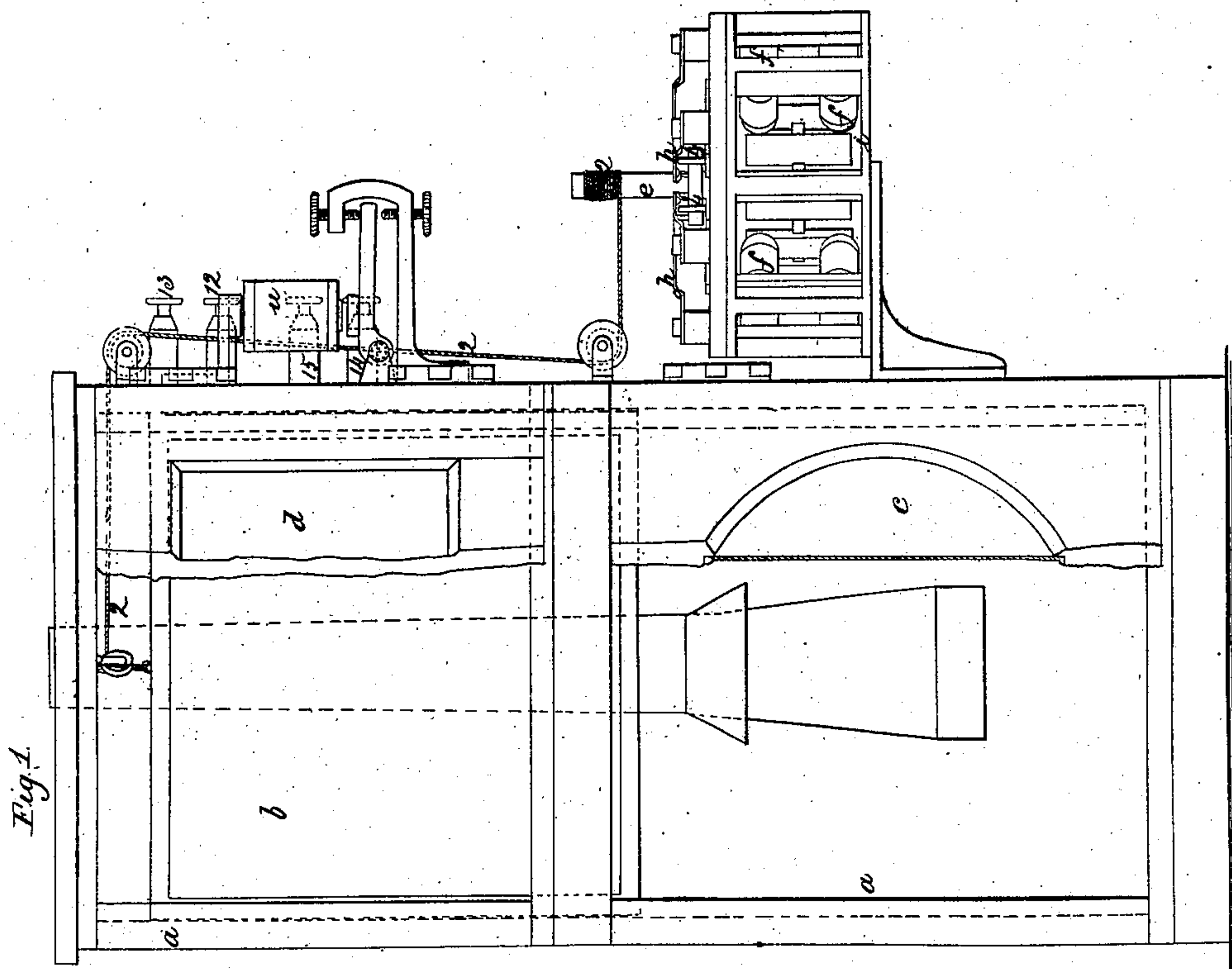
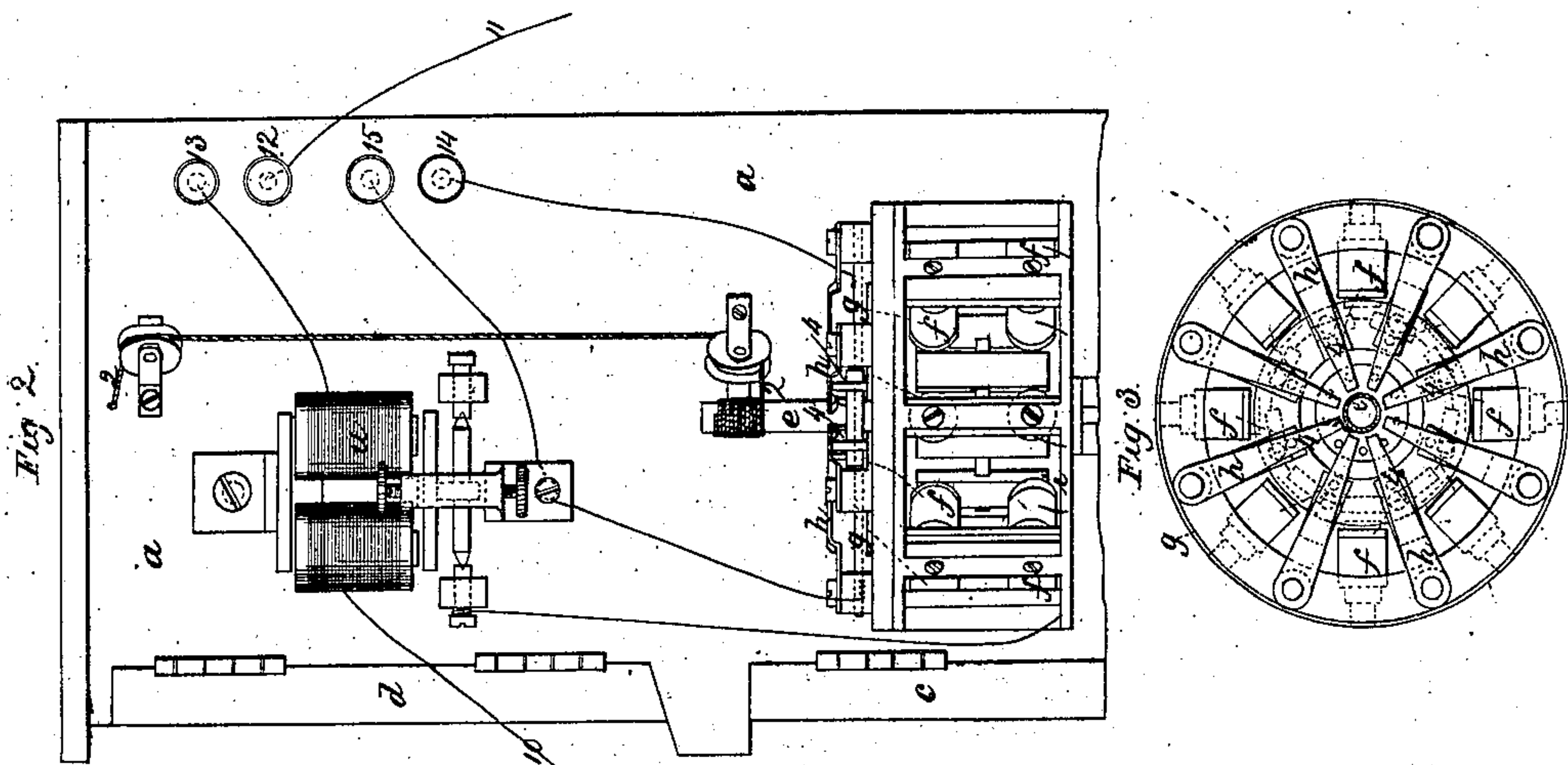


Phelps & Stewart
R. R. Signal

No 93,342.

Patented Aug. 3, 1869.

Sheet 1, 2 Sheets.



Witnesses;
Chas. Smith
Geo. Walker

Inventors;
Geo. W. Phelps
Robt. Stewart
per L. H. Lowell atty

UNITED STATES PATENT OFFICE.

GEORGE M. PHELPS, OF BROOKLYN, NEW YORK, AND ROBERT STEWART,
OF BORDENTOWN, NEW JERSEY.

IMPROVED ELECTRICAL RAILROAD-SIGNAL.

Specification forming part of Letters Patent No. 93,342, dated August 3, 1869.

To all whom it may concern:

Be it known that we, GEORGE M. PHELPS, of Brooklyn, in the county of Kings and State of New York, and ROBERT STEWART, of Bordentown, in the county of Burlington and State of New Jersey, have invented and made a new and useful Improvement in Electrical Railroad-Signals; and we do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1 is an elevation of the signal-box and electrical motor, the box being partially in section. Fig. 2 is a side view, showing the motor and its connections and part of the signal-box. Fig. 3 is a plan of the electrical motor, and Fig. 4 is an elevation illustrative of the switch-lever and circuit-breaker.

Similar marks of reference denote the same parts.

Electrical signals have before been applied to railroad-switches, so that when the switch has been changed to a turn-out an electrical circuit has been closed and a bell rung, or other signal given. In this case the switch may be off the main line, and if the battery is out of order or any of the connections interrupted no signal will be given.

In our apparatus the signal is given when the circuit is broken; thereby a signal will be given if the battery or any of the parts get out of order, as well as by changing the switch, thus rendering the apparatus perfectly safe in signaling danger or its own want of attention.

We employ an electrical motor that furnishes the power necessary for moving the signal, and when the circuit is broken and the motor has no further power to hold up the signal said signal falls by its own weight.

In the drawing, we have shown a box, *a*, in which is a flag, *b*, that should be red. The same is suspended by a cord, 2, over pulleys passing to the electric motor, and the box is also shown with a space for receiving a lamp at night, and doors *c d*, the door *c* having a glass.

When the flag or signal *b* falls, it indicates danger. When it is lifted into the upper part of the box the indication is safety.

We do not, however, limit our apparatus to any particular construction of signal, as that may be varied as desired.

Our electrical motor consists in a central shaft, *e*, around which is placed a series of armatures, standing parallel to the axis, and in a circular range, so as to revolve just clear of a circular range of electro-magnets, *f*, that are sustained by a frame or plate.

One wire of a battery connects with the ring *g* and range of circuit-closing springs *h*, that are insulated from the other parts of the machine; and beneath the inner ends of the springs is a revolving ring with pins or teeth, that turns with the axis *e* and armatures, and the pins or teeth lift the springs in succession, breaking the circuit, or allow them to rest down upon studs 4 to close the circuit through the magnets *f* successively, so that said magnets acting to attract the armatures at the proper point give a rotary movement to the axis *e*, and produce a motor that can be employed for operating the signal by winding the cord 2 directly upon its axis *e*, or by acting through intervening mechanism.

It will now be understood that when the circuit is closed the power of the motor is exerted to wind up and hold the signal out of sight, but when the circuit is broken the motor runs back, the signal falls, and danger is indicated.

The circuit-breaker shown in Fig. 4, as applied with the switch-lever *l*, is represented with its protecting cover removed.

The wires of the circuit pass to the springs *n* and *o*, that are insulated from the case *m* by the block 6, and said springs *n o* have points contiguous to the center block *r*.

The lever *s* stands between the springs *n o* and below the block *r*, and it has insulated pins projecting from its sides to take the springs *n o*. When this lever *s* stands vertically, in consequence of being so held by the switch-lever *l*, when in place on the main line, the springs *n o* rest at the sides of the block *r*; but when the lever *l* is moved it either causes the lever *s* to press one of the springs *n* or *o* out of contact with the block *r* and break the circuit or else it allows the spring *t* to act on said lever *s* and break the circuit between *n* and *r* and operate the signal.

The arrangement of the wires and connections between the switch or other device for operating the circuit-breaker and the motor will be understood by those versed in telegraphy, and will vary according to local circumstances.

We have represented the wires 10 and 11 from the switch circuit-breaker *m* as passing, one to the binding-screw 12 to the battery, and the other through the relay-magnet *u* to the battery-screw 13.

The binding-screws 14 and 15 to the local battery are connected, one to the ring *g* and springs *h* of the motor, and the other to the lever of the local magnet *u*, and thence to the plate *i* of the motor.

What we claim, and desire to secure by Letters Patent, is—

1. A motor operated by electricity and fitted, substantially as specified, to remove and retain the danger-signal while the circuit is closed, and to allow said signal to be shown when the circuit is broken, substantially as set forth.

2. The circuit-breaker formed of the springs *n o*, lever *s*, block *r*, and spring *t*, in combination with the switch-lever *l*, substantially as and for the purposes specified.

In witness whereof we have hereunto set our signatures this 15th day of June, A D. 1869.

GEO. M. PHELPS.
ROBERT STEWART.

Witnesses:

CHAS. H. SMITH,
GEO. T. PINCKNEY.