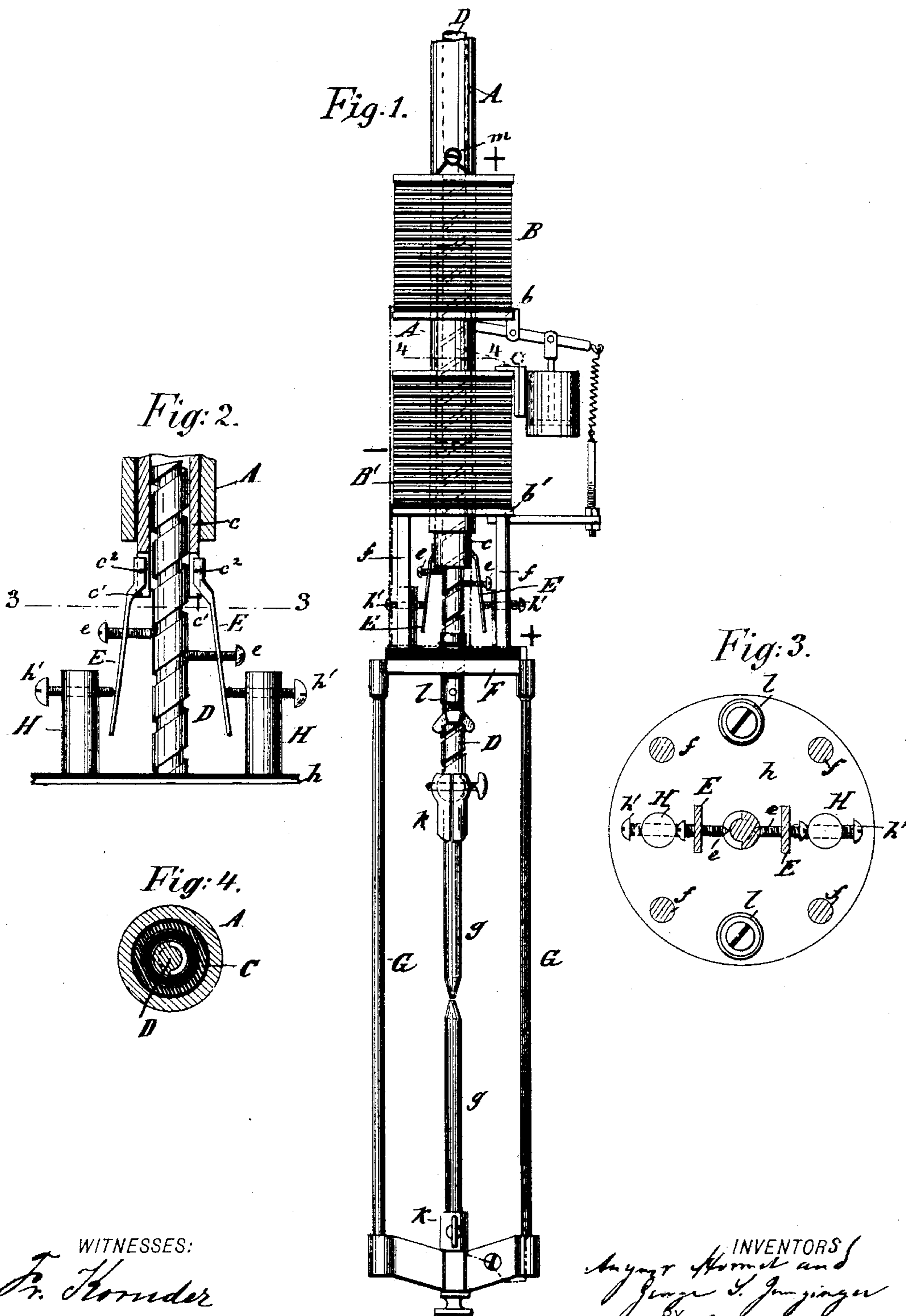


(No Model.)

A. HORMEL & G. S. JUNGINGER.
ELECTRIC ARC LAMP.

No. 511,049.

Patented Dec. 19, 1893.



WITNESSES:
J. Horneder
Jacob Hormel

INVENTORS
August Hormel and
George S. Junginger
BY *Charles Karp*
ATTORNEY

UNITED STATES PATENT OFFICE.

AUGUST HORMEL AND GEORGE S. JUNGINGER, OF NEW YORK, N. Y.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 511,049, dated December 19, 1893.

Application filed March 24, 1893. Serial No. 467,518. (No model.)

To all whom it may concern:

Be it known that we, AUGUST HORMEL and GEORGE S. JUNGINGER, citizens of the United States, and residents of New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Lamps, of which the following is a specification.

Our invention has reference to improvements in electric arc-lamps, and the object of our invention is to provide an electric arc-lamp in which the carbons are more evenly consumed by the action of the electric current and thereby a steady and uniform light is obtained. We attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front view of our improved electric lamp; Fig. 2 a detailed view of the rack-holding arrangement; Fig. 3 a section on line 3—3, Fig. 2, and Fig. 4 a section on line 4—4, Fig. 1, Figs. 2, 3, and 4 being on an enlarged scale.

Similar letters of reference indicate corresponding parts.

A in the drawings represents a metallic tube to which the solenoids B and B' are attached in the usual manner on supporting flanges b and b', the upper solenoid B being for the main current and the lower solenoid B' for the shunt current. In the tube A is loosely inserted the electrode C which consists of an iron tube and is magnetized by the electric current passing through either one of the solenoids, and in the electrode the rack D is located which has on its surface a spiral groove, as illustrated in the drawings. The electrode C has on its lower end an extension c of brass or any other metal that is not magnetically affected by the electric current. This extension is provided with two slits c' in which downwardly extending metal springs E E are pivoted by means of pivot-pins c². Set pins or screws e e pass through holes in the springs and project into the groove of the rack, as clearly shown in Fig. 2, thus serving as supporting devices and, at the same time, as guides for the rack.

The metal plate h, not shown in Fig. 1, rests on the insulated bracket F and is in metallic connection with the supporting plate b' by means of supporting rods f and has two

posts H H which are provided with screw-holes for the set-pins or screws h', which latter touch the springs E, so that a pressure is exerted upon the same and they are pressed against the rack, thus holding the pins or set screws e, which pass through the said springs, reliably in the spiral groove of the rack, as shown in Fig. 2.

The suspending lamp-frame G is secured to the plate F and one carbon g is fastened to the rack D while the other carbon is attached to the lower portion of the suspended lamp-frame G by means of the carbon holders k k, as usual in electric arc-lamps.

The electric current by which the lamp is lighted, passes from the generator through one of the binding posts l l attached to the bracket F and the plate h, but insulated therefrom, to the main solenoid B and is at the same time shunted to the shunt-solenoid B'. The current passes from the solenoid B through the binding-post m to the rack D and to the upper carbon g, from there to the lower carbon g and then through the suspended lamp-frame G back to the generator. Our improved arc-lamp works in the following manner: As soon as the current passes through the solenoids the armature C is magnetized by the main-solenoid B and within the tube A upwardly attracted, and simultaneously therewith the rack D with the upper carbon, as the pins or set screws e passing through the springs E, which are pivoted to the extension c of the armature, as before described, project into the spiral groove of the rack and thereby act as supporters for the rack. The supporting function of the pins e is increased by the set-screws h' passing through the posts H and pressing the springs toward the rack, so that the pins e are in close contact with the grooved surface of the rack and prevent the latter from dropping. By the upward attraction of the electrode and the rack the carbons are disconnected from each other and the light-arc created between the free points of the carbons. As soon as the resistance between the carbons increases, the shunt current in the lower solenoid B' begins to act upon the armature and draws the same down, whereby the springs are somewhat released from the pressure of the set screws h' h', and the rack begins to slowly move down, in which

action it is guided by the screws *e e* projecting into the groove of the rack, so that a rotary motion is imparted to the rack. This downwardly rotary motion of the rack is stopped as soon as the necessary resistance is created again, and then the main solenoid begins its action upon the armature with the rack, as before described. In this manner the sudden interruption of the light, which so often happens in the common arc-lamps, is entirely dispensed with.

Another disadvantage of the electric arc-lamps now in use is that the carbons are consumed mostly on one side, so that the pointed portions of the carbons receive an uneven shape and the light becomes irregular and unsteady. This disadvantage is also done away with by the construction of our rack, as the pins *e e* projecting into the spiral groove of the rack cause a rotary downward motion of the rack, whereby the point of the upper carbon continuously changes its position over the point of the lower carbon, so that the carbons are consumed in a regular manner and thereby an entirely uniform light is obtained.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In an electric arc-lamp a hollow electrode passing through the solenoids of the lamp and having set screws or pins attached to its lower end, and a spirally grooved carbon-rack loosely inserted into the hollow electrode, the set-screws or pins projecting into the groove

of the rack, thus serving as guides in moving the rack up or down, substantially as set forth.

2. In an electric arc-lamp, the combination of a hollow electrode having downwardly extending springs pivoted to the same, with a spirally grooved carbon-rack loosely inserted into the hollow electrode, and pins or set-screws passing through or otherwise attached to the springs and projecting into the groove of the rack, substantially as and for the purpose set forth.

3. In an electric arc-lamp, a spirally grooved carbon-rack, in combination with springs having pins projecting into the grooves of the rack, and set-screws pressing upon the springs and holding the said pins in the groove of the rack, substantially as set forth.

4. In an electric arc-lamp, the combination of an electrode, with downwardly extending springs pivoted thereto, pins or screws attached to the springs, a spirally grooved carbon-rack, the said pins projecting into the groove of the rack, posts on a supporting plate, and set-screws held by the said posts and pressing upon the said springs, substantially as set forth.

Signed at New York, in the county and State of New York, this 28th day of February, 1893.

AUGUST HORMEL.

GEORGE S. JUNGINGER.

Witnesses:

CHARLES KARP,

JACOB HORMEL.