

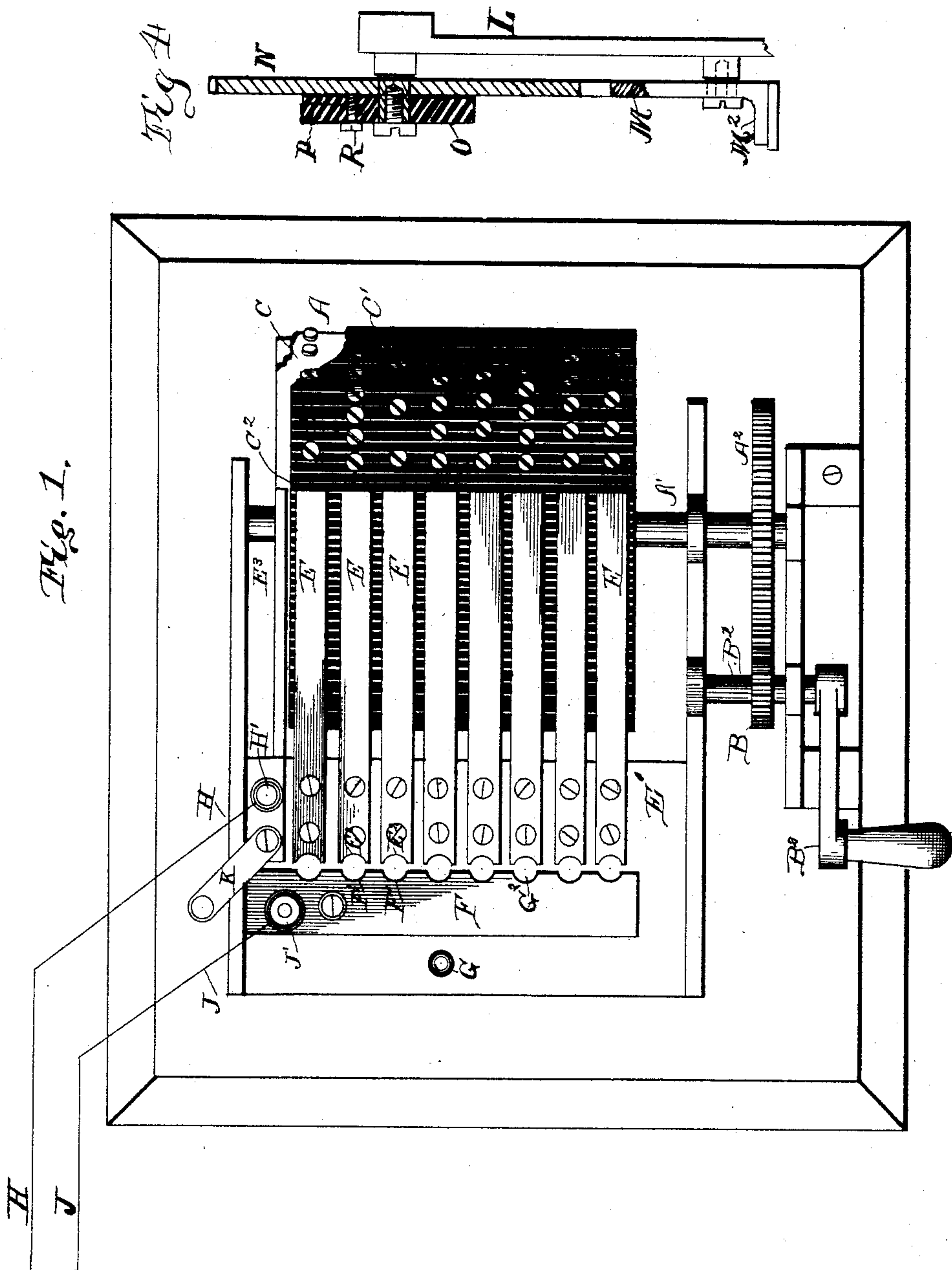
(No Model.)

2 Sheets—Sheet 1.

W. R. McCANN & S. S. CREIDER.  
ELECTRIC LIGHT SIGNAL.

No. 447,894.

Patented Mar. 10, 1891.



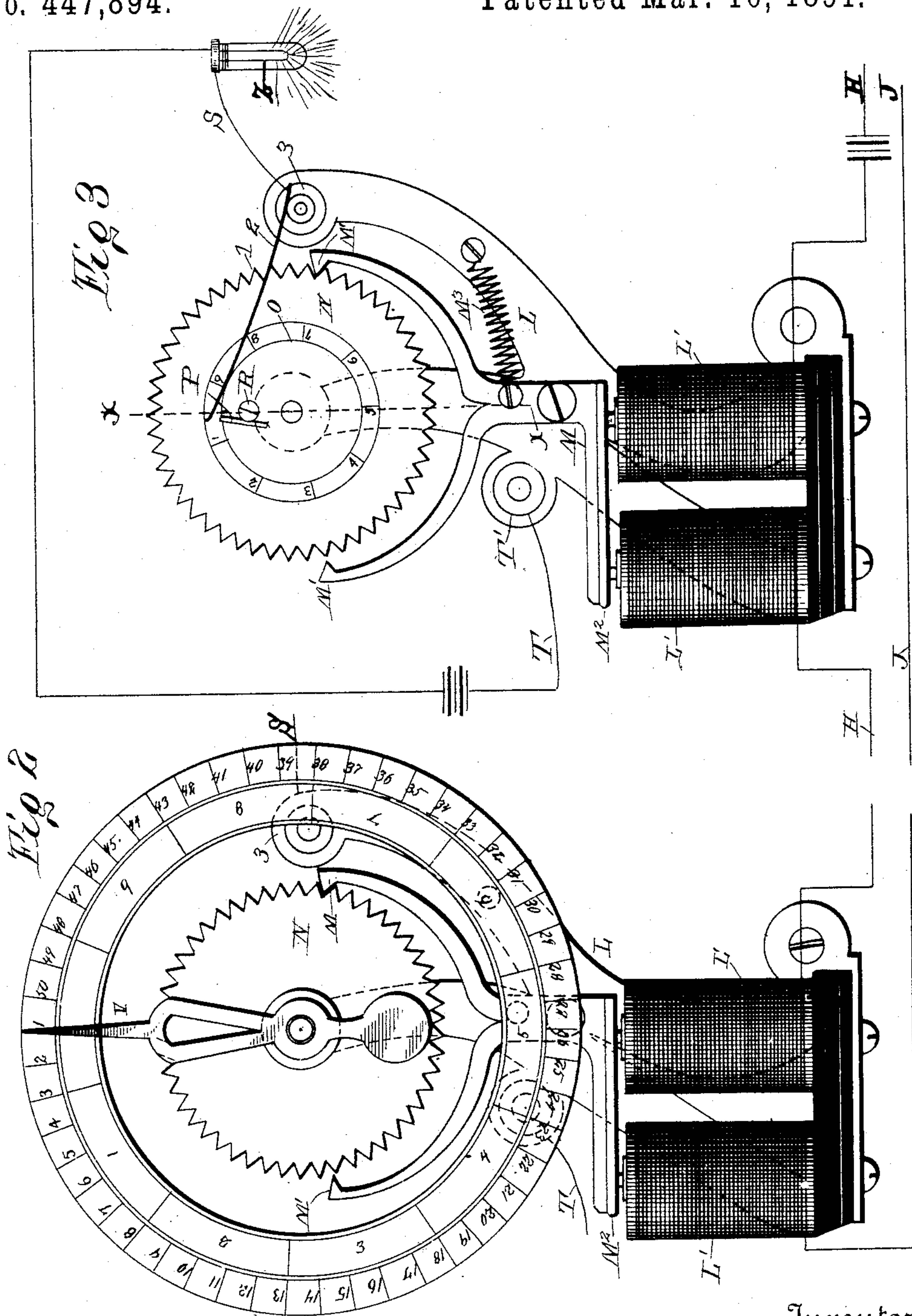
Witness  
C. C. Burdine  
Geo. S. Haycock

Inventors  
Walter R. McCann  
by Simon S. Creider  
John G. Manahan  
Attorney

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# UNITED STATES PATENT OFFICE.

WALTER R. McCANN AND SIMON S. CREIDER, OF STERLING, ILLINOIS.

## ELECTRIC-LIGHT SIGNAL.

SPECIFICATION forming part of Letters Patent No. 447,894, dated March 10, 1891.

Application filed September 8, 1890. Serial No. 364,300. (No model.)

*To all whom it may concern:*

Be it known that we, WALTER R. McCANN and SIMON S. CREIDER, both citizens of the United States, residing at Sterling, in the county of Whiteside and State of Illinois, have invented certain new and useful Improvements in Electric-Light Signals; and we do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention has reference to an electric-light-signal system in which the signal-lights at the several stations can be severally lighted or discontinued from a central station.

The object of our invention is to light and extinguish a signal at separate police-stations or at points between telegraph-offices on railways to call attention to information to be communicated to such signaled station from the central station by telephone, telegraph, the signal itself, or otherwise. This result is attained by an electric switch at each signal-station controlled from a central station by any suitable circuit-breaker there located and adapted to intermittently rotate a ratchet-wheel placed in the signal-station, and thereby complete the local circuit at a pre-adjusted locality on said wheel.

In the drawings, Figure 1 is a plan of a drum, by rotating which the primary circuit is opened and closed any desired number of times, and also of the spring-contact arms adapted to have intermittent engagement with the metallic studs seated in the periphery of said drum. Fig. 2 is an indicator placed in the central station to exhibit the position at all times of the several ratchet-wheels in the respective signal-stations. The ratchet carrying the indicating-hand has synchronously an equal degree of movement with each and all of said signal-station ratchet-wheels. Fig. 3 exhibits one of the signal-station ratchet-wheels and the mechanism located at such station, which by the pulsations communicated from the primary circuit opens or closes the local circuit; and Fig. 4

is a sectional view taken on the line  $x x$  of Fig. 3.

Premising that the sole function of the mechanism involved in the primary circuit is to open and close the respective local circuits severally, we will proceed to describe such mechanism as applied to light a signal located at any special point outside the central station.

A is a wooden drum, suitably journaled and having its axis  $A'$  provided with a gear-wheel  $A^2$ . A small pinion B, having its axis  $B'$  provided with a crank  $B^2$ , is suitably journaled to mesh with gear  $A^2$  and impart a slow rotation to drum A. The drum A is bound with a brass band or tire C. The band C is incased in an outer band or tire  $C'$ , of rubber or other non-conducting substance, of suitable thickness, except at one end, as shown in Fig. 1. Several series of metallic screws D are seated in the periphery of the drum A from the outside, passing through the rubber slightly into the wooden interior and being in electrical contact with the brass tire or band C. The screws or studs D are arranged in a plane perpendicular to the axis of the drum A. Each series aggregates a different number, two or more of which equal the number of teeth on the ratchet-wheel hereinafter named. A space  $C^2$  transversely across the face of the rubber  $C'$  is left devoid of studs D to afford a neutral field where all the springs may rest out of contact with any studs D.

E E are contact-springs suitably attached at one end to the wooden frame  $E'$  and having their opposite or free end adapted to respectively drag over the series of studs D in the rotation of the drum A. The fixed ends of springs E have concavities  $E^2$ , and a metallic plate F is attached to frame  $E'$  and provided with like concavities  $F'$  opposite to concavities  $E^2$ , so that by taking the metallic plug G from its seat in frame  $E'$  and inserting said plug in holes  $G^2$  in said frame, formed between the concavities  $E^2$  and  $F'$ , said plug will complete the circuit between the then contiguous spring E and the plate F and transmit to said plate the impulses successively received by said spring from the series of studs D, over which said contact-spring may drag in the rotation of drum A.



H is one of the primary circuit-wires, connected at its outer end to any suitable battery and at its inner end to the binding-post H' and in constant contact with the end contact-spring E<sup>3</sup>, which latter at its free end rests constantly on the metal band C where the latter projects beyond the rubber C'. J is the other primary circuit-wire, connected at its outer end to the battery and at its inner end to the binding-post J' on the plate F.

As a substitute for the drum A, or to correct any irregularities which may occur in the circuit, an ordinary circuit-closer K is attached to spring-plate E<sup>3</sup> in position to optionally connect the latter with plate F. The advantage of the drum A consists in the fact that it is more precise, insures a more positive contact, avoids the necessity of counting, and its pulsations are more regular and the intervals between them of more uniform length.

Referring to Fig. 3, L is a frame at the signal-post, upon which are supported the ordinary magnets L', suitably insulated from said frame and connected to the circuit-wires H J of the primary circuit.

M is an armature-lever pivoted to frame L, bifurcated at its upper end, and each of said bifurcated ends provided with an actuating-pawl M', adapted to alternately engage the peripheral teeth 1 of the brass ratcheted wheel N on opposite sides of the latter, and thereby impart a partial rotation to wheel N in the oscillations of lever M. One of the pawls M' pulls on wheel N and the other pushes; but both pawls rotate said wheel only one tooth at each full motion of lever M. The lever M is rocked by the alternity of action of the armature M<sup>2</sup> and draw-spring M<sup>3</sup>, which latter connects said lever above its pivotal seat to the frame L.

The ratchet-wheel N is suitably pivoted on the frame L and provided on its face with an annular series of guide-numerals. On the face of the wheel N, and carried thereby, is centrally seated an insulated disk O, in the outside of which, but out of immediate contact with wheel N, is placed a radial metallic tongue P, projected slightly beyond the periphery of disk O and held by a screw R, which latter at its inner end is in electrical contact with the face of the wheel N and sufficiently tight to reinsure against casual rotation of the disk O; but by slightly loosening screw R the position of disk O on wheel N can be readily adjusted annularly.

S is one of the wires of the local circuit, connected at its outer end with any desired signal, as an electric light Z, and at its inner end to the spring-plate 2, attached to and insulated on the binding-post 3 on the frame L. The free end of the spring-plate 2 is in constant contact with the periphery of disk O.

T is the companion wire of the local circuit, connected at its outer end to the source of electricity and at its inner end to the binding-post T' on frame L. In the rotation of

disk O the contact of tongue P with the spring-plate 2 completes the local circuit and lights the signal connected therewith, and the farther rotation of the disk O breaks such local circuit and extinguishes said light. The disk O can be adjusted on its carrying-wheel N, so that said local circuit may be established or broken at any desired point in the rotation of wheel N, and said light can be continued as long as may be desired. There are fifty teeth on the ratchet-wheel N shown, and the numerals on said wheel represent, respectively, the signal-stations.

The apparatus shown is arranged for nine signal-stations, except the drum in Fig. 1, which is only arranged for eight arms; but by obvious changes the number can be increased or diminished.

Starting with the tooth on the wheel N marked 1, directly over the metallic tongue P at station 1, all of the wheels N will be in the same position and all of the local circuits opened. In station 1 the tongue P on disk O will be so placed that when wheel N has rotated the distance of five teeth thereon the tongue on that disk will come in contact with its correlative spring-plate 2, when the local circuit at said signal-station 1 will be established and its signal lighted and will remain lighted so long as wheel N is allowed to remain stationary. In signal-station 2 the tongue P is placed on disk O five ratchet-teeth farther back, so that when wheel N is rotated five teeth farther the local circuit at station 2 will be established and that signal lighted, and the same arrangement is continued as to the succeeding stations ending at signal-station 9 with the forty-fifth ratchet-tooth, the local circuit at each of the intermediate stations being established for an instant as the tongue P passes into and out of contact with the spring-plates of each station. This temporary completion of the circuit causes a faint or imperceptible signal to be given at each of the intermediate stations; but it is of such short duration that it is not noticeable.

By adding additional spring-plates 2 two or more differently-colored lights can be lighted at the same signal-station.

When it is desired to bring all of the ratchet-wheels N to the starting-point 1 common to all of them, the wheel N at the main station is rotated until the indicating-hand V stands over the numeral "1" in the outer circle—as, for instance, by establishing the circuit of such plate E as rests upon a series of studs D sufficient in number to impart the complementary pulsations to rotate the wheel N to the common starting-point.

Referring to Fig. 2, the apparatus there shown is seated in the primary circuit and located in the central station to indicate at all times the position of each and all of the wheels N in the different signal-stations. This machine is the same as that shown in Fig. 3, except that the wheel N carries an indicating-hand V instead of the disk O and that out-



side of the wheel N there is seated a fixed dial having two annular series of numerals, the outer one representing corresponding teeth on all of the wheels N and the inner series indicating the several lighting-points of the different signal-stations. The hand V is carried by its contiguous wheel N, and when over the outer figure "5" and inner figure "1" indicates that signal-station 1 is lighted, and the same as to other signal-stations, and when said hand is not over any of the inner series of figures it shows that all local circuits are open and no signal exhibited.

By obvious additions and changes our invention may be adapted to suddenly light selected spots for any length of time to deter or arrest burglars, or to give railway-signals, or to operate hotel-annunciators, and can be utilized in any analogous situation.

What we claim as our invention, and desire to secure by Letters Patent of the United States, is—

1. In an electric alarm signal, the combination, with the wires of a main circuit having a series of local alarm-circuits controlled thereby, of means for opening and closing the main circuit, consisting of a rotary drum having a metallic band or tire, a covering of non-conducting substance covering the tire, except an annular space at one end, rows of metallic pins through the non-conducting substance in electrical contact with the tire, a metallic tongue in constant electrical contact with the uncovered portion of the tire and with one wire of the main circuit, a series of tongues or strips engaging with the rows of pins, respectively, and means for establishing electrical connection between any one of the series of tongues and the other line of the main circuit, substantially as described.

2. In an electric alarm-signal, the combination, with the wires of a main circuit provided with means for opening and closing said circuit, of a series of magnets connected with the wires of said circuit, each of which said magnets is supported upon but insulated from a signal-post, a ratchet-wheel pivotally connected with the post, an insulated disk on the face of the wheel and carried thereby, a metallic point on the disk in electrical connection with the wheel, a bifurcated armature-lever pivotally connected with the post for rotating the ratchet-wheel, a spring-plate attached to but insulated from the post, the free end of which is in constant contact with the periphery of the disk upon the ratchet-wheel, said parts all being in substantially the same plane, and a local alarm-circuit, one wire of which is connected with the post and the other wire is connected with the spring-plate, substantially as described.

3. In an electric alarm-signal, the combination, with the main circuit provided with means for opening and closing the same and an indicator, of a series of magnets connected with the wires of said circuit, each magnet being supported upon but insulated from a signal-post, a ratchet-wheel pivotally connected with the post, the outer face of which is provided with an annular series of guide-numerals to correspond with the indicator in the main circuit, an insulated disk upon the outside of the ratchet-wheel, a radial metallic tongue in the outside of the disk, a screw for retaining the tongue and the disk in position and for establishing electrical connection between the tongue and the wheel, a spring-plate attached to but insulated from the post, the free end of which is in constant contact with the disk, and a local alarm-circuit, one wire of which is connected with the post and the other wire is connected with the spring-plate, substantially as described.

4. In an electric alarm-signal, the combination, with the main circuit, of a series of local circuits controlled thereby, each local circuit being provided with a ratchet-wheel circuit-breaker, said wheel being provided with guide-numerals, an indicator in the main circuit, consisting of a fixed dial provided with two annular series of numerals, the outer one of which corresponds with the number of teeth of the ratchet-wheel in each local circuit, and the inner one corresponds with the number of local circuits, an indicator-hand adapted to be moved over the dial synchronously with the movements of the ratchet-wheels, and means for opening and closing the main circuit, substantially as described.

5. In an electric alarm-signal, the combination, with the main circuit, of a series of local circuits controlled thereby, each local circuit being provided with a ratchet-wheel circuit-breaker, and the main circuit with a rotary drum having rows or series of pins arranged therein, each row or series of which aggregates a different number, and two or more of which equal the number of teeth in each ratchet-wheel in the local circuits, metallic strips engaging with the rows of pins, respectively, and means for completing the main circuit through any of the strips independently of the other strips, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

WALTER R. McCANN.  
SIMON S. CREIDER.

Witnesses:

JOHN G. MANAHAN,  
V. S. FERGUSON.