

(No Model.)

J. DOYLE.

RHEOSTAT.

No. 321,285.

Patented June 30, 1885.

Fig. 2

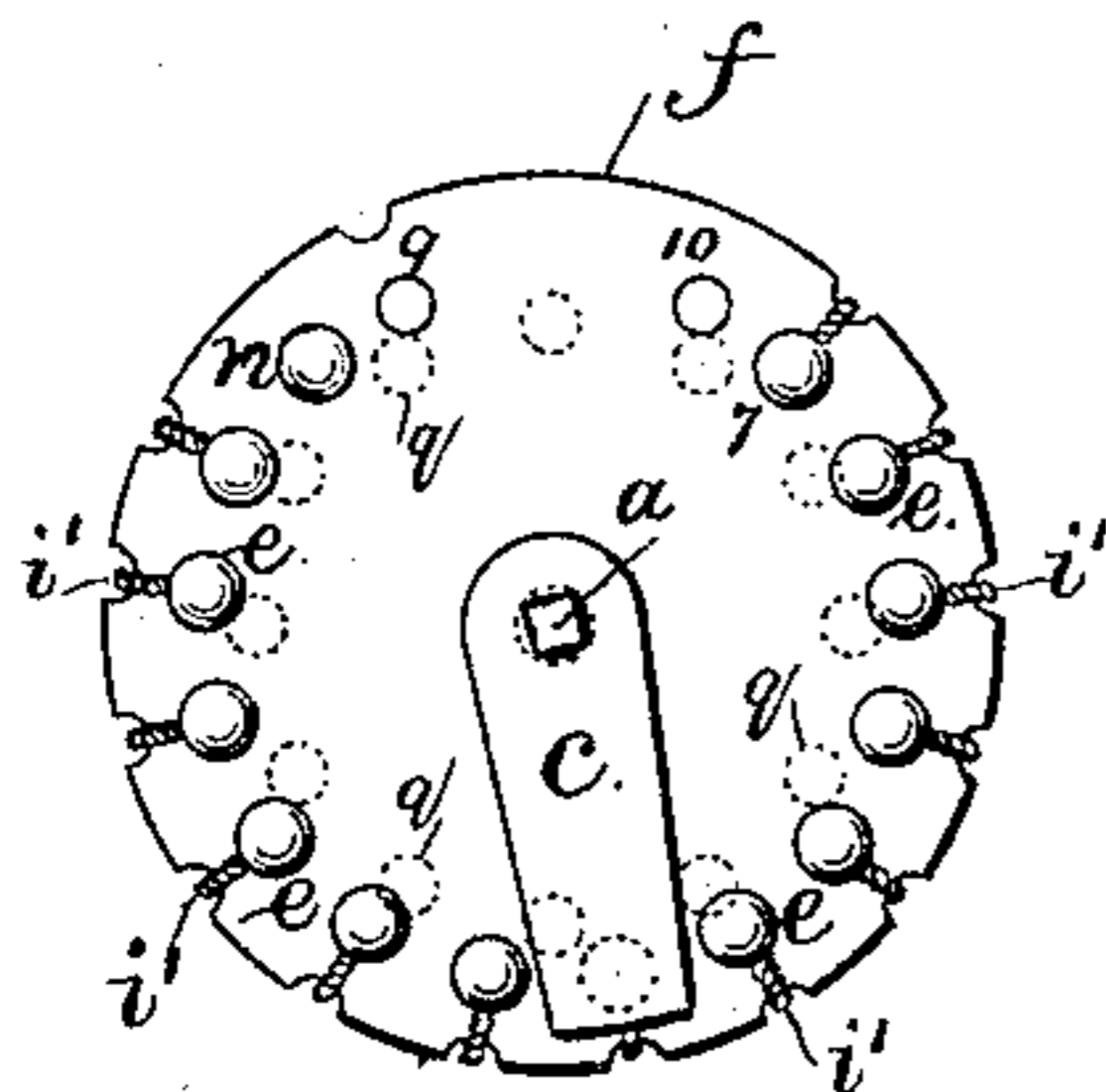


Fig. 1

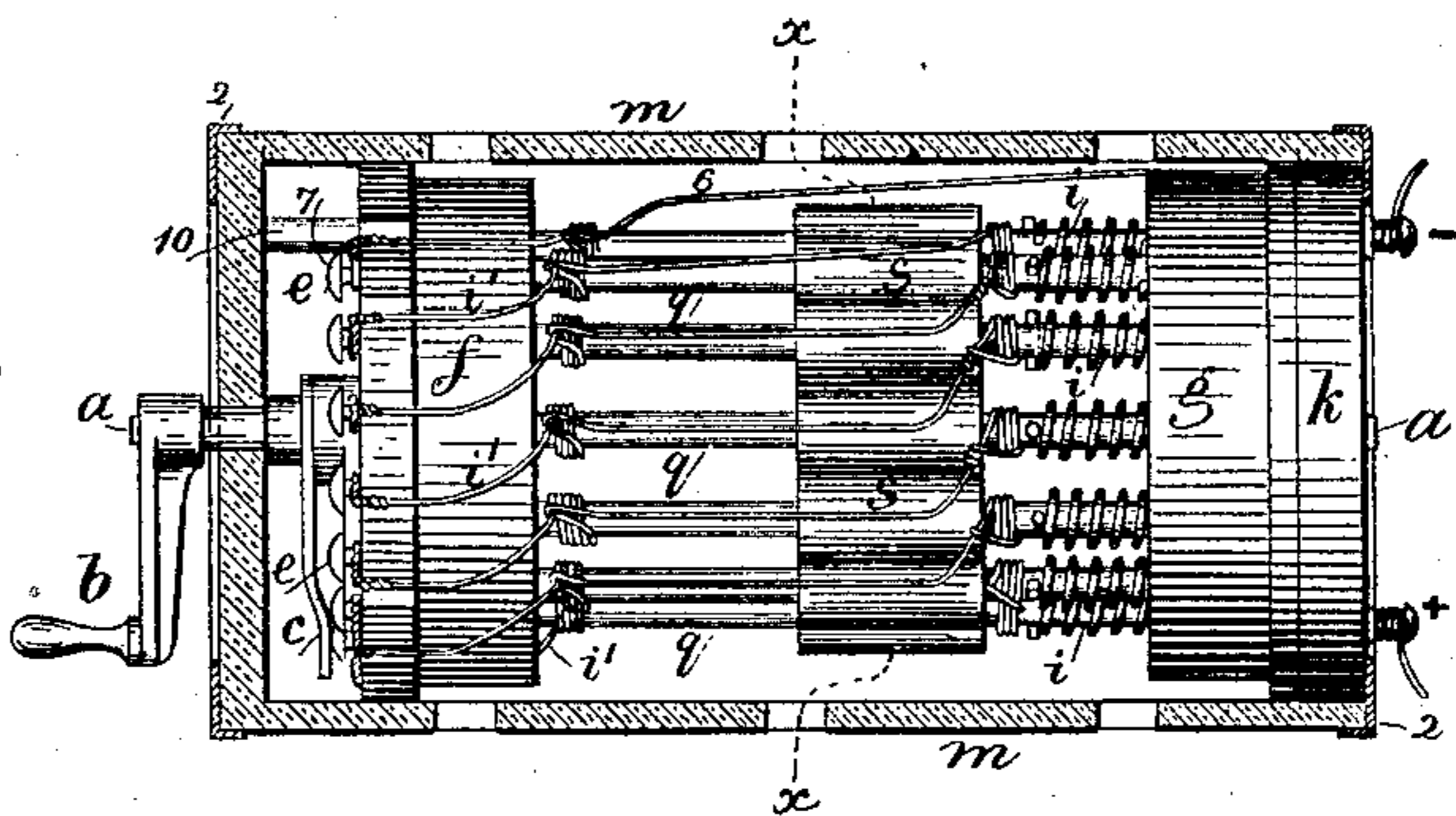


Fig. 3

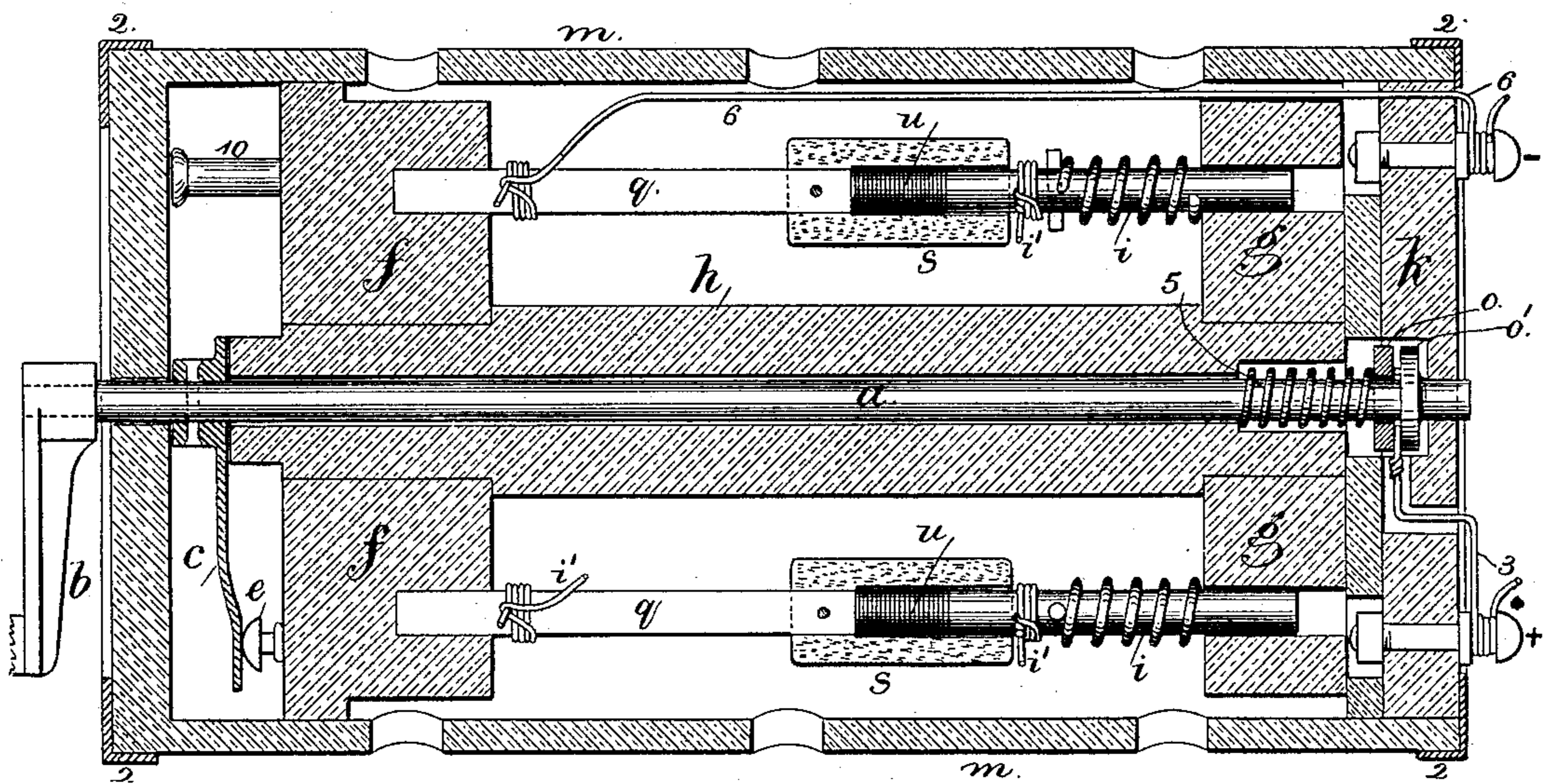
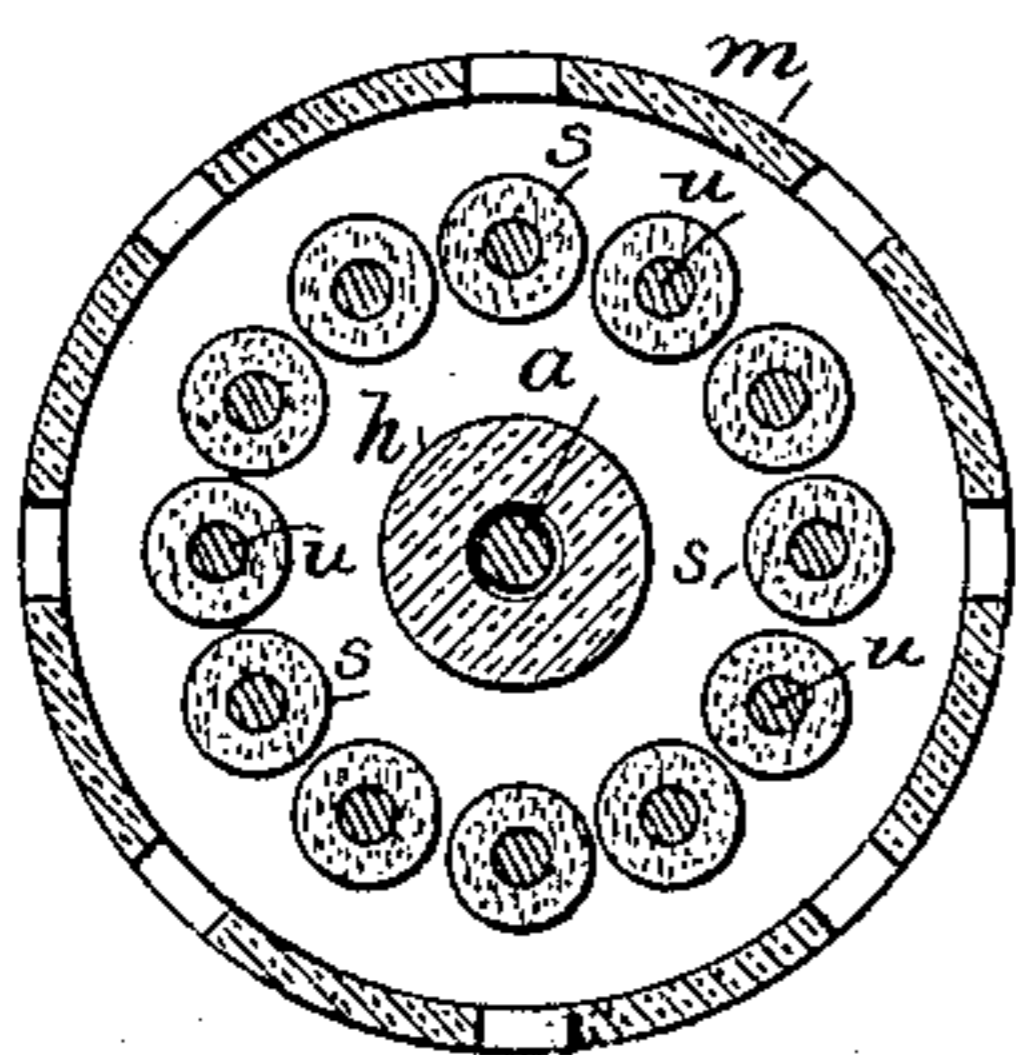


Fig. 4



Witnesses

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UNITED STATES PATENT OFFICE.

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RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 321,285, dated June 30, 1885.

Application filed December 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN DOYLE, of Hoboken, in the county of Hudson and State of New Jersey, have invented an Improvement in Rheostats, of which the following is a specification.

In Letters Patent No. 298,073, granted May 6, 1884, a rheostat is described, in which a number of small plates are placed in a non-conducting holder and pressure applied to bring the surfaces into contact, and in my application No. 126,116, filed March 31, 1884, a rheostat is represented in a circular form with a movable contact or switch.

My present invention relates to a rheostat in which the resistances are placed in a circular range and connected up in such a manner that the movement of a rotating switch or circuit-closer adds resistances successively and ultimately entirely breaks the circuit; or when turned the other way the resistances are cut out one after the other until the current is free from the resistances of the rheostat. In all cases the spark is lessened or prevented by the action of the resistances, and the instrument is within a non-conducting and fire-proof case, so that injury cannot arise from contact with the case, or from any heat generated by the resistance.

This rheostat is especially adapted to electric lamps, and can be used for varying the intensity of the same and for turning them fully on or off.

In the drawings, Figure 1 is an elevation of the rheostat, with the case in section. Fig. 2 is a view of the head and circuit-closing pins. Fig. 3 is a section of the rheostat longitudinally in enlarged size; and Fig. 4 is a cross-section at the line *x x*.

The rheostat is made with a central shaft, *a*, having a handle or pointer, *b*, at one end, by means of which the central shaft can be rotated, and with it the circuit-closer *c*, and there is a circular range of contact-studs, *e*, in a head, *f*, of insulating material, over which studs *e* the closer *c* is moved. This closer *c* is wide enough to rest upon two studs, so as to make contact with the second before separating from the first, and thereby the development of sparks is prevented.

There is a second head, *g*, of insulating ma-

terial, between which and the head *f* there is a circular range of resistances, and the heads *f* and *g* are connected by a central column, *h*, through which the shaft *a* passes.

There is a head, *k*, preferably of asbestos paper, and a case, *m*, of similar material, surrounding the rheostat, and this case *m* is preferably perforated, so as to allow atmospheric air to circulate through the same, and this case is usually ornamented with a vitrified surface and with metal rims 2 2 to connect the cylindrical portion to the heads.

One wire, 3, is attached to the central shaft, *a*, by being wound around the same between the collars *o o'*. One collar is fixed on the shaft, and the spring 5 presses the other collar against the wire to insure electric contact. The circuit-wire 3 may be received at the binding post or stud +. The other circuit-wire, 6, is connected to the head or case and passes to the stud 7, so that when the circuit-closer *c* is in contact with 7 the current passes from + through 3, shaft *a*, to closer *c*, thence by 7 and wire 6 to lamp or other working device.

The wires *i'* pass in succession from one of the studs *e* in the circular range of contact-studs to one end of one resistance and to the other end of the next resistance all the way around the circular range of resistances, as seen in Fig. 1, so that these resistances are added in succession into the circuit by turning the closer around and moving it away from the stud 7, and when the closer has been moved around the circular range it passes off the last stud in the electric circuit upon an insulated stud, *n*, and the circuit is thereby broken. There will be little or no spark, because the resistances check the current before the circuit is broken. The screws or pins 9 10 form stops to the movement of the circuit-closer.

Each resistance is made with the metallic end pieces, *i* and *q*, and intermediate inferior conductor. I prefer to employ the tube *s*, of porcelain or similar material, with the disks of German silver, *u*, or equivalent material, within such tube and between the end pieces, *i q*, and in order to apply a pressure to the pieces *u*, I apply a spring around the end piece, *i*, abutting against a cross pin or collar upon *i* and resting at the other end against the head *g*.

In place of disks of German silver to form

the resistance, plumbago or a composition of plumbago and borax, as in my said application, or any other suitable material, may be made use of.

5 The range of resistances may contain any desired number, each being made as aforesaid, and although it is most convenient to place such resistances in a circular range, I do not limit myself in this particular.

10 The pressure endwise upon the rods or bars *i* may be obtained by screws, instead of the springs.

I do not claim a holder for pieces or plates of carbon and a turning-key and presser for 15 causing the more or less intimate contact of the pieces of carbon.

I do not claim a range of carbon plates and screws or springs to compress them more or less.

I claim as my invention—

20 1. The combination, with the central shaft, *a*, and circuit-closer, of the heads *f* and *g* and connecting column *h*, the range of resistances around the central column, the circular range

of contact-pins, and the circuit-connections, substantially as set forth. 25

2. The combination, in a rheostat, of a range of resistances, each of which is composed of metallic pieces of inferior conductivity, non-conducting holders for the same, circuit-wires for connecting the resistances in series, contact-pins, and a movable switch for bringing 30 into the electric circuit more or less of the resistances, substantially as specified.

3. The combination, with the case *m* and heads *f* and *g*, of the connection between the 35 heads, the range of resistances supported by the heads *f* and *g*, the shaft *a*, extending from the head *g* to the head *h*, and a circuit-closer and handle, substantially as set forth.

Signed by me this 4th day of December, A. 40 D. 1884.

JOHN DOYLE.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.