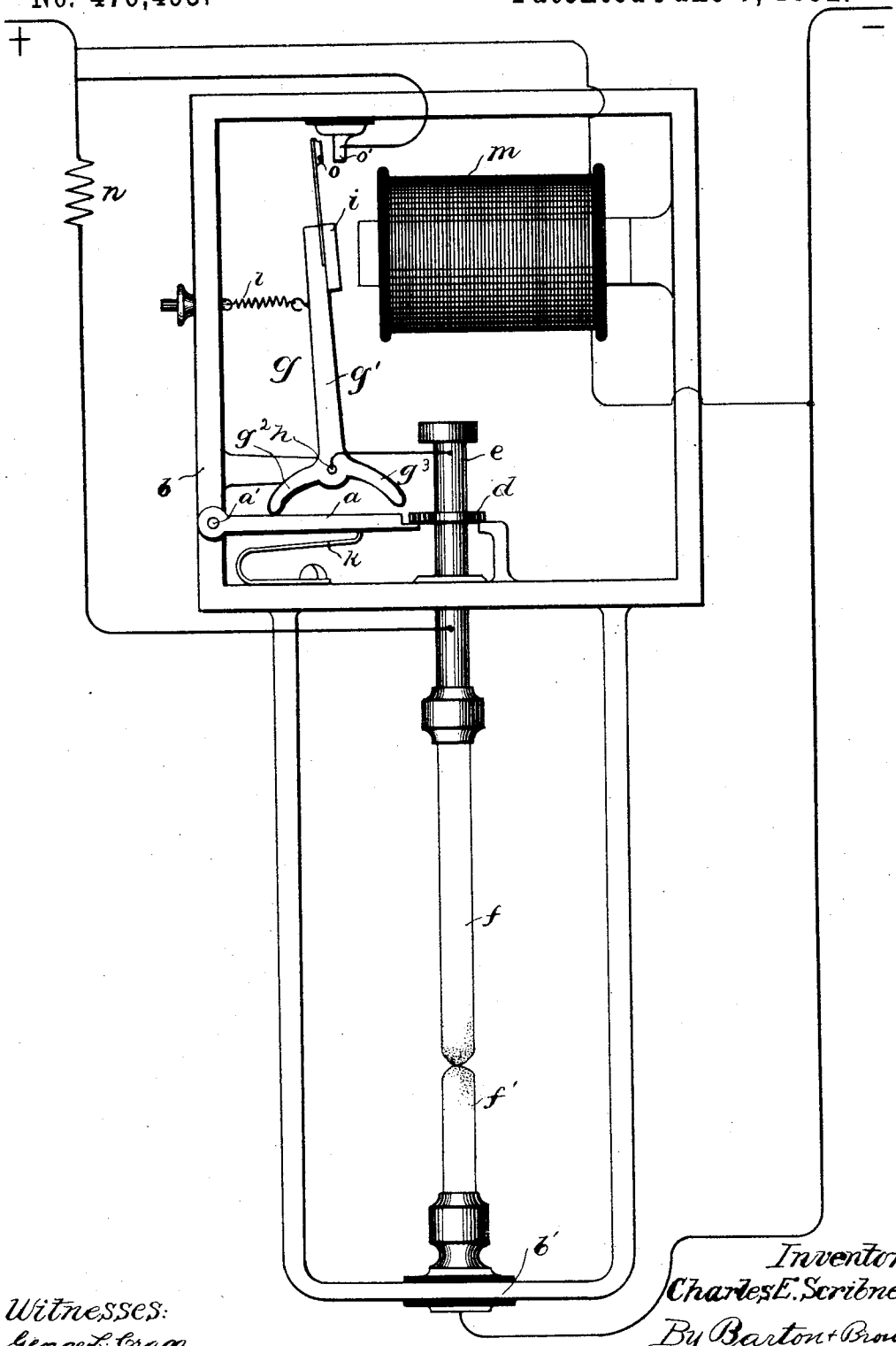
(No Model.)

C. E. SCRIBNER.

ELECTRIC ARC LAMP.

No. 476,493. Patented June 7, 1892.



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UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 476,493, dated June 7, 1892.

Application filed October 13, 1891. Serial No. 408,586. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electric-Arc Lamps, (Case 278,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to electric-arc lamps. Its object is to provide regulating mechanism in which a single electro-magnet in shunt of the carbons acts to form and subsequently to regulate the length of the arc.

My improved lamp mechanism consists, essentially, of a centrally-pivoted lever whose extremities are adapted to engage with a second lever pivoted at one extremity at different distances, respectively, from its pivotal point; an electro-magnet in shunt of the arc, adapted to rotate the centrally-pivoted lever in one direction; a spring tending to rotate said lever in the opposite direction, and a second spring acting to press the end-pivoted lever toward the centrally-pivoted lever. The said "end-pivoted" lever at its free extremity is connected with the clutching mechanism, of any well-known form, grasping a rod carrying one of the carbons of the lamp. The parts described are so disposed that when the electro-magnet is not energized the spring attached to the centrally-pivoted lever causes the latter to exert a pressure upon the end-pivoted lever through that end acting nearer the fulcrum to maintain the said end-pivoted lever in position to cause the release of the carbon rod. When, however, the magnet becomes energized, the armature attached to the centrally-pivoted lever is attracted. In its first motion it allows the two levers to approach parallelism, thereby allowing the end-pivoted lever to rise in response to the pressure of the second spring described, and thus to separate the carbons to form the arc. When under the action of the electro-magnet the centrally-pivoted lever has rotated through a certain distance, the other extremity thereof comes into engagement with the end-pivoted lever and as the rotation continues forces the latter lever into position to lower or release the carbon-rod. Thus the single electro-magnet in causing a continuous movement of its armature toward it performs the two distinct functions of first separating the carbons to form the arc and subsequently causing them to approach to regulate the length of the arc.

It is desirable that the electro-magnet should not shunt any considerable portion of the current from the arc, and hence that it should be of high resistance. In practice, to accomplish this end, while still insuring that sufficient current shall traverse the magnet before the carbons are separated, I preferably include a resistance in the main circuit within the shunt and provide contact-points in connection with the centrally-pivoted lever, adapted to close a short circuit about the said resistance when the carbons have been separated to a sufficient distance.

My invention is illustrated in the accompanying drawing and may be more readily understood by reference thereto.

In the drawing I have shown the mechanism and circuits diagrammatically.

a is the lever pivoted at one end a' to the frame b of the lamp and in connection at its other extremity with the clutch d, of well-known form. A carbon-rod e passes through and is adapted to be grasped by the clutch d. The rod e carries at its lower end the upper carbon f of the pair $f\,f'$. The lower carbon f' is rigidly secured to the base b' of the lamp.

g is the "centrally-pivoted lever," pivoted at h. It is provided with three arms $g'\ g^2\ g^3$. One g' carries at its upper extremity the armature i. The remaining two $g^2\,g^3$ are adapted to engage with the lever a at points at different distances, respectively, from its fulcrum a'. A spring k or its equivalent exerts an upward pressure upon lever a, tending to raise the clutch d, and with it the carbon-rod e, and maintaining it in engagement with one or the other of the arms $g^2\ g^3$. A second spring l, attached to lever g, acts to maintain the armature i separated from its magnet and to depress the lever a through the medium of arm g^2 in opposition to spring k.

m is the electro-magnet, of high resistance and in shunt of the carbons, adapted to act upon armature i in opposition to spring l.

n is a resistance interposed in the main

circuit within the shunt of the electro-magnet, and *o* is a contact-point upon the lever *g*, adapted to close upon the fixed contact-anvil *o'* and thus to short-circuit resistance *n*. The contact *o* is mounted upon a yielding arm, in order that the further forward movement of the lever may not be impeded when the piece *o* has reached the anvil *o'*.

When the lamp is idle, the lever *a* is depressed by the action of spring *l*, as described, and allows the upper carbon to rest in contact with the lower. Current upon entering the lamp finds circuit through the parallel branches, resistance *n*, carbon-rod *e*, carbons *f f'*, and out, and through magnet *m* out. Magnet *m* is thus energized and attracts its armature *i*, producing a movement of lever *g* such as to allow lever *a* to rise. The rise of lever *a* causes the upper carbon to be separated from the lower, and the arc is thus formed. At the same time the contact-piece *o* closes upon its anvil *o'*, short-circuiting resistance *n;* but, owing to the resistance of the arc, the magnet *m* is not de-energized. As the arc increases in resistance the magnet *m* is more strongly energized and draws its armature still nearer to it, until the arm g^3 of lever *g* engages with the lever *a* and depresses it, thus allowing the approach of the upper carbon toward the lower, or, if the motion of *g* be sufficient in extent, the release of rod *e* by the clutch *d*.

Obviously forms of levers other than those described might be devised to perform the same functions and other disposition of the contacts *o o'* might be made without departing from the essence of my invention. Hence I do not limit myself to the precise form shown; but

I claim as new and desire to secure by Letters Patent—

1. The combination, with the lever *a*, pivoted at one end and adapted to impart motion to one of a pair of carbons, of a lever *g*, pivoted at or near its center and having its extremities g^2 g^3 adapted to engage with the end-pivoted lever *a*, an electro-magnet in shunt of the carbons, adapted to impart motion to the centrally-pivoted lever *g*, a spring *l*, acting in opposition to the magnet *m* upon the lever *g*, and a spring *k*, acting upon the end-pivoted lever *a* to cause a separation of the carbons, substantially as described.

2. The combination of an end-pivoted lever adapted to impart motion to one of a pair of carbons with a lever pivoted at or near its center and having its extremities adapted to act independently of each other upon said end-pivoted lever, and a spring or its equivalent acting to maintain said end-pivoted lever in engagement with one of the extremities of said centrally-pivoted lever, whereby the mechanism is adapted to resolve continuous motion in one direction of the centrally-pivoted lever into motions of one of the carbons in successively-opposite directions, substantially as described.

3. The combination of an end-pivoted lever, in connection with mechanism whereby it acts to impart motion to one of a pair of carbons, with a lever pivoted at or near its center and having its extremities adapted to act independently of each other upon said end-pivoted lever, a spring or equivalent acting to maintain said end-pivoted lever in engagement with one of the extremities of said centrally-pivoted lever, an armature in connection with said centrally-pivoted lever, and an electro-magnet in shunt of said pair of carbons adapted to act upon said armature, whereby said electro-magnet in producing a continuous approaching movement of its armature is adapted to cause motions of the said carbons in successively-opposite directions, substantially as described.

4. The combination, with the end-pivoted lever *a*, actuating one carbon *f* of a pair *f f'*, of the centrally-pivoted lever *g*, the spring *k*, the armature *i*, electro-magnet *m* in shunt of said carbons, resistance *n* in series with said carbons and within the shunt *m*, and contacts *o o'*, adapted to be closed by the movement of lever *g* and when closed to complete a short circuit about resistance *n*, substantially as described.

In witness whereof I hereunto subscribe my name this 14th day of September, A. D. 1891.

CHARLES E. SCRIBNER.

Witnesses:
FRANK R. MCBERTY,
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