A. W. HALL.

Electric-Lighting Apparatus.

No. 217,792. Patented July 22, 1879.

Fig 1

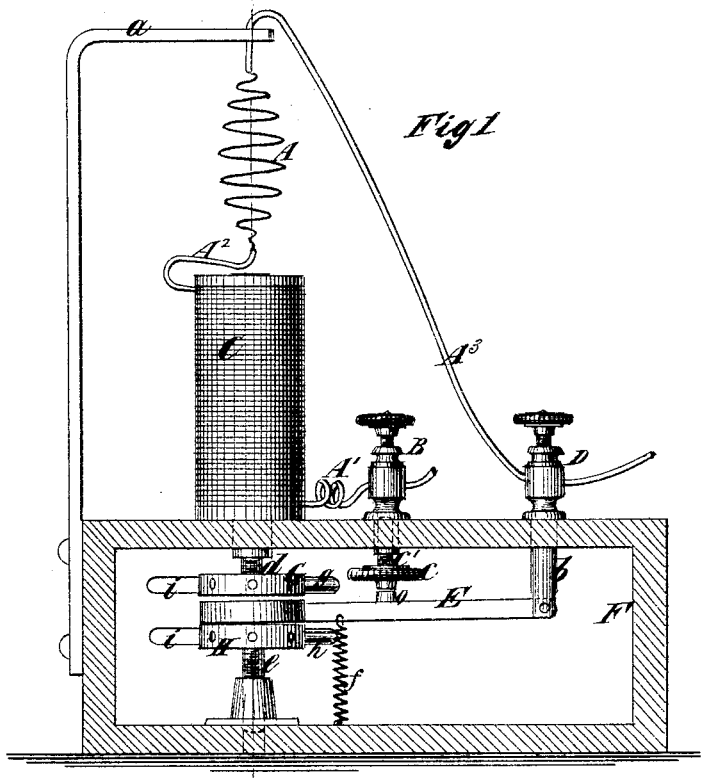
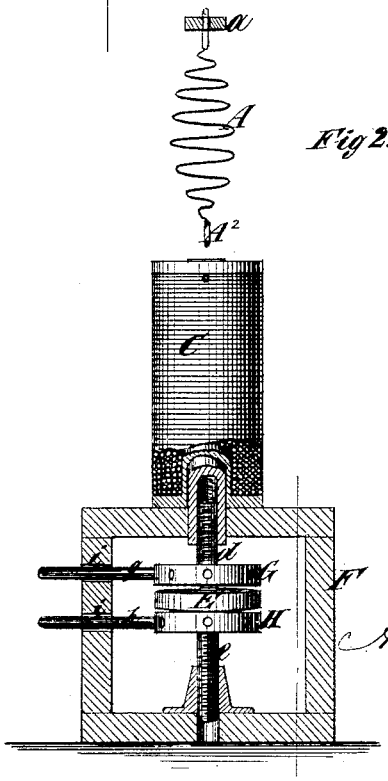


Fig 2.



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A. WILFORD HALL, OF NEW YORK, N. Y.

IMPROVEMENT IN ELECTRIC-LIGHTING APPARATUS.

Specification forming part of Letters Patent No. **217,792**, dated July 22, 1879; application filed May 8, 1879.

To all whom it may concern:

Be it known that I, A. WILFORD HALL, of the city, county, and State of New York, have invented certain new and useful Improvements in Electric-Lighting Apparatus, of which the following is a specification.

My invention, though applicable to electric-lighting apparatus in which the light is produced by two electrodes, forming a voltaic arc, is especially intended for use, and will be described in connection, with lighting apparatus wherein is employed an electric circuit comprising a portion of less conductivity than the remainder of the circuit, which becomes heated to a point of incandescence by the resistance offered to the passage of electricity. For this purpose are employed metals which have a low degree of conductivity, and in which the point of fusion is very high—such, for instance, as platinum. In such apparatus the incandescent or light-giving portion is liable to become heated to a point of fusion and destroyed by the increased intensity of the electric current; and the object of this invention is to provide a regulator, which may be termed a "magneto-stat," whereby, when the electric current becomes too intense, it may be wholly or in part prevented from passing through the incandescent portion of the circuit.

To this end the invention consists in the combination, with the armature of an electro-magnet, the coil of which forms a portion of an electric-light circuit, and a short circuit with which said armature is connected, of an adjustable extension of the core of said electro-magnet, an adjustable stop for the armature, an inclosed case containing said armature, core-extension, and stop, and levers or arms inserted through the walls of said case, and connected with said core and stop for the purpose of adjusting the same, whereby the distance between the armature and core may be increased or decreased, and different tensions of the magnet required to operate the former to close the short circuit and divert the electric current from said magnet.

In the accompanying drawings, Figure 1 represents a side view of an electric-lighting apparatus embodying my invention and a sectional view of a case inclosing certain parts thereof; and Fig. 2 is a transverse section on line *x x*, Fig. 1.

Similar letters of reference designate corresponding parts in both figures.

A designates the light-giving portion or burner of an electric circuit. It is here represented as a wire or strip of platinum, iridium, rhodium, or any other metal having a low degree of conductivity and a high point of fusion. Electricity passes from a battery (not here represented) through a conductor, A^1, secured in a binding-post, B, and thence, through an electro-magnet, C, and conductor A^2, to the portion A, from which a conductor, A^3, leads through a binding-post, D, to the battery. The conductor A^3 passes through a properly-insulated opening in a standard, *a*, whereby it is supported.

It will be seen that the light-giving portion or burner A, as it possesses less conductivity and is very much smaller than the remainder of the circuit, will become heated to a point of incandescence at which it will emit light.

E designates an armature, represented as arranged within a case, F, and pivoted at one end to a fulcrum-piece, *b*, extending from the binding-post D. From the binding-post B extends a circuit-closing device, *c*, tipped with platinum, with which a platinum tip or contact-point, *o*, on the armature E may come in contact, thereby forming a short branch circuit, and conducting or shunting a portion of the electric current through the armature E and fulcrum-piece *b*, and thence to the battery without passing through the main circuit and light-giving portion A.

A series of lights might be employed, in which case the electric current would pass to another light instead of direct to the battery.

The circuit-closing device *c* is preferably adjustable, and is here represented as secured to the binding-post B by a screw-thread, C′, permitting such adjustment.

G designates an adjustable extension-piece with which the fixed core of the magnet C is provided, and which is here represented as provided with a screw-threaded shank, *d*, for effecting its adjustment. This extension-piece makes what may be termed an "extension-magnet." H designates a stop, also shown as

adjustable by means of a screw-thread, *e*, and which serves to regulate the falling back of the armature E. The armature E rests between the adjustable extension G and stop H, and when not otherwise actuated is pulled down by a spring, *f*, thereby rendering the circuit-closing device *c* inoperative. In lieu of a spring, *f*, a weight might be employed.

The adjustable extension G and stop H may both be adjusted from outside the case F by means of levers *g h*, which extend through slots *i* in the side of said case. Before the intensity of the electric current passing through the main circuit increases to such a degree as to overheat the light-giving portion A, the armature E is raised by the action of the magnet C, so as to make contact with the circuit-closing device *c*, and a portion of the electricity is shunted, or caused to pass off through the short branch circuit. By raising the adjustable extension G a greater intensity of the electric current is required to operate the armature E, and consequently a brighter light is obtained. By raising the stop H the armature may be kept in contact with the circuit-closing device, and the entire electric current passed through the short branch circuit, thereby extinguishing the light.

After properly adjusting the circuit-closing device *c*, extension G, and stop H, the case F is intended to be closed to prevent the said parts from being tampered with. By turning the lever *g* to the right the adjustable extension-piece is raised, causing the magnet C to exert less force on the armature E, and thus allowing a larger portion of the electric current to pass through the light-giving portion A of the main circuit. By turning the lever *h* to the right the stop H is raised, thereby raising the armature, and by causing the platinum contact-point *o* to come in contact with the circuit-closing device *c* completes the short branch circuit, as before described.

By my invention I produce a simple and reliable regulator for an electric-lighting apparatus, whereby a light of uniform brilliancy may be maintained, and injury to the incandescent or light-giving portion is prevented, and by which the current may be subdivided for the purpose of maintaining a number of lamps by a single generator.

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

The combination, with the armature E, magnet C, adjustable extension G, and stop H, of the closed case F and the levers *g h*, extending through the side thereof, substantially as specified.

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