(No Model.)

C. P. HOENACK.

ELECTRIC LAMP.

No. 256,685. Patented Apr. 18, 1882.

Fig. 1

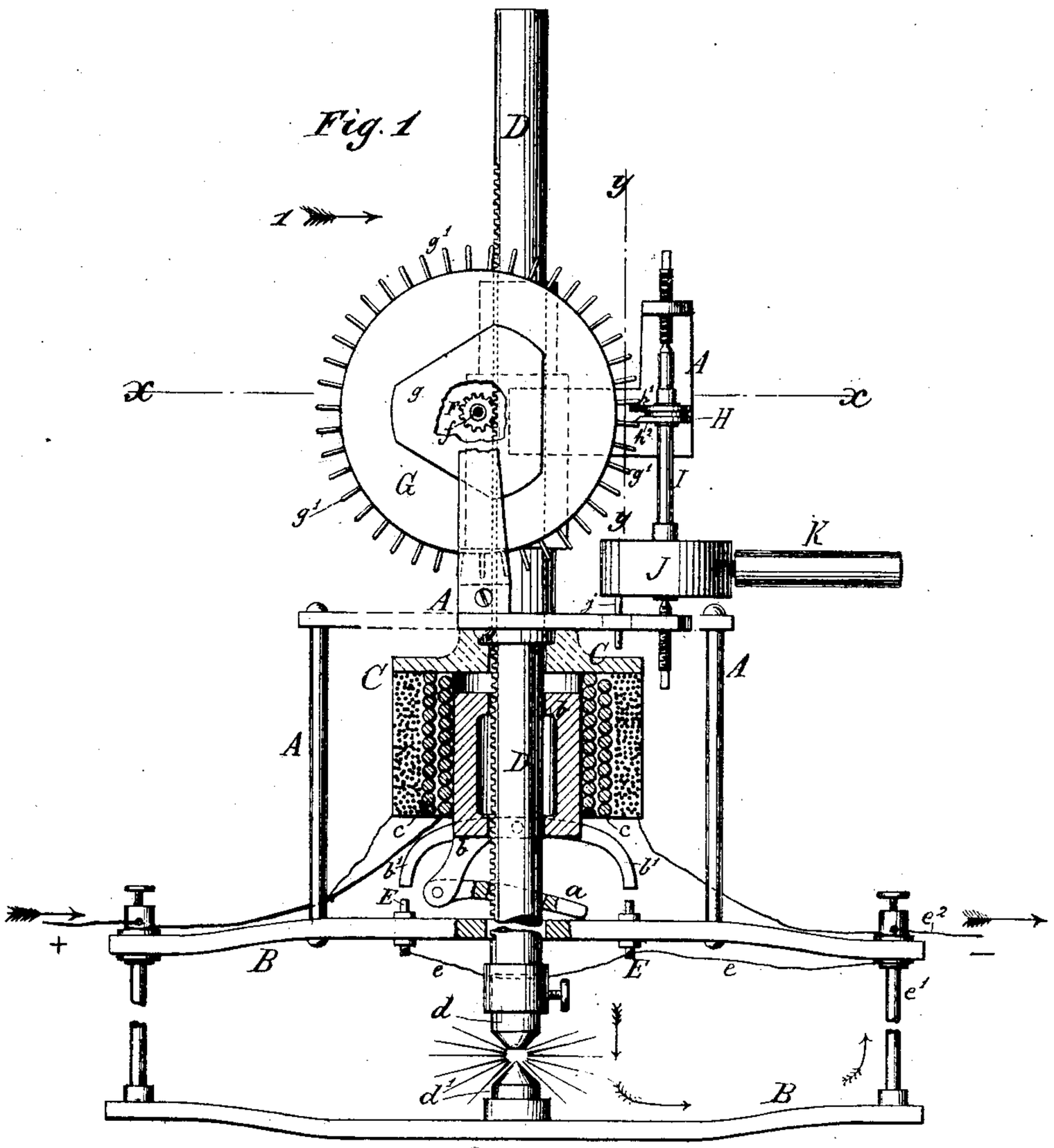


Fig. 2

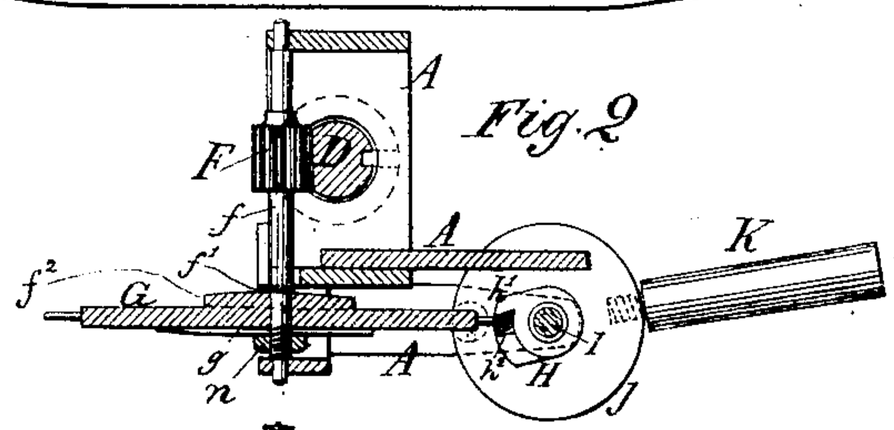
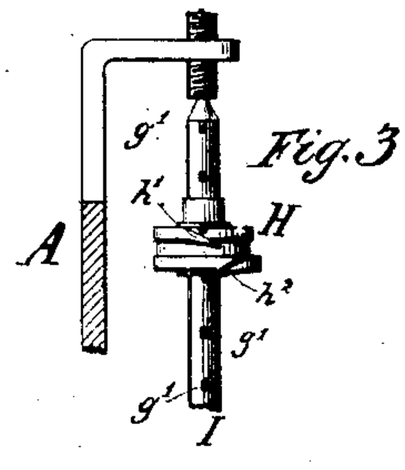


Fig. 3



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UNITED STATES PATENT OFFICE.

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

ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 256,685, 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-Feed for Electric Lights, of which the following is a specification.

My invention relates to electric-circuit lamps in which the feed of the carbon is effected by means of a rack and pinion regulated by an escapement to retard and graduate the descent of the carbon, the object being to provide a simplified construction involving less friction and less expense to manufacture than similar devices heretofore in use, while yet admitting of a perfect electro-magnetic action to maintain uniform distance between the opposite carbon points, and consequent steady light.

The invention consists in the construction and combination of parts whereby the "escapement is made to act directly on the carbon rod," or, in other words, the pinion actuated by the weight of the carbon rod is centered on the axial line of the escapement-wheel, and the escapement-pawl oscillates in a plane at right angles to that in which the wheel is moving, as will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a side elevation of my improvement, partly in section. Fig. 2 is a horizontal section of the same, taken on the line *x x* of Fig. 1. Fig. 3 is a detail section of the same, taken on the line *y y* of Fig. 1, and seen in direction of arrow 1.

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

A designates any suitable frame-work or bracket supporting the movable parts upon the frame B of an electric lamp in operation, the carbon points being assumed to be at the proper distance apart to establish the voltaic arc and emit the electric light. The friction-pawl *a* of the core *b* of the electro-magnet C is keeping up the carbon rod D to retain the upper carbon point, *d*, at the proper distance above the lower carbon point, *d'*.

The wires and arrows indicate the direction of the current.

When the inner coarse-wired coil, *c*, weakens by the increased resistance due to the distances apart of the carbon points as they are gradually consumed, the fine-wired coil *c'* (which is wound in opposite direction to the coarse coil *c*, and thus has opposite polarity) forces the magnet-core *b*, with its pawl *a*, downward, thus allowing the rod D to proportionally descend by its own gravity and to re-establish the proper distance and formal resistance, when the coarse magnet-coil *c* again becomes active, its force predominating, and the core *b* is pulled up enough to make the pawl again grasp and retain the carbon in the thus re-established normal position. Of course these movements are infinitesimally small, so as to practically always retain the carbon points at the same distance apart. When the carbon is burned out the core *b* drops down until the armature *b'* rests upon the insulated studs E, connected by wire *e* to the binding-post *e'*, the light is extinguished, and the current passes on directly through the wire e^2 to the next and subsequent lamps in the circuit, and thence to the electric machine or generator.

The rod D is a rack, being provided with cogs or teeth, as usual, in which mesh the cogs of a pinion, F, by which pinion the descending motion of the rod is transmitted to the escapement-wheel G and its pawl H, which latter react by retarding the motion, so as to make the descent of the rod gradual and uniform.

One end of the arbor *f* of the pinion F is reduced a little in size, so as to form a shoulder at *f'*, and the escapement-wheel G is fitted upon the reduced portion of the arbor and held in position with sufficient working friction between the said shoulder (or a washer, f^2, fast upon the arbor) and a spring-plate, *g*, tightened against the wheel G by an end nut, *n*, upon the arbor. This allows of sliding the rod D by hand and placing it at any desired elevation when it is required to adjust or replace the carbon by simply applying force sufficient to overcome the friction between the plate *g* and the wheel G. The teeth of the escapement-wheel G consist of round pins *g'*, fastened either radially in its periphery, as shown in the drawings, or near its periphery, at right angles to the side of the wheel.

The escapement-pawl H, instead of oscillating in the wheel's plane of motion, as in ordinary escapements, is pivoted in the said plane and oscillates in a plane at right angles there

to; and the pawl is made of two members, h' and h^2, placed upon the arbor I at the proper distance apart to allow one pin, g', to pass through the opening between them when the pawl H is oscillated by the pressure due to the combined weight of the rod D and the carbon *d*.

The working surface of each of the members h' h^2 of the pawl H are tapering or inclined toward the center line of the pins g', so that each in its turn acts as a gradually-receding stop against each tooth or pin g', thus allowing the wheel G to move only with slow and uniform velocity when the rod descends.

The desired amount of velocity is obtained by regulating the velocity of oscillation, which is done by a weight, J, fastened upon the arbor I, and exchangeable weights or rods K, attachable to the perimeter of the weight J, as shown in the drawings, an increase of the weight decreasing the velocity, and vice versa. By thus attaching the escapement-wheel G directly upon the arbor of the pinion F and constructing the teeth g' and pawl H as described, a uniform feed is obtained, not liable to sudden falls and stops, as would be the inevitable effect of the old escapement, in which the pawl oscillates in the plane of the wheel, and not necessitating the complicating gearing hitherto employed to obviate such variable velocity.

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

In an electric lamp, the escapement-pawl H, wheel G, having peripheral teeth g', pinion F, and the carbon-rack D, in combination with the clutch *a* and means, substantially as described, for operating said clutch, as and for the purpose specified.

CARL PAUL HOENACK.

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