No. 661,682. Patented Nov. 13, 1900.

# W. AVERY & A. BURRELL.

## LARYNGOSCOPE.

(Application filed Mar. 24, 1900.)

(No Model.)

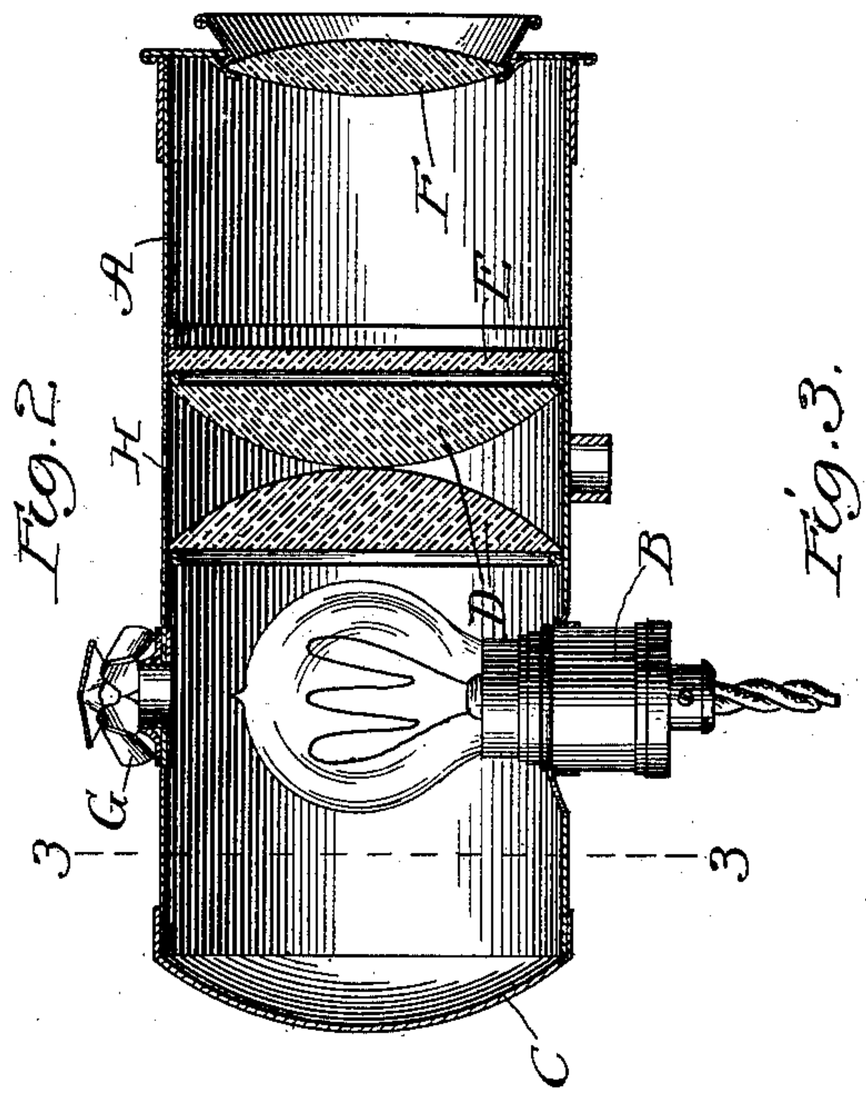


Fig. 2.

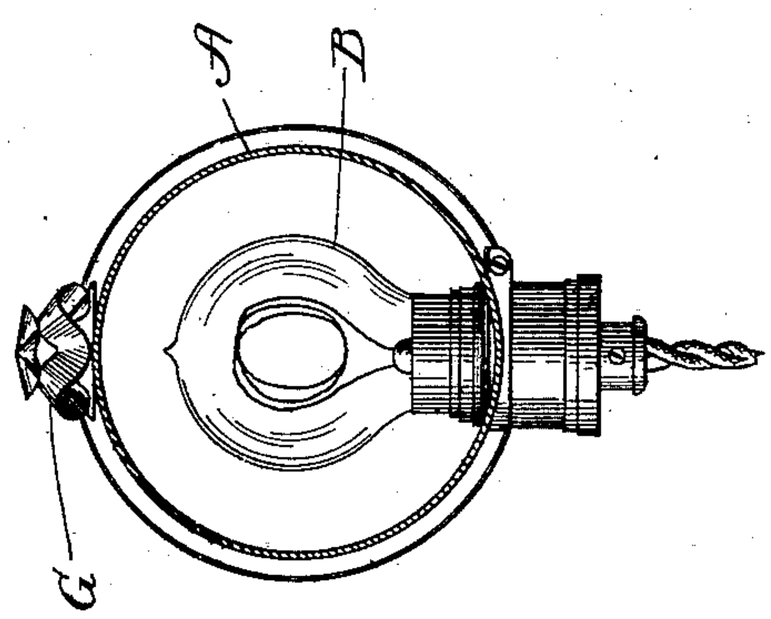


Fig. 3.

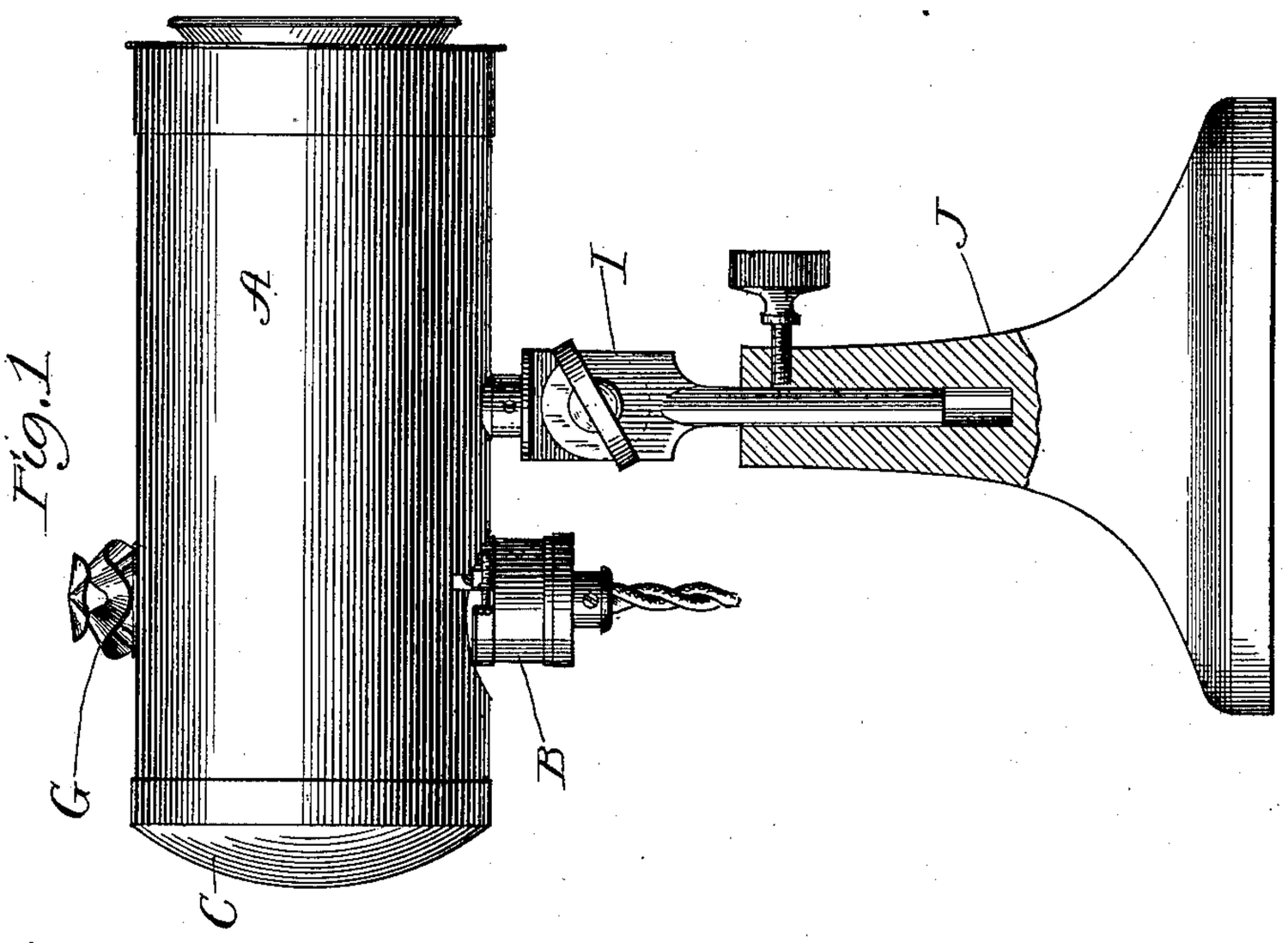


Fig. 1.

Witnesses:
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# UNITED STATES PATENT OFFICE.

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## LARYNGOSCOPE.

SPECIFICATION forming part of Letters Patent No. 661,682, dated November 13, 1900.

Application filed March 24, 1900. Serial No. 10,006. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM AVERY and ABRAHAM BURRELL, citizens of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented a new and useful Improvement in Ophthalmoscopic and Laryngoscopic Lamps, of which the following is a specification.

The object of our invention is to provide a lamp, preferably of the electric class, which will produce a soft, even, yet intense light, unobtrusive to the eye, without much heat, such as will be suitable for doctors' use in examining the eye, or ear, or throat. Heretofore lights for this purpose have been produced which have had objectionable bright spots or shadows in them. It is found difficult with the electric light to completely diffuse the brilliancy of the filament. Our invention aims at overcoming these objections.

It consists of details hereinafter described, and particularly pointed out in the claims.

Figure 1 is a side elevation of our lamp. Fig. 2 is a longitudinal section, the standard being removed. Fig. 3 is a cross-section on lines 3 3, Fig. 2.

A represents the cylindrical casing; B, the lamp; C, the reflector; D, the concentrating-lenses; E, the ground glass; F, the object-lens; G and H, the ventilators; I the bracket, and J the base.

The operation of our invention is as follows: The lamp B is placed at focal distance from the reflector C and focal distance from the lens D. The light is reflected from C in parallel rays upon the lens D. The lens D is preferably made of two plano-convex lenses, and the light is refracted by it upon the object-lens F. This object-lens is a double convex lens of smaller diameter and placed at about double the distance of the lamp from D, in order that the light may be concentrated upon it. The light then passes through F and is focused at a short distance beyond. The ground-glass diaphragm E is interposed, preferably, between D and F in order to soften or diffuse the light.

Ventilators G H are placed in the top in order to keep the lamp cool and prevent the breaking of the lenses.

The lamp is set up by means of a bracket I, which sets into a base J.

The electric lamp is made, preferably, with the filament wound in a circle or circles substantially at right angles to the line of projection of the light in order that the light from it may be more perfectly dispersed.

What we claim, and desire to secure by Letters Patent, is—

1. The herein-described lamp, consisting of the combination of the casing A, the light B therein, the concentrating-lens D, the objective lens F, and the ground-glass diaphragm E, all substantially as shown and described.

2. The herein-described lamp consisting of the combination of the casing A, the light B therein, the reflector C, at focal distance from said light, the concentrating-lens D, at focal distance from said light, the objective lens F, all about double the distance from said lens D, and the ground-glass diaphragm interposed between said lenses, all substantially as shown and described.

3. The herein-described lamp consisting of the combination of the casing A, the light B, therein, the reflector C on one side of said light, the compound plano-convex lens D on the other side of said light, the object-lens F on the further side of said lens D, and the ground-glass diaphragm E located between said lenses, all substantially as shown and described.

4. The herein-described lamp, consisting of the combination of the casing A, the electric light B located therein, having its filament disposed in circles at right angles to the line of projected light, the concentrating-lens D, the object-lens F, and the ground glass E between said lenses, all substantially as shown and described.

5. The herein-described lamp, consisting of the combination of the casing A, the light B, therein, the double convex lenses D, having an air-space between them, ventilating-holes H, leading from said space, the object-lens F, and the ground glass E, between said lenses, all substantially as shown and described.

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