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1,441,150.

W. D. HAWLEY.  
INCANDESCENT ELECTRIC LAMP.  
FILED JUNE 10, 1920.

Fig-1 -

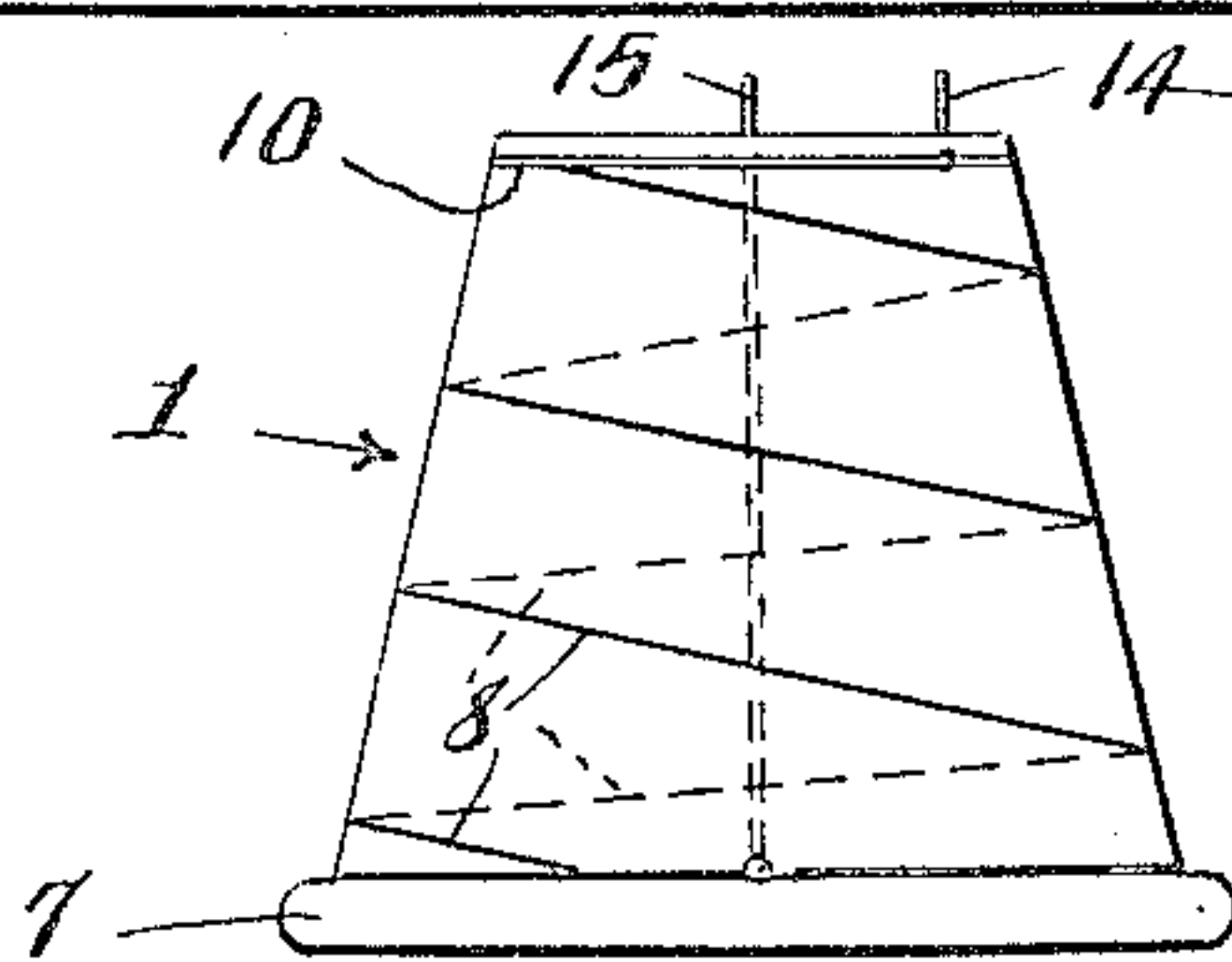
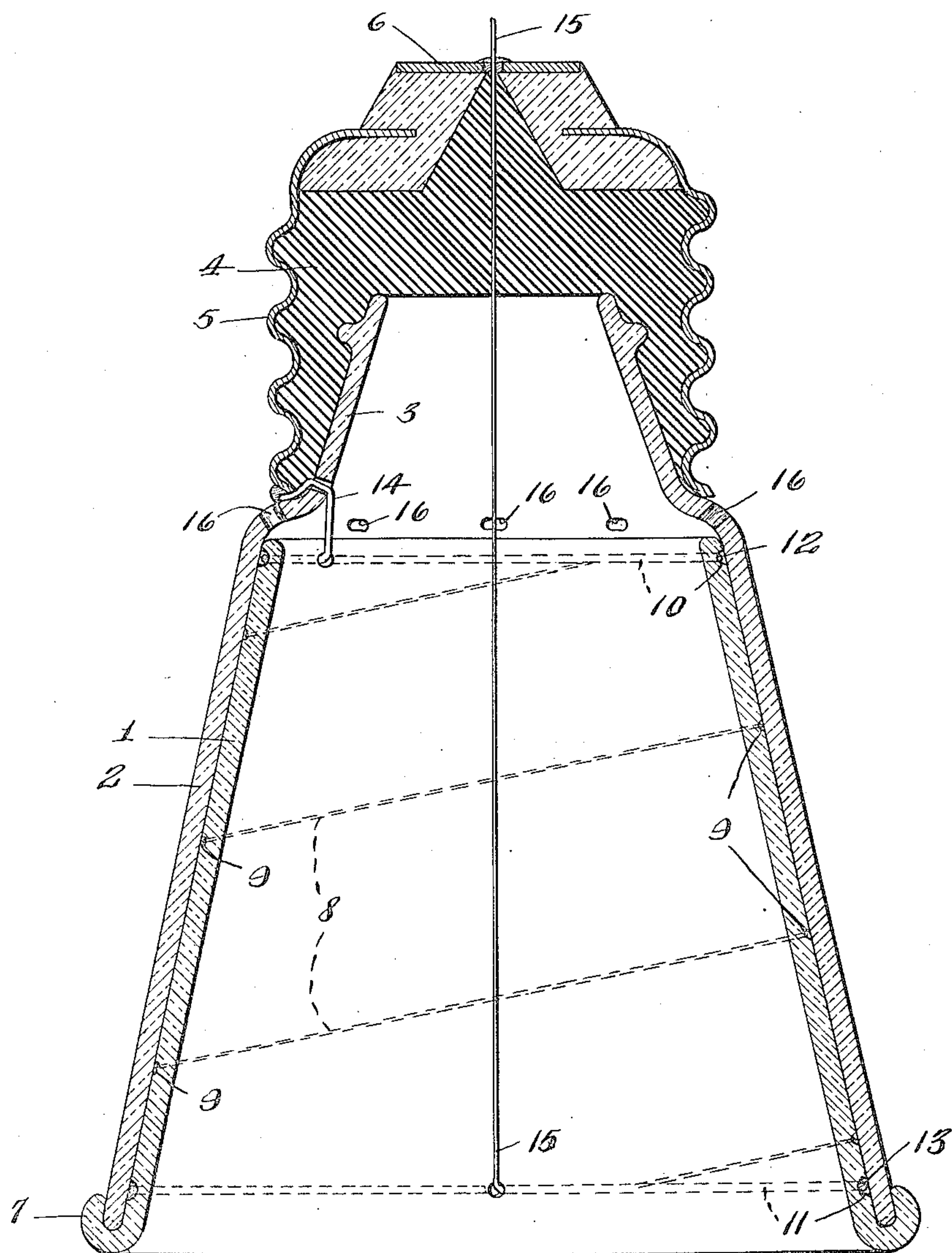


Fig-2 -

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BY

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ATTORNEYS.



## UNITED STATES PATENT OFFICE.

WILLIAM D. HAWLEY, OF SYRACUSE, NEW YORK.

## INCANDESCENT ELECTRIC LAMP.

Application filed June 10, 1920. Serial No. 388,013.

*To all whom it may concern:*

Be it known that I, WILLIAM D. HAWLEY, of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Incandescent Electric Lamp, of which the following is a specification.

This invention has for its object an incandescent electric lamp in which the incandescing element, filament, conductor or wire is protected from the outer air by outer and inner layers of transparent or translucent insulating material between which said element is interposed so that no vacuum is required and the incandescing element is not subject to the destructive effects of evaporation or of the atmosphere.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is an enlarged sectional view of one embodiment of my invention.

Figure 2 is an elevation of the inner member of insulation.

My incandescent electric lamp comprises layers of insulating material, one or both of which are penetrable by light rays, that is, one or both is translucent or transparent, and an incandescing lighting element as a filament, wire or conductor between said layers and preferably lying in a groove formed in the face of one of said layers, the insulating material having a higher melting or fusing point than the temperature at which the incandescing element becomes incandescent.

The layers of insulating material are here shown as inner and outer members 1, 2, one nested in the other and preferably, the inner member 1 is tubular as well as the outer member, these members being snugly fitted together so that air cannot enter between them. The outer element 2 is shown as formed with a contracted extension 3 at one end which is embedded in the moldable material of a plug 4 by means of which connection is made with a standard lamp socket. The plug 4 is shown as provided with the usual outer threaded sleeve terminal 5 and central terminal 6.

The members 1, 2 are here illustrated as conoidal or in the form of truncated cones and the inner member 1 has an outwardly

turned lip or flange 7 at its lower end formed with a channel for receiving the lower margin of the outer member 2.

8 is the incandescing element which is here shown as a wire interposed between the tubular members 1, 2, and one of these members is formed with a groove in its face opposed to the other member in which groove the wire is located. Preferably, the inner member is formed with a peripheral spiral groove 9 for the wire, this groove being semi-circular in order to provide clearance for any expansion of the round wire. This groove 9 is here illustrated as spiral and communicating at its ends with annular peripheral grooves 10, 11 in which conductors 12, 13 of relatively low resistance as copper are located. The conductor 12 is connected by a suitable conductor 14 to the outer terminal 5 of the plug 4 and the conductor 13 is connected by a suitable conductor or wire 15 to the central terminal 6 of the plug, the wire 15 being located in the space enclosed within the inner member 2. The perforations where the wires 14, 15 enter the grooves 12, 13 are sealed to exclude air.

The tubular members or shells 1, 2 are preferably formed of quartz refined to have a high fusing point or a higher fusing point than the temperature at which the incandescing element becomes incandescent. The incandescing element is preferably molybdenum as molybdenum when protected from evaporation by the layers of a tubular member make a highly satisfactory filament and is more economical than tungsten. Other materials that may be used instead of quartz are what is known as vitresol and vitrified silica.

The outer tubular member or shell 2 is formed with holes 16 at the base of the extension 3 thereof to permit circulation of air.

My lamp lasts indefinitely as the protected filament is practically indestructible and the expansion of the quartz and filament are practically the same, and further the lamp can be used in places where it is exposed to the weather as it will not fracture when hot even when water is thrown thereon.

What I claim is:

1. An incandescent electric lamp comprising inner and outer nested conoidal members of insulating material closely fitted together one within the other to exclude air, the outer member being penetrable by light

rays, and an incandescing lighting element interposed between said members, substantially as and for the purpose described.

2. An incandescent electric lamp comprising inner and outer nested members of transparent quartz fitted together and an incandescing wire conductor located between

said nested members and having a fusing point less than the quartz members.

In testimony whereof, I have hereunto signed my name, at Syracuse, in the county of Onondaga, and State of New York, this 25th day of May, 1920.

WILLIAM D. HAWLEY.