

No. 684,823.

Patented Oct. 22, 1901.

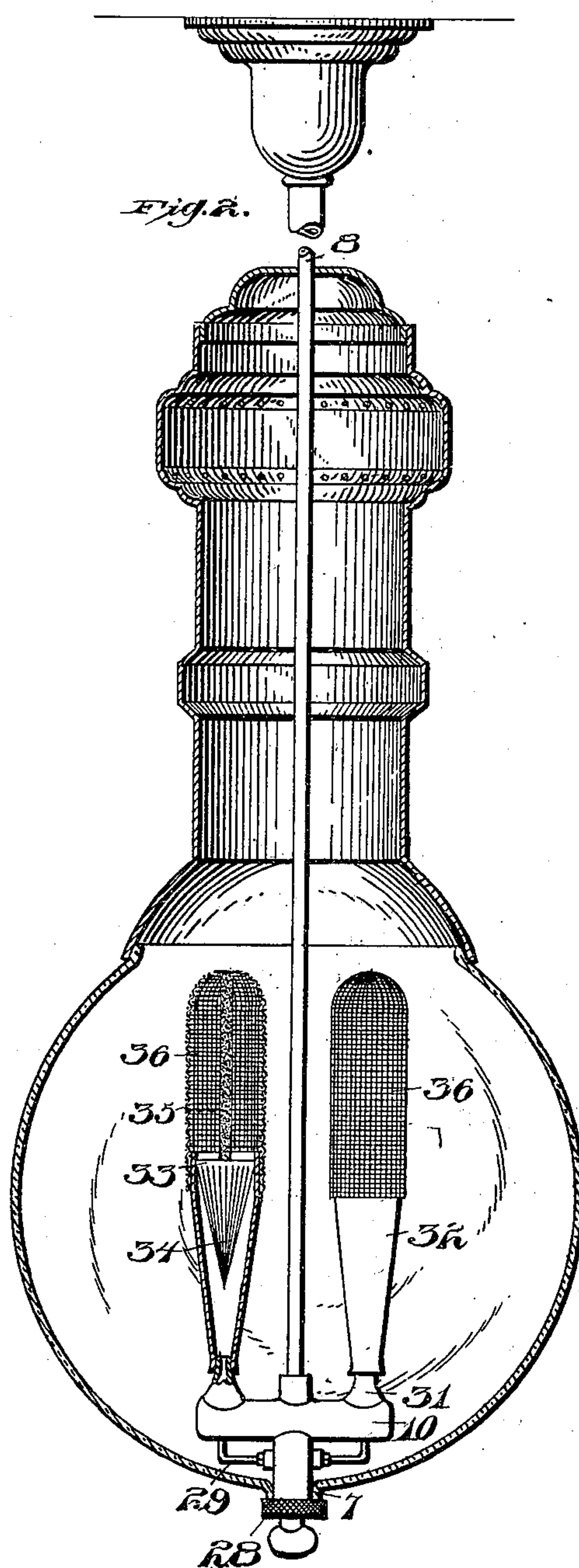
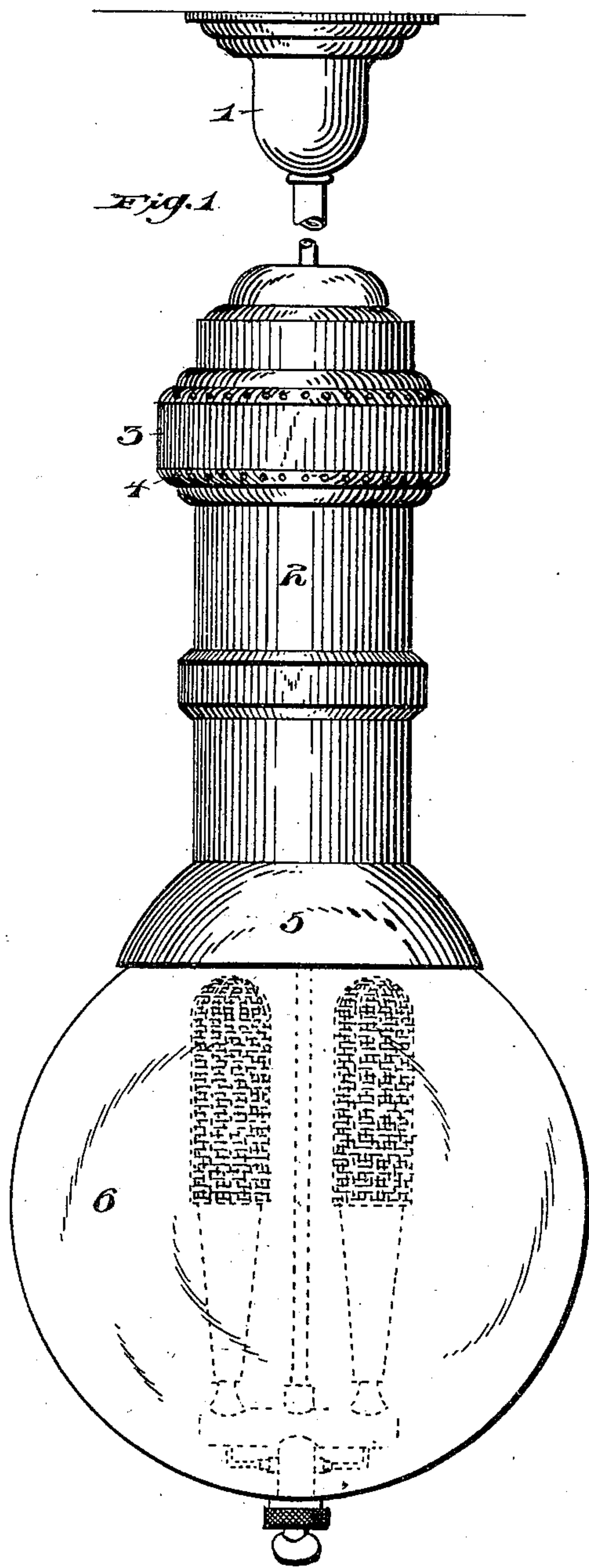
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INCANDESCENT LAMP AND HEATING APPARATUS.

(Application filed Sept. 12, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

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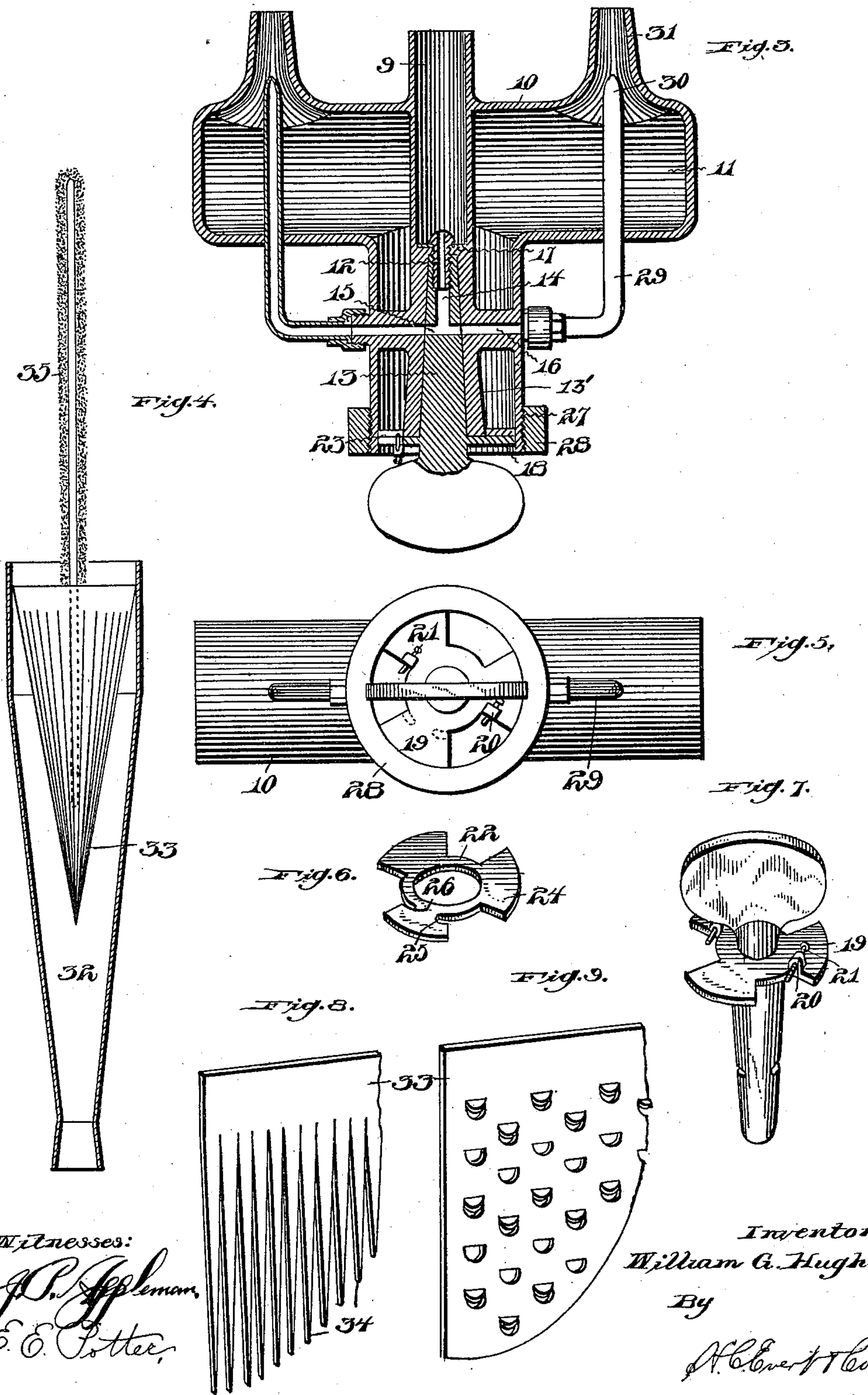
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# UNITED STATES PATENT OFFICE.

WILLIAM G. HUGHES, OF PITTSBURG, PENNSYLVANIA.

## INCANDESCENT LAMP AND HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 684,823, dated October 22, 1901.

Application filed September 12, 1900. Serial No. 29,760. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM G. HUGHES, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Incandescent Lamps and Heating Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in light and heat appliances, and relates more particularly to a system of lighting and heating not heretofore known in this art.

The invention has for its object the provision of novel means for increasing the volume of light or heat with a less consumption of gas and when the device is employed for heating to provide a larger heating-surface as well as to derive a more intense heat.

My invention further aims to construct an appliance of the above-described character that will be extremely simple in its construction, durable, and highly efficient in its operation.

The present invention is more particularly directed to an appliance for lighting, although, as will be hereinafter more fully described, the same may be advantageously employed for a heating system.

The invention broadly consists of a gas-supply pipe leading into a suitable chamber, said pipe being heated, thereby expanding the gas in the supply-pipe, then leading the gas through a suitable channel into the mixer having air-inlet ports, again superheating the expanded gas and air through the medium of a novel appliance, and thence conveying the same to the burner proper, as will be hereinafter more fully described, and specifically pointed out in the claims.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate corresponding parts throughout the several views, in which—

Figure 1 is a side elevation of my improved appliance. Fig. 2 is a vertical sectional view thereof. Fig. 3 is an enlarged vertical sectional view of the air-chamber, valve, and

ports. Fig. 4 is a similar view of the mixer, having arranged therein the cone carrying the pencil or mantle holder. Fig. 5 is an underneath view of Fig. 3. Fig. 6 is a perspective view of the spider. Fig. 7 is a similar view showing the regulating-valve secured in position upon the valve-stem. Fig. 8 is a perspective view, partly broken away, of the inverted cone before the same is coiled. Fig. 9 is a modified form thereof.

In the drawings the reference-numeral 1 indicates an ornamental canopy, which is arranged at the top of the casing. 2 represents the casing proper, said casing carrying an enlarged portion 3, said portion having arranged therein a series of apertures 4 for the purpose of ventilation. The lower end of the casing, as indicated by the reference-numeral 5, is adapted to receive and retain the globe 6, which may be secured in any suitable manner, forming an air-tight connection. Said globe has arranged centrally in the lower part thereof an opening 7.

The reference-numeral 8 indicates a gas-supply pipe extending through the entire length of the casing 2 and downwardly into the globe 6, said gas-supply pipe leading into a gas-supply chamber 9, said gas-supply chamber being formed integral with the casing 10, said casing 10 forming air-chambers 11. At the lower end of said gas-supply chamber 9 is arranged a split screw 12, the head of said screw forming a seat in the lower portion of the said gas-supply chamber and is secured in the valve-stem 13, said valve-stem having formed therein a vertical port 14 and a transversely-extending port 15, communicating with said port 14. The port 15 by the rotation of the valve-stem 13 is brought into or out of registry with ports 16, provided in the valve-casing 13' of the valve-stem 13. The said valve-stem 13 operates in a valve-seat 17, and this valve-stem also carries an air-regulating valve 18, having segmental wings 19 and upwardly-extending apertured lugs 20, which are adapted to receive screw-threaded pins 21.

22 indicates a spider which is mounted on the lower end of the valve-casing 13' and in connection with the regulating-valve 18 is adapted to close the air-ports 23, which communicate with the chamber 11. This spider



carries segmental wings 24, conforming to the wings 19 of the valve, and one of these wings is provided with recesses 25 26 to receive the regulating-screws 21, carried by two of the wings of the regulating-valve 18.

The lower end of the casing 10 is provided with screw-threads 27, adapted to receive the screw-threaded collar 28. The transversely-extending port 16 leads into an upwardly-extending pipe 29, the upper extending end 30 leading into a nipple 31, to which is connected the mixing-chamber 32, which is preferably of an inverted-cone shape and in which is seated a metallic cone 33, having downwardly-extending fingers or lips 34. To the interior apex of said cone is secured a pencil or mantle holder 35, upon which is secured centrally the mantle 36.

The operation of my improved light and heat appliance is as follows: The gas passing through the gas-supply pipe is heated in the casing 2, passing through the valve into the transversely-extending ports in the air-chamber. From this point to the mixing-chamber, where the gas is reheated and the heated air within the chamber and the heated gas are mixed together and pass upwardly through and between the fingers or lips of the metallic cone to the burner proper, where perfect combustion takes place, illuminating the mantle and also the pencil or mantle holder, the latter reflecting the rays against the walls of the mantle and adding brilliancy to the light. The pencil or mantle holder not being transparent the walls of the same are readily illuminated with a small consumption of gas, and the rays from the walls reflecting upon the mantle proper serve to increase the brilliancy of the light. The quantity of gas and air admitted is simultaneously controlled entirely by the valve 13. When this valve is in the open position, Fig. 1, the port 15 will be in full registry with the ports 16, admitting the full force of gas obtainable through the orifice in the screw 12. As this valve 13 is turned so as to decrease the registering portions of the port 15 with the ports 16 the amount of gas admitted to the pipes 29 is decreased and the quantity of air through ports 23 simultaneously decreased, owing to the partial closing of these ports by the valve 18. The extent to which the valve 13 may be rotated is controlled by the regulating-screws 21, and it will be observed that the full force of the gas is always passing through the orifice in the screw 12, the amount, however, passing to the burner being dependent upon the extent of the registry of port 15 with ports 16. When the pilot-light is burning, the regulating-valve 18 is closed entirely, and as the valve 13 is turned to open the ports for the gas the air-ports 23 will be opened, so as to admit sufficient air to form the combustion.

The apparatus may be made of any suitable material; but I wish to call particular attention to the metallic cone. This cone is

preferably constructed of aluminium, this metal possessing greater heat-conducting qualities than other metals. The pencil or mantle holder is formed of a mineral substance composed of clay, asbestos, and other substances, which are secured upon a metal base, whereby the incandescence of the light is increased. This pencil or mantle holder will, however, be made the subject of a separate application. The gas being first heated is expanded, and consequently broken up more thoroughly, so that when superheated with the air a more thorough mixing is obtained, resulting in more perfect combustion at the burner.

In Fig. 9 I have shown a modified form of mantle-holder with lips. These lips are preferably turned inwardly and outwardly in alternate rows.

Attention is called to the fact that by removing the pencil and mantle and applying a suitable burner to the mixer the above-described apparatus affords many advantages when used for heating purposes, as heretofore stated and particularly pointed out. I also call particular attention to the fact that the globe and casing are air-tight to the enlarged portion 3, the openings 4 creating sufficient draft in conjunction with the air-ports to form a perfect combustion.

It will be noted that various changes may be made in the details of construction without departing from the general spirit of my invention.

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

1. In a device of the character described, the combination with a gas-supply pipe, of a burner connected thereto, means for retaining the heat from the burner to heat the gas in the supply-pipe previous to delivery to the burner, an air-chamber within the burner, a mixing-chamber, an inverted metallic cone arranged in the mixing-chamber and through which the gas passes and is reheated previous to ignition, a pencil carried by said cone, and a mantle supported on said pencil, substantially as described.

2. In a device of the character described, the combination with the gas-supply pipe, of a burner connected thereto, means for retaining the heat from the burner to heat the gas in the supply-pipe previous to delivery to the burner, an air-chamber within the burner, a mixing-chamber, an inverted metallic cone arranged in the mixing-chamber through which the gas and air pass previous to ignition and in which the gas is reheated, a pencil carried on the cone for supporting the mantle, and means for simultaneously controlling the gas and air admitted to the burner.

3. In a device of the character described, the combination with a gas-supply pipe, of a burner connected thereto, a casing surrounding the gas-supply pipe for retaining the heat from the burner to heat the gas in



the supply-pipe, a globe surrounding the burner, a mixing-chamber in which the air is heated, means carried by the burner for simultaneously controlling the admission of air and gas, and a mixer in the form of an inverted cone arranged in said mixing-chamber, within which the gas is reheated and through which the reheated gas and heated air pass to the point of ignition, substantially as described.

4. In combination with a gas-supply pipe, a burner, a mixing-chamber in said burner, and an inverted metallic cone arranged in the mixing-chamber by which the gas is reheated and through which it passes to the point of ignition, substantially as described.

5. In combination with a gas-supply pipe, a burner connected thereto, means for retaining the heat from the burner to heat the gas in the supply-pipe previous to delivery to the burner, a mixing-chamber within the burner, and an inverted metallic cone arranged in the mixing-chamber by which the gas is reheated and through which the gas and air pass previous to ignition, substantially as described.

6. An incandescent gas-lamp having a gas-supply, a burner connected to the gas-supply, a casing surrounding the gas-supply to retain the heat from the burner to heat the gas previous to delivery to the burner, a mixing-chamber within the burner, an inverted perforated cone in said mixing-chamber through which the gas passes and is reheated previous to ignition, and a mantle supported on said cone, substantially as described.

7. In an incandescent gas-lamp, the combination with a gas-supply, of a burner connected thereto, means for retaining the heat

from said burner to heat the gas in the supply-pipe, a mixing-chamber, means for simultaneously controlling the quantity of gas and air admitted to the burner, and a mixer in the form of a perforated cone arranged in said mixing-chamber by which the gas is reheated and through which the reheated gas and heated air pass to the point of ignition, substantially as described.

8. In an incandescent gas-lamp, the combination with a gas-supply pipe, of a burner connected thereto, means surrounding the gas-supply pipe for retaining the heat generated by the burner for heating the gas previous to delivery to the burner, a mixing-chamber within the burner, and a mixer comprising a perforated cone by which the gas is reheated and through which the gas passes previous to ignition, substantially as described.

9. In an incandescent gas-lamp, the combination with a gas-supply pipe, of a burner connected thereto, a casing surrounding the gas-supply pipe for retaining the heat generated by the burner to heat the gas passing through the supply-pipe previous to the delivery of said gas to the burner, a mixing-chamber within the burner, means for simultaneously controlling the gas and air admitted to the burner, and means within the mixing-chamber by which the gas is reheated previous to ignition, substantially as described.

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

WILLIAM G. HUGHES.

Witnesses:

JOHN NOLAND,  
E. E. POTTER.