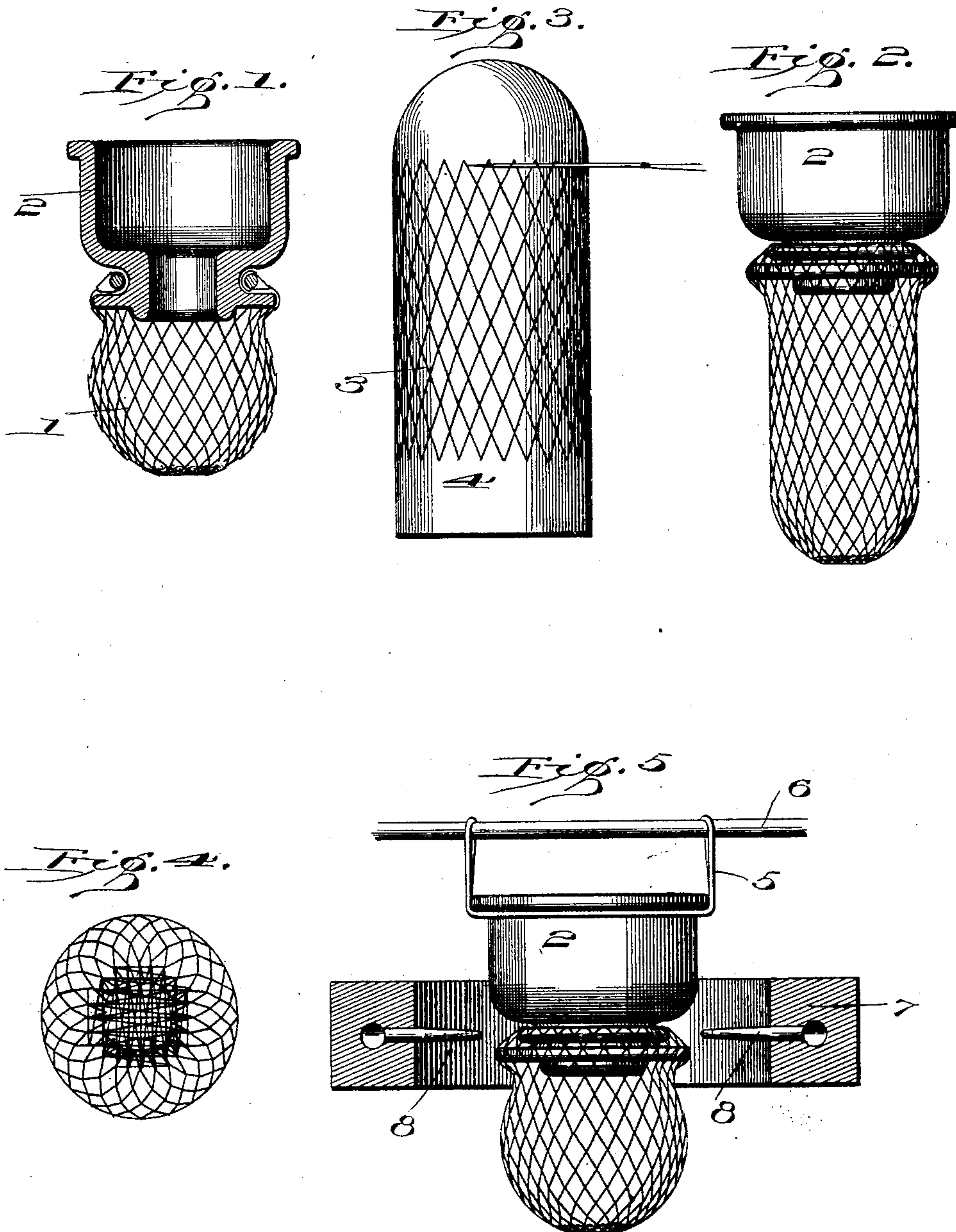


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PATENTED NOV. 7, 1905.

C. M. LUNGREN.
INCANDESCENT GAS MANTLE.
APPLICATION FILED AUG. 12, 1904.



Witnesses

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INCANDESCENT GAS-MANTLE.

No. 803,835.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed August 12, 1904. Serial No. 220,476.

To all whom it may concern:

Be it known that I, CHARLES MARSHALL LUNGREN, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Incandescent Gas-Mantles, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

10 This invention relates to mantles to be used in connection with gas-lamps and other sources of light. The invention aims to produce a mantle having its free end thickened and its supporting end hardened and preferably depending from its point of support.

15 Broadly, one of the objects thereof is to provide a mantle in which the thickness of the several parts shall be substantially proportioned to the stress to which they are exposed in use without substantial loss in the efficiency of the same.

Another object is to provide a mantle which is so hardened at certain parts as to strengthen these parts.

25 Another object is to provide a device of the above type which shall be simple in construction and durable and efficient in use.

Other objects will be in part obvious and in part pointed out hereinafter.

30 The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the device herein described and the scope of the application of which will be indicated in the following claims.

35 In the accompanying drawings, which illustrate two of various possible embodiments of my invention and some of the steps performed in forming the same, Figure 1 is a sectional elevation of a mantle embodying my invention with the part on which it is mounted. Fig. 2 is an elevation of a slightly different embodiment. Fig. 3 is a diagrammatic view showing one of the steps in forming a mantle 40 embodying this invention. Fig. 4 is a similar view showing a method of closing the end or "crown" of a mantle. Fig. 5 is a sectional elevation showing a method of hardening one end of the mantle.

45 Similar reference characters refer to similar parts throughout the several views.

In order to make clear the general nature of some features of my invention, it may here

be noted that the apex or crown of an incandescent mantle, such as that with which this invention deals, is exposed to a relatively great stress, partly owing to the mechanical action of the jet acting directly against the same and partly due to other causes. It may also be noted that the fastening end or end at which the mantle is secured to the member upon which it is mounted is severely tested, as it is obliged to support the entire weight of the mantle and is also substantially the center about which the mantle vibrates when jarred. This portion is rendered still more susceptible on account of the difficulty of heating properly when the mantle is burned to remove the hood, the member upon which it is mounted tending to conduct heat away from the same.

70 The above and other defects are remedied in constructions in the nature of that hereinafter described.

Referring now to Fig. 1, there is represented at 1 a mantle which is supported upon a spool or ring 2, but may obviously be mounted in any other desired manner. This mantle may be formed according to any preferred process, but is preferably made in accordance with those set forth in my copending applications filed of even date herewith. The "crown" of the mantle, as that part which is remote from the spool 2 or its equivalent will be termed, is thicker than the sides of the same and may be formed by means of partially gathering one end of a hood 3, woven in substantially tubular form and stretched over a mandrel 4, as shown in Fig. 3, and darning the remaining opening, as shown in Fig. 4. By means of forming this part in this manner any desired thickness may be attained after the hood is burned out and also considerable strength in its connection with the body of the mantle.

95 As is clearly shown in the drawings, the thickening of the mantle is preferably at a maximum substantially in the central portion thereof and becomes gradually less or is of a graduated thickness toward the sides. In this manner there is no marked line of junction of the thickened portion with those portions of normal thickness. Although in this form the crown is the only part which is substantially thickened, it is obvious that any other desired portions may be similarly treated. It is an important feature of this inven-

tion that the several parts of the mantle are so formed as to be to a certain degree proportionate in thickness to the stresses to which they are exposed. This end may be attained
5 by any desired means; but there have been found to be peculiar advantages in that herein described.

After the mantle has been formed, impregnated, and otherwise prepared for use the
10 "fastening end," as that end which is remote from the crown will be termed, is hardened, in order to render it better able to resist the stresses to which it is peculiarly exposed, as above indicated. This is preferably accomplished by means of directing against the same
15 a series of converging jets of extremely high temperature. As shown in Fig. 4, the mantle 1 is suspended by spool 2 and wires 5 from rod 6, so as to hang substantially at the center of
20 an annular gas-conduit 7, provided with a series of burners 8 about the inner surface thereof. The mantle is suspended at such a height that the inwardly-directed jets from
25 these burners are caused to play about the upper end thereof. In this manner the fastening end of the mantle is shrunk into the desired shape and is also hardened for the above-indicated purposes.

A mantle embodying this invention may be
30 used in the obvious manner, the spool 2 or equivalent part being mounted directly or indirectly upon the burner in such manner as to direct a jet of flame against the inner surface of the mantle. This jet strikes the
35 thickened crown and the flame rolls back on all sides. Thus the crown of the mantle is at what may be termed the "focus" of the flame both as regards temperature and force of the
40 jet, and the advantage of the construction described will accordingly be clear. It will also be seen that I have provided a mantle which is peculiarly adapted to withstand the effect of any jars or vibration to which it may
45 be subjected in use and that the same is accomplished without decreasing the efficiency or economy of the mantle. On the contrary, it is found that the above qualities are enhanced. It will also be noted that although
50 this mantle is peculiarly adapted for use in a position in which the free end is below the point of support it may nevertheless be used at any angle.

The method of manufacture is simple and the apparatus inexpensive, and the product
55 has been found to be durable and efficient and to accomplish well the objects for which it is designed.

It will be obvious that my invention may be embodied in any desired shape of mantle
60 and that shown in Fig. 2 is given merely as illustrative of many other forms to which it could be applied.

As many changes could be made in the above construction and many apparently widely different
65 embodiments of my invention could be

made without departing from the scope thereof, I intend that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A mantle having a crown of graduated thickness.

2. A mantle having a fastening end hardened with respect to the body thereof.

3. A mantle having one end thereof hardened with respect to the body thereof.

4. A mantle having a thickened crown or
80 free end and a fastening end hardened with respect to the body thereof.

5. A mantle having its several parts proportioned in thickness to the stress to which they are subjected in use and having one end
85 thereof hardened with respect to the body thereof.

6. An incandescent gas-mantle having a free end and a supporting end, the thickness of the mantle at the free end being greater than at
90 the body portion thereof, and having the material thereof at the supporting end hardened with respect to that of the body thereof.

7. A mantle having the fabric upon which its crown is formed of a maximum thickness in
95 the center and of decreasing thickness toward the sides thereof.

8. A mantle having the fabric upon which its crown is formed of a maximum thickness in
100 the center and of decreasing thickness toward the sides thereof, the fastening end of said mantle being hardened.

9. A pendent mantle the thickness of the free end of which is at a maximum at the center thereof and is graded in thickness laterally
105 with respect to said point.

10. A pendent mantle having a closed free end of a thickness greater than the body thereof.

11. A globular mantle having a closed free
110 end, the fabric upon which said mantle is formed being of a maximum thickness at the center of said free end and of a thickness graded laterally with respect to said central point.

12. In combination, a spool having an annular groove in the sides thereof and a pendent mantle tied to said spool within said annular groove, the closed free end of said mantle being of a thickness greater than that of the
120 body thereof.

13. In combination, a spool having an annular groove in the sides thereof and a mantle tied to said spool within said annular groove, the closed free end of said mantle being of a
125 thickness greater than that of the body thereof and the fastening end of said mantle being hardened.

14. In combination, a spool having an annular groove in the sides thereof and a pendent
130

mantle tied to said spool within said annular groove, the portion of said mantle adjacent to said spool being hardened with respect to the remainder thereof.

- 5 15. In combination, a spool having an annular groove in the sides thereof and a pendent mantle tied to said spool within said annular groove, the closed free end of said mantle being of a thickness greater than that of the

body thereof, and the fastening end of said mantle being hardened.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES M. LUNGREN.

Witnesses:

H. S. DUELL,

H. M. SEAMANS.