

(No Model.)

A. C. CAREY.
RHEOSTAT.

No. 539,216.

Patented May 14, 1895.

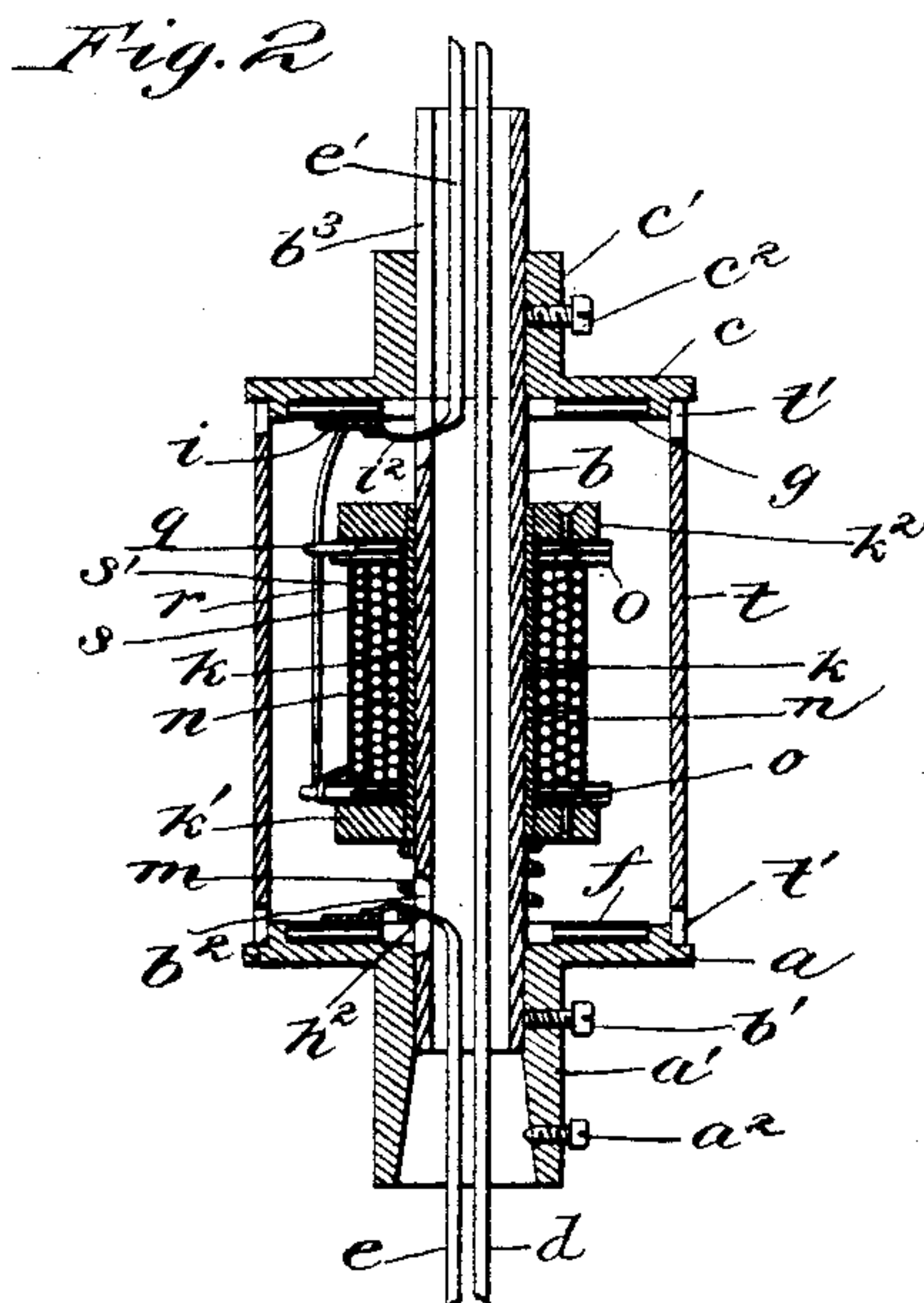
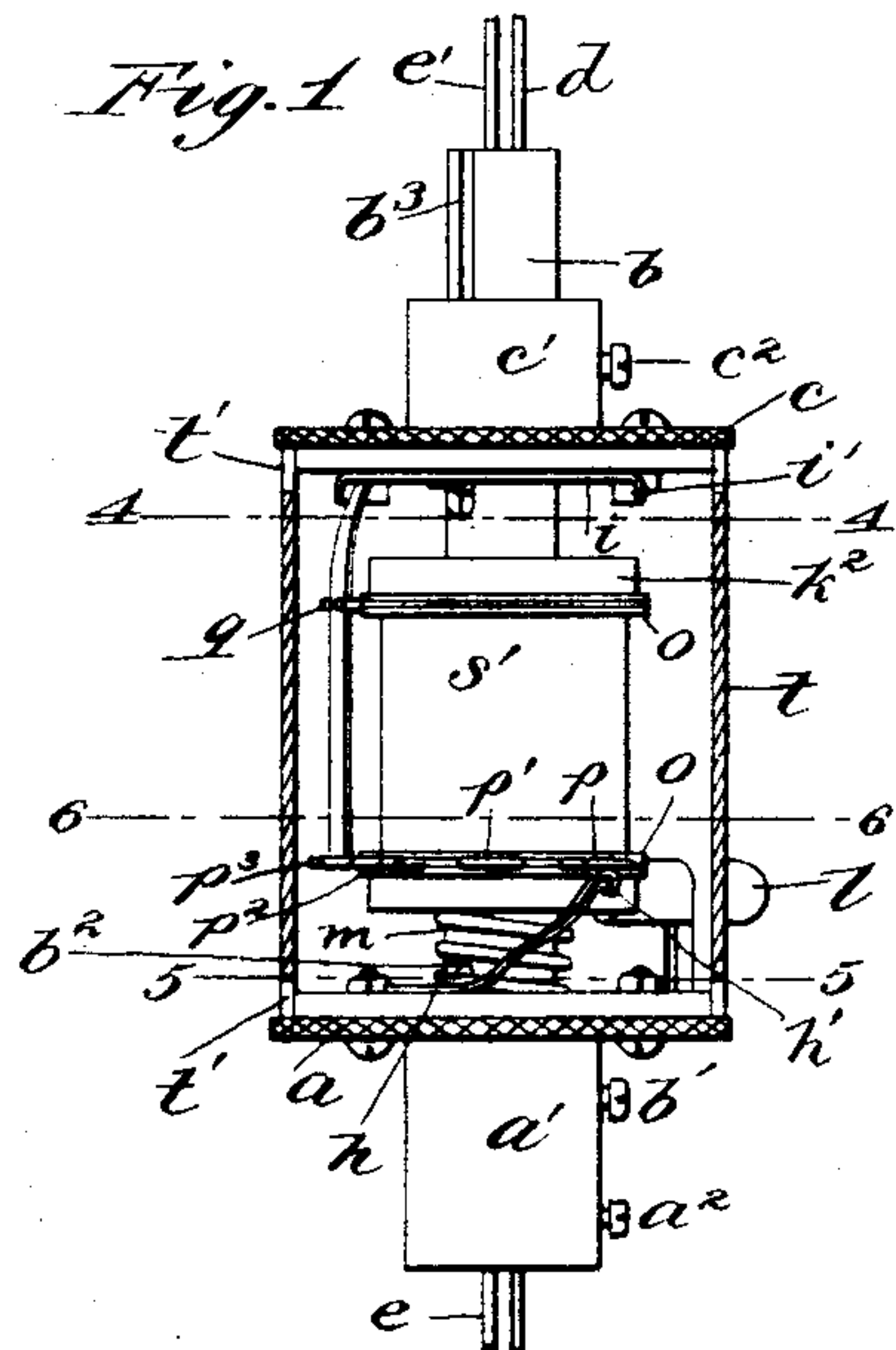


Fig. 4

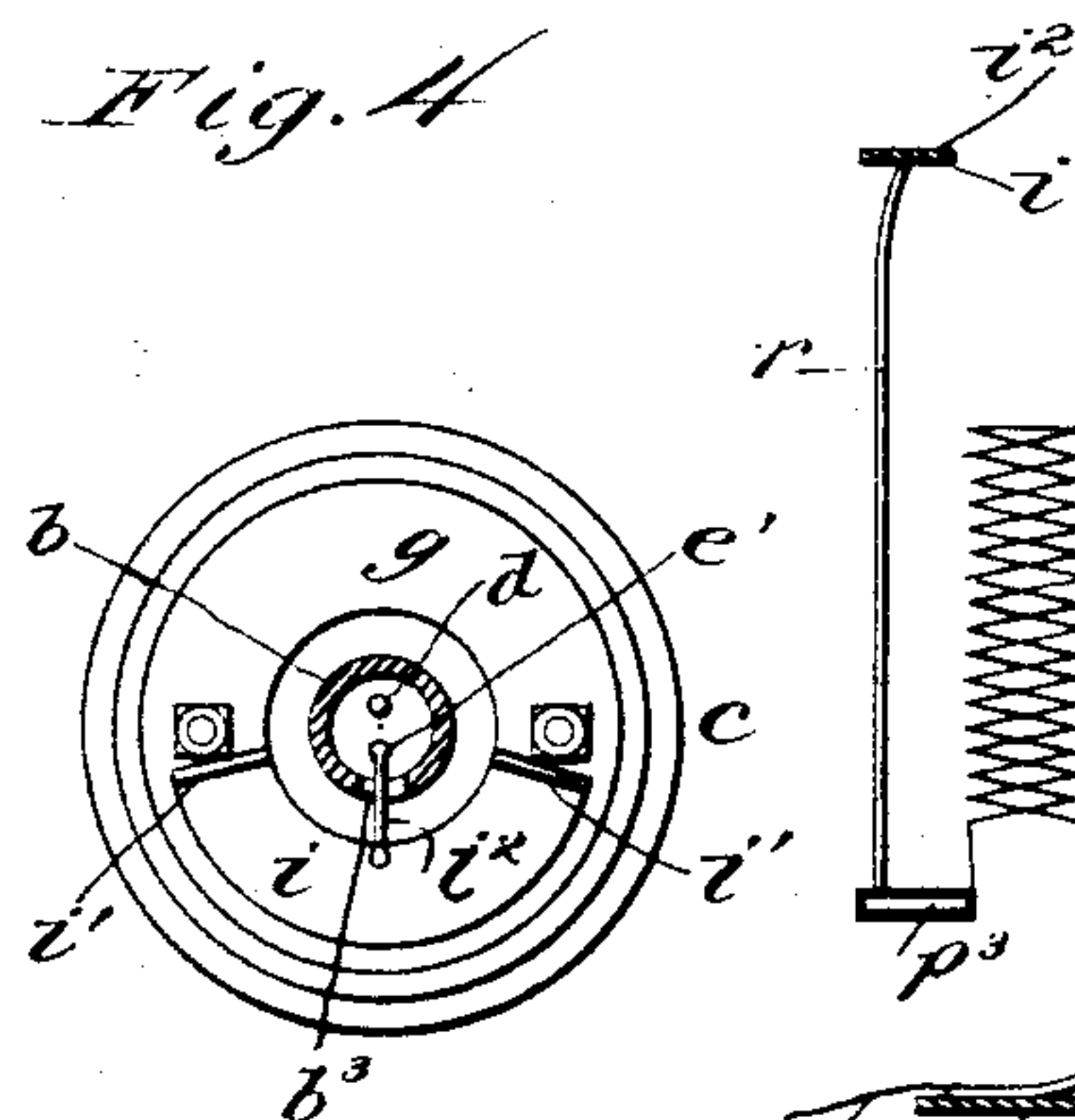


Fig. 3

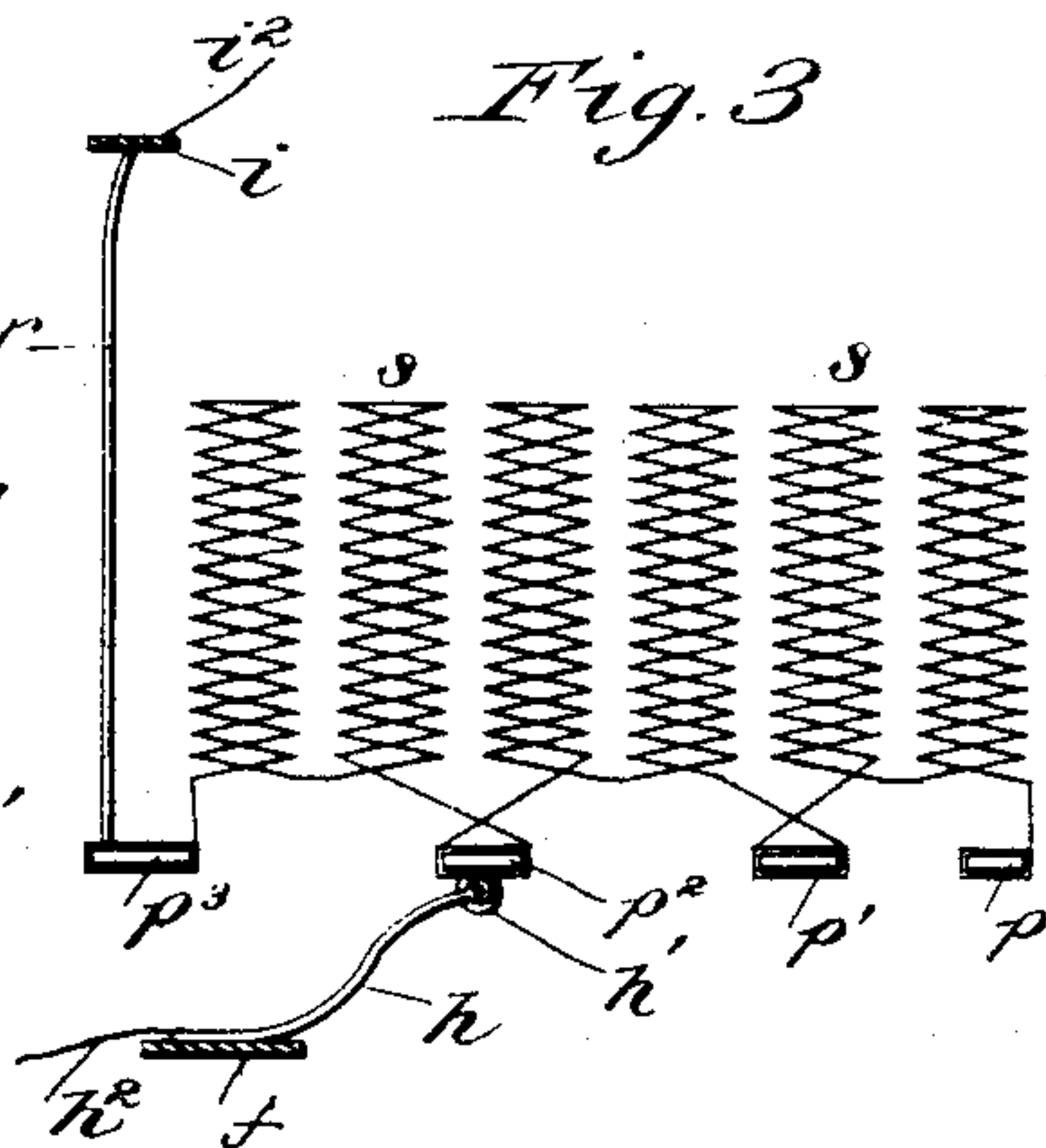


Fig. 5

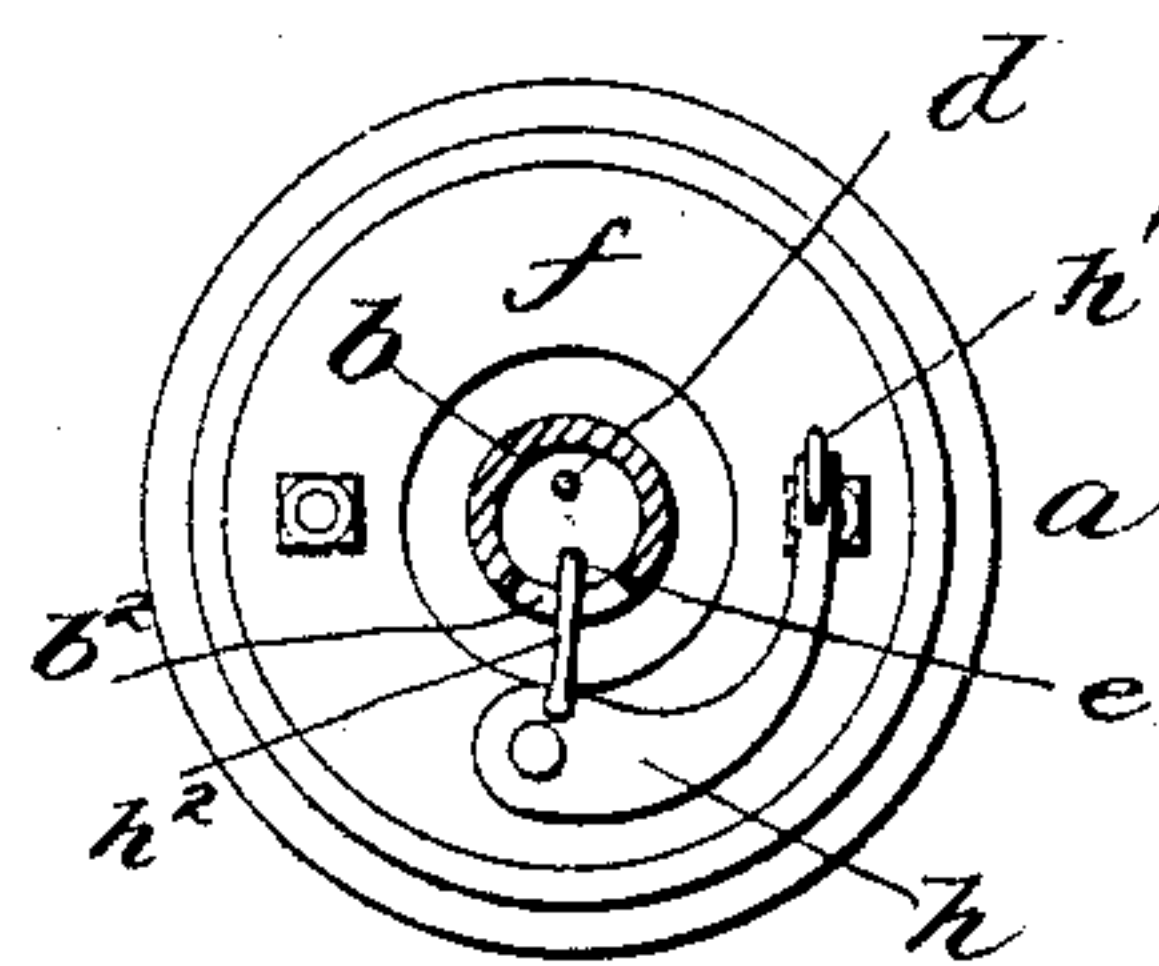
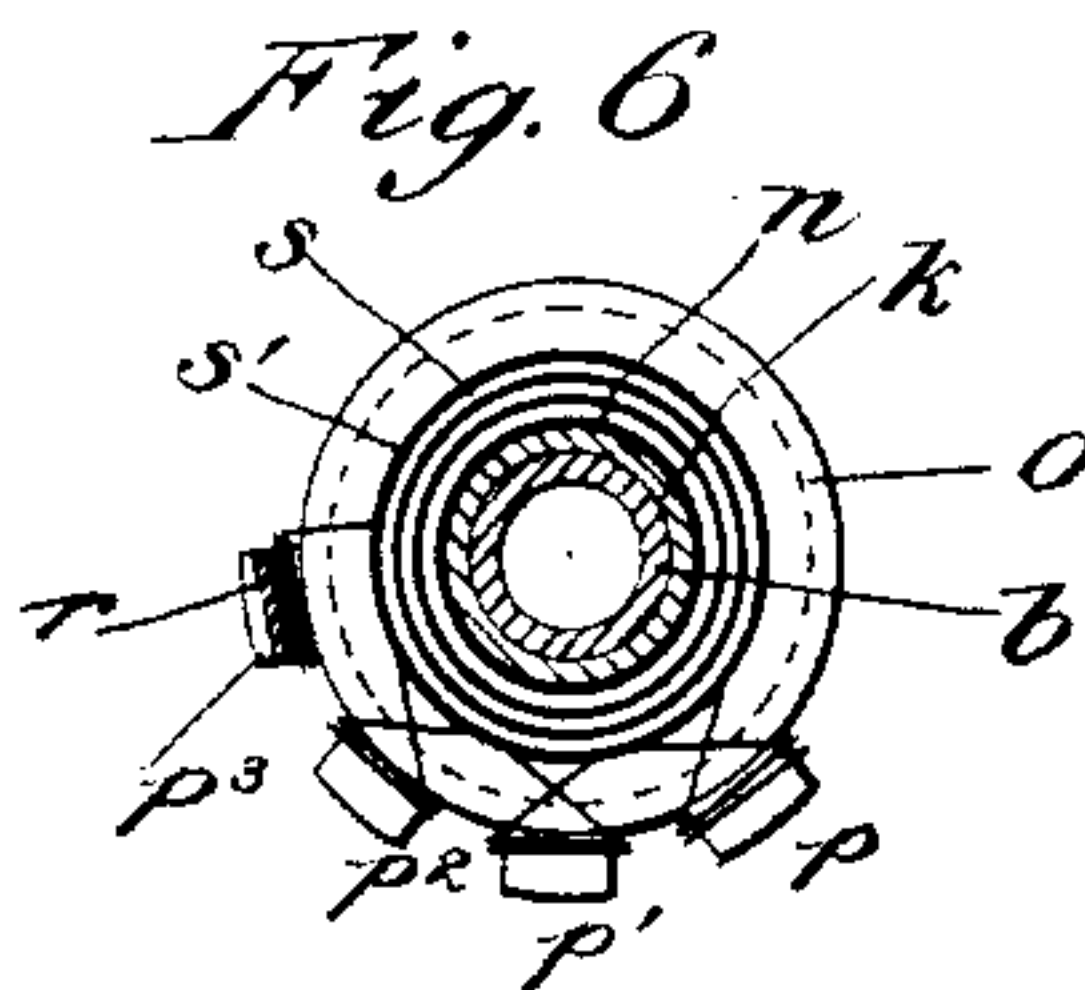


Fig. 6



Witnesses

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UNITED STATES PATENT OFFICE.

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RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 539,216, dated May 14, 1895.

Application filed February 26, 1895. Serial No. 539,779. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS C. CAREY, a citizen of the United States, residing at Lake Pleasant, in the county of Franklin and State of Massachusetts, have invented a certain new and useful Improvement in Rheostats, of which the following is a full, clear, and exact description.

This invention relates more especially to the construction of the wire-holding spool, and the laying on of the wire and insulating and protecting it. The spool has a body of metal and an insulating barrel and heads of mica, or other refractory and insulating material, and the wire is wound thereon in layers, which layers and the various turns of wire thereof are insulated from each other. The invention comprises these main and other minor features of construction, as hereinafter described and claimed.

In the accompanying drawings, illustrating this invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation; Fig. 2, a vertical section. Fig. 3 is a diagram illustrating the winding of the spool. Fig. 4 is a cross-section on line 4 4, Fig. 1, showing the under side of the top head of the rheostat. Fig. 5 is a cross-section on line 5 5, Fig. 1, showing the upper side of the lower head; and Fig. 6 is a cross-section on line 6 6, Fig. 1.

The lower head *a* is made with a hub or boss *a'*, the interior of which is made tapering so as to be frictionally fitted to an electrolier or other fixture without the necessity of turning the rheostat, thus avoiding the danger of twisting the conductors. A set screw *a²* may be used to fix the rheostat in position. A central tube *b* is secured in the boss *a'* by a set screw *b'*. The top head *c* is made with a boss *c'*, which is fitted to the tube *b*, as by a set-screw *c²*. The tube *b* extends beyond the boss *c'* sufficiently far to admit of the lamp or other object being securely fitted thereto in any suitable manner.

d is the return or leading-out conductor. The leading-in conductor *e, e'* is divided so as to include the rheostat, the part *e* extending from the distributing plant to the rheostat and the part *e'* extending from the rheostat to the lamp or other object to be supplied.

These conductors are arranged within the tube *b*.

The adjacent faces of the heads *a* and *c* are supplied with one or more layers (flat rings) of mica, *f, g*, or other appropriate refractory and insulating material, which may be riveted or otherwise secured thereto.

The head *a* has secured to its mica lining the contact spring *h*, which I prefer to provide with a roller contact *h'*, and this spring is connected by wire *h²* with the leading-in wire *e*, said wire *h²* extending through a hole *b²* into the tube *b*. The head *c* is provided with a contact plate *i* applied to the mica lining, and having its ends *i'* turned down to form stops. This contact plate is connected by wire *i²* passed through a slot *b³* in the tube *b*, with the leading-out section *e'* of the divided leading-in wire *e, e'*.

The spool containing the rheostat or resistance wire is composed of a metallic barrel *k* and heads *k', k²*, arranged to be revolved about the tube *b*, a knob or handle *l* being applied to the head *k'* for this purpose. The spool may be supported so as to be thus freely revolved, upon a coiled spring *m*, interposed between it and the lower head *a* and encircling the tube *b*.

The barrel of the spool is provided with a tube or jacket *n*, of mica or other refractory and insulating material, and the adjacent faces of the metallic heads, *k', k²*, are provided with a series, three, more or less, of mica rings *o*, which may be secured to such heads in any suitable manner. I prefer to use a series of three rings and securely rivet the spool next adjacent to the metallic heads to such heads, leaving the internal ring free. A series of contact pieces *p, p', p², p³*, more or less, are secured to an intermediate one of the mica rings *o* in any suitable manner, and a contact piece *q* is secured similarly to the mica rings of the upper head of the spool, and the contact pieces *p³* and *q* are connected by a connecting strip or finger *r*, which is secured to each and extends thence above the spool and into wiping contact with the contact plate *i* of the upper head of the rheostat, the projections *i', i'*, of such contact plate forming stops to limit the movement of the spool by arresting the movement of the finger.

The spool is wound with wire, s , in insulated layers, and I prefer to wind the spool in the following manner, referring more especially now to diagram Fig. 3: I prefer to use silk-covered German silver wire, and the naked portion thereof is first secured to the contact piece p , and is then wound about the spool from one end to the other and coated with a coating of liquid cementitious matter of refractory and insulating nature, s' . I have found an efficient mixture for this purpose to consist of water-glass and finely powdered chalk of proper consistence to spread easily. This cement is thoroughly applied to the layer of wire so as to cover it externally and to enter in between its turns; and after so coating the layer, the winding is continued to the starting point, and another layer of cement applied, and then another layer of wire and another layer of cement, and finally, the fourth layer of wire and fourth layer of cement; and the wire is then stripped of its silk covering for a short distance and the naked portion wound once or more around the contact p' , the naked wire having been passed to the far side of said contact to begin the winding, and then a second winding of four layers of wire with interposed cement is placed upon the spool and the silk covering again stripped from the wire and the wire wound about contact p^2 , and another turn of four layers of wire applied to the spool alternating with layers of cement, and the end of the wire is then finally stripped and wound around the contact p^3 in such manner as to be in intimate union with the finger or strip r . Care should be taken that the cement be thoroughly dried, otherwise there is danger of short circuiting.

In Fig. 2, for clearness in the drawings, I have shown three layers of wire, but it is to be understood that each of these layers represents in point of fact four turns of the wire, as just described, and the same is true of Fig. 6.

The operation is obvious, but it may be stated that if the contact roller h' be brought into contact with the contact p , the current will pass through the four layers of wire first wound on to the spool and go thence to contact p' , and then through the second four layers of wire to contact p^2 , and then through the final four layers of wire to contact p^3 , and thence through the strip or finger r to contact plate z , and so on to the lamp, thus putting in the full measure of resistance. Any less measure of resistance may be included in the circuit by moving the spool so as to place one or the other of contacts p' or p^2 , in engagement with the contact roller h' . If the contact piece p^3 be placed in engagement with the contact roller h' , obviously the current goes directly therefrom through the finger r to the lamp; and so, also, obviously, if the spool be turned so as to move its contact piece p beyond the contact roller h' , (to the right, Fig. 3,) then the current is shut out from the lamp or other object altogether. Thus the rheostat may be used not only for purposes

of resistance, but also to turn on and off the current from the object to be supplied.

An outer casing t may be applied between the heads a and c , and said casing may be provided with openings t' , t'' , for purposes of ventilation.

What I claim is —

1. In a rheostat having heads or ends, a central tube upon which they are mounted and through which the main conductors pass, refractory and insulating linings for the adjacent faces of said heads, contact devices applied to such linings and connected with the leading-in conductor, and a rotary spool provided with a series of layers of wire insulated from one another and from the spool and provided with contacts for inclusion in the main circuit, substantially as and for the purpose described.

2. In a rheostat having heads or ends, a central tube upon which they are mounted and through which the main conductors pass, refractory and insulating linings for the adjacent faces of said heads, contact devices applied to such linings and connected with the leading-in conductor, and a rotary spool arranged upon such tube between the heads and having a jacket of refractory and insulating material, a series of layers of wire insulated from one another, and contacts for including such layers of wire in the main circuit, substantially as described.

3. In a rheostat having heads or ends, a central tube upon which they are mounted and through which the main conductors pass, refractory and insulating linings for the adjacent faces of said heads, contact devices applied to such linings and connected with the leading-in conductor, and a rotary spool having a barrel and heads of metal jacketed with a refractory and insulating material, such as mica, a series of layers of wire wound about such jacketed spool and insulated from one another, and a series of independent contacts for including any number of such layers of wire in the main circuit, substantially as described.

4. In a rheostat having heads or ends, a central tube upon which they are mounted and through which the main conductors pass, refractory and insulating linings for the adjacent faces of said heads, contact devices applied to such linings and connected with the leading-in conductor, and a rotary spool having an inner jacket of refractory and insulating material, a series of layers of wire arranged upon such jacketed spool and insulated from one another and means to cut into and out of the main circuit any number of such layers of wire, substantially as described.

In testimony whereof I have hereunto set my hand this 23d day of February, A. D. 1895.

AUGUSTUS C. CAREY.

Witnesses:

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WALTER S. ROBINSON.