

W. H. SAWYER.
Telegraph Signal-Box.

No. 159,771.

Patented Feb. 16, 1875.

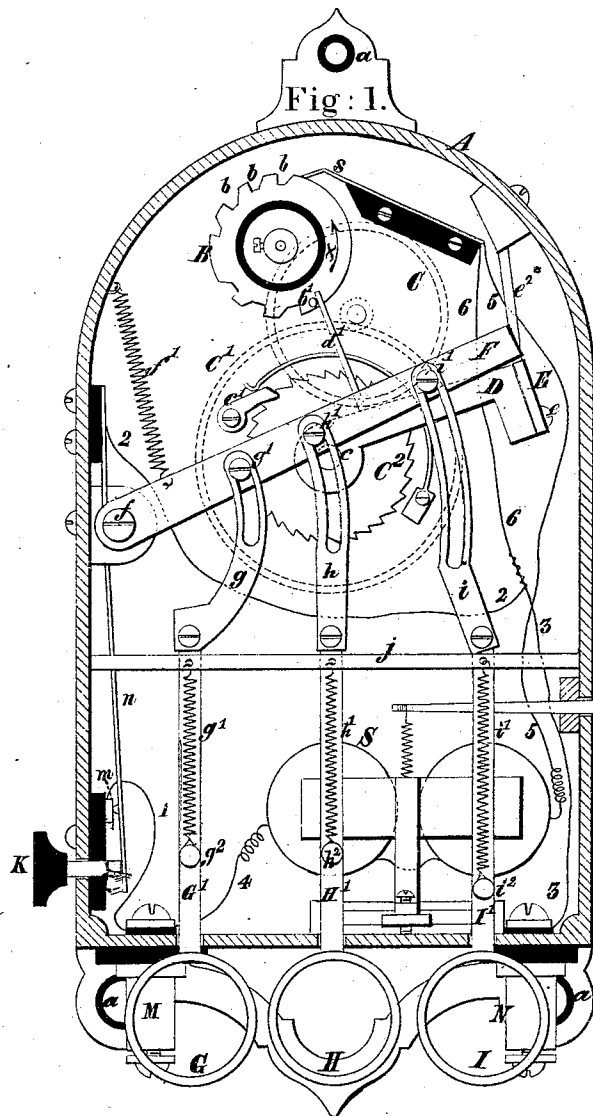


Fig: 2.

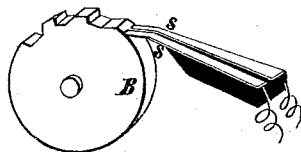
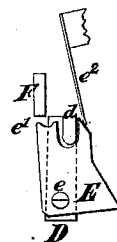


Fig: 3.



Witnesses,

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IMPROVEMENT IN TELEGRAPHIC SIGNAL-BOXES.

Specification forming part of Letters Patent No. **159,771**, dated February 16, 1875; application filed December 4, 1874.

To all whom it may concern:

Be it known that I, WILLIAM H. SAWYER, of the city of New York, in the county and State of New York, have invented an Improved Telegraph Apparatus for Automatic Signaling; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms a part of this specification.

My invention relates to certain improvements in the system of automatic signaling now known and designated as municipal or district telegraphs, in which signal-transmitting boxes are arranged in an electric circuit, including the signaling and recording apparatus in the office from which assistance is required, the signals being given by the breaking of a closed circuit, according to a prearranged and understood system.

The distinguishing features of the present invention consist in a novel combination and arrangement of a winding-arm, a lever for regulating the operation of the circuit-breaker, and pull rods or slides for operating the said lever, whereby the device is simplified, and can be operated by a person in haste, and by one unskilled in the use of such instruments, with little or no liability of sending wrong or confused signals.

In the accompanying drawing, Figure 1 is a front elevation of the apparatus, the outer case being removed. Fig. 2 is a detached view in perspective, showing the transmitting-wheel and its attachments. Fig. 3 is an end view of the regulating-lever, winding-arm, and some of the mechanism attached thereto.

The working parts of the apparatus are inclosed in a dust-proof metallic box or case, A, Fig. 1. B is the transmitting-wheel, which is capable of being made to revolve in the direction of the arrow *x* by means of the train of wheel-work C C'. The wheel C is driven by a coiled mainspring in the rear of the ratchet-wheel C², arranged in a well-known manner, so that the said spring may be wound to a certain extent by depressing the winding-arm D, which is made fast to the arbor *c* of the ratchet-wheel. When the arm D is thus depressed, the click *c*¹ slips over the

teeth of the wheel C²; but when the arm is released, the coiled mainspring, by means of the ratchet-wheel *c*² and click *c*¹, communicates motion through the train of toothed wheels C and C' to the transmitting-wheel B. The number of revolutions made by the latter wheel depend upon the extent to which the spring is wound by the greater or less depression of the winding-arm D.

The transmitting-wheel B has notches *b b* cut into its periphery, which correspond to the arbitrary numerical designation of the station at which the apparatus is situated. Thus the notches in the figure represent the number 34.

Two insulated metallic contact-springs, *s s*, press upon the periphery of the transmitting-wheel B as it revolves, and these springs form part of the electric circuit.

When the wheel B revolves in the direction of the arrow *x*, the electrical connection between the two springs is ordinarily completed by the metallic wheel B. When, however, one of the notches *b b* passes beneath the springs, the circuit is momentarily broken, and this operation is repeated as each succeeding notch passes beneath the springs; and thus in a single revolution of the wheel B the signal 34 would be transmitted to the central office, indicated by a group of three breaks followed, after a brief interval, by a group of four breaks, and it would thus be understood that the signal proceeded from station No. 34.

The character of the information which it is desired to convey to the central office is indicated by the number of times the primary signal, viz., the station-number, is repeated. Thus, for example, the signal 34 given once may indicate that a messenger is required; if given three times, that a policeman is wanted; and if given five times, that a fire has broken out.

As hereinbefore explained, the number of revolutions made by the transmitting-wheel B each time the apparatus is operated depends upon the extent to which the winding-arm D is depressed, and the extent to which the coiled mainspring is consequently wound.

To insure the proper winding of the spring

for each distinct signal, the apparatus is arranged as follows: Upon the end of the winding-arm D a dog, E, is pivoted by means of a screw, *e*. This is more clearly shown in the detached view, Fig. 3. When the arm D is in its normal position, as shown in Fig. 1, the dog E is pressed forward by the spring *e*², attached to the frame, so that it rests against the stop *d* on the end of the arm D, with its upper front corner projecting forward, as seen at *e*¹.

A lever, F, Fig. 1, is capable of moving in a vertical plane upon a fulcrum at *f*, but is ordinarily maintained in the position shown in the figure by the spiral spring *f*'. When this lever is drawn down, by means hereinafter to be explained, it is brought in contact with the upper front corner of the dog E, as seen at *e*¹ in Fig. 3, and thus the winding-arm D is carried along with the lever F.

Three links, *g*, *h*, and *i*, take hold of three corresponding screw-studs, *g*¹, *h*¹, and *i*¹, situated at different points upon the lever F. The lower extremities of the three links *g*, *h*, and *i* are attached to vertical slide-rods G' H' I', terminating in three rings, G H I, underneath and outside of the box or case A.

The screw-studs *g*¹, *h*¹, and *i*¹ are placed at different distances from the fulcrum *f* of the lever F, and thus the sweep or movement of the lever F will be much greater when it is operated by means of the link *g*, which is attached to a point near the fulcrum, than when it is operated by the link *i*, which is attached at a point at a much greater distance from the fulcrum.

The amount of movement communicated to the lever F is also limited by the stops *g*² *h*² *i*², placed upon the respective slide-rods at the proper point, which are so arranged as to come in contact with the bottom of the box or case A when the respective rods are operated by pulling the rings beneath.

The electric current enters the apparatus by the binding-screw M, and proceeds by the wire 1 to the stud *m*; thence by the flat spring *n*, wires 2 and 3, to the binding-screw N, to which the other line-wire is attached; but when the knob K is pushed in, so as to break the contact between *n* and *m*, the current takes a different route, viz., by the wire 4 to the helices of the sounder S; thence by wire 5 to the contact-springs *s s* of the transmitting-wheel, and thence by wires 6 and 3 to the binding-screw N.

As the case or box A itself forms a part of the circuit, or is in metallic connection therewith, it is necessary or desirable to insulate it from the wall or other support to which it is attached. This is accomplished by means of the non-conducting bushings *a a*, surrounding the apertures through which the screws pass for securing the signal-box to its support.

The operation is as follows: Suppose it is desired to transmit a signal of one revolution to the central office, signifying, for example,

that a messenger is wanted. By first pushing in the knob K the electric circuit is caused to pass through the sounder S, by which means it may be known if the circuit is uninterrupted, and through the transmitting-wheel B. The ring I is then pulled down until the stop *i*² comes in contact with the bottom of the box A. This movement is communicated to the lever F by means of the link *i* and screw-stud *i*¹. The end of the lever F, in its downward movement, takes hold of the projecting corner of the dog E at *e*², (see Fig. 3,) and by this means the winding-arm D is carried along with the lever F.

The stop *i*² is so adjusted as to allow only a sufficient amount of winding to cause the transmitting-wheel B to make one revolution. The ring I being then released, the lever F is at once restored to its original position by the action of the spring *f*', while the winding-arm D is carried back more slowly by the recoil of the mainspring acting through the medium of the wheel-work as the transmitting-wheel B is revolved.

A wire, *d*', is fixed upon the arm D in such a position as to be brought into the path of a pin, *b*, on the wheel B, to prevent the latter being carried too far after the prescribed number of revolutions have been completed.

After the lever F has been disengaged from the dog E of the winding-arm D, the said dog, being now free from the spring *e*², by its own weight falls back into such a position that the upper front corner no longer projects into the path of the lever F. Therefore, if the ring I be pulled twice or more in succession the subsequent pulling of the ring will not in any way affect the winding-arm D until it has returned to its normal position, and the transmission of the proper signal is completed, when the dog E will be again pushed forward by the spring *e*² in readiness for another signal.

If either the rings G or H be pulled down instead of the ring I, the operation would be precisely similar, except that the lever F and winding-arm D would be caused to move through a larger arc, and the mainspring would be wound far enough to cause the transmitting-wheel to make five or three revolutions, as the case might be, instead of one only.

It is obvious that a greater number of rings might be arranged on the same plan, if found necessary or desirable, to give a corresponding number of different signals.

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

1. The combination of the winding-arm D, train of wheel-work C C¹ C², transmitting-wheel B, and lever F, substantially as herein specified.

2. The combination of motor-train and circuit-breaking or transmitting wheel with lever F, rods G' H' I', and links *g h i*, substantially as and for the purpose specified.

3. The combination of the dog E with the

lever F, the former so arranged with reference to the latter and with the winding-arm D as to permit the former to engage with the latter after a complete signal has been transmitted, but at no other time.

4. The dog E, in combination with the stationary spring e^2 and stop d , substantially as herein described.

5. The stops $g^2 h^2 i^2$, in combination with the lever F and links $g h i$, substantially as herein specified.

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Witnesses:

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