(No Model.)

N. McCARTY.

ELECTRIC ARC LAMP.

No. 305,096. Patented Sept. 16, 1884.

Fig. 1

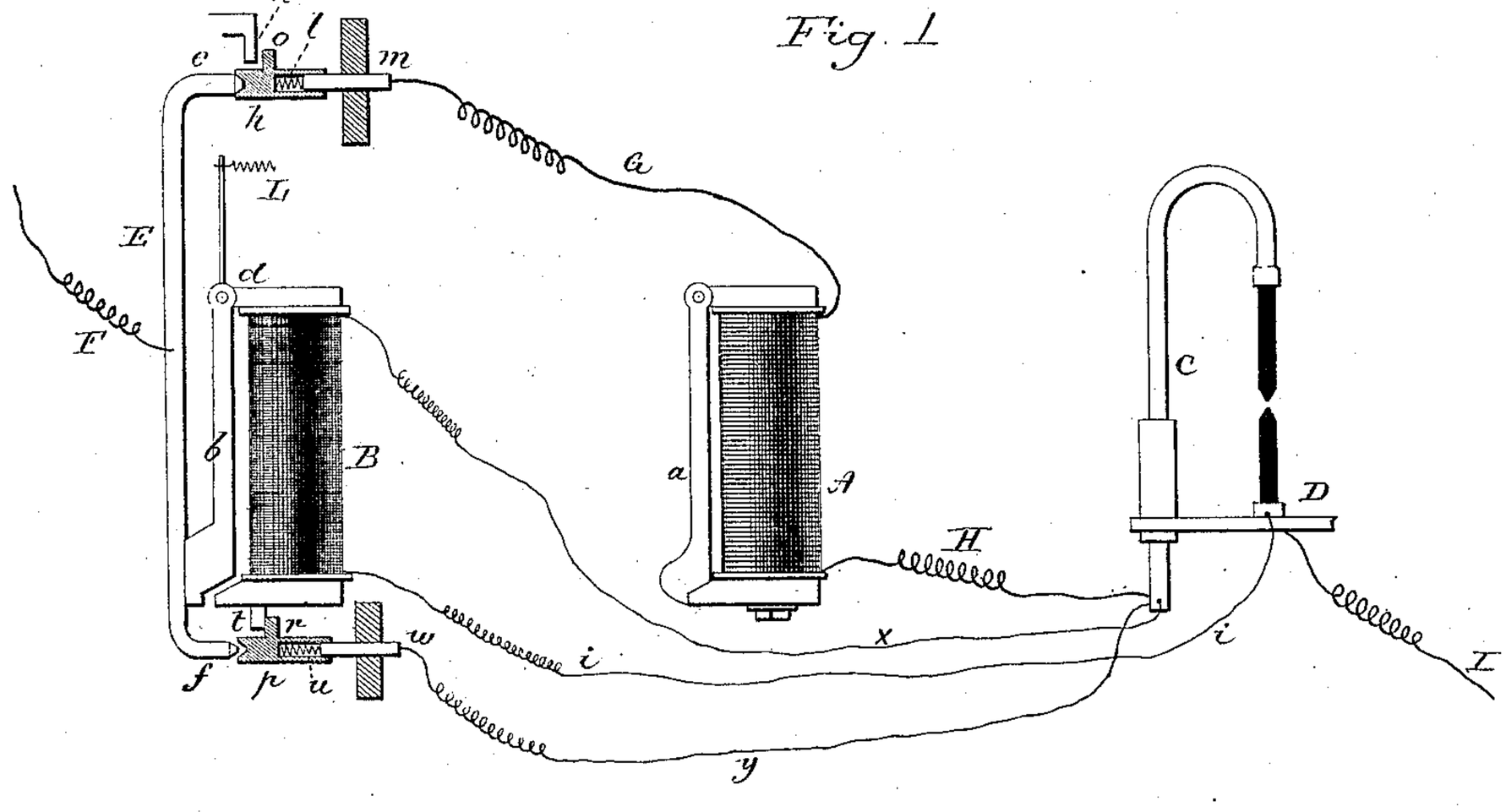


Fig. 2

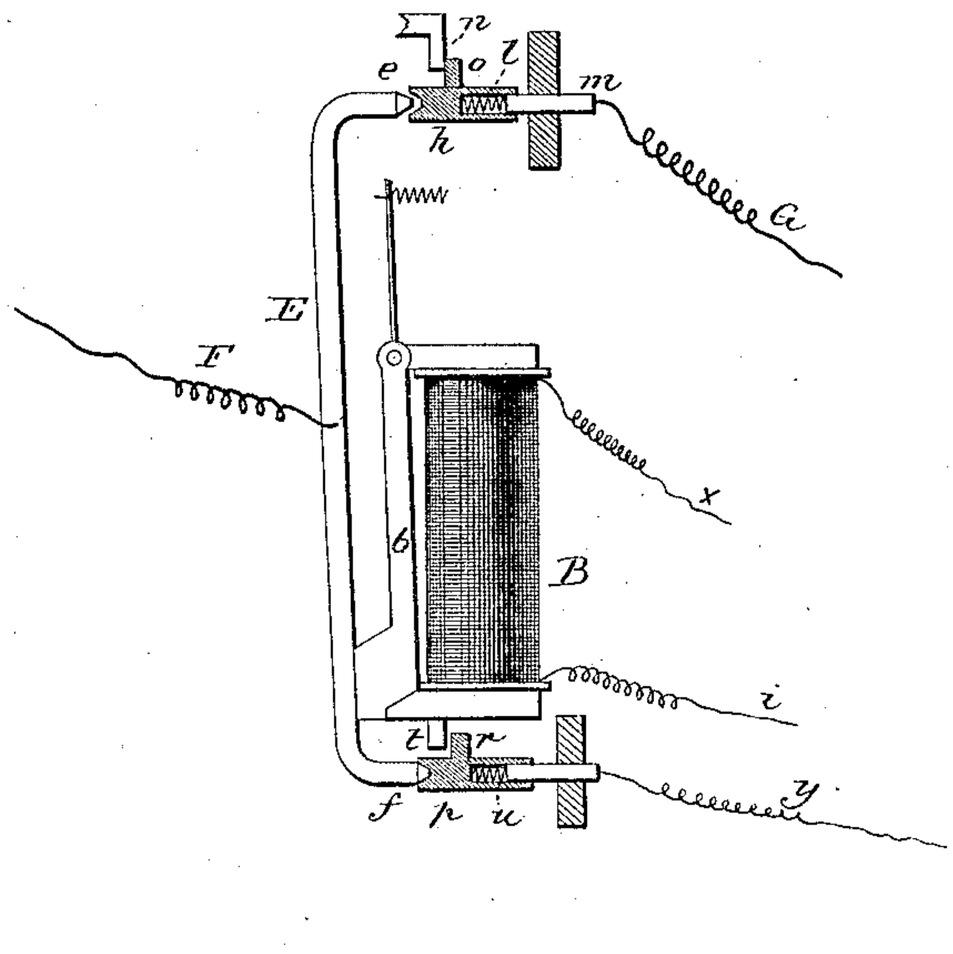
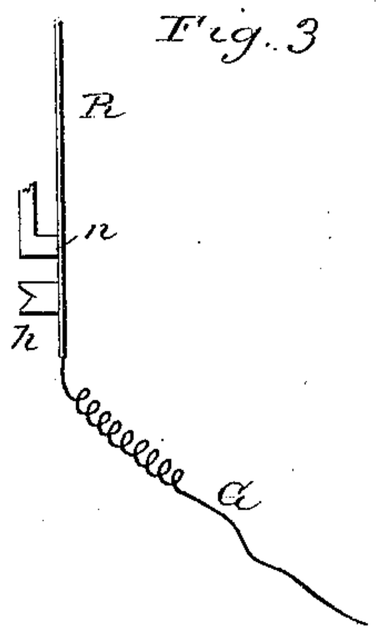


Fig. 3



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UNITED STATES PATENT OFFICE.

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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 305,096, dated September 16, 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 side view showing the principal magnet, carbon-holders, and the shunt-magnet, with my improvement in connection with said shunt-magnet, the parts in position of the main circuit closed; Fig. 2, the shunt-magnet and my improvement in connection therewith in a position of the main circuit broken and the shunt-circuit closed. Fig. 3 represents a modification of the blocks *h p*.

This invention relates to an improvement in electric-arc lamps, and in which a shunt-magnet is employed, the object being to break the circuit through one line before it is completed through another; and the invention consists in combining with the principal and shunt magnets a device whereby the automatic action of the shunt tends to complete the circuit through the main magnet after it has been closed through another line around the magnet, and vice versa, as more fully hereinafter described.

For convenience of illustration I show the principal magnet, the shunt-magnet, and the carbons detached from the usual mechanism of the lamp.

A represents the principal magnet; B, the shunt-magnet; C, the upper-carbon holder, and D the lower-carbon holder; *a*, the armature of the principal magnet, and *b* the armature of the shunt-magnet.

To the armature *b* of the shunt-magnet a bar, E, is fixed, extending above the hinge *d* of the armature, where it is constructed to form a contact-point, *e*, and also extending below the armature to form a contact-point, *f*. To this bar E the incoming line F is attached.

In line with the contact-point *e* is a block, *h*. From this block a line, G, runs to the principal magnet, and from the principal magnet a line, H, runs to the upper-carbon holder, and from the lower-carbon holder a line, I, leads to the next lamp in the circuit. Contact being made between the point *e* and the block *h*, the circuit is made through the principal magnet, and the carbons burn in the usual manner. As the carbons are consumed, and the arc thereby increases, a portion of the current will be shunted through the wire *i*, that current gradually increasing as the arc increases until the current shunted be strong enough to overcome the spring L. Then the shunt-armature will be drawn toward its pole. The block *h* is arranged for a certain amount of longitudinal movement under the influence of the spring *l*. As here shown, this block is recessed at its rear end to pass on over a fixed spindle, *m*, to which the wire G is attached, but so that electric contact is made between the block *h* and the spindle *m* in the recess, and between the spindle *m* the spring operates, tending to force the block *h* toward the point of the bar E. Forward of the block is a stop, *n*, against which a shoulder, *o*, on the block may strike. As the current through the shunt increases, tending to draw the shunt-armature to its pole, it gradually draws the point *e* away from the block *h*; but as the shoulder *o* stands back away from the stop *n* when the shunt-armature is fully opened, the block *h* is forced against the point *e* under the pressure of the spring *l*, and as the armature closes and turns the point *e* the block *h* will follow the point and in contact with it until the shoulder *o* strikes the stop *n*, as seen in Fig. 2. Then as the shunt-armature completes its closing movement the point *e* will separate from the block, as seen in Fig. 2.

In line with the lower point, *f*, of the shunt-armature is a block, *p*, like the block *h* above, and which stands with its shoulder *r* against a stop, *t*, when the circuit is closed through the principal magnet, and as seen in Fig. 1. This lower block is of the same construction as the block *h*, and in like manner is provided with a spring, *u*, acting against a spindle, *w*, from which a wire, *y*, connects with the principal carbon-holder C, and from the same point of connection with the main carbon-holder a wire, *x*, runs to the other end of the shunt-

magnet B. The action of the spring *u* on the block *p* is to press it forward and against the stop *t*, as seen in Fig. 1. Standing in that position, the lower point, *f*, from the armature of the shunt-magnet will come in contact with that block before it leaves the blocks *h* above, and after making such contact the complete closing of the armature will force the block *p* away from its stop, as seen in Fig. 2, and draw the point *e* from contact with the block *h* above. The feeding of the carbon then takes place, and the arc is restored. Then the shunt-magnet loses its strength in the usual manner, its armature opens, drawing the point *f* below, followed by its block *p*, until the shoulder *r* strikes the stop *t*, as seen in Fig. 1, and at or about the time of contact of the block *p* with its stop, contact is made between the point *e* and its block *h* above. Then as the opening of the armature is completed the block *h* is forced back from its stop, as seen in Fig. 1.

By this device the circuit through the main line cannot be broken before it is completed through the shunt, or vice versa; but the main circuit may be gradually broken before the feeding of the carbon takes place.

It will be understood that the power of the magnet to close its circuit is greater than that of the spring *u* for the lower block, and that the armature-spring L is also of greater power than the spring *l*, so that each contact-point acts upon its respective block with a force greater than the said springs *u l*, and whereby such movement of the points will force the blocks away from their respective stops.

I have represented the contact-points *e f* as conical, and their respective blocks as having a corresponding cavity; but the shape of the contact-surfaces is immaterial.

Instead of arranging the blocks *h* and *p* to slide upon a spindle in connection with the respective wires, they may be otherwise arranged—as, for illustration, the block or surface *h* may be attached to or made a part of a spring, R, as seen in Fig. 3, which will yield under the pressure of the contact-point or be arrested by the stop *n*. In this case the block or contact-surface will follow the contact-point the same as in the first illustration. I therefore do not wish to be understood as limiting this part of my invention to the particular construction shown and described. By the term "block" I wish to be understood as meaning any surface with which the contact-points may engage to make electrical connection.

I have not illustrated the feeding mechanism for the carbons, or any particular arrangement of the principal and shunt magnets, as such mechanism is no part of my invention and immaterial to it, the essential feature of my invention being a device combined with the principal and shunt magnets, whereby the shunt, acting automatically, will tend to send the current through the main magnet after it has been closed, through another line around the magnet, and vice versa.

I claim—

1. The combination of the principal magnet and the shunt-magnet, the armature of the shunt-magnet hinged to produce a vibratory movement in breaking and closing the main circuit, and constructed with a contact-point above and a contact-point below the hinging-point, a movable block arranged in line with the respective contact-points, said blocks connected the one with the principal magnet and the other with the main-line shunt, and so as to yield under the pressure of their respective contact-points, the one on the breaking of the main circuit and the other on the closing of said circuit, said blocks also arranged to return or follow their respective contact-points when the main circuit is closed or broken, as the case may be, and a stop arranged to arrest either block as soon as the opposite contact-point has made engagement with its block, substantially as described.

2. The combination of the principal magnet and the shunt-magnet, the armature of the shunt-magnet constructed with a contact-point, *e*, above and a contact-point, *f*, below its hinge, the movable block *h* in line with the contact-point *e* above, and the movable block *p* below in line with the lower contact-point, *f*, the one in connection with the principal magnet, the other in connection with the main-line shunt, each block provided with a spring which yields under pressure of its respective contact-point, and whereby said blocks are forced to follow their respective contact-points as the point recedes, and a stop arranged to arrest the movement of each block before the said point has completed its retreating movement, substantially as described.

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Witnesses:
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