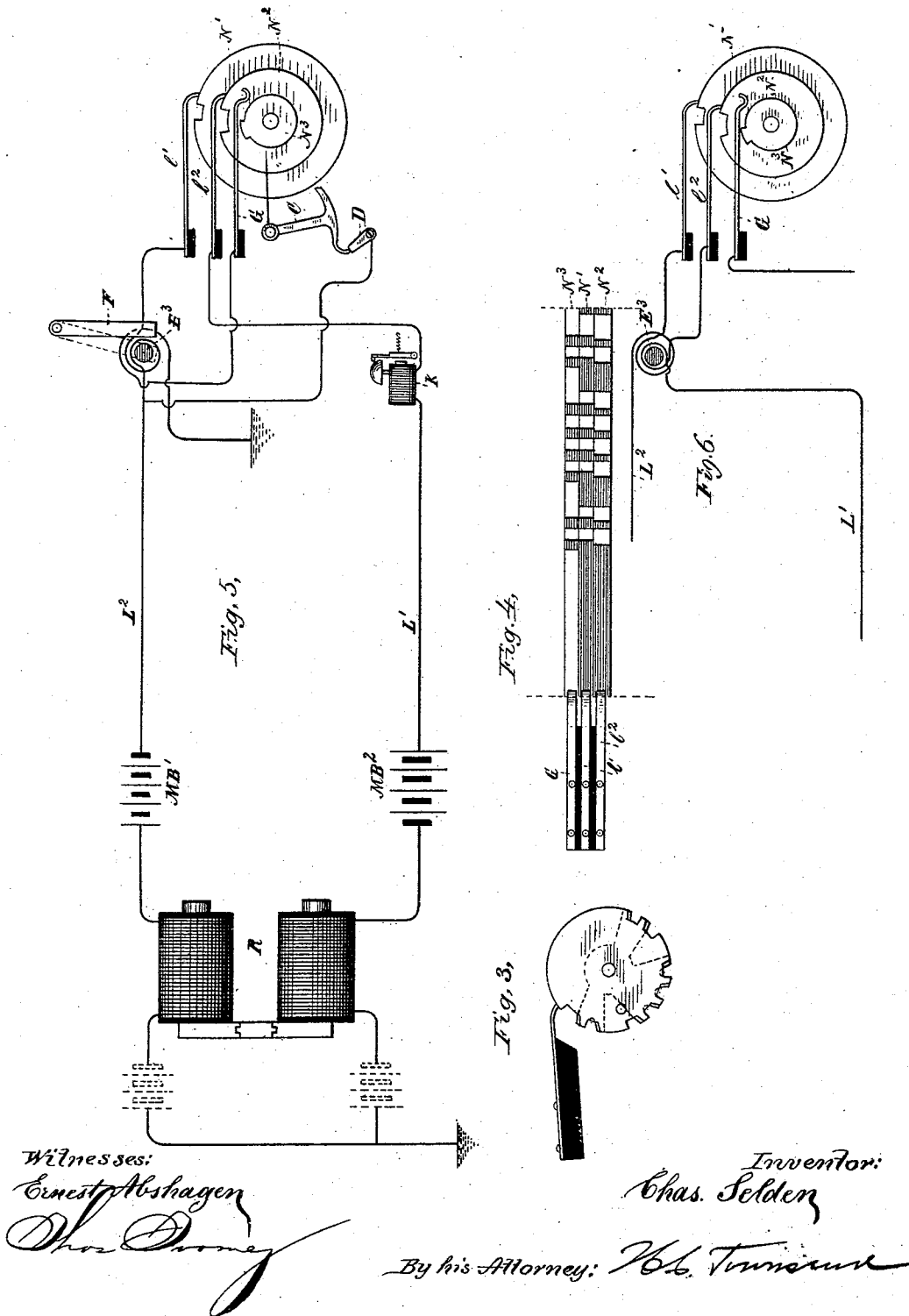
(No Model.)

2 Sheets—Sheet 2.

C. SELDEN.
DISTRICT TELEGRAPH BOX.

No. 473,024.

Patented Apr. 19, 1892.



UNITED STATES PATENT OFFICE.

CHARLES SELDEN, OF BALTIMORE, MARYLAND.

DISTRICT-TELEGRAPH BOX.

SPECIFICATION forming part of Letters Patent No. 473,024, dated April 19, 1892.

Application filed June 15, 1885. Serial No. 168,688. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SELDEN, a citizen of the United States, and a resident of Baltimore, State of Maryland, have invented certain new and useful Improvements in District-Telegraph Boxes, of which the following is a specification.

My invention relates to those telegraph systems in which the signal is sent over one or the other side of a loop-circuit from a signal-box by making and breaking the circuit or grounding one or the other side of the line entering the box, according to the condition of the line.

In my prior application for patent, Serial No. 124,000, filed March 13, 1884, I have described the approved arrangement of circuit and signaling apparatus such that under some conditions of a closed metallic or loop circuit signals will be sent by interruptions of the circuit in the box. If both sides of the line be grounded at any one point, signals are sent from the boxes in each grounded side of the line by simple interruptions of such grounded side. If the line be broken at any point without grounding, boxes between said break and the central office send their signals by connecting that side of the line leading into the box from the central office to ground, the side thus grounded to send a signal therefore depending upon the location of the box with reference to the break.

The object of my present invention is to furnish for systems such as that described in my prior application and for any other system in which the signals may be sent, according to the condition of the circuit, in either of the three ways, to wit: through breaking and making the circuit through the box from one side of the line to the other, by making and breaking the connection between the line on one side of the box and ground, or by making and breaking the connection between the line on the other side of the box and ground, a means whereby the person operating the signal apparatus may know whether the circuit is in proper condition to send the signal and that said signal has been therefore properly transmitted.

My invention consists in the combination, with a district box or signal apparatus of the general character specified, of a visual, audi-

ble, or other signal or indicator operated by an electro-magnet having two coils connected, respectively, as hereinafter described, one on each side of the box in the line-circuit, or one in the line-circuit and the other in the circuit or connection to ground.

I have in the present specification described my invention as carried out in connection with a visual signal, but may use any other kind of signal or indicator.

Referring to the accompanying drawings, Figure 1 is a front elevation of a signal-box mechanism with my visual indicator or signal attached. Fig. 2 is a side elevation of the same. Fig. 3 is a side view of the circuit closing or breaking wheels and springs. Fig. 4 is a plan view of the circuit closing and breaking surfaces developed or spread out in the plane of the drawings. Fig. 5 is a diagram of circuits, illustrating the way in which the signal or indicator magnet is connected. Fig. 6 shows a modified way of connecting the two coils or wires of the signal or indicator magnet.

A indicates the base-board of the apparatus, and B the main spring-wheel of a clock-work mechanism, such as is ordinarily employed for district-telegraph boxes.

B² indicates the operating-handle which is used to wind the spring when an alarm is to be transmitted by the signaling wheel or wheels, one of which is indicated at W², and which wheel or wheels are turned by gear of any desired kind, operated by the spring when the latter is wound up.

C indicates the stop-arm, which is connected to the shaft carrying the handle B², and against which a pin *a* impinges to bring the mechanism to rest at the proper normal or starting point upon the completion of a signal. A toe or projection *d* on the stop-arm rests against an insulated spring D when the apparatus is at rest, and thus serves to complete a shunt around the box formed by the connection of the spring to the line on one side of the box, as indicated in Fig. 5, the shunt connection to the line on the other side being formed through the signal mechanism in any desired way—as, for instance, by the stop-pin *a*, against which the stop-arm rests, the wheel W², which is a line-wheel, and the spring bearing on said wheel and itself con-

nected to the line on the other side of the box, as shown in Fig. 5.

E indicates the electro-magnet for the signal or indicator. This magnet is provided with two coils arranged, preferably, so as to assist one another in energizing the core, and connected, as will be presently described. F indicates an armature for said magnet, pivoted from a magnetic extension of the core for the said magnet, with its free end arranged so that it may swing into line with the pole of the magnet when the latter is energized, and thus give an indication. When the magnet is not energized, the armature or indicator is held by gravity or other retractile force in a position where it is out of view. It is preferable to coat the front surface of the armature or target with a luminous paint, so that it may be visible in the dark.

Referring to Fig. 5, N' N² N³ indicate the signaling disks or surfaces, upon which the springs L' L² G, respectively, bear. The springs L' L² are the line-springs and are connected, respectively, to the line at the opposite sides of the box. The spring G is connected to ground. The surfaces of the disks are cut or formed into suitable conducting and non-conducting spaces arranged after the manner described in my prior patent No. 321,058 of June 30, 1885, or in any other suitable way, so that normally the line-circuit will be formed through the box, and when the box is operated the circuits will be made and broken suitably for sending the signal in either of three ways, according to the conditions of the line—that is to say, either by makes and breaks of line-circuit through the box or by connecting one or the other side of the line to ground. The manner in which the signaling disks or surfaces may be cut for this purpose is indicated in Fig. 4, the dark or shaded spaces indicating the raised or circuit-closing portions of the disks.

For a detailed description of the way in which the signal is sent under various conditions of the circuit reference may be had to my prior patent.

The two sides or portions of the complete or metallic loop-circuit are indicated by the letters L' L², while R indicates the relay at the receiving or central station. This relay may be constructed in any desired way to permit the signals sent under varying conditions to be properly received, but is preferably constructed with its two coils connected or arranged to neutralize one another's effects when the current from both batteries M B' M B² circulates through them and over the complete metallic circuit, thus permitting signals to be sent by Morse keys or other devices and to be received on instruments—such as indicated at K—in the complete metallic circuit without affecting the relay placed at the main station to receive signals sent from the boxes. A connection to ground between the two relay-coils is made as described in my prior patent before referred to.

The core of the indicator or signal magnet is indicated at E³, Fig. 5, and the two coils thereon are connected, as shown, one in the side L² of the line and the other in the circuit to ground from spring G. When the apparatus is at rest, the magnet and the box are shunted through the spring D and stop-arm C and the indicator or target F is held by gravity out of view. When the box is operated, the shunt is broken, and at every electric impulse indicating one of the dots or dashes of the signal sent the target will be moved into view, showing a proper condition of the circuit for sending the signal. If the complete metallic circuit L' L² be intact, the target will be moved into sight when the whole line-circuit is completed by the current in the line-coil and will be drawn back when the line-circuit is interrupted through disconnection of spring L' from its wheel or simultaneous disconnection of both springs L' L², will be moved into sight again when springs G and L' make contact with their disks by the current flowing in both line and ground coils, will again fall back when the circuit through L' L² is interrupted, and so on with each energization of the magnet by current in one or both coils. If the line be grounded to side L² of box, side L' between box and station being intact, the closings and breakings of said grounded side through springs L' L² will operate the target or indicator, as before. If the line to side L² of the box be open-circuited, the currents caused to pass through the coil in ground-circuit during operation of sending signal over side L' by groundings of side L' at box will operate the indicator. In similar way when signals are sent over side L² of the circuit-line to side L' of the box being interrupted or grounded, the indicator will be operated by the current passing through one or the other of the coils, so as to indicate that the circuit is in condition for the transmission of the signal. If the line be cut at both sides of the box, it is obvious that no signal can be sent in, and the operator will be apprised of the fact through the failure of the indicator to act.

I have described the two coils on the indicator-magnet as placed one in the line to one side of the box and one in a ground connection; but it is obvious that instead of the coil in the ground connection a coil in the line to the opposite side of the box from that in which the first coil is placed may be used. I have illustrated such an arrangement in Fig. 6. The circuit of the two sides L L² of the loop-circuit is carried around the core of the indicator-magnet, as shown before, passing to the signal mechanism, and in such way that the current over the line passing through the coils will in both coils tend to produce the same effect on the core. By this arrangement the indicator will, as before, be operated whether the signal goes in over one side or the other of the loop-circuit or whether it be transmitted by simple groundings at the box

when the line is open-circuited. In the latter instance the coil in the side of the loop-circuit grounded by the box operates the indicator. When the line is accidentally grounded, the indicator is affected by the current in both coils. By the employment of the two coils in the manner described it is obvious that notice is given of the condition of the line under all actions of the signal-box in sending a signal. The coil in the ground-circuit of the box operates on the indicator by currents coming to ground from the central office over either side of the loop and for this reason might be employed in systems in which no provision is made for signaling by closing and breaking the circuit through the box.

As before stated, my invention is intended especially for application to those boxes in which provision is made for sending the signal by interruptions of the circuit through the box and by grounding both sides of the line at the box.

What I claim as my invention is—

1. In a district-telegraph system, the combination, with signal-boxes having circuit closing and breaking contact-springs and con-

nections in the line and ground circuits, as described, of an indicator having two magnet-coils connected, respectively, to the ground and line circuits from the box, as and for the purpose described.

2. The combination, in a district-telegraph system, of a complete metallic circuit grounded at the central office, signal-boxes having circuit-breaking springs for interrupting the line-circuit through the box and circuit making and breaking connections for interrupting the ground connection from line at either side of the box, and indicators having magnet-coils in the circuits over which currents flow both in sending signals by make and break of line and by make and break of ground connection, as and for the purpose described.

Signed at New York, in the county of New York and State of New York, this 11th day of June, A. D. 1885.

CHARLES SELDEN.

Witnesses:

THOS. TOOMEY,
GEO. C. COFFIN.