

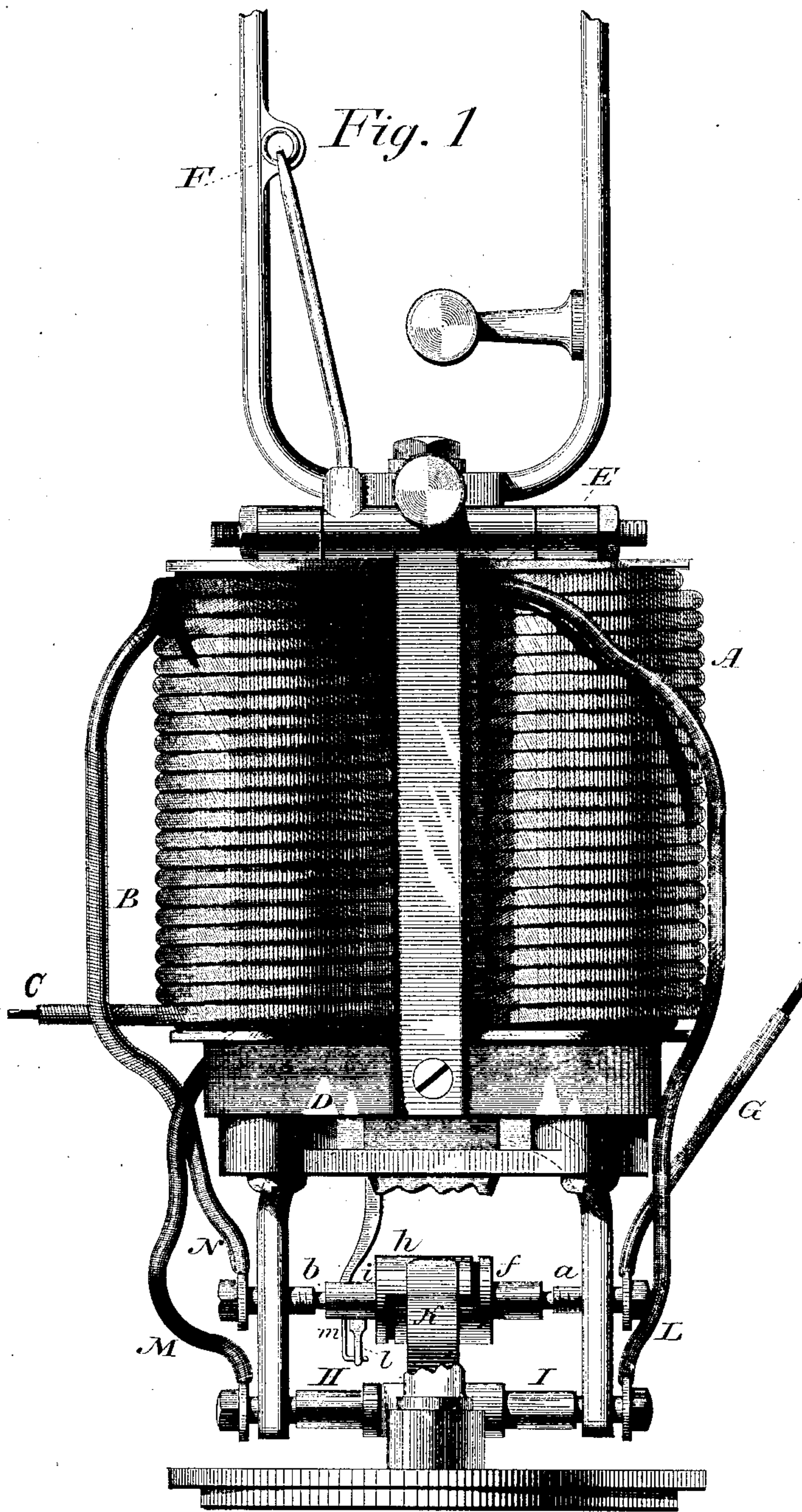
(No Model.)

3 Sheets—Sheet 1.

N. McCARTY.  
ELECTRIC ARC LAMP.

No. 308,620.

Patented Dec. 2, 1884.



Witnesses  
J. H. Shumway  
J. C. Carle

Norman M. Carty  
Inventor  
By atty.  
J. M. H. H. H.

(No Model.)

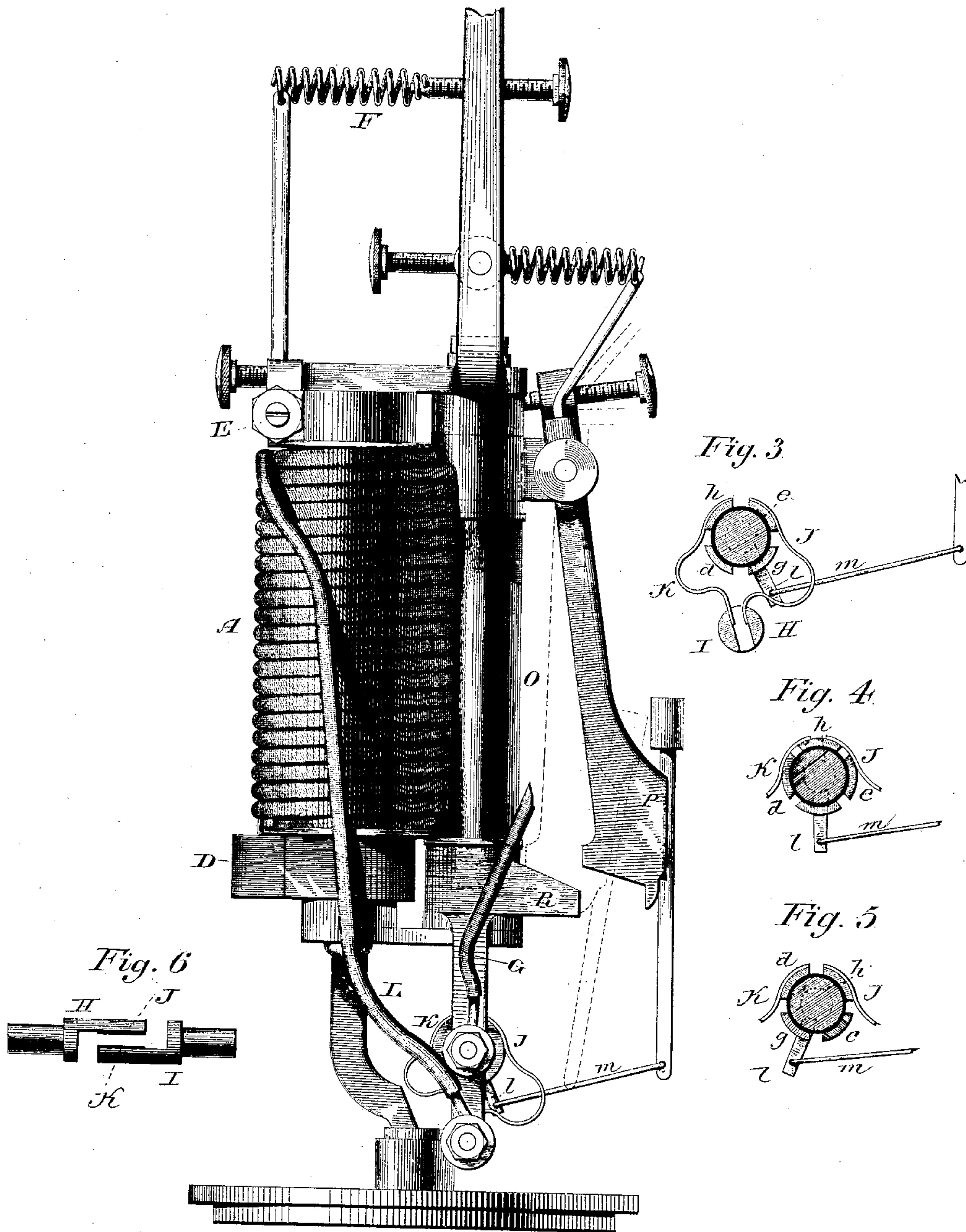
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*Fig. 2*



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(No Model.)

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Fig. 7

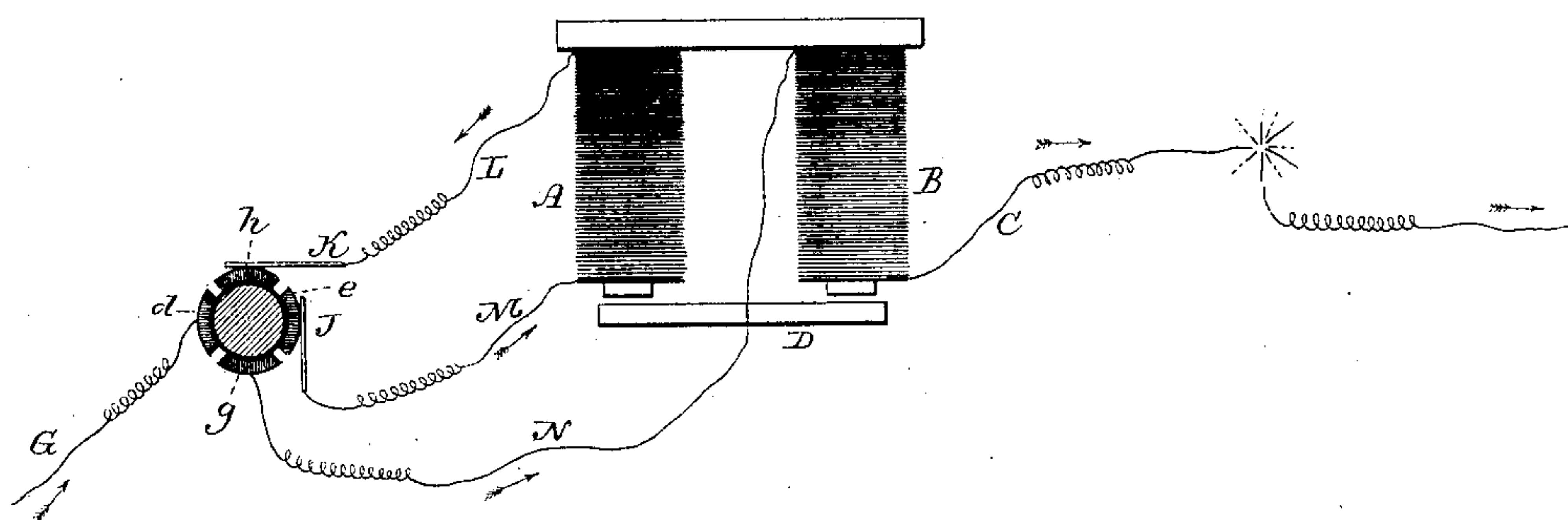
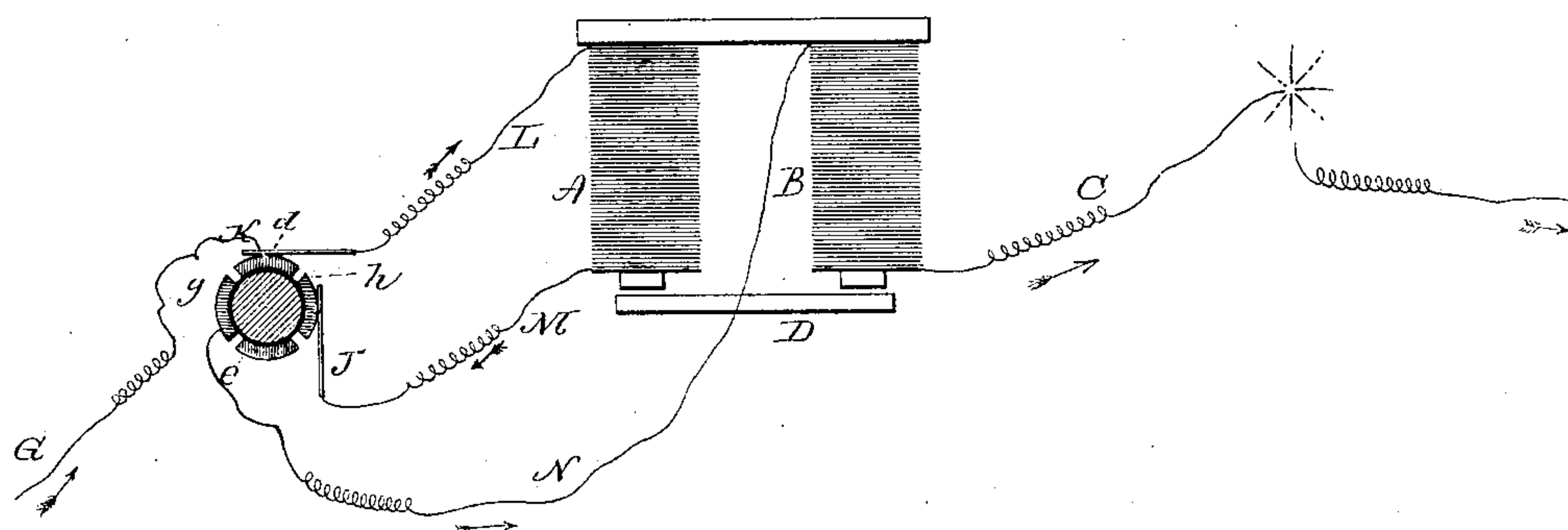


Fig. 8



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# UNITED STATES PATENT OFFICE.

NORMAN McCARTY, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE ELECTRICAL SUPPLY COMPANY, OF ANSONIA, CONNECTICUT.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 308,620, dated December 2, 1884.

Application filed February 2, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, NORMAN McCARTY, of Brooklyn, in the county of Kings and State of New York, have invented a new Improvement in Electric-Arc Lamps; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view looking toward the principal magnet, the supporting-arm between the base and the principal magnets broken away to show the commutator; Fig. 2, a side view, parts broken away for convenience of illustration; Figs. 3, 4, 5, and 6, detached views to illustrate the construction and working of the commutator; Fig. 7, a diagram illustrating the circuit in the normal or working condition; Fig. 8, a like diagram showing the circuit as reversed by the commutator.

This invention relates to an improvement in electric-arc lamps.

The object of the invention is the introduction of a commutator controlled by a shunt-magnet or its equivalent, which will cause the commutator to revolve whenever the arc gets beyond a fixed limit, and whereby the direction of the current through the principal magnet may be reversed to cause one leg of the magnet to neutralize the other, and whereby the armature of the principal magnet will be instantly released to cause the carbons to come together, and in such a device, as more fully hereinafter described, and particularly recited in the claim, my invention consists.

The arrangement of the carbon-holders, levers, and clutch mechanism is substantially the same as in the patent granted to me November 14, 1882, No. 267,553, and they do not require to be particularly described in this specification, as they constitute no part of this present invention. The invention, however, is applicable to other clutch and feeding mechanism.

A represents one leg of the principal magnet, through which the current is received; B, the other leg of the same magnet, and from which the current passes to one carbon through

the wire C from the lower end of the leg or coil B; D, the armature hung above upon a hinge, E, and provided with the usual adjusting-spring, F. Below the magnets is the commutator, arranged between bearings *a b*, and so as to turn freely thereon. The one part is composed of two bars, *d e*, connected across the end *f*, and with the bearing *a*, electrical connection being made between the bearing *a* and the two bars *d e*. The other part is composed of two bars, *g h*, intermediate between the bars *d e*, and connected at the end, as at *i*, and in electrical connection with the bearing *b*, the bars of one part being insulated from the bars of the other part, as in the usual construction of commutators. The incoming line G is in connection with the bearing *a* and the two bars *d e* of the commutator. Below the commutator are two horizontal bars, H I. To the one bar, H, a brush, J, is attached that lies upon the bar *e* in the normal condition of the commutator. From the other bar, I, a brush, K, extends, and lies upon the bar *h* in the normal condition of the commutator.

To the bar I the upper end, L, of the coil A is attached. To the bar H the other (that is, the lower) end, M, of the same coil, A, is fixed.

To the bearing *b* of the commutator the upper end, N, of the other coil or leg, B, is attached.

O is the shunt-magnet, P its armature. From the commutator-shaft an arm, *l*, extends radially, and from this arm a connection, *m*, is made with the armature P. In the normal condition the armature of the shunt-magnet stands away from its pole R, and the armature D is in connection with the poles of the principal magnet, as seen in Fig. 2.

To better illustrate the working of the commutator, I make a diagram Fig. 7. The current enters by the wire G, and making contact through the bars *d e* with the brush J the current passes from the brush J through the wire M to the coil A; thence up through the coil, and from the upper end, L, of the coil to the brush K in connection with the bar *h* of the commutator, and from that bar *h* to the opposite bar, *g*; thence through the wire N to the upper end of the other coil or leg, B, down through that coil and out through the other end, C, to the carbon, the direction of the cur-



rent being indicated by arrows. In this circuit the armature D is drawn to its poles. The clutch is operated in the usual manner to form the arc. In this condition the parts will stand  
 5 until the arc gets beyond the established limit. Then the current will increase through the shunt-magnet in the usual manner, to close the armature P, as seen in broken lines, Fig. 2. The armature P, in thus closing, through  
 10 its connection *m*, turns the commutator as from the position seen in Fig. 3 to that seen in Fig. 5, to bring the bar *h* into contact with the brush J, and the bar *d* into contact with the brush J, as seen in Figs. 5 and 8. Now  
 15 the incoming current, instead of being directed through the brush K and up through the leg A, as before, and thence to return to the brush K, is reversed—that is, the incoming current passes through the brush K to the upper end  
 20 of the leg or coil A, and returns down through the coil to the brush J in the opposite direction, and thus reverses the direction of the current and causes one leg to neutralize the other. This is the extreme action.  
 25 The feeding of the carbons may be accomplished by simply causing the commutator to revolve until both brushes bear on the same bar of the commutator, in which position the current passes from one brush to the other  
 30 without passing through the leg A, which cuts that leg out of the circuit, but does not break the circuit through the carbons. This is always the first stage of the action of the commutator. If the main armature does not let  
 35 go at this stage the shunt will pull harder and reverse the current through the leg A and force the main armature from its poles. To avoid this reversing of the current, it is only necessary to make the movement of the arma-  
 40 ture of the shunt-magnet so much less that it will turn the commutator, say, as from the

position in Fig. 3 to that in Fig. 4, to bring the bars of both sets of the commutator-arms into joint contact with the respective brushes.

In the diagram, Fig. 7, I have illustrated 45 the wires G N as in actual contact with the bars *d g* of the commutator, and in Fig. 8 with the bars *g e* of the commutator. I do this for convenience of illustration, the connection between these wires and the commutator being 50 shown in the other figures.

I claim—

The combination of the principal and shunt magnets and the commutator in connection with the shunt-magnet, whereby in the closing 55 and opening of the armature of the shunt-magnet a partial rotation is imparted to the commutator, said commutator composed of two sets of bars, one set in connection with the incoming line, the other in connection 60 with one end of the coil of one leg of the principal magnet, the other end of the coil of said leg leading outward to the carbon, and a pair of brushes, one of which is in connection with one end of the coil of the second leg of the 65 principal magnet, and the other in connection with the other end of the coil of said second leg, the said brushes arranged the one to bear upon one set of bars and the other upon the other set of bars, whereby in the working con- 70 dition the incoming current passes through the commutator and the respective legs or coils of the magnet to the carbon, but so that upon the closing of the shunt-magnet the commutator is turned to reverse the relation of the 75 bars to the brushes, and whereby the current is reversed through one leg of the magnet, substantially as and for the purpose described.

NORMAN McCARTY.

Witnesses:

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 NOBLE PHILLIPS.