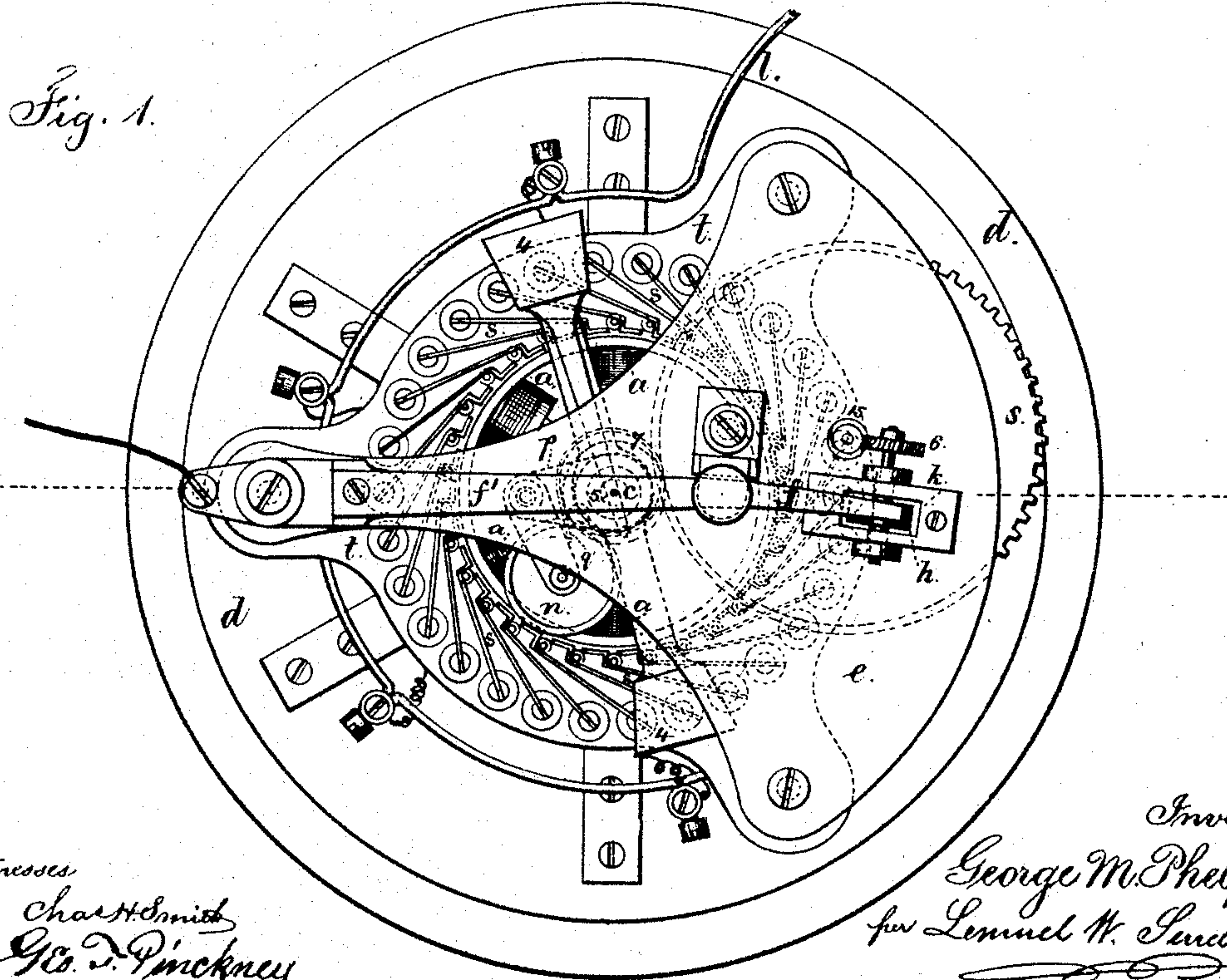
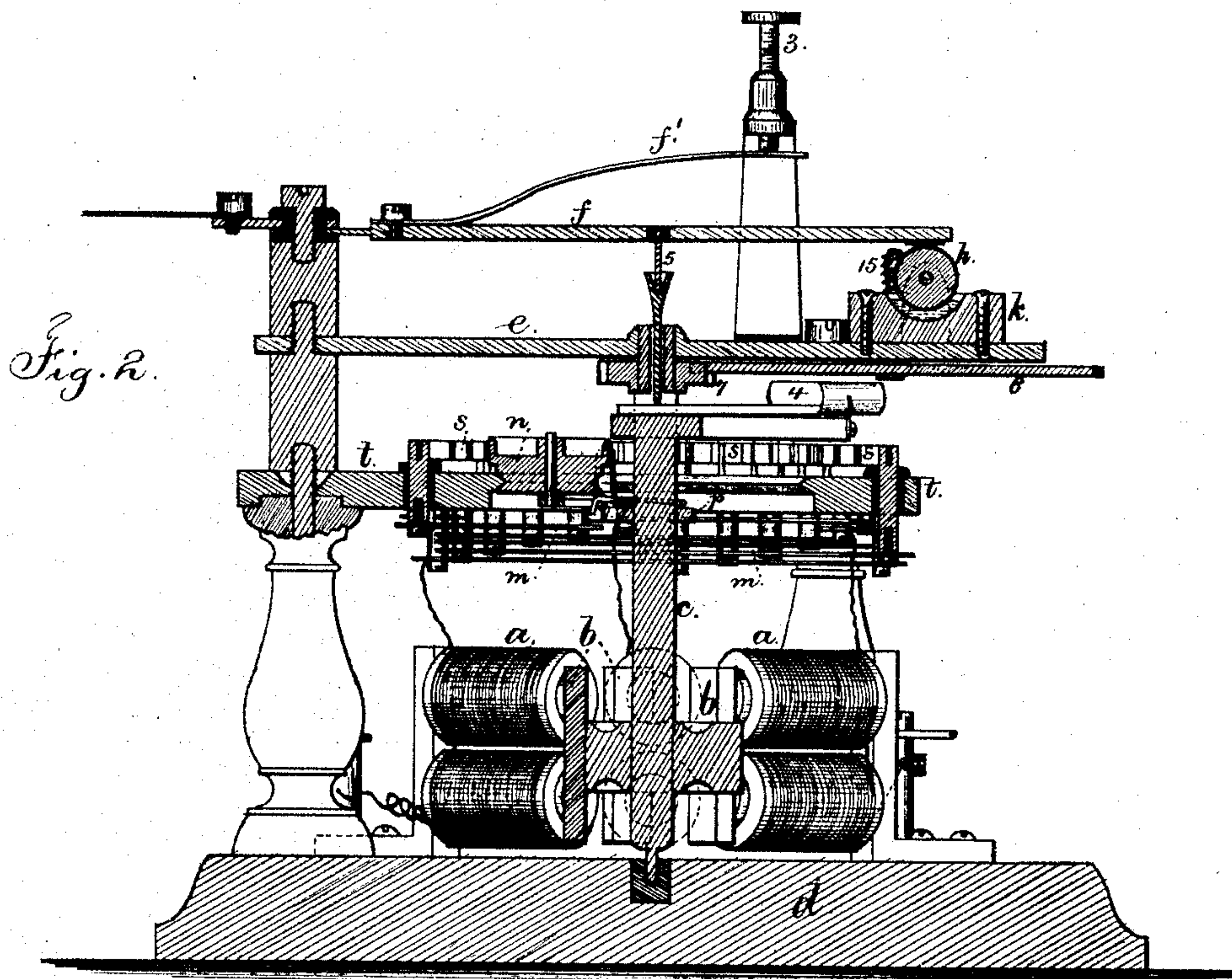


G. M. PHELPS.
Magnetic Motors.

No. 156,942.

Patented Nov. 17, 1874.



Witnesses
Chas. H. Smith
Geo. D. Pinckney

Inventor
George M. Phelps
per Lemuel H. Lowell
att'y.

UNITED STATES PATENT OFFICE.

GEORGE M. PHELPS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN MAGNETIC MOTORS.

Specification forming part of Letters Patent No. **156,942**, dated November 17, 1874; application filed October 8, 1874.

To all whom it may concern :

Be it known that I, GEORGE M. PHELPS, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Magnetic Motors, of which the following is a specification:

I make use of a circular range of electro-magnets and armatures upon a revolving shaft similar to those that have before been used. My improvement relates to the circuit-closing devices of the commutator.

Difficulty has heretofore arisen from the circuit-closing devices being injured by sparks, or else from the surfaces in contact becoming coated with oxide or other non-conducting material.

My invention is made for preventing injury at the contact-closing points from the spark, and also for keeping the contact-surfaces of the commutator clean and free from any dust or other materials that obstruct the passage of the electricity, and at the same time wear is prevented.

I make use of a platinum-faced wheel revolving in oil or similar material to form one of the contact-points where the circuit is opened and closed by a lever to regulate the electric force according to the speed. The platinum surface on this lever is kept bright by contact with the revolving wheel. The commutator-springs are arranged in a circle, within which is a contact-roller that travels also in contact with a fixed ring that is of a different diameter to that of the range of contact-springs, and the contact-roller is larger at one place than the other, so that there may be a slipping motion of the surfaces in contact, and hence particles of dust and other foreign substances are rubbed off and the metallic surfaces kept clean.

In the drawing, Figure 1 is a plan of the said machine, and Fig. 2 is a vertical section of the same.

The circular range of electro-magnets *a* surrounds the armatures *b*, that are upon the vertical shaft *c*, supported at the lower end in the bed *d*, and at the upper end in the top plate *e*. The battery is connected with the insulated spring-lever *f*, that is pressed upon by the spring *f'* and insulated adjusting-screw 3, to regulate the speed, according to the force

exerted by the centrifugal lifting-weight 4 upon the cup and insulated pin 5, this centrifugal lifter and lever being similar to that in the Patent No. 19,042, heretofore granted to me. The platinum or platinum-faced wheel *h* is revolved gradually by a worm, 15, wheel 6, and gearing 7 and 8 from the shaft *c*, and this wheel *h* is placed in a box, *k*, containing oil or similar material. The platinum edge of this wheel *h* and platinum block on the lever *f* are in contact when the circuit is closed, and the turning motion of the wheel *h* keeps the surfaces clean, and there is but little friction on account of the oil. When the speed of the instrument becomes too great, the weight 4, flying outwardly by the centrifugal force as its attaching-spring bends, causes the inner end of its arm to rise and lift the center-pin 5 and lever *f*, and break contact with the roller *h*, and lessen the battery force. The charge, passing through the lever *f* and frame of the machine to the commutator, next described, goes thence through the electro-magnets successively, and leaves them by the common battery-wire *l*. The commutator-springs should equal in number that of the magnets multiplied by the armatures. Thus, with six electro-magnets and five armatures there should be thirty commutator-springs, so that each electro-magnet may be energized as the armatures come to it successively. To effect this I connect each magnet with one of the ring-segments *m*, and to each ring-segment five of the commutator-springs *s* are connected by studs passing through the frame *t* and insulated, the studs being connected, each fifth one, to the same ring-segment. The frame *t* has a circular opening in it, within which the circuit-closing wheel *n* runs. This wheel *n* is at the end of a link that is hinged to the arm *p* upon the shaft *c*, and the wheel *n* is pressed to the frame *t* by a spring, *q*, so that the frictional contact is always sufficient to turn the said wheel *n*, and it is preferable that the wheel be grooved and the frame have a rib to keep the parts exactly in position. The wheel *n* runs in contact with the ends of the circuit-closing springs *s*, and said springs yield sufficiently to bring one into contact before the other is out of contact, thereby preventing sparks, and the portion of the wheel

n that is in contact with the springs s is of a different diameter to the portion in contact with the frame.

I have shown the largest portion in contact with the springs, but it might be the reverse, the object being to cause the surface of the wheel n to slide upon the springs s as the wheel revolves, and thereby keep the surfaces clean without unnecessary wear.

It is to be understood that the wheel n closes the contact between the frame and the commutator-springs in succession, so as to charge the magnets in succession, each magnet being charged five times in the revolution of the armatures, to attract each armature at the proper time.

I claim as my invention—

1. The wheel h , revolved in oil or similar material, and forming one of the circuit-closing points, in combination with the lever f , forming the other part of the circuit-closer,

and a governor for opening or closing the circuit, according to the speed, substantially as set forth.

2. A commutator composed of a range of springs, s , and a circuit-closing wheel, n , running in contact with a circular bearing, when the said wheel is of different diameters at the two points of contact, for the purposes set forth.

3. The ring-segments m , connected by insulated studs with the circuit-closing springs s and with the electro-magnets a , in combination with a circuit-closer, n , revolving in contact with the commutator-springs s , substantially as set forth.

Signed by me this 3d day of October, 1874.

G. M. PHELPS.

Witnesses:

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