No. 784,612. PATENTED MAR. 14, 1905.

R. S. ALLYN.

INCANDESCENT MANTLE SUPPORT.

APPLICATION FILED AUG. 3, 1901. RENEWED SEPT. 1, 1904.

Fig. 1.

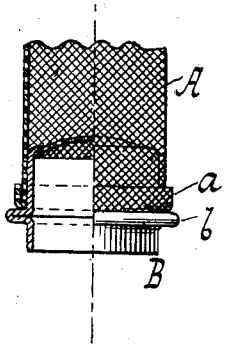


Fig. 2.

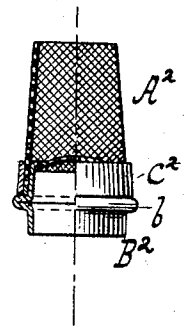


Fig. 3.

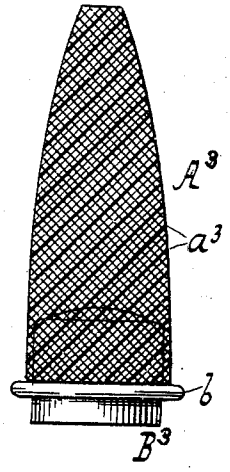


Fig. 4.

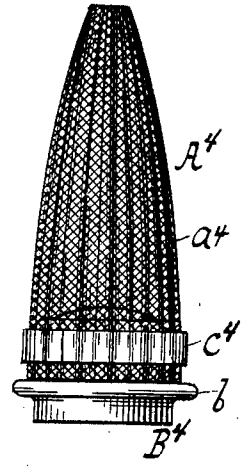
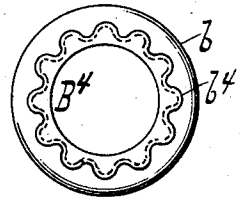


Fig. 5.



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UNITED STATES PATENT OFFICE.

ROBERT S. ALLYN, OF NEW YORK, N. Y.

INCANDESCENT-MANTLE SUPPORT.

SPECIFICATION forming part of Letters Patent No. 784,612, dated March 14, 1905.

Application filed August 3, 1901. Renewed September 1, 1904. Serial No. 223,005.

To all whom it may concern:

Be it known that I, ROBERT S. ALLYN, a citizen of the United States, residing at New York, State of New York, have invented new and useful Improvements in Incandescent-Mantle Supports, of which the following is a full, clear, and exact description.

The invention herein set forth relates to artificial illuminants, and particularly to the class of incandescent-mantle gas-lights.

Efficiency, simplicity, and durability and the consequent economy of construction, maintenance, and repair, being obviously desirable, useful, and valuable, are the objects of this invention, which are attained as will hereinafter appear.

The mantles in use at present with gas-lights are composed of a deposited network of salts of "rare earths" in a shape and general appearance similar to an original "stocking" or "form" of gauze. The stocking is knitted of a suitable combustible fiber and of a considerably larger size than the final mantle desired. After impregnation with the proper saturated solution of the salts the stocking is dried on a form and the fiber burned away, leaving a most fragile network of the salts, which in the process has shrunk perceptibly. For convenience in handling and safety in transportation the mantles are then dipped in some liquid substance of a readily congealable and combustible nature—such as melted wax, paraffin, or similar material—which when set gives strength and elasticity to the otherwise fragile mantle.

It has been customary to provide a loop at the top of the mantle, by which it is suspended from a wire or clay support above a gas burner or tube. After adjusting the mantle in position the temporary wax or other stiffening material is ignited and burned away. The fragile mantle being thus hung up, the entire stress due to the weight of the mantle must then be borne by the substance of the deposited salts itself. Now such a structure has almost no tensile strength and is not adapted to bear any weight whatever when applied so as to produce a longitudinal or tensional strain. The consequence is that a disturbance, though exceedingly slight, will overcome the cohesive strength of the dried salts and cause rupture of the mantle at the upper part. It is most likely to occur here, because of the fact that the stress due to the weight of the mantle increases as the point of suspension is approached and because the diameter of the mantle is least near the loop.

This invention consists in providing means to support a fragile mantle of deposited salts at its base, the mantle being adapted to withstand the peculiar stresses incident thereto. By so doing use is made of the superior compressional strength of such a structure.

In the accompanying drawings, Figure 1 illustrates, partly in section, a burner-cap supporting a fragile mantle reinforced at its base. Fig. 2 is a vertical section and elevation of a fragile mantle supported at its base with a ring to hold it in place. Fig. 3 is a vertical projection of a burner-cap supporting a fragile mantle reinforced by its own fibers. Fig. 4 is a vertical projection of a burner-cap supporting a fragile mantle laterally reinforced by its scalloped or grooved structure and held in place by a ring. Fig. 5 is a horizontal projection or plan view of a burner-cap suitable to be used with a scalloped mantle as shown in Fig. 4, the tube being grooved to correspond with the shape of the mantle.

Because of the difficulty of illustrating the actual weave of a mantle it is shown diagrammatically; but the principles of support and reinforcement are the same.

A, A^2, A^3, and A^4 designate the fragile mantles of Figs. 1, 2, 3, and 4. The letters B, B^2, B^3, and B^4 refer to the burner-caps of the corresponding figures. C^2 and C^4 likewise are rings, preferably of metal. (Shown in Figs. 2 and 4.)

At *a* in Fig. 1 the lower edge of the mantle is doubled back upon itself to give it additional stiffness and to prevent it from tearing. A ledge or projecting flange *b* is provided on the cap to serve as a support for the lower edge of the mantle. Obviously this flange may be made as a part of the burner-tube instead of the removable cap. It is preferred, however, to spin the ledge as a part of the cap. In Fig. 3 certain of the fibers are made heavier and stronger than the others, as at a^3.

The mantle is thus laterally reinforced. The mantle of Fig. 4 is scalloped or grooved at a^4, as shown.

At b^4 in Fig. 5 the tube of the burner-cap is shown grooved to correspond with the desired form of the mantle. The ring C^4 is similarly formed.

The mantle is preferably open at the top, as in the form shown in Fig. 2. Less injury is then likely to occur to the mantle in lighting.

The fragile mantle is found to possess a considerable compressional strength and when properly secured at the base will stand up remarkably. The term "fragile mantle" is used throughout this application to designate a mantle formed of the deposited salts of rare earths.

When fragile mantles of a low candle-power having a fine and light texture are used, however, they are found to collapse laterally or cave in at the sides when under incandescence. This may be partially prevented by reducing the height of the mantle, by fitting it carefully to the burner-cap, and by giving it a uniform and considerable taper. To particularly obviate this difficulty, the mantle itself may be reinforced by weaving certain fibers, as a^3, into the stocking of a larger size than the others or by weaving some of the fibers more closely together.

The structure shown in Fig. 4 has the peculiar property of a uniform texture and lateral reinforcement combined, the scalloped portions a^4 acting as arches to prevent inward or outward collapse and as a beam to prevent abrupt flexure. This shape may be obtained by drying the impregnated stocking upon a grooved form, or a plain mantle may be placed over a grooved burner-cap, as b^4, and made to take the shape of the grooves by having a scalloped ring, as C^4, pushed down about the base. The scallop thus formed will extend up the body of the mantle. Another difficulty to be guarded against in this new form of support is that occasioned by the stress sometimes set up in the mantle when it has been stretched over the cap or top of the burner-tube. This is likely to split the fragile mantle up the side. The ring, as C^2 and C^4, will prevent this, or it may be otherwise reinforced, as at a.

The absence of any external rod-support insures a uniform distribution of light, and there being no inside rod the heat of the flame is conserved to the purpose of the mantle.

Experiment has shown that a mantle supported at the base will withstand prolonged and more violent shocks without rupture than any mantle of similar texture and power suspended from the top.

What I claim is—

1. In an incandescent-mantle gas-lamp, the combination of a fragile mantle formed of deposited salts of rare earths suitably shaped and free from support or constraint at the top with removable means for supporting said mantle at the base.

2. In an incandescent gas-burner the combination of a mantle of deposited salts laterally reinforced by its own structure, with removable means for supporting said mantle on the burner from the base alone.

3. In an incandescent-mantle gas-lamp, a burner-cap, a mantle, the lower end of said mantle fitting about the tube of said cap, a scalloped ring fitted over said mantle and about said tube so as to draw said mantle into a scalloped shape and hold said end of said mantle in place substantially as described.

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

ROBT. S. ALLYN.

Witnesses:
F. A. CARTER,
JOHN DE YONGS.