

No. 619,599.

Patented Feb. 14, 1899.

L. MOSS.

WELSBACH OR SIMILAR INCANDESCENT LIGHT.

(Application filed July 30, 1896. Renewed Jan. 17, 1899.)

(No Model.)

Fig. 1.

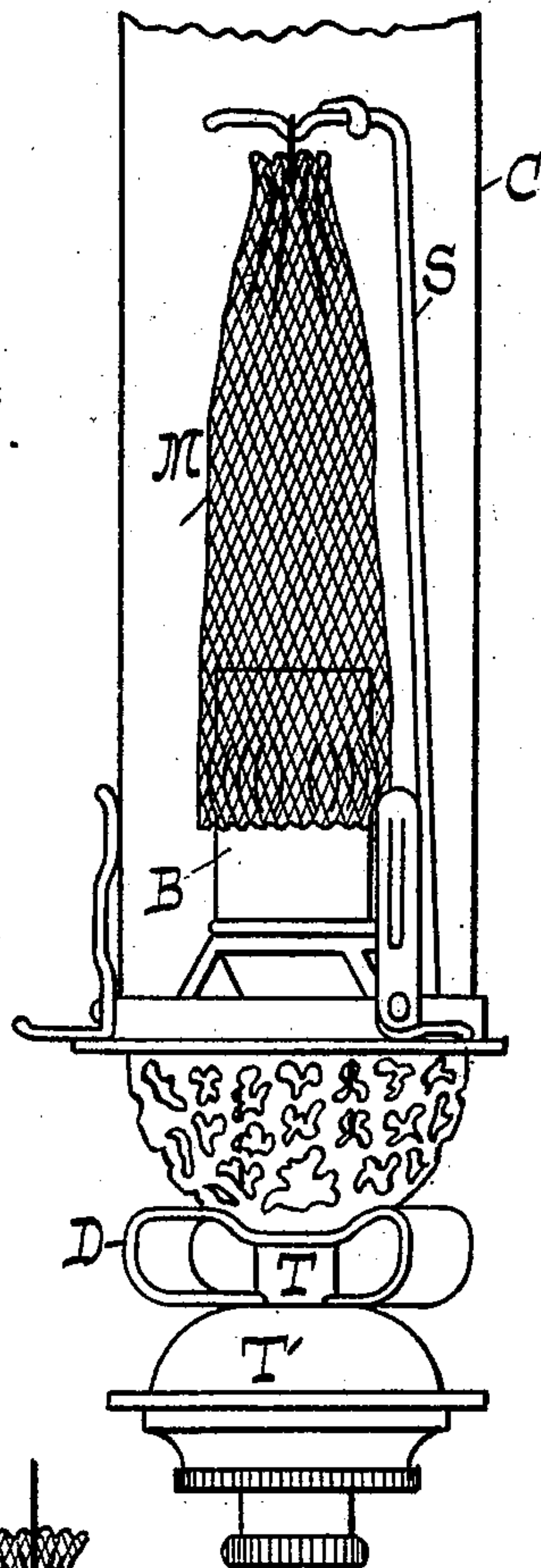
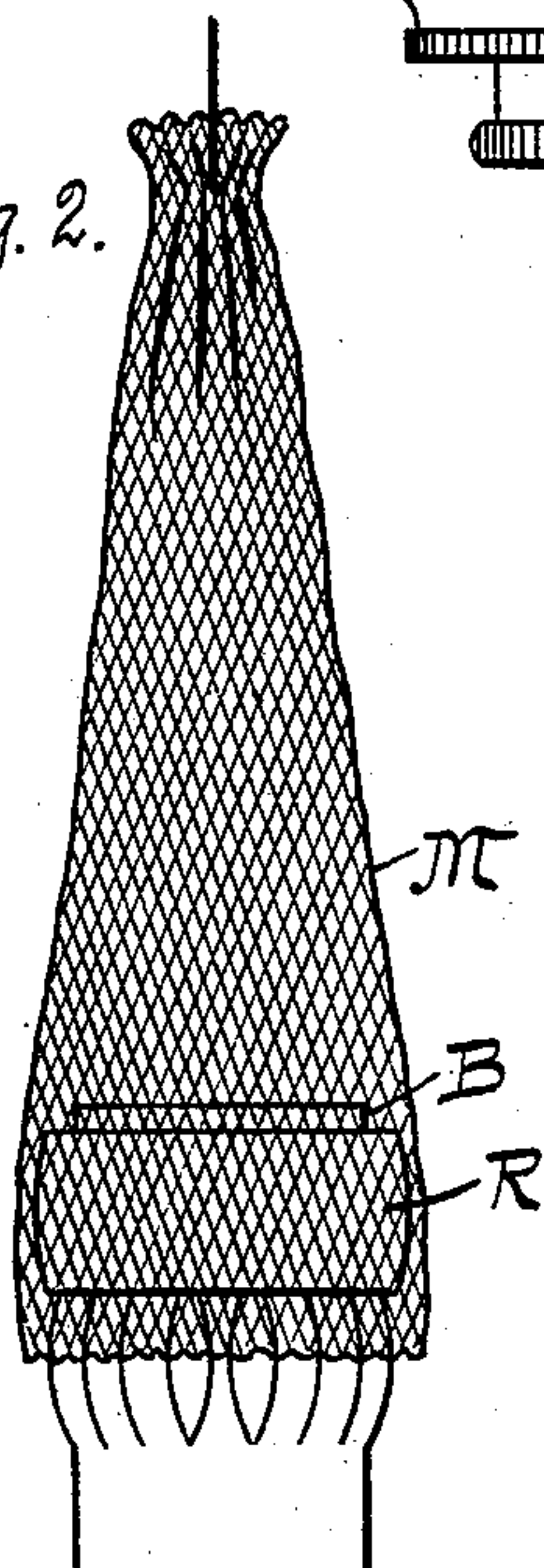


Fig. 2.



Witnesses  
J. Landeig.  
George H. Sonneborn.

Fig. 5.

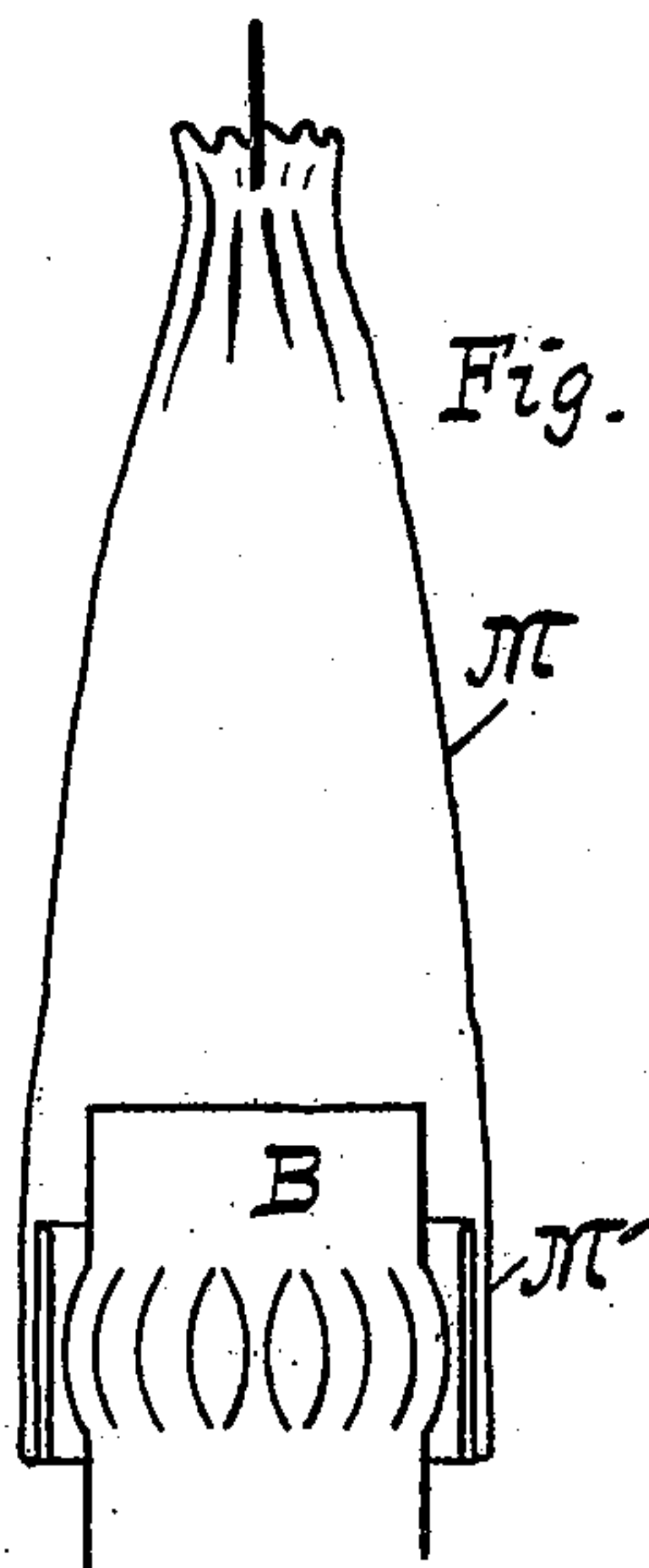


Fig. 4.

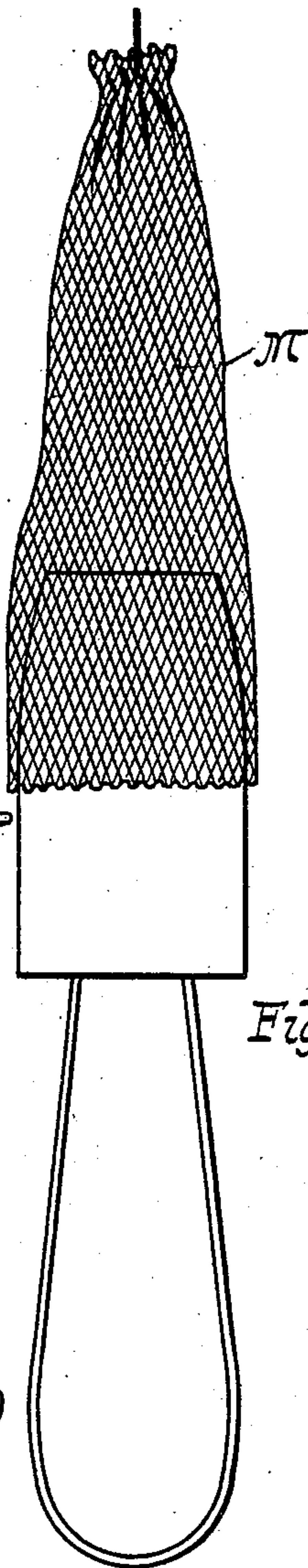


Fig. 3.

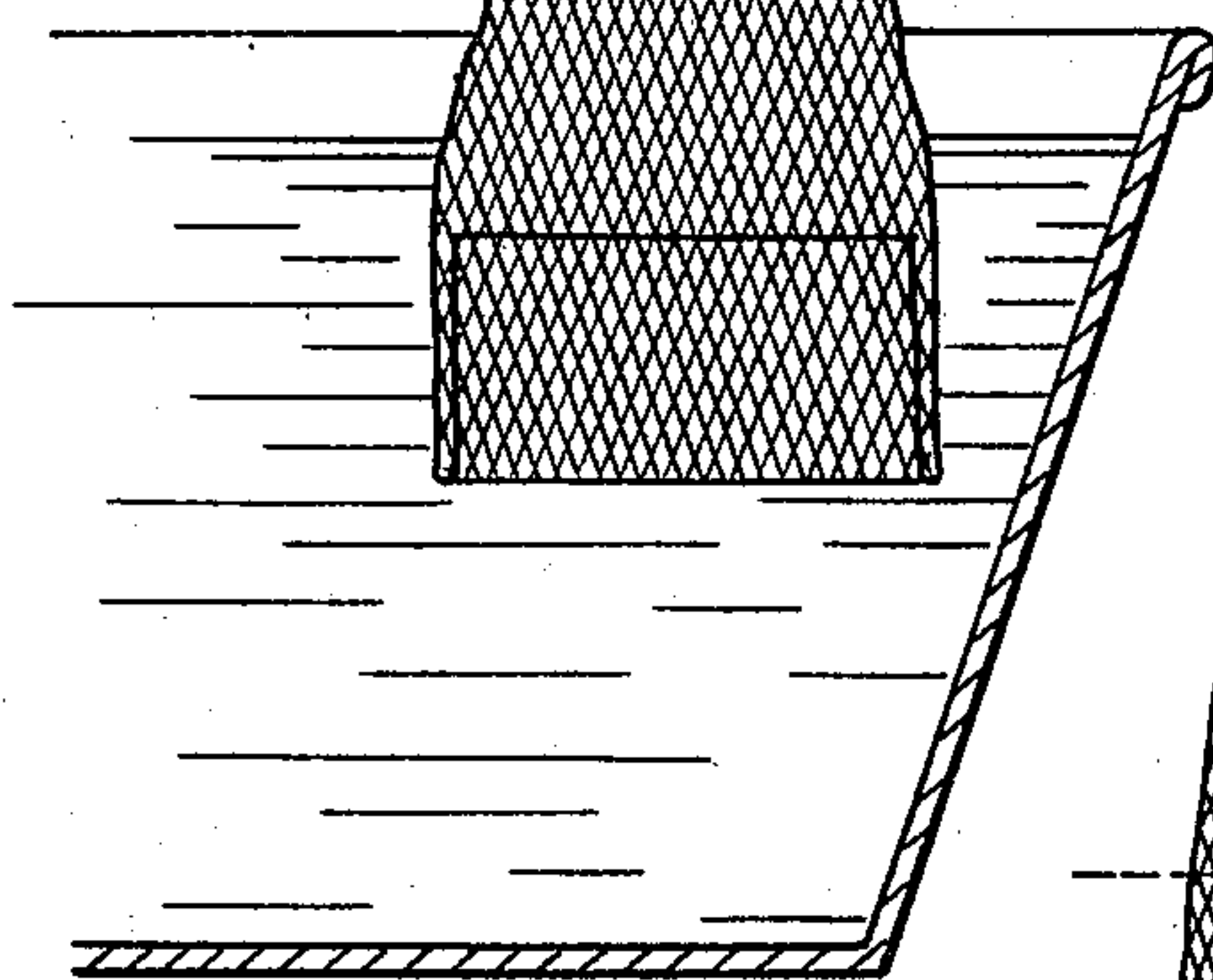
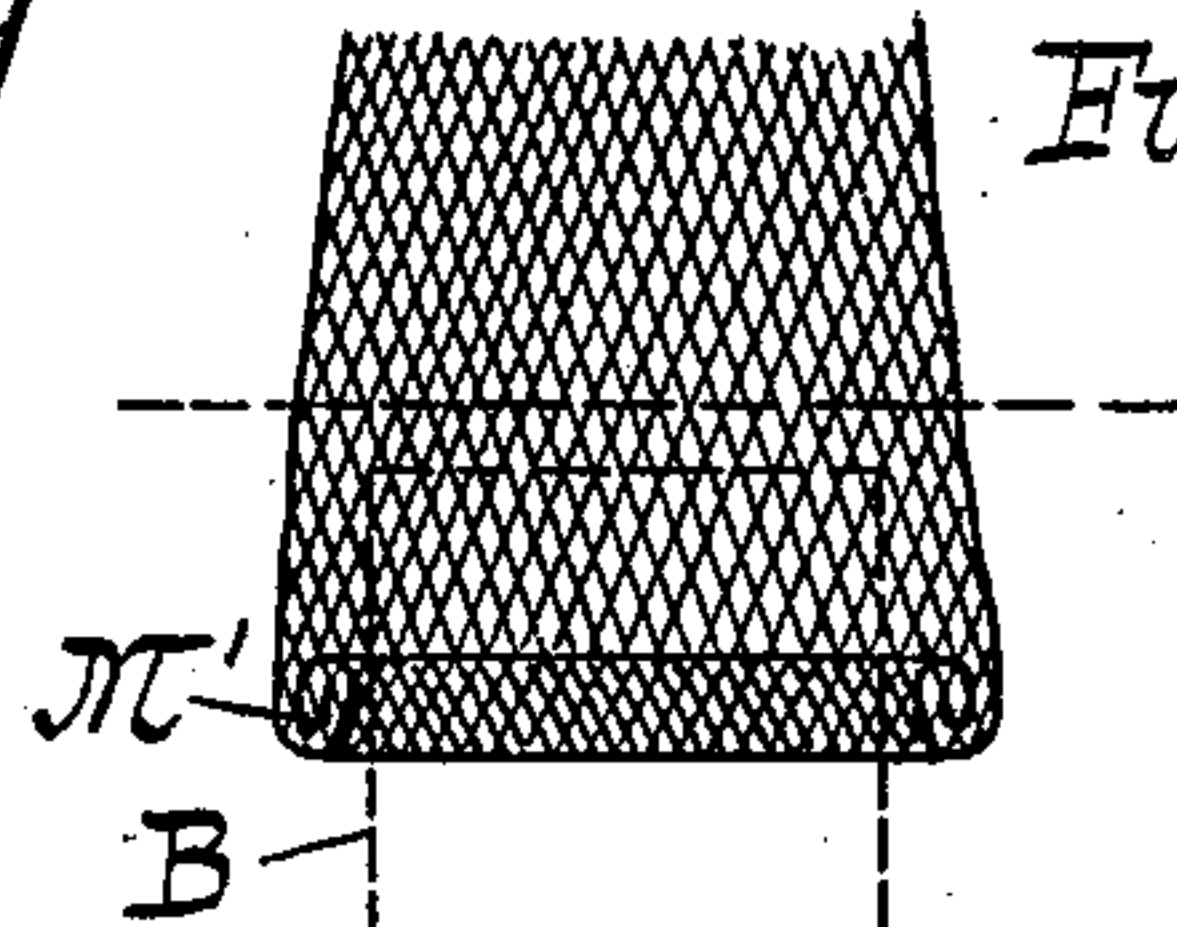


Fig. 6.



Inventor.  
Lincoln Moss  
by Harold Binney  
Attorney.



# UNITED STATES PATENT OFFICE.

LINCOLN MOSS, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO WESLEY S. BLOCK, OF SAME PLACE.

## WELSBACH OR SIMILAR INCANDESCENT LIGHT.

SPECIFICATION forming part of Letters Patent No. 619,599, dated February 14, 1899.

Application filed July 30, 1896. Renewed January 17, 1899. Serial No. 702,469. (No model.)

*To all whom it may concern:*

Be it known that I, LINCOLN MOSS, of New York city, State of New York, have invented a new and useful Improvement in Welsbach or Similar Incandescent Lights, of which the following is a description, referring to the accompanying drawings, which form a part of this specification.

The present improvements include both an improvement in the art or process of preparing the incandescents or mantles and improvements in the mantles themselves and in the lamp as ready for use. In another application filed and pending concurrently with this I have set forth means for preventing the shock or jars (to which the lamps are subjected) from injuring the mantles.

The present invention contemplates an improved mantle and a process of forming in such a way that the mantle of itself is able to resist much greater jars and vibrations than heretofore and can be handled with far less danger of injury.

The invention is of so simple a nature that I will explain it in connection with the accompanying drawings, wherein—

Figure 1 shows a Welsbach or other incandescent lamp embodying some of my improvements. Fig. 2 illustrates a modification. Fig. 3 shows my preferred method of improving the mantle. Fig. 4 illustrates a modification, and Figs. 5 and 6 show two constructions of mantle.

Throughout the drawings like letters of reference indicate like or similar parts.

The burner-tube is shown at B, the mantle at M, the mantle-support at S, and the chimney at C. The gallery and the burner, together with the mantle and chimney, of the usual Welsbach lamp fit loosely down around a tube T, and rest upon the enlarged portion T'. In the improved burner described in my other application just referred to I have set forth the use of an interposed spring D, upon which the burner, gallery, chimney, and mantle are supported, as indicated in Fig. 1. The spring or springs D absorb or neutralize the effect of vertical vibrations or shocks, and as I have covered the use of such a spring in the other application I make no unrestricted

claim for the use of such a spring in this case; but, as will be presently seen, the spring D, in combination with my improved mantle, produces a new and useful result, which I desire to protect in this application. The jars to which the lamps in railway-cars and in factories and some other locations are subjected have heretofore been found so destructive to the mantles of Welsbach and similar lights as to entirely prohibit their use in almost all cases. This is largely due to the extreme delicacy of the mantle or incandescent, which after it has been burned out amounts to little more than a fabric of ashes.

To assist in the transportation of the mantles after they are burned, they have been impregnated with protective toughening material, such as crystalline, which has been carefully applied by spraying or in some other delicate manner, and the mantle thereby rendered tough enough to stand transportation and application to the lamp. After being put in place in the lamp fire is applied to the upper part of the mantle and the crystalline or other protective material burns out in a second or two, leaving the ash, which constitutes the light-giving body. The least jarring of such a light, if constantly repeated, causes the breaking or disintegration of the lower portion of the mantle, particularly where it comes in contact or swings against the burner. Formerly similar troubles existed in the upper portion of the mantle; but by means of the light yielding support and special provisions for increasing the strength of the upper parts of the mantle (even at the expense of some loss of brilliancy at that point) the mantle has been rendered far more durable at that point than around the base. I find when supported by the spring, which together with the friction of the tube T, absorbs the vertical vibrations, there is little danger of breaking the upper end of the mantle.

I have now devised a means of toughening the lower portion of the mantle, so that it is even stronger than the upper end. My preferred method consists in the dipping of the mantle (before it is finally burned out and put in use) into a solution of alum or other difficultly-combustible material. When such



a mantle is lighted, it burns out until it reaches the edge of the portion that has been impregnated with the incombustible material, and there the flame stops, leaving the lower portion of the mantle as tough and strong as before burning out. I prefer to dip the mantle to the depth shown in Fig. 3, so that the upper margin of the portion protected against burning out will be nearer or somewhat above the upper end of the burner-tube B. Instead of a solution of alum in water, which takes some little time to dry out, I may use a finely-powdered alum shaken up with alcohol or other fluid. The alcohol when it is used quickly evaporates, depositing the alum upon the mantle. The protection afforded by the alum or other substance is not a sharply-defined area, but seems to blend gradually into the unprotected portions, so that when burned out the delicate ash-like area of the mantle merges gradually and in most desirable manner into the unburned protected area, rendering the mantle less likely to break than if the ash-like portion and the tough unburned portions joined abruptly.

I may either protect the bottom portion of the mantle from burning before the cotton has been burned out in the first instance or after the cotton has burned out and the mantle has been rendered tough by impregnating it with crystalline or other material, which is subsequently burned out. Instead of dipping the mantle, as just described, I may spray the incombustible fluid or otherwise apply it to the mantle instead of by dipping before burning. Indeed, one of the chief distinguishing features of my invention is that the lower portion may be (and preferably is) treated at a time when the mantle is in a fairly tough state. I have also discovered that I may also burn out a mantle from the top and leave an unburned portion around the bottom by inserting a plug of copper, asbestos, or any other material which approaches closely to the mantle and prevents the flame from burning down around it. When a plug is inserted, as in Fig. 4, and the mantle then lighted from the top, the flame burns down readily to the upper end of the plug, but there (probably because of the heat-absorbing effect of the plug) the flame gradually dies out, leaving an unburned section at the bottom. When in use in the lamp, the gas-flame does not raise the temperature of the lower end of the mantle sufficiently to ignite it or even carbonize the material, even if the original cotton is still left in. I prefer, however, to have the lower edge of the mantle impregnated with non-combustible material, such as alum or other salt. Where an asbestos ring R is employed to protect the mantle against the lateral vibrations, as set forth in my other application, I find that if the ring R fits into the mantle fairly closely it will act in the same manner as the plug of Fig. 4 and prevent the burning out of the lower end of the mantle when ignited

after being placed upon the lamp, so that it is possible under the present invention to either prepare the mantle at the factory by preventing the burning out of the cotton or, after the first burning out and the impregnating of the mantle with crystalline or other material, to prevent the burning out of that by the ring placed like the ring R, Fig. 2, or to impregnate the mantle by dipping or otherwise with a non-combustible material around its base, and thereby prevent the burning out.

As explained in my other application already mentioned, the ring R in itself protects the mantle to a great extent against lateral vibrations, and in that application I have claimed the use of the ring R. Under the present invention I find that I can reinforce the thickness of the bottom of the mantle, as in Fig. 5, or provide a ring made from the lower edge of the mantle or otherwise secured to the mantle, as at M' in Fig. 6. Such a ring M' acts in a like manner to the ring R and serves the same function of protecting the mantle against lateral vibration and also holds it out of contact with the burner-tube B. Preferably, of course, the reinforced or thickened lower end of the mantle, as in Figs. 5 and 6, is protected from combustion, as already described. In Fig. 1 I have shown the mantle without any reinforcement. When such a mantle is protected from combustion around the bottom, the beading or projections, which are usually present around the burners of the Welsbach lamps, serve to dampen the vibration and prevent the more fragile portions of the mantle from coming in contact with the upper edge of the burner B.

By the expression "incombustible substance" which is used in this application it must not be understood that I mean a substance which cannot be burned, for I desire it to be explicitly understood that by "non-combustible substance" I mean any substance which when introduced or applied to the mantle in the manner described will prevent the burning out for the purposes which I have set forth.

Having now stated my invention, what I claim, and desire to secure by Letters Patent of the United States, is the following:

1. The mantle for Welsbach and other incandescent lights, provided with the substantially incombustible and stronger lower portion.

2. As an article of manufacture, the mantle ready for burning out in a Welsbach, or other incandescent lamp, the said mantle being in part rendered incombustible, substantially as set forth.

3. The mantle for Welsbach, or other incandescent lamps, protected in part against combustion by an incombustible substance, substantially as set forth.

4. In combination in a Welsbach, or other incandescent lamp, and with the burner thereof, the mantle extending down around the said burner, the lower portion of the said



mantle being unburned, and thereby tougher than the incandescent portions, substantially as set forth.

5 5. In combination in a Welsbach, or other incandescent lamp, and with the burner thereof, the mantle extending down around the said burner, the lower portion of the said mantle being unburned, and the spring D interposed between the burner and the support  
10 T', substantially as set forth.

6. The improvement in the art of manufacturing incandescents or mantles, which consists in impregnating a portion of the said mantle, or incandescent, with a non-combusti-

ble material, and thereafter burning out the 15 said mantle, substantially as set forth.

7. The improvement in the manufacture of Welsbach, or other incandescents or mantles, by partially burning out the said mantles, but preventing the combustion of a portion, 20 substantially as set forth.

In testimony whereof I have hereunto set my hand this 24th day of July, 1896.

LINCOLN MOSS.

Witnesses:

GEORGE H. SONNEBORN,  
HAROLD BINNEY.