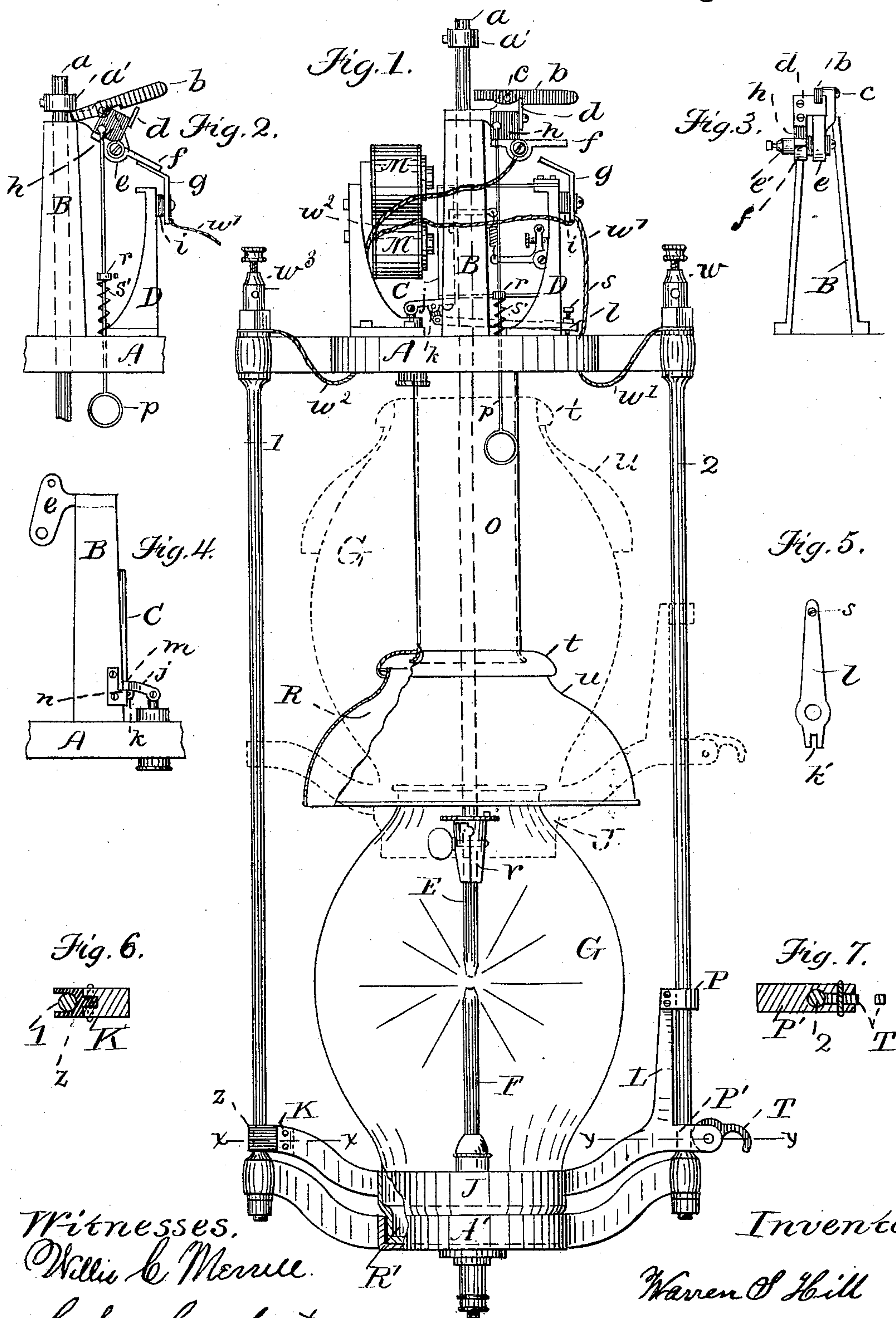


(Model.)

W. S. HILL.
ELECTRIC LAMP.

No. 246,390.

Patented Aug. 30, 1881.



Witnesses.
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UNITED STATES PATENT OFFICE.

WARREN S. HILL, OF BOSTON, MASSACHUSETTS.

ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 246,390, dated August 30, 1881.

Application filed April 30, 1881. (Model.)

To all whom it may concern:

Be it known that I, WARREN S. HILL, of Boston, county of Suffolk, and State of Massachusetts, have invented a new and useful
5 Improvement in Electric Lamps, which improvements are fully set forth in the following specification.

This invention relates to electric lamps; and it consists of a novel manner of arranging and
10 operating a switch for changing the course of the electric current, so that when the carbons have been burned as low as desired the switch may be made to act mechanically to divert the current from its course through the carbons
15 to a more direct passage, whereby the regulating mechanism will be rendered inoperative and the light extinguished without thereby affecting the other lamp in the same circuit.

It further consists in the use of a device for
20 holding the glass globe, by means of which it may be raised and held suspended at an altitude sufficient to admit of the carbons being replenished beneath it, thereby rendering unnecessary the removal of the globe from the
25 lamp; also, in connecting the globe, or a reflector surmounting it, with the top plate of the lamp by a tube embracing the feed-rod, and protecting the whole from the weather, as becomes necessary when the lamps are used for
30 outdoor illumination.

My invention is fully illustrated in the drawings accompanying this specification, in which—

Figure 1 is an elevation showing the general outline of the lamp with all its parts in place, and the position of the globe and its holder when raised shown in dotted outline. Fig. 2 is a side elevation, showing the switch and locking device when closed, as when the
40 carbons have burned to their lowest limit, and the light extinguished. Fig. 3 is an end view, showing the manner of connecting and of insulating the switch-bar and the locking device. Fig. 4 is an elevation showing the support for the switch-bar and sear or locking lever attached to the bridge or feed-rod support. Fig.
45 5 is a plan of the gripe-lever. Fig. 6 is a section showing the manner of insulating the globe-holder from electric contact with the
50 side rod. Fig. 7 is a section showing the con-

nection of the cam for holding the globe-holder when elevated by its action against the side rod, 1.

My improvements may be successfully employed in connection with different styles of
55 regulating apparatus. I therefore do not limit myself to its use in connection with the regulating mechanism shown in the drawings, which are an illustration of the lamp invented by Edward Weston, with my improvement 60 added thereto.

In Fig. 1 is shown the general form of a lamp manufactured by me under the Weston patent. It consists of the plates A and A', united at a suitable distance apart by the side rods, 1 65 and 2. To the top plate, A, is secured the electro-magnets *m m* and the armature C, which is connected to the support D by flexible pieces, which admit of its moving perpendicularly in close proximity to the magnets. The support 70 B furnishes bearings for the feed-rod *a*, which, in turn, carries the carbon-holder *r* and the carbon E. Feeding motion is imparted to the rod *a* by means of the gripe *l*, which is connected to the armature by the link *k*, and which embraces the rod loosely, allowing it to move
75 freely when the gripe lies at a low angle; but as the end connected to the armature is raised, placing the gripe at a greater angle, the sides of the opening impinge against the rod, and by
80 gripe raise the rod, separating the carbons and producing the electric arc at the points of the carbons in a manner understood, and therefore not necessary to be herein described.

To apply my improvements to the regulating apparatus thus described I attach to the
85 feed-rod support B a projecting arm of the form shown at *c* in Fig. 4. To this arm is pivoted the vibrating switch-bar *f*, which is insulated from electric connection therewith by
90 the use of rubber or other non-conducting material. The pivot or stud *e* is made also to serve as a binding-post to receive the wire *w*². To the arm *c* is also pivoted the lever *b*, as shown in Figs. 1 and 2. The inner end of this
95 lever extends toward and quite near to the feed-rod *a*, while its outer end is provided with a notch, which engages with the plate *d*, acting as a sear or catch. The plate *d* is secured to the switch-bar *b* by means of the rubber 100

block *h*, whereby it is insulated from metallic connection therewith. The collar *a'* is secured to the rod *a* by a set-screw, and operates by the descent of the rod *a* to engage with and trip the lever *b*. The rod *p'* is connected to the switch-bar *f* by a screw entering the rubber block *h*, whereby it is insulated from metallic connection with the bar *f*. It extends below the plate *A* and terminates in an eye or ring. A spiral spring, *s'*, bearing against the collar *r*, acts to force the bar *f* against the plate *g*, as shown in Fig. 2. The plate *g*, of copper or other good conducting material, is secured to and insulated from metallic contact with the support *D*, and has electric connection with the wire *w'*.

The operation of the parts thus specified is as follows: The lamp being put in connection with an electric generator, the current enters the lamp at the binding-post *w*, passing through the wire *w'* to the magnets *m m*, and to the plate *A*, thence down the feed-rod *a*, through the carbons *E E*, making the light at their meeting points, up the side rod, 1, and out at binding-post *w*³, proper insulation being employed to direct its course. The wire *w*² has electric connection with the binding-post *w*³ and with the insulated switch-bar *f*, which, being held open or in the position shown in Fig. 1, causes no interruption to the regular working of the lamp. The collar *a* is placed at such a point that when the carbons have burned as low as desired it will strike and depress the inner end of the lever *b*, causing it to release its hold of plate *d*, when the action of spring *s* moves the switch-bar *b* to the position shown in Fig. 2, or into closed contact with plate *g*, thereby offering a more direct passage to the current, which is diverted from its course, and the regulating mechanism and the carbons are cut out of the circuit, and the light, of course, extinguished, and, inasmuch as the circuit is not broken, no interruption is caused to the other lamps in the same circuit. After the lamp has thus been cut out it may be supplied with new carbons, and is again put in action by drawing down the rod *p*, which will open the switch and restore the current to the regular course. The notch in lever *b*, engaging with plate *d*, will hold the switch open until again closed by the descent of the collar *a*, as has been described.

My improved device for holding the glass globe in an electric lamp consists of a ring to embrace the bottom of the globe, said ring having arms on either side extending to the side rods, which rods act as guides upon which the holder is moved up or down.

In Fig. 1, *J* is the ring, the bottom of which is made to fit into the recess within the plate *A*, as is shown at *R'*. The arm *K* is insulated from metallic connection in its bearing on rod 1 by the rubber *z*. The arm *L* is made to extend higher up on the side rod, 2, and has two bearings thereon, the upper one, *P*, consisting of a metallic band, embracing the rod and se-

cured to the arm by screws or otherwise, while the bearing *P'* is provided with a cam-lever, *T*, which acts by its eccentric bearing against the rod, to prevent a downward movement of the holder *J*. Both bearings are shown in section in Figs. 6 and 7. The globe is raised by the simple act of sliding the holder upward, the rods 1 and 2 acting as guides or ways, and the cam-lever *T*, bearing against the rod 2, will hold it securely at any point. By raising the lever *T*, thereby releasing its bearing on the rod 2, the holder may be lowered to its former position.

Instead of the eccentric cam-lever shown, a simple pawl may be used, and one or more notches made in the rod, in which it may rest, and thus hold the holder up; but I prefer the method shown.

When the lamp is used for outdoor illumination it is desired to protect the feed-rod and carbon-holders from the action of the weather. For this purpose I attach a tube, *O*, to the plate *A*. It embraces the feed-rod, and has a flange, *t*, fitted to slide loosely on its outer surface. It may be made of any thin metal, and at its lower end may be turned outward slightly to prevent the flange *t* from falling off when the globe is removed from the lamp.

A reflector, *R*, may be secured to the flange *t*, as shown, and as the holder *J*, with the globe *G*, is raised the top of the globe will strike against the under side of the flange *t*, and it, with the reflector *R*, may be raised to the position shown in the dotted lines, the loosely-fitted flange moving readily on the tube *O*, and said tube entering the opening in the top of the globe. If desired, the reflector *R* may be omitted and the tube *O* extended downward sufficient to allow the flange *t* to rest continually on the top of the globe.

It will, of course, be understood that when in use the regulating mechanism is incased within a suitable cover, although such cover is not shown in the drawings.

In an application now pending in the Patent Office for an improvement in electric lamps having two sets of carbons, I have shown a device consisting of a vibrating bar operated by a spring and held in one of its positions by a sear, said sear being caused to release its hold of the bar by the action of a collar on the feed-rod. I do not, therefore, now claim the use of these parts in severalty.

In conclusion, I remark that I am aware that a mechanical cut-out operated from or by the feed-rod of an electric lamp has before been suggested; but in all cases of which I have knowledge the cut-out or switch has been actuated either by the feed-rod or by some part moved or brought into action by the said rod. In my case, however, the cut-out or switch-bar is not actuated either by any device moved by the feed-rod or by the feed-rod itself. The latter acts only upon a switch-holding detent, with the effect of releasing the switch or cut-out mechanism, which, when thus released,

has, for the purpose of cutting out the lamp, its own proper motion, unaffected and uninfluenced by after movement of the feed-rod.

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

1. In an electric lamp, the combination, substantially as hereinbefore set forth, of a switch or cut-out mechanism and a detent which holds the switch or cut-out mechanism open, and is operated by or from the feed-rod to release said switch mechanism at the time and in the manner substantially as specified.

2. In an electric lamp, a switch mechanism consisting of a stationary plate having electric connection with one pole of the lamp, a vibratory or movable lever or arm having electric connection with the opposite pole of the lamp, and a spring or its equivalent which moves the lever toward the stationary plate, in combination with the feed-rod and a detent or catch adapted to hold the switch-lever out of contact with the stationary plate, and operated by or from the feed-rod to release said switch-lever at the time and in the manner substantially as hereinbefore set forth.

3. In combination with the side rods of the lamp, the globe or shade holding ring having bearing-arms K L, the latter formed with two bearings, P P', and provided with a cam, T, substantially as and for the purposes shown and described.

4. In an electric lamp, a device for incasing the feed-rod and its connecting parts, consisting of the tubular case O, secured to the top plate of the lamp and arranged to enter the opening in the globe as it is raised, and having fitted thereto the flange t, arranged to cover the opening in said globe and to move with it when it is raised, substantially as shown, and in the manner described.

5. In an electric lamp, the combination, with the moving carbon-feed rod, of a normally-held open switch or cut-out mechanism released by the action of said rod at predetermined times, substantially as specified, and arranged and operating, when so released, to automatically close and remain closed without reference to the after movements in either direction of the feed-rod, and a handle whereby said switch mechanism can be reset in its open position, substantially as hereinbefore set forth.

In testimony whereof I have signed my name to this specification in presence of two subscribing witnesses.

WARREN S. HILL.

Witnesses:

E. F. HODGES,
ION F. BARRETT.