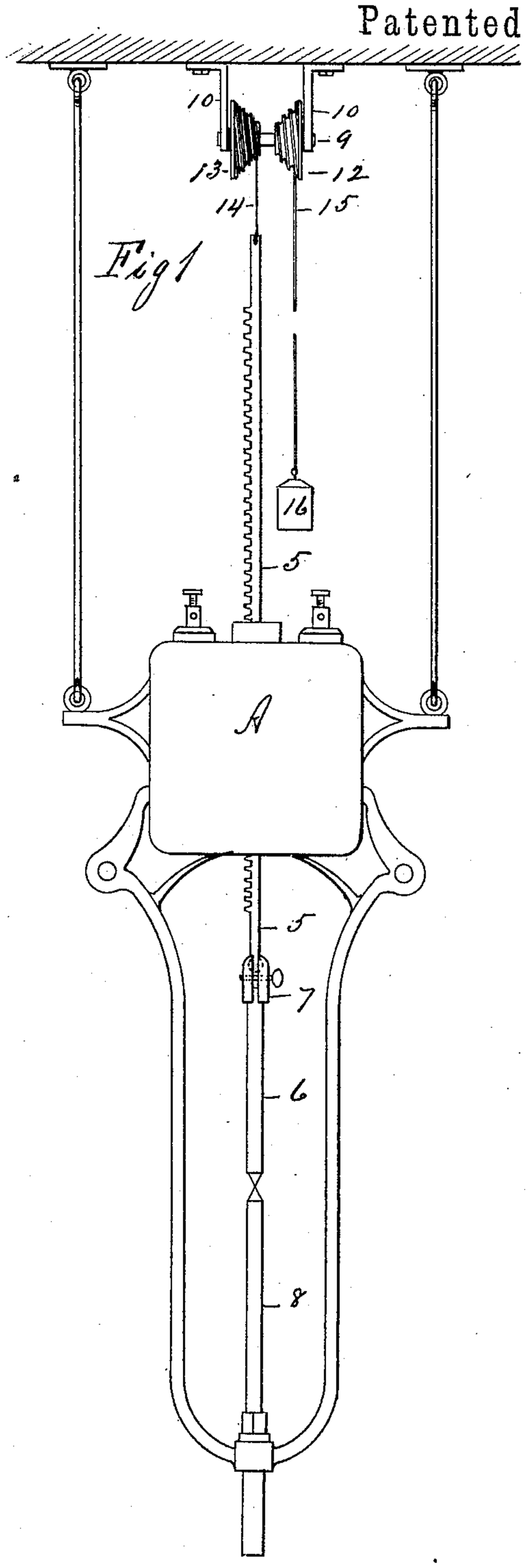
(No Model.)

J. A. LAKIN.

COMPENSATING MECHANISM FOR REGULATING ELECTRIC LIGHT CARBONS.

No. 362,289. Patented May 3, 1887.



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JAMES A. LAKIN, OF WESTFIELD, MASSACHUSETTS.

COMPENSATING MECHANISM FOR REGULATING ELECTRIC-LIGHT CARBONS.

SPECIFICATION forming part of Letters Patent No. 362,289, dated May 3, 1887.

Application filed January 17, 1887. Serial No. 224,515. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. LAKIN, a citizen of the United States, residing at Westfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Compensating Mechanisms for Regulating Electric-Light Carbons, of which the following is a specification.

This invention relates to electric lamps of the arc-light class, and pertains to improved means for counterbalancing the movable carbon-rod and its attached carbon; and the invention consists in the peculiar construction and arrangement of the said counterbalancing mechanism, all as hereinafter fully described, and pointed out in the claim.

In the drawing forming part of this specification, the figure is a side elevation of an electric lamp having applied thereto devices for counterbalancing the weight of the movable carbon thereof and its supporting-rod embodying my invention.

The particular class of arc-light electric lamps shown in the drawing to which my improvements are applied is that known as the "Schuyler Lamp;" but said improvements may be applied to any electric lamp which is provided with a vertically-moving carbon rod or rack, to which is suspended one of the carbons.

In the drawing, A indicates the body or case of the lamp, which contains the usual regulating mechanism, as shown, and with which the carbon rack-rod 5 has an engagement, and to the lower end of which the moving carbon 6 is attached by the clamp 7, 8 being the fixed carbon, which is supported in the usual pending portion of the frame of the lamp.

B indicates the ceiling of a room or other place, on which the lamp is suspended in the well-known way.

The said carbon rod 5 extends vertically through the central part, A, of the lamp, and, with the carbon 6, has a gradual downward movement while the lamp is burning, which movement is more or less under the control of the regulating mechanism of the lamp. Owing, however, to the weight of said rack-rod 5 and carbon 6 and the constantly-decreasing weight of the latter while it is being consumed, the movement of the said rod and carbon is not uniform, and the result is, that the light is unsteady, because of the constantly-varying distance between the points of the carbons 6 and 8. The purpose of the herein-described improvements is to so counterbalance the rod 5 and its attached carbon that their weight, beyond just so much thereof as may be necessary to cause them to move downward by gravitation, under the control of the said regulating mechanism of the lamp, is taken off from said mechanism, thereby leaving the latter the greatest possible freedom to act, under the varying resistance of the current, to control the degree of separation of the carbon points. The preferable counterbalancing mechanism which I employ in connection with said rod 5 and its attached carbon is shown in the figure, and is constructed and operates as follows: On a shaft, 9, which is adapted to rotate freely in suitable hangers, 10, attached to the ceiling B, or other place, I fix two cone-pulleys, 12 13, each of which has formed in its surface a spiral groove, as shown. The cone-pulley 13 is shown with the cord 14, one end of which is attached to the upper end of the rod 5, wound upon said pulley, and pending from the end of the spiral groove therein at the point of the smallest diameter of said pulley, and consequently nearest the axis of the shaft 9. To the pulley 12 is attached one end of a cord, 15, and hangs from one end of the spiral groove therein at the end of said pulley having the largest diameter, as shown, and capable of being wound thereon, following its spiral groove gradually to the smaller end of said pulley. A weight, 16, is attached to the free end of said cord 15, which weight is graduated to slightly less than the weight of the rod 5 and carbon 6, which hangs on the cord 14; or, in other words, the weight 16 is adapted to so counterbalance the weight of said rod and carbon as to permit the latter to move vertically by gravitation, but not with sufficient force to disturb the proper action of the aforesaid regulating mechanism of the lamp.

The spirally-grooved cone-pulleys 12 and 13 are provided for an operative medium between the rod 5 and its carbon and the weight 16, in connection with the connecting-cords 14 and 15, in order to provide suitable differential mechanism between the resistance, which is the weight 16, and the power, which con-

sists of the united weights of said rod 5 and carbon 6, whereby the said resistance remains substantially the same relative to the decreasing power, which is caused by the reduction of the length of the carbon under consumption.

The above results are attained by the varying positions of attack which each of said cords has with its particular pulley while the rod 5 and its carbon are moving downward.

In the figure the position of the rack-rod 5 relative to the pulley 13 is substantially that which it occupies when the lamp is to be lighted, excepting that for so doing, after the current is turned on, the cord 15 is drawn upon sufficiently to separate the points of the carbons 6 and 8 in the usual way, after which the rod 5 and carbon 6 will move downward, subject strictly to the regulating effect of the mechanism of the lamp, as aforesaid, the cords 14 and 15 meanwhile being respectively unwound and wound upon their pulleys, one from the largest to the smallest diameter thereof and the other from the smallest to the largest diameter of its pulley. Thus while the weight of the carbon 6 is being reduced the contact of the cord 14 with the pulley 13 is gradually moving onto a larger diameter of said pulley, and the contact of the cord 15, to which the weight is attached, is constantly moving onto a smaller diameter of its pulley, so that the resistance of the weight 16 decreases relatively to the decreasing weight of the carbon 6, thereby producing a regular movement of the latter toward the opposite carbon under the control, as aforesaid, of the governing mechanism of the lamp.

The above-described differential mechanism, whereby the said regular motion of the movable carbon-supporting rod is attained, is only one among many equivalent devices that may be adopted for equalizing the movement of said rod while the weight of its attached carbon is gradually being reduced, as aforesaid—as, for instance, an ordinary fusee, such as is used in a watch, (see Knight's Mechanical Dictionary, Vol. 1, page 930, Fig. 2,133,) may be employed; but the only substantial change that would thereby be effected from the construction shown in the figure would consist in substituting the spring-drum *b* shown by Knight for the said weight 16, and one is the resistance equivalent of the other.

What I claim as my invention is—

The combination, with the movable carbon-supporting rod of an electric lamp, of a shaft supported to rotate freely over the lamp, having fixed thereon two cone-pulleys, as 12 and 13, each having a spiral groove formed in its surface, one of which pulleys is attached by a winding-cord to said rod, and a weight attached by a winding-cord to the second of said pulleys, substantially as set forth.

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Witnesses:

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