

Electric Signalling Apparatus.

Patented July 28, 1874.

Fig: 1.

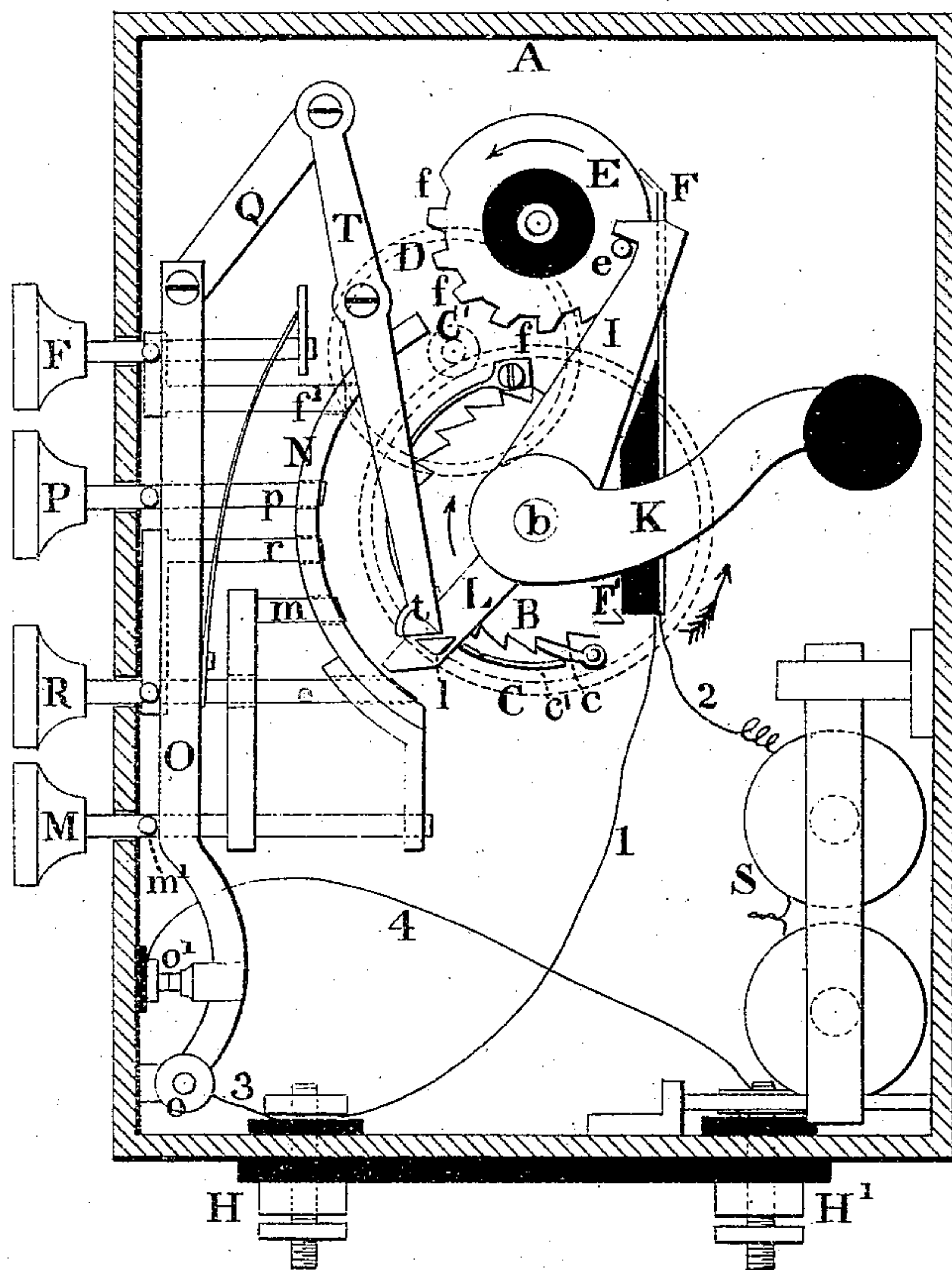
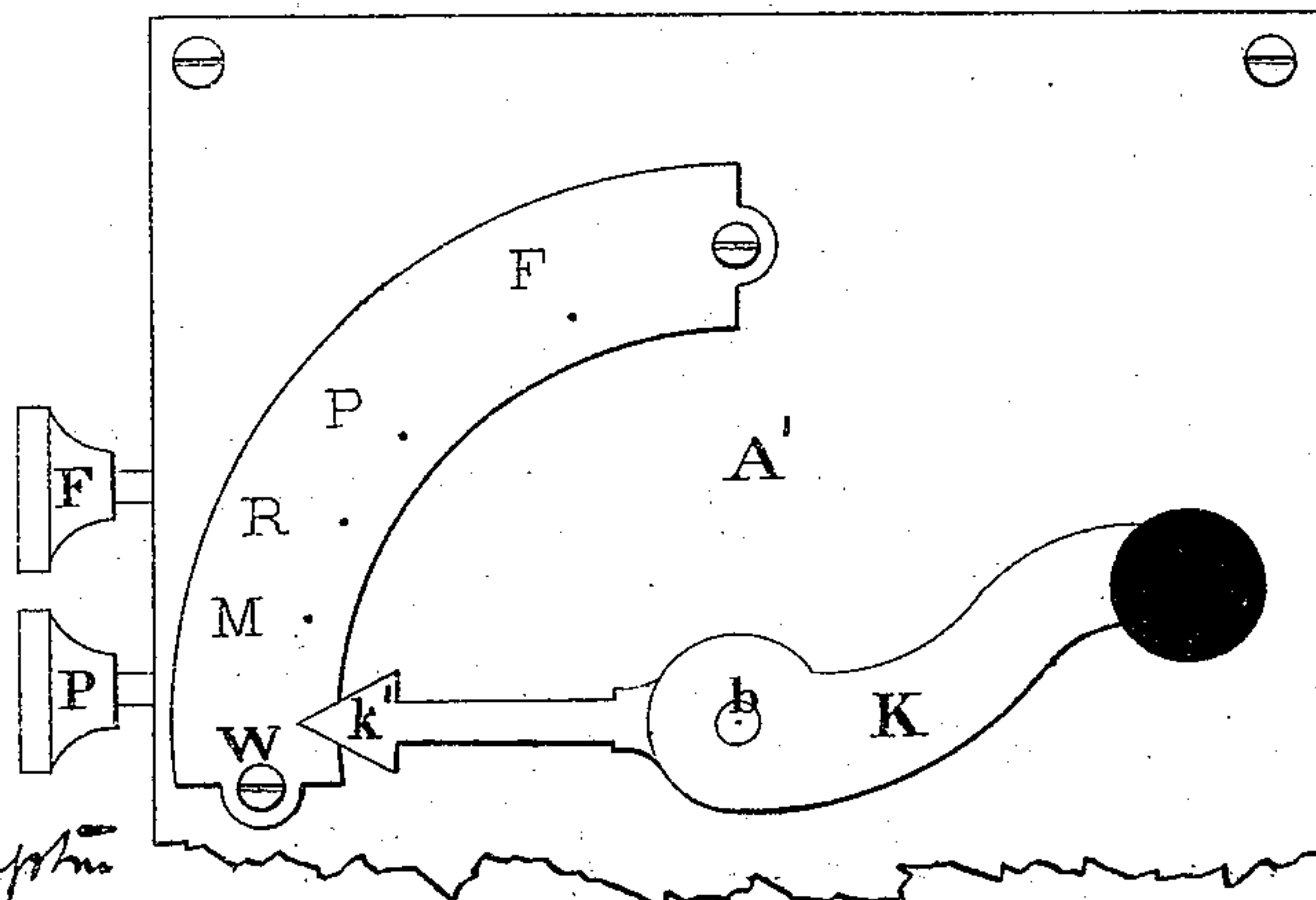


Fig : 2.



Witnesses:

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IMPROVEMENT IN ELECTRIC SIGNALING APPARATUS.

Specification forming part of Letters Patent No. **153,498**, dated July 28, 1874; application filed April 16, 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 certain new and useful Improvements in Automatic Electric Signaling Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms a part of this specification.

This invention relates to that class of telegraphs by means of which any desired number of houses or other buildings are connected by means of a continuous electric circuit with a central office, for the purpose of giving warning of fires or accidents, or summoning assistance when needed. To this end each house is provided with an automatic-signal box, by which a certain arbitrary signal or group of signals (preferably so arranged as to denote the number of said house) is transmitted to the central station whenever the apparatus in such box is designedly put in operation.

My improvement consists in so arranging the said automatic-signal box that the kind of assistance required may be indicated by the number of times the said arbitrary signal is repeated, so that, in practice, several different kinds of information may be communicated by a single signal-box. Hence an arbitrary signal or group of signals may thus be employed to denote not only the number of the house from which the call proceeds, but also the information to be conveyed, as will be hereinafter more fully explained.

In the accompanying drawing, Figure 1 is a vertical longitudinal section through the signal-box or casing itself, exposing the whole apparatus a little more effectually than if simply the cover or door were removed without disturbing any of the operative parts of the device; and Fig. 2 is a face view of a portion of the said cover, showing the position of the same on the box.

A designates the body of the box or case containing the mechanism, and A' its cover or door, both being preferably composed of metal. B is a wheel mounted upon the axis *b*, and provided with ratchet-shaped teeth upon its periphery. A pawl, *c*, attached to the toothed wheel C, is arranged so as to engage

with the teeth of the wheel B, so that the said wheels B and C shall revolve together when moving in the direction of the winged arrow, at the same time permitting the wheel B to be moved independently of the wheel C when revolved in the direction of the plain arrow marked upon it. A spring, *c'*, may be employed for causing the said pawl *c* to bear against the toothed periphery of the said wheel B. The wheel B is driven by a concentrically-coiled spring, one end of which is fastened to the axis *b*, and the other to a stationary post, (not shown in the drawing,) as is usual in automatic signaling apparatus of this general class. The cogs on the periphery of the wheel C engage with the pinion-wheel C', and the shaft which carries the said pinion-wheel carries a cog-wheel, D, (the two latter wheels C' and D being shown in dotted lines,) which latter wheel D engages a pinion on the shaft of the circuit-breaker E, by which means the said circuit-breaker E is revolved. Two flat springs, one of which is shown at F, (the other being immediately behind it,) are secured to an insulating-support, F', while their free ends are so arranged as to press against the metallic periphery of the insulated revolving-circuit-breaker E. A portion of the periphery of the circuit-breaking wheel E is cut away so as to form spaces *fff*, the object of which will be hereinafter explained. Thus it will be understood that if a constant electric current be made to pass through the circuit-breaker E, and if the latter be caused to perform one revolution, the circuit will be broken when each one of the spaces *fff* passes beneath the springs F. The apparatus thus far described is similar in principle and mode of operation to that shown and described in the reissued United States patent of Crane & Rogers, No. 4,513, of August 15, 1871.

In the signal-box shown in the drawing, the circuit-breaking wheel is provided with six spaces, indicating the number of the box, which, in this instance, is 6. Let it be assumed that the signal "6" once given indicates that a messenger is required, while two repetitions of the same denote a request for a representative to be sent, the latter being sometimes required by the exigencies of business. Three repetitions are a call for a police-

officer, and five repetitions denote that a fire has broken out.

The mechanism by means of which these different signals are given automatically is as follows: A crank, K, on the exterior of the signal-box, (see Figs. 1 and 2,) is fixed upon the axis *b* of the ratchet-wheel B, and when this crank is depressed it turns the wheel B around in the direction of the arrow marked on it, the pawl *c* slipping over the teeth of said wheel B. The coiled spring is wound up by this movement, but when the crank K is released the said spring acts upon the axis *b* to revolve it, and thereby causes the train of wheel-work and the circuit-breaking wheel E to revolve in the direction of the winged arrow in a manner well understood. It is necessary that the number of revolutions made by the circuit-breaker E shall depend in each case entirely upon the distance that the crank K is moved. The movement of the crank K is, therefore, limited and controlled in the following manner: M, R, P, and F are four knobs projecting from the side of the signal-box, and they are, respectively, connected with four rods, *m*, *r*, *p*, and *f*¹, passing through the side of the box and through a supporting-frame, N, the face of which frame, in the present instance, is semicircular, and so arranged within the box that when either knob is depressed its corresponding rod will be caused to project beyond the inner surface of this frame N. L is an arm fixed upon the axis of the crank K, and provided with a stop, *l*, which acts against a projection, *t*, on the extremity of a lever, T. The object of this stop is to prevent the crank K from being turned until some one of the knobs M R P F has first been depressed—as, for instance, the said lever T is connected at the end beyond its fulcrum to a connecting-rod, Q, which latter is connected to a lever or circuit-closing key or bar, O, and the rods *m r p f*¹ are, respectively, provided with pins *m'*, *r'*, *f*², and *p'*, arranged behind the lever O, so that on depressing a knob such pin will throw the movable end of the lever O inward, and will, through the said connecting-rod Q, vibrate the lever T sufficiently to disengage the catches *t l*, so that the crank K may be moved until the end of the arm L strikes against a rod attached to the depressed knob.

I will now proceed to describe the operation of the apparatus, and in doing so will refer by letter to certain parts of the apparatus which I have not as yet mentioned, as in this way a more definite knowledge of the same may be communicated.

When the apparatus is at rest the electric current enters at the screw-post H and passes, by the wire 3, to the pivot *o* and lever O, and thence, by contact-points *o'*, to wire 4 and opposite screw-post H'. Now, in order to operate the crank K so as to transmit a signal, it is first necessary to depress one of the knobs corresponding to the signal which it is desired to transmit; for example, if a messenger-signal is required to be sent, the knob marked M must

first be depressed. The depression of the knob performs three distinct offices: First, by means of the pin *m'* it pushes the lever O, breaking the circuit at O', and thereby changing its route and causing it to pass from the post H by the wire 1 to the spring F; thence through the wheel E to the other spring in the rear of F; thence, by wire 2, to the helices of the sounder S, and thence to the screw-post H', to which the outgoing line-wire is attached. The sounder S being now in circuit, it may be known whether any other signal-station is using the circuit before moving the crank K. Second, the lever O, by means of the lever-bar Q, moves the upper end of the lever T to the right and the lower end to the left, thus moving the projection *t* out of the path of the stop *l* on the arm L, thus permitting the crank K to be moved. Third, the pin *m* is caused to project beyond the semicircular frame N, forming a stop which limits the distance traveled by the arm L. The crank K is now depressed until its movement is arrested by the arm L coming in contact with the rod *m*. The crank K being then released, it is carried back to its original position by the coiled spring attached to its axis, which is constantly kept sufficiently wound up by the very act of moving the crank K to cause the circuit-breaker E to make one revolution and transmit the signal 6 once to the central office. The circuit-wheel is prevented from revolving too far on its return by means of the pin *e*, which engages with an arm, I, attached to the axis of the crank K.

If a fire-signal is to be transmitted, the operation is the same, except that the knob F is depressed, causing the rod *f*¹ to be pushed out. In this case the arm K is allowed to move through a much greater distance before being arrested by the rod *f*¹, and the recoil of the spring causes the circuit-breaker E to revolve five times, giving five repetitions of the signal 6. Hence the number 6 indicates the number of the box or house, and the number 5 indicates that a fire has been discovered in that house.

As an additional assistance in assuring the giving of the desired signal, I arrange an index and plate in such manner that they will indicate to the person operating the mechanism the amount of winding required to transmit any given signal. An index-plate or dial, W, is attached to the outside of the box, as shown in Fig. 2, and is provided with letters corresponding to those upon the knobs. An index-hand, *k'*, attached to the crank K, moves over this dial, and serves to show that the mechanism is wound up sufficiently to give the required signal. I will here remark that the knob depressed should be kept depressed until the arm L strikes its rod, and if this rule were followed the dial and index would not be necessary; and I will also remark that in the hands of observing persons the dials and index, without the knobs, would be all-sufficient.

I am aware that it is not new to cause a cir

circuit-breaking wheel, by means of a spring or weight acting through the medium of a train of clock-work, to give one particular prearranged signal whenever the clock-work is wound. Neither is it new to provide a signal-box with a sounder so arranged as to be thrown into the circuit by pressing a knob or key before operating the signaling mechanism. But I believe it to be new to give one of two or more different signals at pleasure by repeating a signal denoting the number of the signal-box a specified number of times, the number of repetitions varying according to the kind of intelligence which it is desired to convey; also, to arrange the mechanism so that the sounder must necessarily be put in circuit before the signaling mechanism or circuit-breaking wheel can be operated.

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

1. In a telegraph apparatus for automatic signaling, the combination of the circuit-breaker E, (arranged to transmit a specific arbitrary signal,) and a train of wheel-work driven by a weight or spring for actuating the same, with the stops $f^1 p r m$, arranged to permit

said spring or weight to be wound sufficiently tight to repeat said arbitrary signal one, two, or more times, at pleasure, substantially as herein specified.

2. The combination of the stop t with the winding mechanism and the cut-out O' , all arranged to prevent the operation of said mechanism until after the cut-out is opened, placing the sounder in the circuit, and until the rod which is to limit the travel of the arm L is put into position, substantially as herein specified.

3. The combination of one or more stops, $f^1 p r m$, with the cut-out lever O and the stop-lever T, (either or both,) substantially as and for the purpose specified.

4. The combination of the dial-plate W, index K, ratchet-wheel B, pawl c , and axis b , the latter being provided with a convolute spring, substantially as and for the purposes herein specified.

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Witnesses:

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