(No Model.)

2 Sheets—Sheet 1.

C. P. HOENACK.

ELECTRIC LIGHT.

No. 256,686.

Patented Apr. 18, 1882.

Fig. 1.

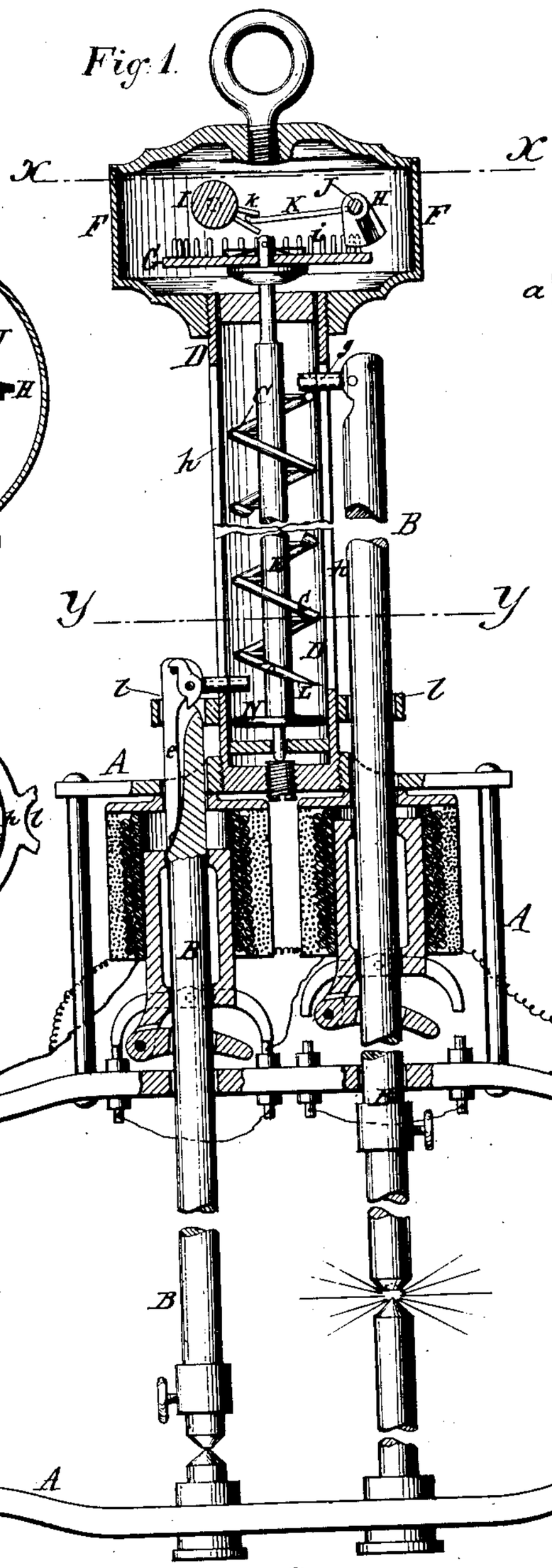


Fig. 2.

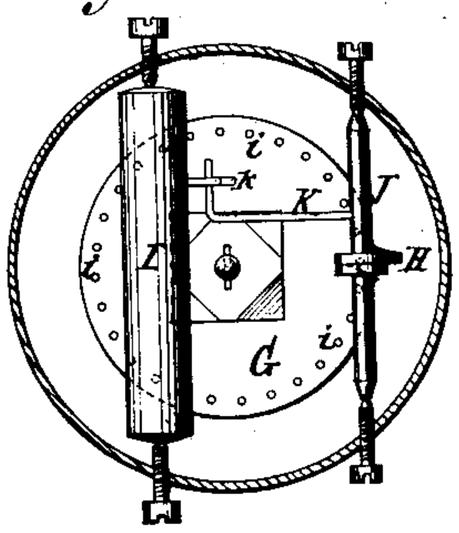


Fig. 3.

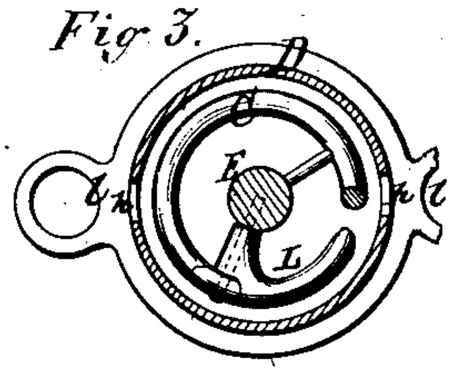


Fig. 4.

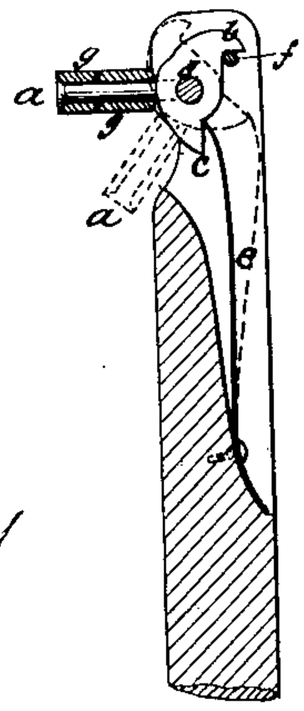
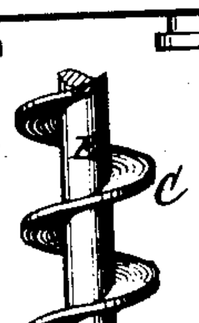


Fig. 5.



Witnesses

John M. Stelle

L. B. Summerson.

Inventor:

Carl Paul Hoenack

by N. W. Almqvist

Attorney

(No Model.)

2 Sheets—Sheet 2.

C. P. HOENACK.

ELECTRIC LIGHT.

No. 256,686.

Patented Apr. 18, 1882.

Fig: 6.

Witnesses:
John W. Kelly
L. Summergren.

Inventor:
Carl Paul Hoenack.
by A. W. Almqvist
Attorney

UNITED STATES PATENT OFFICE.

CARL PAUL HOENACK, OF NEW YORK, N. Y.

ELECTRIC LIGHT.

SPECIFICATION forming part of Letters Patent No. 256,686, dated April 18, 1882.

Application filed May 17, 1881. (No model.)

To all whom it may concern:

Be it known that I, CARL PAUL HOENACK, of the city, county, and State of New York, have invented a new and useful Improvement in Carbon-Feeds for Electric Lights, of which the following is a specification.

The object of my present invention is to provide an improved feed mechanism for carbons in electric-circuit lamps, by which the ordinary rack and pinion will be entirely dispensed with, and one, two, or more, or any desired number of carbon rods may be operated separately or simultaneously by one and the same electro-magnet, and the feed regulated by one and the same escapement wheel and pawl.

The invention consists in the construction and combination of two or more or a series of carbon rods arranged laterally to or annularly around and supported by a vertical central revolving spiral or screw regulated by an escapement, the spiral being revolved by the weight of the rod to allow the latter to proportionally descend when the magnet weakens and relaxes its hold upon the supporting-core, in consequence of an increase of the distance between the carbon points, due to their gradual combustion.

It also consists in the combination, with the spiral incline which supports the lateral rods, of a central magnet whose core supports the said spiral incline, as will be hereinafter described and claimed.

In the accompanying two sheets of drawings, Figure 1 represents in vertical section my improvement connected to be operated by a separate magnet upon each carbon rod. Fig. 2 is a plan view of the escapement as seen from the horizontal section-line *x x* of Fig. 1. Fig. 3 is a horizontal section of the spiral and its inclosing-tube, seen from the line *y y* of Fig. 1, and enlarged. Fig. 4 is an enlarged detail vertical section of the upper end of one of the carbon rods, showing the construction of its supporting-arm. Fig. 5 is a detail view, showing a modification of the spiral. Fig. 6 represents in vertical section my improvement connected to operate all the carbon rods by one common magnet only.

Similar letters of reference indicate like parts in the several figures.

A designates any frame-work suitable for attaching the improvement for use in an electric lamp. The electro-magnets and wire-connections shown in the drawings are the same as usual and need no further description.

In Fig. 1 each carbon rod is shown as working through the center of the magnet-core in the usual manner. In Fig. 6 the carbon rods are arranged outside, on opposite sides of and surrounding one central magnet common for them all.

B are the carbon rods or holders, which may be of any number, and are so arranged that when one carbon point is consumed the next in order is automatically switched in and begins to operate, and so on continuously. For illustration the drawings represent a lamp of two carbons. In a slot in the upper end of each rod B is pivoted an arm, *a*, which has little shoulders or projections *b c* on the periphery of its pivoting-eye, above and below the pivot *d*, and in a groove adjoining the slot is fastened to the rod a spring, *e*, which presses upon the lower shoulder, *c*, and forces the arm *a* to swing upward until it is stopped in a horizontal position by the upper shoulder, *b*, lodging against a pin, *f*, fastened across the slot in the rod. The free end of the arm *a* is provided with two friction-rollers, *g*, by which it rides on a spiral incline, C, and bears against a guide-slot, *h*, in the tubular casing D, attached to the frame A, thus supporting the rod B upon the said spiral, as shown in the drawings, the rod being itself fitted to slide vertically in the frame A. The spiral C may be made of a screw, as shown in Fig. 5; but I prefer to make it of a wire, as shown in the main figures, as that insures less friction than the screw, and fasten it upon a shaft or axle, E, pivoted in the upper and lower ends of the tube D, as shown.

Upon the upper end of the tube D is fastened a circular box, F, containing the escapement for regulating the velocity of the revolving spiral, and said box is provided with a cap, to which latter is fastened an eye-screw, as shown, by which the lamp is suspended. The escapement-wheel G is mounted (and held, as usual, between friction-washers) upon the upper end of the shaft E, and is provided with pins *i*, near its periphery, at right angles to its surface. The escapement-pawl H oscillates in

a plane at right angles to the plane of the wheel, and is made of two members placed upon the arbor J at proper distance apart to allow of one pin, *i*, to pass through the opening between them when the pawl is oscillated by the pressure due to the combined weights of the rod and its carbon, the weight acting upon the supporting-spiral C to revolve the latter.

The working-surface of each member of the pawl H is tapering or inclined toward the center line of the pins *i*, so that each in its turn acts as a gradually-receding stop against each tooth or pin *i*, thus allowing the wheel to move with slow and uniform velocity as the rod descends. The desired amount of velocity is obtained and regulated by a pivoted weight, I, oscillated from the pawl-arbor J by the small wire-and-pin connections K *k*, as shown, or in some other suitable manner.

In order not to impede the revolving of the spiral incline needed for the feeding of the next carbon when the first is burned out and the rod has descended to its final stop at *l*, a portion of the lower end of the spiral is cut off and pivoted to the shaft E in the manner shown in Figs. 1, 3, and 6, so as to form a little pawl or click, L, which, while it supports the descending carbon to the extreme end of the spiral, rises when striking the arm *a* of the rod of the consumed carbon and passes over the latter, resuming immediately by its own gravity the required normal position in the line of the spiral incline. This will be understood with reference to Fig. 1, where the rod B, at the left of the figure, has descended to its stop *l*, its carbon being burned out, and the carbon at the right is just beginning to operate.

In Fig. 1 each rod is operated directly by a separate magnet. I will now explain with reference to Fig. 6 how all the rods may be operated by only one and the same magnet (arranged preferably in the center between them) to stop and start the motion of the spiral incline itself, which supports them. The carbon at the left side in the figure has not yet been switched in, and is simply supported upon the lower carbon in a position to keep the arm *a* just above and clear of the extreme upper end of the spiral C until the carbon at the right is nearly burned out. When the right carbon just slides off the lower end of the spiral its arm *a* (or other projection) strikes a lever, pin, or other usual and simple switching devices, (which will be presently described,) "switches in" the left carbon, and the magnet-core M rises and lifts the spiral C off its pivot until its extreme upper end raises the arm *a* and rod B of the left carbon sufficiently to support it and to establish the voltaic arc. When so raised the spiral is kept from turning by the contact between a disk or plate, N, fastened upon the shaft E, and two pins, *n*, secured eccentrically in a rubber or other insulating top, *m*, screwed into the upper end of the core M. When the distance between the points of the voltaic arc becomes too great the core M descends, the spiral becomes free to revolve, and the rod sinks, feeding down the carbon just enough to re-establish the normal distance between the carbon points. The aforesaid switching-in of the left carbon (in Fig. 6) by the right carbon falling off of the lower end of the spiral C may be effected in the following manner: The projection O strikes and depresses the spring-raised sliding pin P, whose lower insulated end bends down the spring Q to break contact with the upper spring or pin, R, and close contact with the lower spring, S. This will cause the current to pass from the coarse coil-wire T through the springs Q S and wire U to the carbon rod A, which is thus switched in. Before the falling of the carbon rod B causes the projection O to depress the pin P and spring Q the current passes from the wire T and spring Q by way of the spring R and wire V to the carbon rod B, as represented in Fig. 6.

When the carbon wants to be replaced or adjusted by hand either rod B may be slid up without disturbing the others, because the arm *a* recedes from the coils of the spiral, passing over them, the spring *e* yielding, and, in passing the coils, assumes the position indicated by dotted lines in Fig. 4.

Be it strictly understood that I lay no claim to matters herein shown, except such as are covered by the following distinct clauses of claims.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, it—

1. In a carbon-feed for electric lights, the combination of a spiral incline with one or more carbon-holders arranged to be supported upon and to gradually descend the said incline, according as the carbon is consumed.

2. In combination with a revolving spiral incline supporting one or more carbon-holders for electric light, and with mechanism regulating the velocity of its revolution, of a magnet arranged to stop and start such spiral, according as the carbon is consumed.

3. The combination of an upright revolving spiral supporting one or more sliding carbon-holders of an electric light, with an escapement-wheel mounted upon the axis of the said spiral and with an escapement-pawl oscillating at right angles to the wheel's plane of motion.

4. The pivoted spiral incline C, supporting one or more carbons of an electric light, and having a disk or plate, N, transverse to its axis, in combination with the sliding magnet-core M, provided with devices *n n*, arranged to stop the motion of the said spiral by contact with eccentric points of the said disk, substantially as specified.

5. The combination of the spiral incline C, pivoted in the vertically-slotted tube D, with the sliding carbon-holders B, provided with horizontal supporting-arms *a*, guided by the said slots, substantially as specified.

6. In combination with the spiral incline C

and with the carbon-holders B of an electric light, the spring-raised pivoted arm *a*, and a stop, *f*, to limit its upward throw, for the purpose of supporting the rod during its downward movement and yielding to its upward movement, substantially as specified.

7. In an electric lamp, the combination, with the carbon rod B, having a laterally-projecting arm, *a*, of the supporting spiral incline C, having its lower end terminating with a detached and pivoted portion, L, to allow it to revolve past the stationary arm *a* when the carbon is consumed, substantially as specified.

8. The combination, in an electric lamp, of a central spiral revolving incline, a series of carbon-holders supported by and arranged laterally or annularly around the said spiral, and one central actuating-magnet, substantially as specified.

CARL PAUL HOENACK.

Witnesses:
A. W. ALMQVIST,
JOHN TREGONING.