

(No Model.)

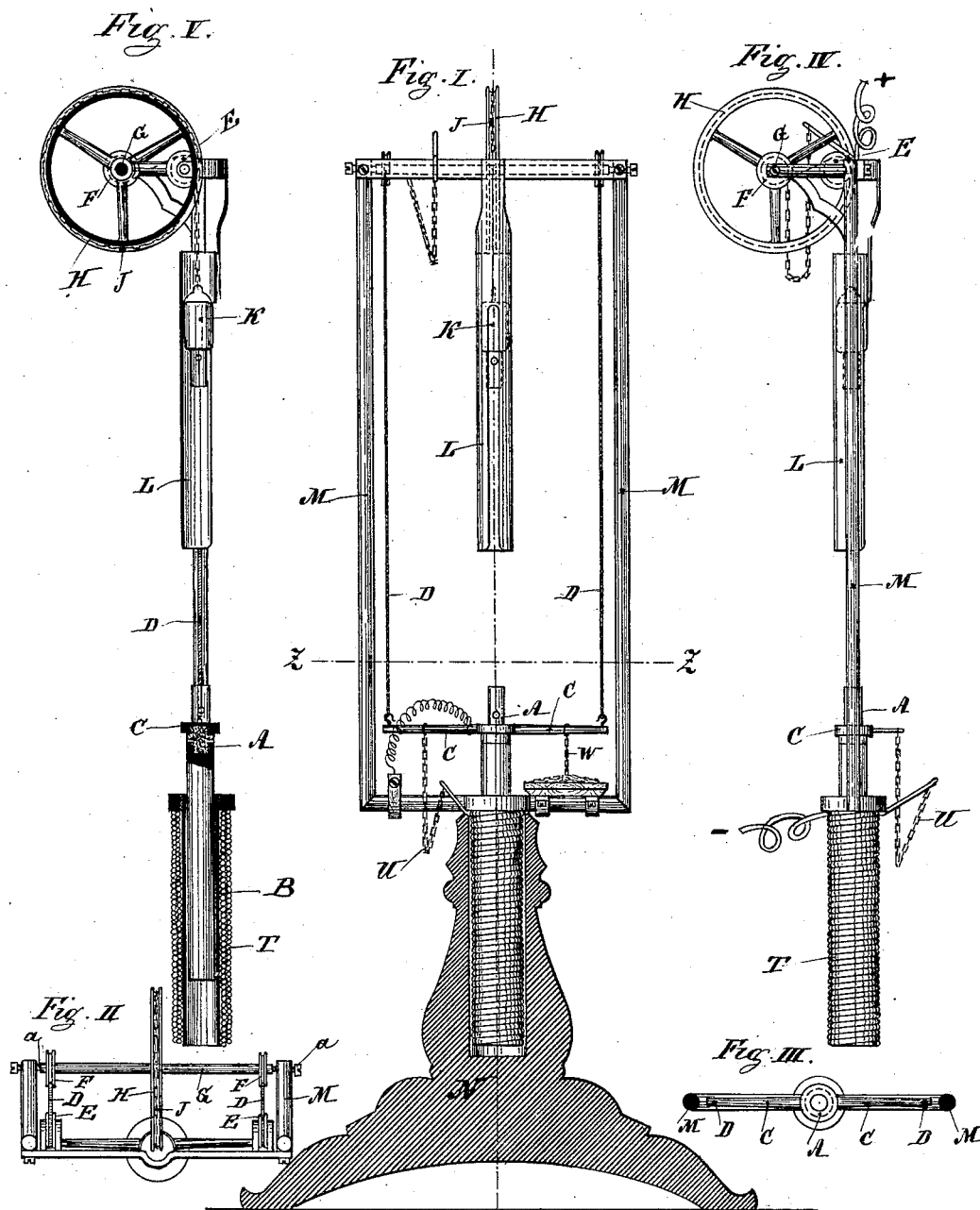
2 Sheets—Sheet 1.

E. BOETTCHER.

ELECTRIC LAMP.

No. 303,614.

Patented Aug. 19, 1884.



Witnesses.  
F. Schlacter  
J. Gemmel, Jr.

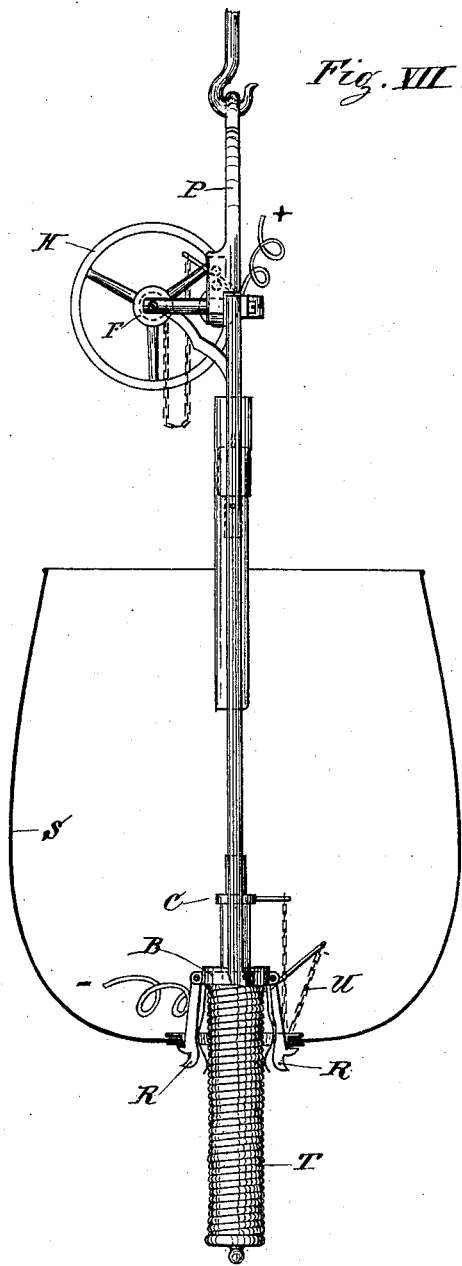
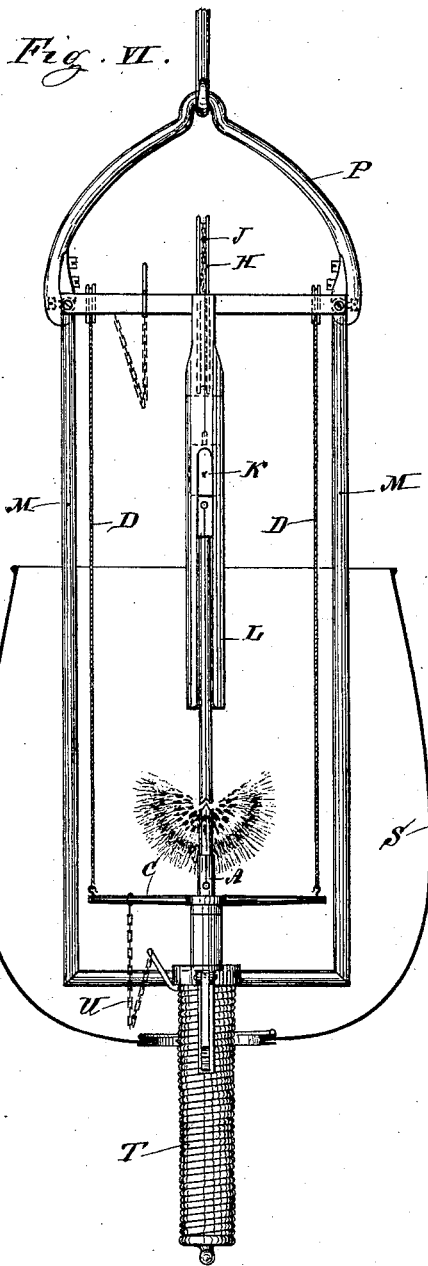
Inventor.  
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Inventor.  
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*per Henry E. Rader*  
*Attorney*

# UNITED STATES PATENT OFFICE.

EMIL BOETTCHER, OF LEIPSIK, GERMANY.

## ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 303,614, dated August 19, 1884.

Application filed September 29, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, EMIL BOETTCHER, a citizen of Germany, and resident of Leipsic, in Germany, have invented a new and useful Improvement in Electric Lamps, of which the following is a specification.

This invention relates to electric lamps of the arc-light kind; and it consists, partly, in certain devices, hereinafter particularly described and claimed, for regulating the feeding of the carbon points to one another.

In the accompanying drawings, Figure I represents a standing electric lamp, partly in section, with the carbon points removed. Fig. II shows a top view of the same; Fig. III, a horizontal section at line Z Z, Fig. I. Fig. IV is a side view of the same without the lower stand. Fig. V is a vertical section of the same. Fig. VI is a front view, and Fig. VII a side view of a suspended electric lamp surrounded by a glass globe.

Similar letters represent similar parts in all the figures.

The lower-carbon carrier A, isolated through a suitable non-conducting material from its casing B, the latter being surrounded by helix T, which is in the circuit and makes said casing a tubular electro-magnet, is provided with arms C C, connected through cords D D, passing over guiding-pulleys E E, and the under side of small pulleys F F, and partly around the surfaces of said pulleys F F with these pulleys. These pulleys F F are attached to a shaft, G, supported in suitable center points, *a a*, for the purpose of reducing friction. In the center of this shaft G a large pulley, H, is fixed, to which a metal chain, J, is attached, passing partly around this pulley, and the other end of which is attached to the holder K of the upper carbon point.

M is a light frame attached to the lower casing, B, which supports the pulleys E E, the center points, *a a*, and shaft G, with their pulleys, as well as the split tubing L, in which the holder K is guided, and capable of moving with the least possible amount of friction.

N is the stand for the lamp.

In Figs. VI and VII a suitable strap, P, is attached to the upper part of the frame M, from which the lamp is suspended, and suitable hooks, R, are attached to the lower casing, B,

to support the glass globe S. The coil T, surrounding the lower case, B, is connected through the chain U with one of the arms C.

The positive electric current is communicated to the shaft G and through the same, the wheel H, and metal chain J to the upper charcoal point, while the negative electric current is communicated to one of the arms C, and at the same time connected with the coil T, is thus communicated to the lower charcoal point. On account of the excess of the weight of the upper carbon point, together with the weight of part of the chain J, this upper carbon point will descend, moving at the same time the lower carbon point, with its holder A and cross-arms C C upward until the two carbon points touch or are brought in contact. The admission of the electric current separates the points of the charcoal to produce the electric light, which may be regulated according to the desired intensity of the current by increasing or diminishing the weight of the lower-carbon holder. The loss of weight resulting from the quicker consumption of the upper carbon point will be equalized by the greater amount of metal chain J unwound from the wheel H. At the same time will the diminishing magnetic strength of the coil T, resulting from the gradual withdrawal of the lower-carbon holder A, in consequence of the consumption of the lower carbon point, be equalized by the raising of a chain, W, Fig. I, (or any suitable spring,) attached to one of the cross-arms C, the other end or body of which rests in a suitable plate on the frame M. It will be apparent that as the body of the chain W rests in a suitable plate on the frame M, that part of said chain lifted from said plate, or the length between this plate and the arm C, will act upon the arm C, and add as much weight to the lower-carbon carrier A, to retain thereby at all times nearly the relative equilibrium between the lower and upper-carbon carrier, which otherwise changes on account of the faster consumption of the upper carbon point. The advantages of this arrangement are, first, its very simple construction; second, the facility with which every part of the mechanism is made accessible; third, the great reduction of weight of the mechanism and lamp; fourth, the cheapness of the whole construction, and, fifth, the great

facility whereby the whole arrangement and mechanism can be regulated.

What I claim as my invention, and desire to secure by Letters Patent, is—

- 5 1. A tubular electro-magnet, in combination with a lower-carbon holder which has vertical motion therein, a vertically-movable upper-carbon holder, intervening devices whereby the descent of the upper-carbon holder causes  
10 the ascent of the lower-carbon holder, and chains which respectively make electric connection between the coil of the tubular electro-magnet and the lower-carbon holder, and between the upper-carbon holder and a fixed part  
15 of the frame, thus completing the circuit while allowing the motion of said holders, as set forth.

2. The combination of the lower-carbon holder A, cross-arms C C, cords D D, pulleys E E and F F, shaft G, pulley H, and chain J, with the upper-carbon holder K, substantially in the manner and for the purpose described. 20

3. The combination of a chain, W, with the lower-carbon holder A, substantially as described, whereby the gradual reduction of the electro-magnetic attraction of the coil T is  
25 equalized, as set forth.

EMIL BOETTCHER.

Witnesses:

J. ULLIG,  
O. SCHMIDT.