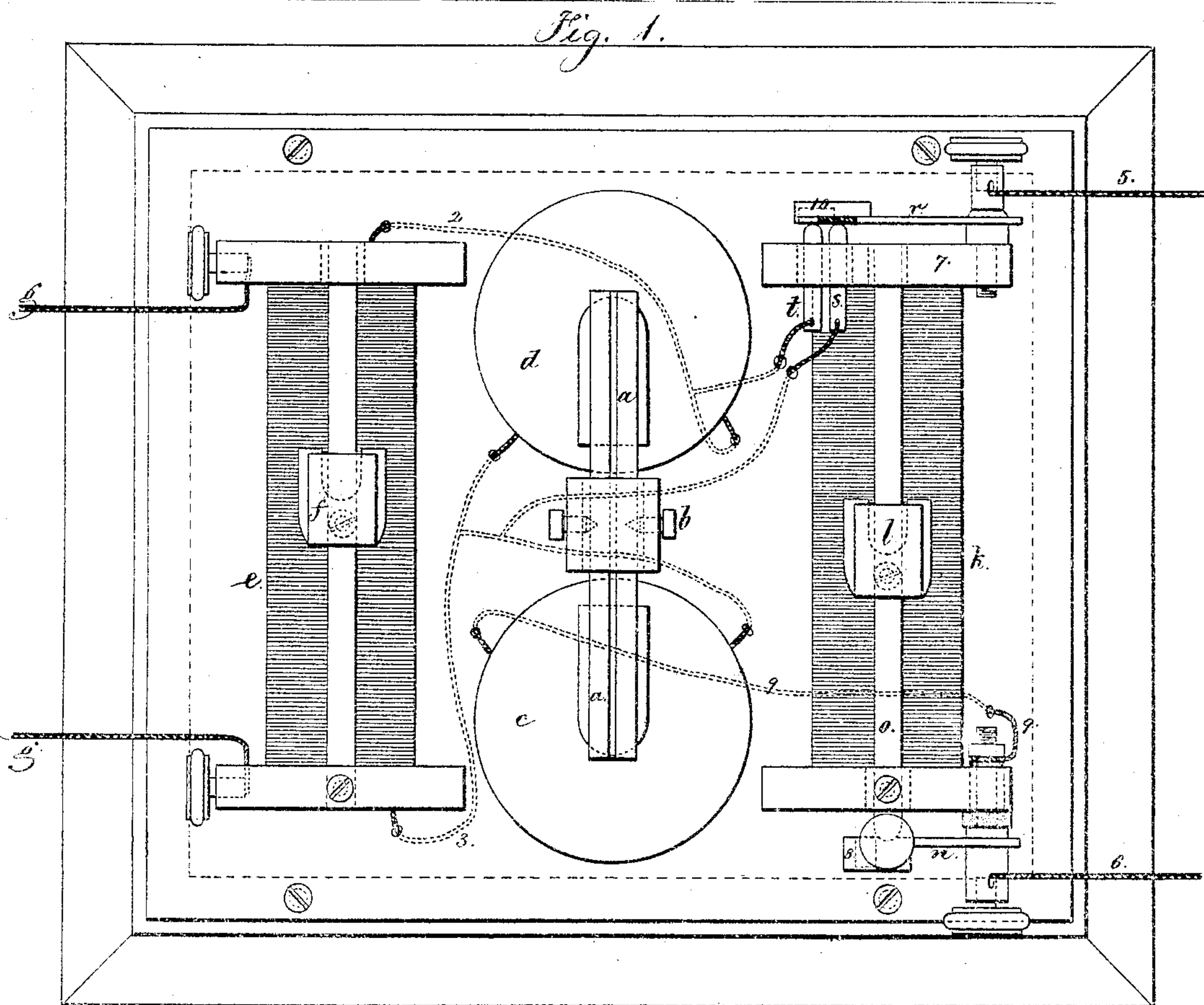
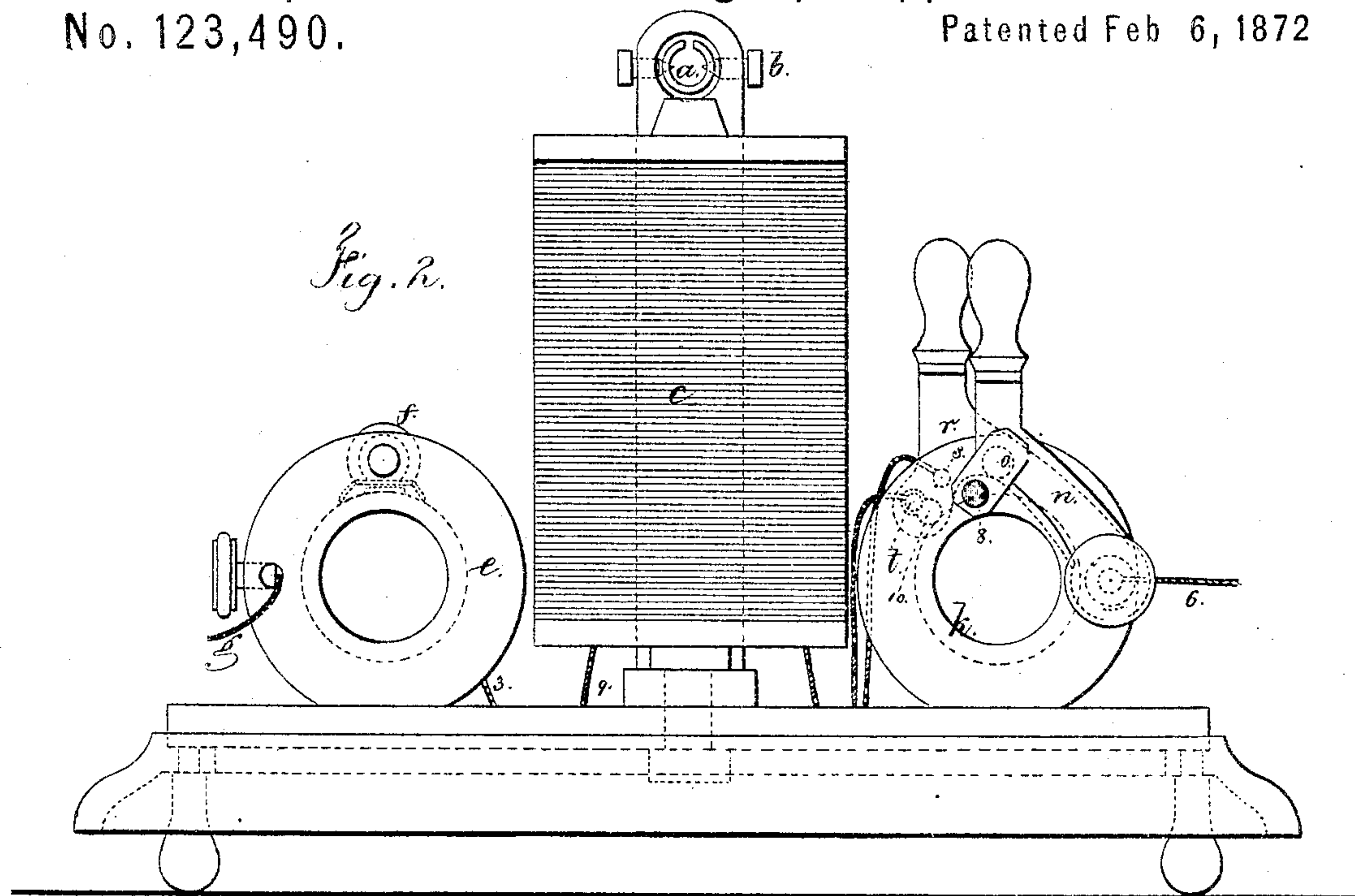


GEORGE LITTLE.
Improvement in Telegraph Apparatus.
No. 123,490.

Patented Feb 6, 1872



Witnesses,
Chas. H. Smith
Harold L. Linnell

George Little,
Lemuel M. Lippell atty

UNITED STATES PATENT OFFICE.

GEORGE LITTLE, OF RUTHERFORD PARK, NEW JERSEY.

IMPROVEMENT IN TELEGRAPH APPARATUS.

Specification forming part of Letters Patent No. 123,490, dated February 6, 1872.

To all whom it may concern:

Be it known that I, GEORGE LITTLE, of Rutherford Park, in the county of Bergen and State of New Jersey, have invented an Improvement in Telegraphic Apparatus; and the following is declared to be a correct description of the same.

In an application for a patent by me dated October 26, 1871, and allowed, an armature is shown vibrating by the action of two electro-magnets, and the force of the currents acting in such electro-magnets is regulated by rheostats, so that a current in the main line will vibrate the armature in one direction and a local current will produce the reverse movement when the pulsation in the main line ceases.

The present invention is a modification of this device; and consists in an arrangement of connections and switches for directing a portion of the main-line current through one of the electro-magnets when that current is intense, either from the strength of the battery or from atmospheric influences, such as thunder storms, &c., and thereby giving free vent for surplus electricity and avoiding the risk of injury to the electro-magnet. In this case the force of the main-line magnet is sufficient to overpower the magnet that is in the local circuit without that local circuit being neutralized as in the aforesaid application. When the current of the main line is weak the switches allow of its being directed through both helices, and in the one attracting the oscillating armature and in the other neutralizing the local circuit and rendering the second electro-magnet inoperative, so that it offers no resistance to the movement of the armature.

In the drawing, Figure 1 is a plan of the apparatus; and Fig. 2 is an elevation of the same.

The armature *a* is mounted upon the fulcrum *b*, and vibrates toward or from the electro-magnets *c* and *d*. This armature should be balanced upon its fulcrum and may be employed to give motion to any pen, stylus, or marking device, or perform any desired operation in telegraphic or other apparatus. The rheostat *e* is provided with the adjuster *f* and the connecting wires *g* to a local battery. The

wires 2 and 3 connect to the electro-magnet *d*, and the force of the current shunted off by the rheostat through this magnet *d* is regulated by the adjuster *f*, as in the aforesaid application. The rheostat *k* is provided with the adjuster *l*, and 5 and 6 are the line-wires. The wire 5 is in metallic contact with the head 7 of the rheostat, but the wire 6 is insulated, and at the binding-screw thereof the switch *n* is applied. This switch *n* has a non-conducting plug, 8, that, when the switch is moved one way, insulates the wire or bar *o* of the rheostat, so that the current cannot pass through the same, but will only go directly by the wire 9 to the magnet *c*. At the head 7 is the switch *r*, that has an insulating-block at 10, and adjacent thereto are the insulated conductors *s* and *t*, the conductor *s* connecting with the magnet *c* and the conductor *t* with the magnet *d*; and the position of the non-conducting block 10, in *r*, is such, relatively to insulated conductors *s* and *t*, that when the switch *r* is moved one way the conductor *s* will be in metallic contact with *r*, and the conductor *t* insulated, and the reverse when the switch is moved in the other direction. When the switches *n* and *r* are in the position shown in the drawing the line-current entering at 6 is divided, a portion going by the switch *n*, bar *o*, adjuster *l*, rheostat-coil *k*, and head 7, to the other line-wire 5, or earth connection, the other portion of the current passing by the wire 9, through the coil of the electro-magnet *c*, thence to the conductor *s* and switch *r* to 5. In this case the main-line current through *c* must be sufficient to overcome the attraction of the armature by the local current continuing to act in *d*. The adjuster *l* can be positioned to carry off all surplus electricity from the atmosphere or otherwise by the rheostat coil and head 7. When the switches *n* and *r* are changed the rheostat is cut off from the main line 6 and the current goes by the wire 9, through *c*, and then through *d*, to the conductor *t* and switch *r* to the line-wire or connection 5, and in so doing the current of the main line being of opposite polarity to that of the local current in the magnet *d*, the one neutralizes the other, allowing the weak current of the main line to operate in *c* without any resistance from mag-

netism in *d*. The switches *r n* may be connected together so as to be moved simultaneously; or one lever or switch might be applied with metallic connections so arranged as to effect the before-described electrical connections and disconnections with the respective parts by one switch.

I claim as my invention—

Two electro-magnets and a vibrating armature, in combination with a local circuit connected with one of the electro-magnets and

with switches, substantially as specified, for directing the main-line current either through the other electro-magnet or through both of the electro-magnets, substantially as set forth.

Signed by me this 22d day of December, A. D. 1871.

GEO. LITTLE.

Witnesses:

GEO. T. PINCKNEY,

CHAS. H. SMITH.