(No Model.)

2 Sheets—Sheet 1.

J. W. CHASE.

DISTRICT TELEGRAPH.

No. 346,355. Patented July 27, 1886.

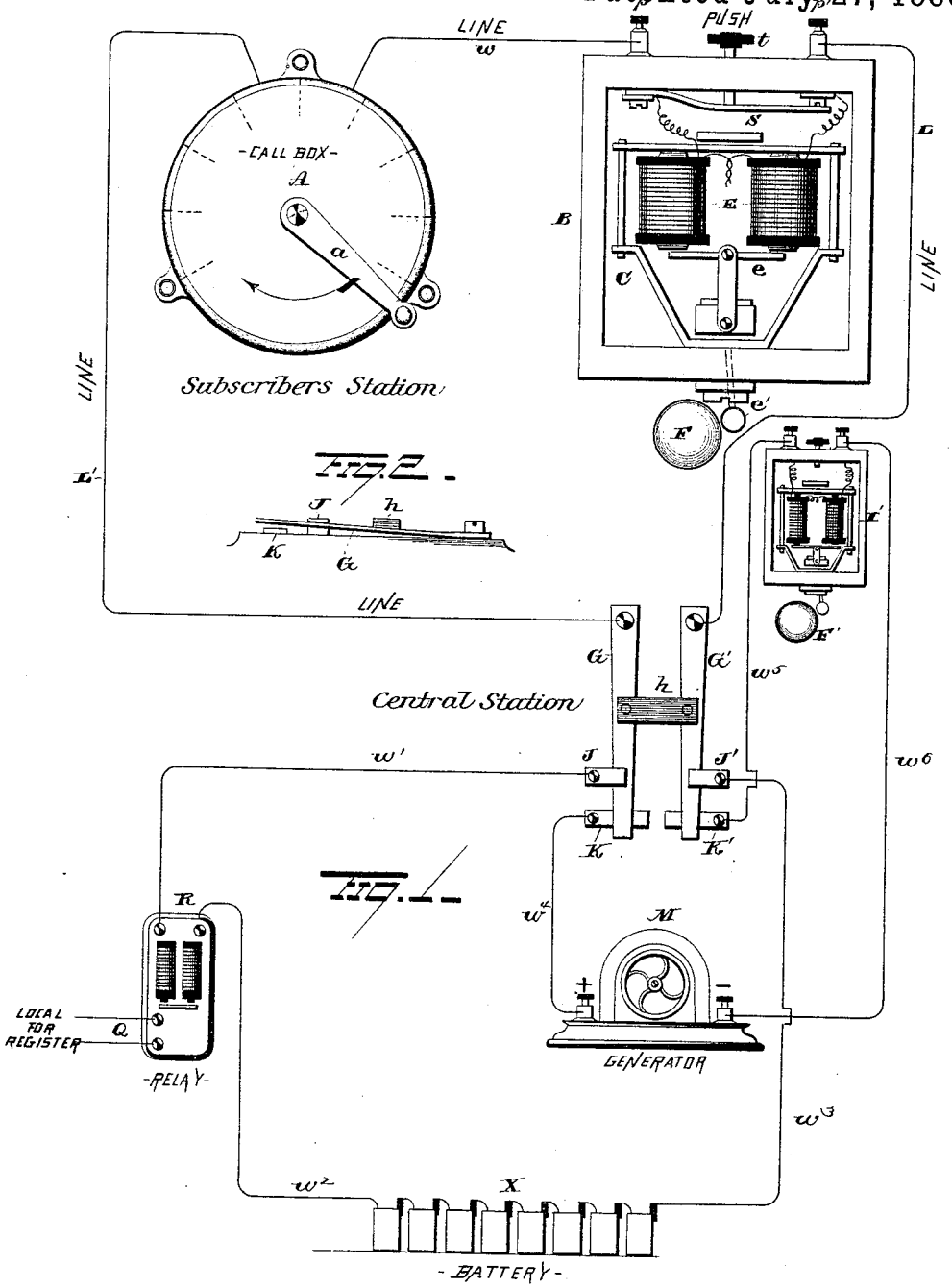

FIG. 2.

FIG. 1.

WITNESSES

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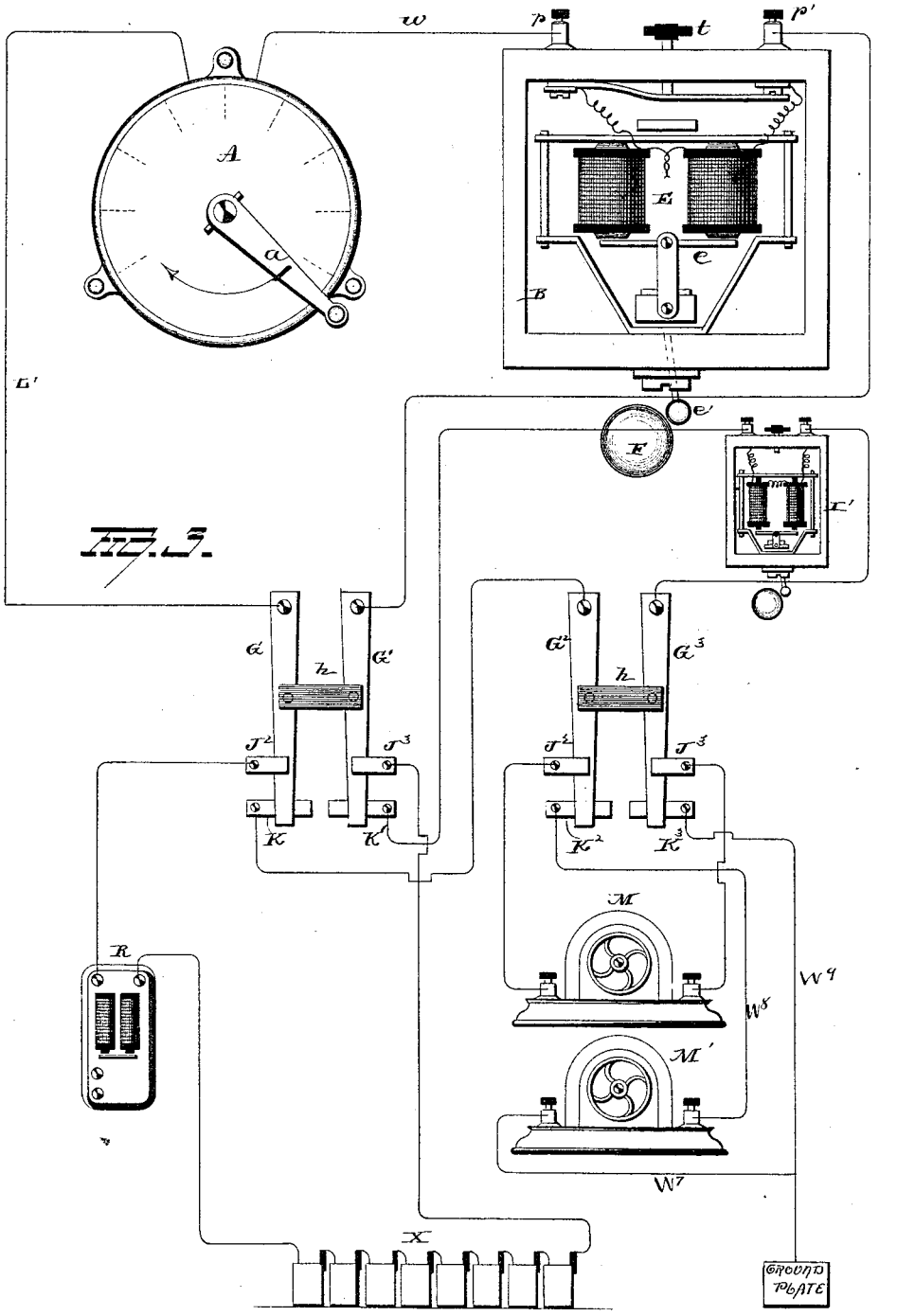

FIG. 1.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN W. CHASE, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO FRED A. HOLCOMB, OF SAME PLACE.

DISTRICT TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 346,355, dated July 27, 1886.

Application filed October 2, 1885. Serial No. 178,827. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. CHASE, of Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in District 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 that class of electric telegraphs usually known as "district telegraphs," and in which a circuit-breaking apparatus at an outlying subscriber's station is connected in circuit with an electro-magnetic signaling apparatus at a central station, the wants of the subscriber being indicated by predetermined number of successive breaks or arrangement of breaks and intervals between the same.

The object of my invention is to provide such a telegraph system with "answer-back" devices, or means by which a calling subscriber may be notified when a call he has made has been properly received at the central office; and in carrying out this object my improvement consists in certain novel constructions and combinations of circuits and electric signaling, generating, and switching devices, which will be hereinafter particularly described in connection with the accompanying drawings, and the novel features thereof definitely pointed out in the appended claims.

In the drawings, Figure 1 is a diagram illustrating a district telegraph provided with answering devices according to my invention. Fig. 2 is a section of the double switch on line *x x* of Fig. 1. Fig. 3 is a diagram illustrating a modified arrangement of the answering devices in connection with a district telegraph.

Referring to Fig. 1, the "subscribers' station" and "central station" are indicated by name. At the subscribers' station is a "call-box," A, which may be of any ordinary construction suitable for use in district telegraphy—such, for instance, as shown in the patents of McGonegal and Lake, No. 308,036, granted November 11, 1884, and L. B. Firman, No. 192,644, granted July 3, 1877, in which a break-wheel is arranged to send a signal designating the station from which it is sent, and also the wants of the subscriber or person calling. One side or contact of this box is connected by a wire, *w*, with one binding-post, *p*, of an electro-magnetic answering-signal apparatus, B, the case *c* of which is shown in section, and the interior parts in full lines. From the other binding-post, *p'*, of this apparatus the line-wire L, forming one leg of a metallic circuit, leads to the central station, and the other leg or line-wire, L', leads to the central station directly from the call-box contact, which is opposite that from which the wire *w* leads. To the inner end of binding-post *p* is secured one end of a metallic strip-spring, S, the other end of which is free but normally bears against the inner end of binding-post *p'*, and through the top wall of the case plays a push-pin, *t*, by means of which the spring S may be forced out of contact with the binding-post *p'*. The binding-posts *p* and *p'* are respectively connected with the coil-terminals of an electro-magnet, E, which is supported by a suitable frame and provided with an armature, *e*, pivoted at its middle point and carrying a bell-hammer, *e'*, which projects through a slot in the bottom wall of the case, and is arranged to strike bells F F when the armature is vibrated. The cores of the electro-magnet are permanently magnetized, and both poles facing the armature are of the same kind. Any bell-magnet may be used of the type to be operated by magneto-electric currents, or such as have alternate impulses in opposite directions. It will be seen that the spring S normally shunts the electro-magnet E out of circuit. At the central station the line-wires L and L' are respectively connected with two metallic spring-switches, G and G', which are connected by an insulating-block, *h*, and both of which bear normally against overhanging separate metallic brackets J and J'. Beneath the switches G and G', respectively, are arranged contact-plates K K', against which said switches may be pressed by bearing upon the block *h*. From the bracket J a wire, *w*, leads to one terminal of the magnet of a relay, R, from the other terminal of which a wire, w^2, leads to one

pole of a battery, X, the other pole of which is connected by a wire, w^3, with bracket J'. With the "make-and-break" contacts of the relay R are connected, in the usual manner, the terminals of a local circuit including a register, Q, for receiving calls. The circuit of the battery of the local circuit including the register is normally closed, and when this circuit is broken intermittently by the turning of the lever *a*, for operating the call-box in the usual manner, the relay R will be operated, and the register Q in the local circuit will register the call. The contact-plate K is connected by a wire, w^4, with one polar terminal of a magneto-electric generator, M, and the contact-plate K' is connected by a wire, w^5, with one side of an electro-magnetic signal apparatus, I', similar to the apparatus B at the subscriber's station. A wire, w^6, connects the apparatus I' with the generator M. When the subscriber has sent in a call by means of his call-box, he immediately presses the push-pin *t*, thus throwing into circuit the answering-signal apparatus, and the operator at the central office starts into operation the generator M and depresses the block *h*, to bring the switches G and G' in contact with the plates K K' a number of times corresponding to the call sent in by the subscriber. If the calls are numbered in series, the central-station operator will press down the switches a number of times corresponding to the serial number of the call. For instance, if the subscriber should send in the fifth call of the series, the answering signal would be five rings of the bells. When the switches G G' are thus depressed, the battery X and relay R are cut out of circuit, and the electro-magnetic signal apparatus B will be thrown into circuit with the generator M, and the bell F will be rung each time the switches G G' at the central station are depressed, thus informing the subscriber that his call was properly received.

In Fig. 3 the answering-signal devices are so arranged that the operator at the central office may use either a "grounded" magneto-electric generator or one on a metallic circuit. The main circuit, the switches G and G', relay, and battery in this figure are the same as in Fig. 1; but the contact-plates K and K' are respectively connected with switches G^2 G^3 through the electro-magnetic signal apparatus I'. The magneto-electric generator M has its polar terminals connected with the metallic brackets J^2 J^3, against which the switches G^2 G^3 normally press, and thus the said generator is brought into a metallic circuit when the switches G and G' are pressed into contact with the plates K K'. The supplementary magneto-electric generator M' has one of its polar terminals connected to ground by a wire, w^7, and its other terminal is connected by a wire, w^8, with the contact-plate K^2 of switch G^2, while the contact-plate K^3 of switch G^3 is connected to ground by a wire, w^9. In order to use the supplementary or grounded generator M', both pairs of switches G G' and G^2 G^3 must be depressed against their lower contact-plates, in which event both the generator M and battery X will be cut out, and the apparatus B at the subscriber's station will be operated by the current from generator M'. The advantage of the grounded generator is, that it may be used for testing for grounds in connection with the signal apparatus I', for it will be seen that if one of the main-line wires should by accident become grounded the earth would make the connection back to the ground at the central station, thus short-circuiting the apparatus I', which would fail to respond when the switches are all pressed against their lower contact-plates. The function of the apparatus I', in the arrangement shown in Fig. 1, is simply to enable the operator to hear the signal he is sending back in reply to a call, and it has this additional function also in the modified arrangement shown in Fig. 3.

Of course, I do not limit myself to the precise form and arrangement of devices shown in my drawings, as there are many well-known equivalents for each of the devices illustrated, and it is within the skill of a practical electrician to construct substitutes for any or all of them to carry out the main idea without departing from the essential principle of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a district telegraph, a main circuit having included therein at a subscriber's station a circuit-breaking calling apparatus and an electro-magnet signaling apparatus, and a central station having a main battery and receiving apparatus connected therewith, in combination with a supplemental circuit having included therein a separate and independent generator and signaling apparatus, and a switch located at the central station, the switch being constructed and arranged to switch the main battery and receiving apparatus at the central station out of the main circuit, and to switch into the main circuit the supplemental circuit and generator and signaling apparatus included therein, substantially as set forth.

2. The combination, with the main circuit including the subscriber's calling apparatus and electro-magnet answer-receiving apparatus and the main battery and call-receiving apparatus at the central station, of the grounded normally-open sub-circuit at the central station, the supplemental generator and signal apparatus included in said sub-circuit, and switching mechanism for cutting out the main battery and connecting said sub-circuit to the main circuit, substantially as and for the purpose set forth.

3. The combination, with the main metallic circuit including the subscriber's calling and answer-receiving apparatus, of the two

switches included in said main circuit at the central station, the contacts for said switches connected, respectively, with the opposite poles of a main battery and opposite terminals of a receiving apparatus, and the contacts forming terminals of the sub-circuit including a supplementary generator, the arrangement of the switches and contacts being such that in one position of the switches the main battery and receiving apparatus are included in the main circuit, and in another position of said switches the main battery and receiving apparatus are cut out and the sub-circuit is connected to the main circuit, essentially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN W. CHASE.

Witnesses:
CHAS. W. EATON,
HENRY SPRING.