R. CARTER.

Fire-Alarm Telegraphs.

No. 140,011. Patented June 17, 1873.

Fig: 1

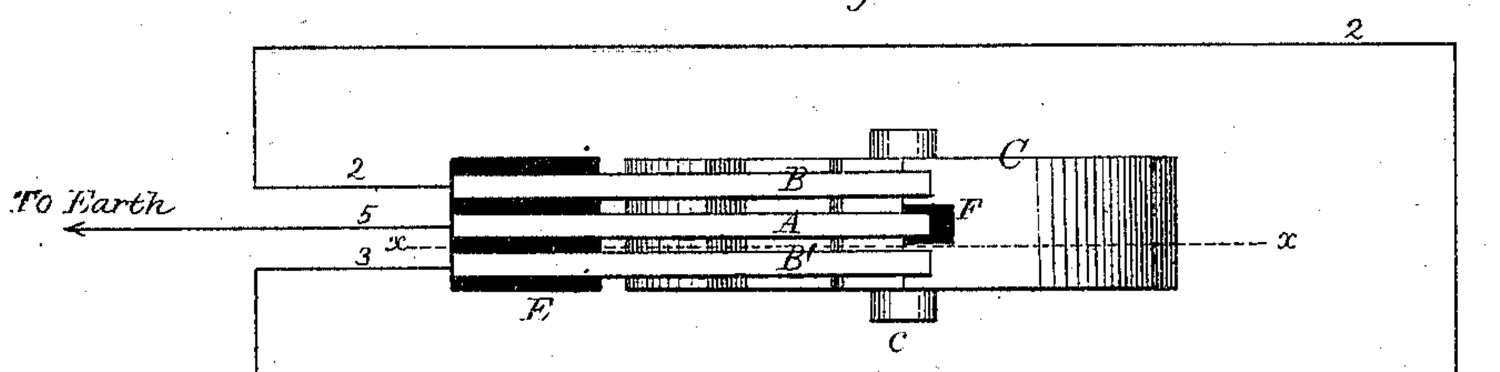
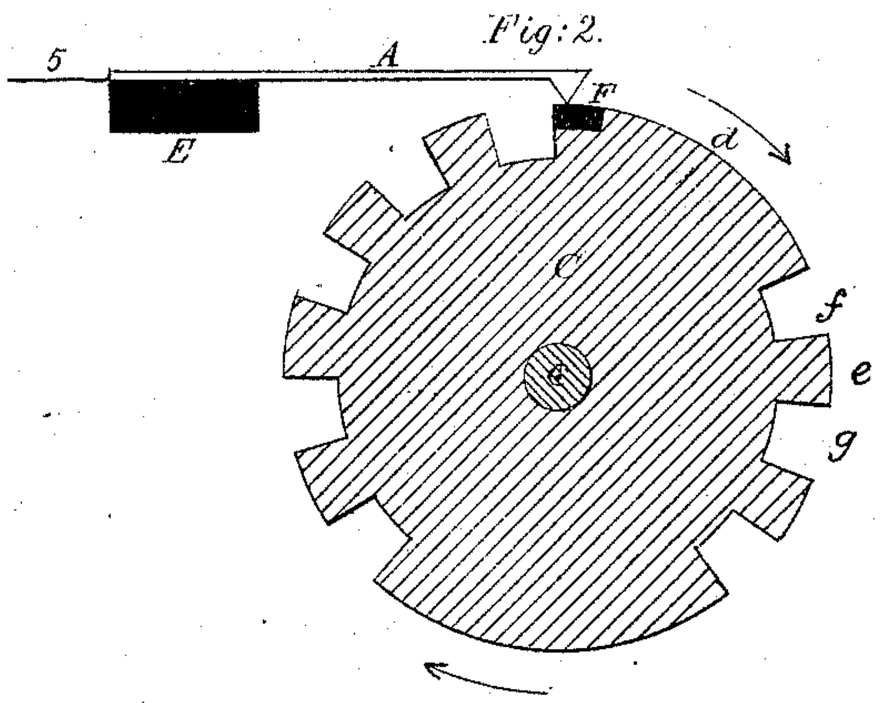


Fig: 2.



Witnesses:
Frank L. Pope.
L. P. Freund.

Inventor:
Robert Carter

UNITED STATES PATENT OFFICE.

ROBERT CARTER, OF NEW YORK, N. Y.

IMPROVEMENT IN FIRE-ALARM TELEGRAPHS.

Specification forming part of Letters Patent No. **140,011**, dated June 17, 1873; application filed October 24, 1872.

To all whom it may concern:

Be it known that I, ROBERT CARTER, of the city, county, and State of New York, have invented certain new and useful Improvements in Fire-Alarm Telegraphs, which are also applicable to signaling-telegraphs of any description; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings forming part of this specfication, in which—

Figure 1 is a top view of the mechanism of a signal-box or signal-station. Fig. 2 is a vertical section of the same taken on the plane of the line *x x* in Fig. 1. Fig. 3 is a diagram, showing the arrangement of wires, batteries, and instruments at the central station to which the alarm is to be communicated.

This invention has for its object to arrange an earth or ground wire, in connection with each signal-box or signal-station of a fire-alarm or other similar telegraphic system, in such a manner that, in case of the breakage or interruption of the circuit at any point, the transmission of signals from any station in said circuit to the central office shall not be stopped.

In Figs. 1 and 2, C represents the circuit-wheel or circuit-breaker of a signal-station in its normal position. When an alarm is given the circuit-wheel C is caused to turn through one or more revolutions in the direction of the arrow by means of wheel-work so arranged that it will afterward come to rest in precisely the same position as that shown in the figures, and which it originally occupied.

The manner in which the mechanism for moving the circuit-wheel is arranged is shown in the reissue United States patent No. 4,513, granted to Moses G. Crane and Edwin Rogers, dated August 15, 1871, and therefore need not be further described.

The circuit-wheel C is composed of metal, its circumference being divided into cogs *d e*, &c., alternating with spaces *f g*, &c. (See Fig. 2.) Two metallic springs or circuit-closers, B and B′, attached to an insulating support, E, are so arranged as to press upon the cogs *d* and *e*, &c., as the wheel C revolves. The wires 2 and 3 of the electric-circuit are attached to the springs B and B′.

It will therefore be understood that, when the wheel C is at rest in the position shown in Figs. 1 and 2, the springs B and B′ are in electrical connection with each other through the cog *d* of the metallic wheel C; but if the wheel C be made to revolve, the connection between the springs B and B′ will be interrupted during the passage underneath them of the spaces *f g*, &c., and restored again during the passage of the cogs *d* and *e*, &c.

By varying the number and arrangement of cogs and spaces upon the circuit-wheels of the signal stations, a different signal will be given by each station when its circuit-wheel is caused to revolve.

Figure 3 shows the arrangement of the apparatus at the central station. B is a voltaic battery of any suitable construction. M and M′ are electro-magnets, arranged to strike the bells N and N′ by means of hammers *m* and *m′* each time the circuit is broken.

Commencing at the positive or + pole of the battery B, the circuit traverses the wire 1, electro-magnet M′, wire 2, spring B, circuit-wheel C, spring B′, wire 3, electro-magnet M, and wire 4, to the negative or — pole of the battery. Thus, it will be understood that each time the circuit is broken by the passage of one of the spaces *f g*, &c., underneath the springs B and B′, the signal-bells M and M′ will be struck simultaneously.

It is obvious, that any required number of signaling-stations may be included in the circuit, and the number and arrangement of cogs and spaces in the respective circuit-breakers varied, so that each of the said circuit-breakers will give a different signal. If a circuit including any number of signaling-stations arranged in the manner hereinbefore described, is broken or disconnected at any point, the whole apparatus becomes inoperative until the circuit is again completed, either by joining the severed ends of the wire, or by making a connection to the earth at some point between the break and the adjacent signal station in each direction, which will allow the current to pass through the earth between the dissevered ends of the wire. When the circuit extends to a great distance, much time is often occupied in reaching the point where the break is situated, and in restoring the continuity of the circuit.

My invention provides a means whereby this result may be accomplished at once by the attendant at the central office, and this is done by the following device:

A, Figures 1 and 2, is a spring similar to B and B′, which is attached to the same insulating support E, and arranged so as to rest upon the circuit-wheel C. A piece of insulating material, F, is let into the circumference of the circuit-wheel so that the spring A will rest upon it when the wheel is in its normal position, as shown in Figs. 1 and 2. The same result may be obtained by cutting away a portion of the circumference of the wheel C at F, thus forming an insulating-space. The spring A of each signal-station is permanently connected with the earth by the wire 5. At the central station a wire 7 is attached to the middle of the battery connected with the switch S, which, when closed upon the slide *s*, forms a connection with the earth by means of the wire 6.

If now, for example, the circuit should accidentally be interrupted at the point G, the attendant at the central station is at once notified of the interruption in consequence of the hammers *m m′* being released by the magnets M M′, and allowed to strike the bells N N′. He then turns the switch S, on the stud *s*, forming a connection between the middle of the battery and the earth by the wires 6 and 7.

If now an alarm be sent by turning the wheel C, the cogs, *d*, *e*, &c., will form a connection as they pass under the springs A and B, and the passage of each cog will complete a circuit as follows: Commencing at the positive or + pole of battery B, thence by wire 1, magnet M′, wire 2, spring B, wheel C, spring A, and wire 5 to the earth, returning through the earth and wires 6 and 7 to the battery, and including that portion of the battery between 7 and +.

If the circuit were broken at H the connection would, in like manner, be made from the battery at — through 4, M, 3, B^1, C, A, and 5 to the earth, returning by 6 and 7. It will be observed that an earth circuit put on at any signal-station must necessarily include one of the two magnets M or M′, which operate the alarm-bells as they are situated on either side of the battery, while, when the circuit is in its normal condition both magnets will be in circuit.

Thus, in a circuit containing any number of stations, all the stations on one side of a break will be enabled to communicate with the central station in one direction; and all the stations on the other side of the break in the other direction, until the break is repaired, when the switch S may be thrown open and the circuit restored to its normal condition.

I do not desire to confine myself to the particular methods and devices shown for breaking and closing the circuit in a signal-box, or of giving an alarm at the central station.

What I claim as my invention and desire to secure by Letters Patent is:

1. The combination of the earth-wire 6, 7, and the earth-wire 5, with a telegraphic fire-alarm circuit, substantially in the manner and for the purpose herein specified.

2. The combination of a spring or circuit-closer A, electrically connected with the earth, with the springs or circuit-closers B and B^1 connected with the line, substantially in the manner and for the purpose specified.

3. The combination of the insulating-space F, with the circuit-wheel C, substantially as and for the purpose specified.

4. The arrangement of the electro-magnets M and M′ for giving an alarm, one on each side of the battery, substantially as and for the purpose specified.

Signed by me this 3d day of October, 1872.

ROBERT CARTER.

Witnesses:

FRANK L. POPE,

EDWIN EAGLES.