

No. 760,317.

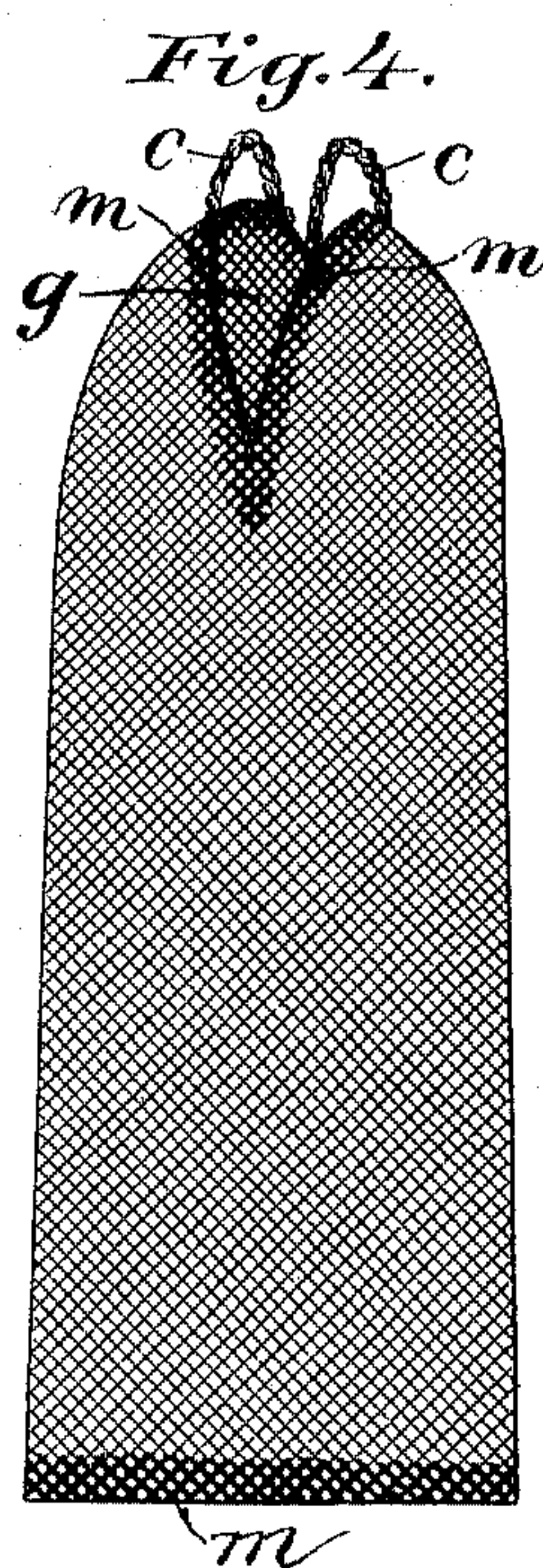
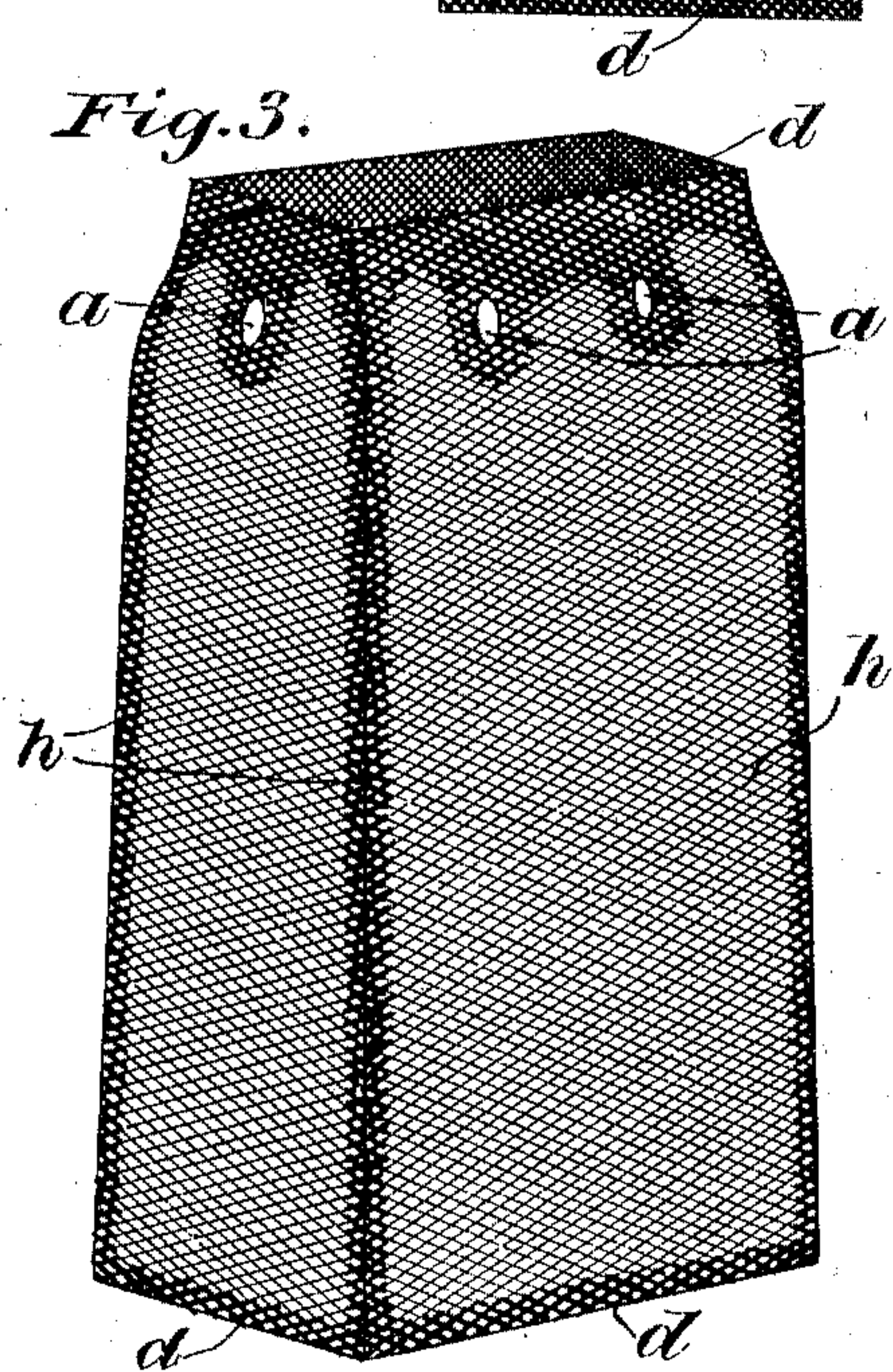
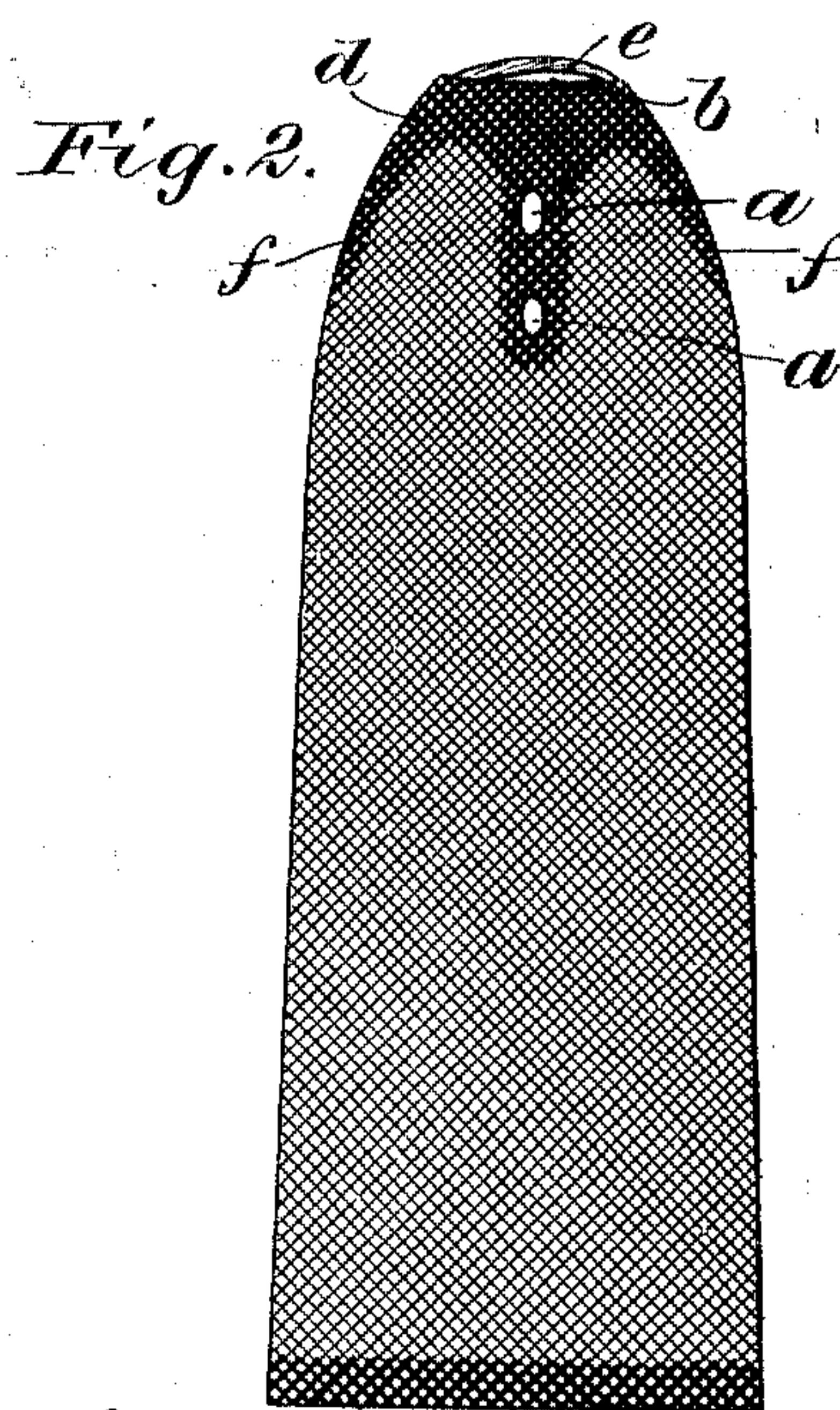
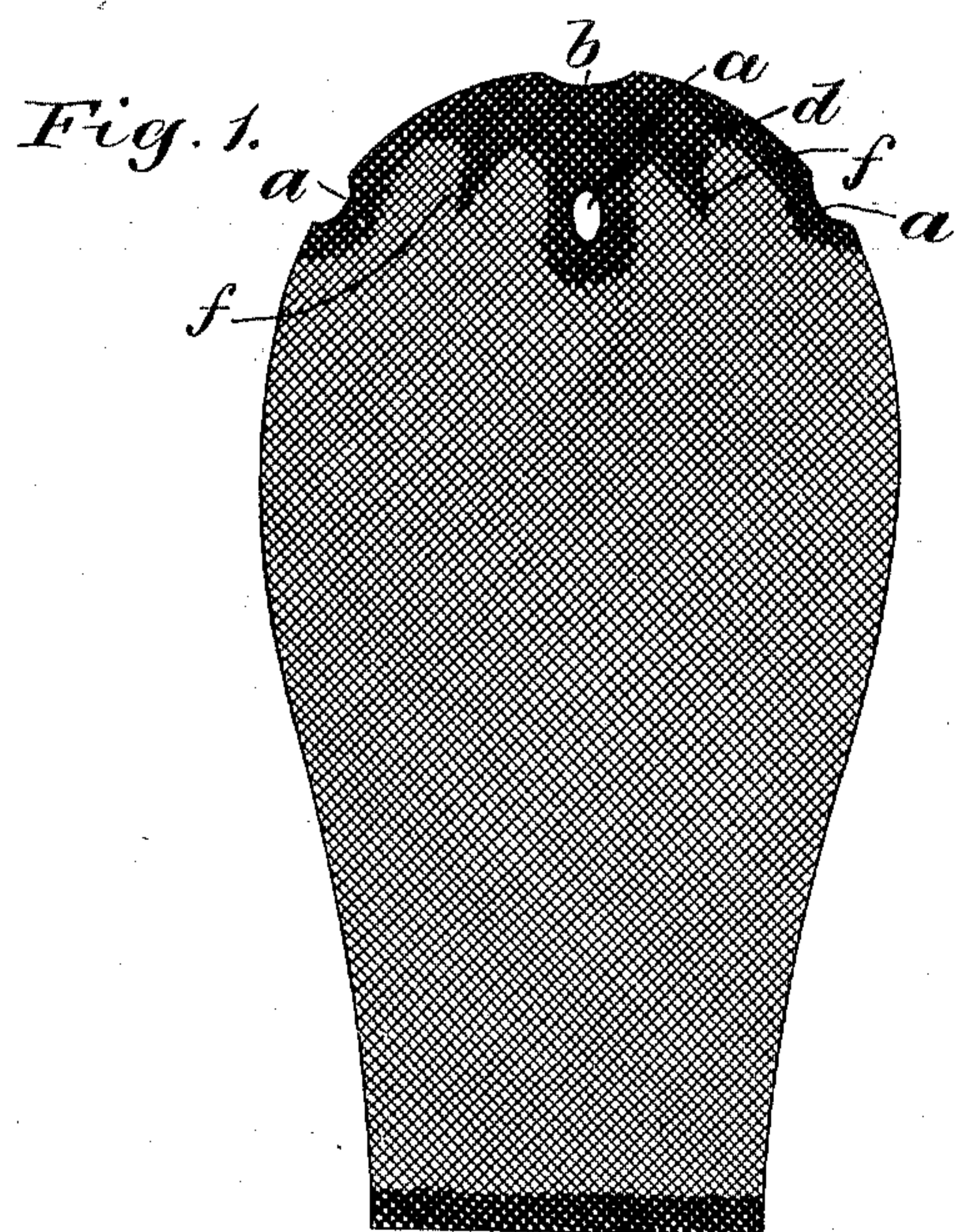
PATENTED MAY 17, 1904.

W. K.-L. DICKSON.

INCANDESCENT MANTLE AND ART OF MANUFACTURING SAME.

APPLICATION FILED JUNE 24, 1901.

NO MODEL.



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UNITED STATES PATENT OFFICE.

WILLIAM KENNEDY-LAURIE DICKSON, OF LONDON, ENGLAND.

INCANDESCENT MANTLE AND ART OF MANUFACTURING SAME.

SPECIFICATION forming part of Letters Patent No. 760,317, dated May 17, 1904.

Application filed June 24, 1901. Serial No. 65,795. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM KENNEDY-LAURIE DICKSON, a subject of the King of Great Britain and Ireland, and a resident of London, England, have invented certain new and useful Improvements in Incandescent Mantles and the Art of Manufacturing the Same, of which the following is a specification.

My invention relates to that class of devices known as "mantles" or "hoods" which are used in connection with a gas or other flame to be made incandescent thereby and thereupon to emit light.

The object of the invention is to increase the durability and efficiency of such mantles or hoods, and the nature of the invention is fully hereinafter set forth and described.

In the accompanying drawings, Figures 1 to 4, both inclusive, are views of different forms of mantles or hoods constructed according to my invention, all as hereinafter particularly described.

The ordinary incandescent mantle or hood, while an efficient agent for greatly increasing the illumination derived from a gas or other flame, is subject to two great objections which in practice detract largely from its usefulness. These are, first, its extreme fragility, and, second, its short period of maximum efficiency due to the dissipation or disorganization of the light-emitting substance of the mantle. It is well known that the fragility of mantles is such that they must be transported and handled with the greatest care, a slight shock or pressure being sufficient to tear or break them, and that they sometimes break while in use without apparent cause, and their progressive and rapid decrease in their light-emitting capacity after a certain amount of use is equally well understood. These defects are especially noticeable and serious when mantles are used in connection with flames burning gas or gas and air under pressure, the mantles in such cases undergoing a rapid deterioration and sometimes giving way almost immediately after being put into use. It is to mantles intended for use with such flames,

therefore, that my invention has special reference, though it is not limited thereto.

Various methods of strengthening mantles during the process of manufacture have heretofore been proposed; but all have been open to the objection that even when successful in reducing the fragility of the mantle they result in a considerable diminution of its light-giving power. My invention, however, increases the strength of the mantle without decreasing the light-giving power.

In carrying my invention into effect I provide vents or openings in the mantle for the relief of excessive or undue pressure in the interior of the same, and I reinforce or strengthen the edges of these vents, as hereinafter described. One form of such vents or openings is shown in Figs. 1, 2, and 3. In carrying out this form of my invention I make one or more perforations about one-eighth of an inch in diameter in the upper part of a mantle, as shown in Figs. 1, 2, and 3 of the accompanying drawings. These perforations should be located in that part of the mantle in which a fracture or rupture usually first occurs when used, particularly when used in connection with a flame burning gas under pressure. The exact location of this weakest portion, and consequently of the most favorable position for the perforations, will vary somewhat according to the size and shape of the mantle, but may be found for any given size or shape by testing a specimen of the same with a flame under pressure and observing the places at which fractures first become manifest. I have found that with flames produced by gas under pressure a mantle shaped somewhat as shown in Fig. 1 of the accompanying drawings produces good results, and mantles of such shape and average size can advantageously be perforated in four places, substantially as shown in the said figure. The perforations are there designated by the reference-letter *a*. The mantle has the usual circular opening *b* at its upper portion.

Fig. 2 of the accompanying drawings shows a mantle more nearly resembling the usual or

ordinary form. In this form I have found good results to follow the providing of two perforations *a a*, one a short distance below the other on each side of the mantle near the top, as shown. This form of mantle also has the usual opening *b* at the top and may be provided with a supporting-strap *c*.

Fig. 3 of the accompanying drawings shows a form of mantle adapted to be used with a flat flame. In this mantle I usually form two perforations on each side and one on each end. These perforations are also designated by the reference-letter *a*.

It must be understood that I do not limit myself to the particular arrangement of perforations described and shown nor to any particular arrangement or number or size of the same, since the size, number, and arrangement of such perforations must be varied according to circumstances. The important point is to provide perforations at the places most liable to rupture and in order to decrease as little as possible the light-emitting surface of the mantle to make such perforations as small and as few in number as is consistent with the performance of their function of preventing such rupture. It will also be understood that the perforations may be formed in the mantle at any convenient and suitable stage of the manufacture.

After the mantle has been perforated, as above described, I apply to the top and bottom edges of the mantle and extending down from the top edge to and around the perforations and also extending down midway between the perforations a solution of substances adapted to strengthen and toughen the mantle and prevent tearing or breaking at any of the edges. Any substance or substances may be used which will accomplish this purpose of toughening, strengthening, and reinforcing the mantle. In practice I have found that a solution of pipe-clay or fire-clay containing a small proportion of silicate of soda gives excellent results. The solution may be alcoholic, aqueous, or otherwise. No particular proportions are essential to success; but I prefer to use a considerable excess of the pipe-clay or fire-clay over the silicate of soda. This application renders the parts to which it is applied practically non-illuminating, but makes them very strong, and, as these parts do not require to give light, practically there is no loss of light-giving power of the mantle.

The strengthening preparation may be applied by dipping the top and bottom edges of the mantle into the same and by painting it on, down to, and around the margins of the perforations; but I prefer to apply the same by spraying it onto the proper places by means of any suitable mechanism for such purposes, having found that by such spraying

better results are obtained. A sufficient number of coats or sprayings should be applied to thoroughly strengthen the mantle at the points where it has been found it is most liable to break. In the drawings this application is indicated by *d*, the tongues between the perforations being specifically designated *f*. In the case of the form of mantle shown in Fig. 3 it may be necessary to spray or paint the corners with the application, as shown at *h*.

Fig. 4 shows a modified form of mantle in which instead of the perforations *a* a vent is provided at the top of the mantle by constructing the mantle with a frog-mouth opening *g* instead of the usual contracted ring. The top is thus somewhat dome-shaped. The edges are strengthened, as shown at *m*, by the solution heretofore mentioned as being applied to the edges of the perforations *a*. Two loops may be provided, as shown at *e*, or a single loop, similar to that shown in Fig. 5, may be used.

I have found that mantles manufactured according to my invention may be used for many hours even with flames burning gas under pressure and generating most intense heat without breaking. They have proved fully able to stand the great strain to which mantles in such cases are subjected.

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

1. The improvement in the art of manufacturing incandescent mantles, which consists in perforating the mantle at one or more points liable to be ruptured, torn or broken, and strengthening or reinforcing the margins of such perforations.

2. The improvement in the art of manufacturing incandescent mantles, which consists in perforating the mantle at one or more points liable to be ruptured, torn or broken, and applying to the margins of such perforations a substance adapted to strengthen the portions of the mantle to which it is applied.

3. An incandescent mantle provided with one or more pressure-relieving vents or perforations at points where it is liable to be ruptured, torn or broken.

4. An incandescent mantle provided with one or more perforations at points where it is liable to be ruptured, torn or broken, and having the margins of the said perforations strengthened or reinforced.

5. An incandescent mantle provided with one or more perforations at points where it is liable to be ruptured, torn or broken, and having applied to the margins of such perforations a substance adapted to strengthen the same.

6. An incandescent mantle provided with perforations at points where it is liable to be ruptured, torn or broken and having applied

to the margins of such perforations and adjacent parts a solution of pipe-clay or fire-clay and silicate of soda.

5 7. An incandescent mantle edges of which are provided with a coating of pipe-clay or fire-clay and silicate of soda, adapted to strengthen the same.

Signed at London, England, this 15th day of June, A. D. 1901.

WILLIAM KENNEDY-LAURIE DICKSON.

Witnesses:

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F. L. RAND.