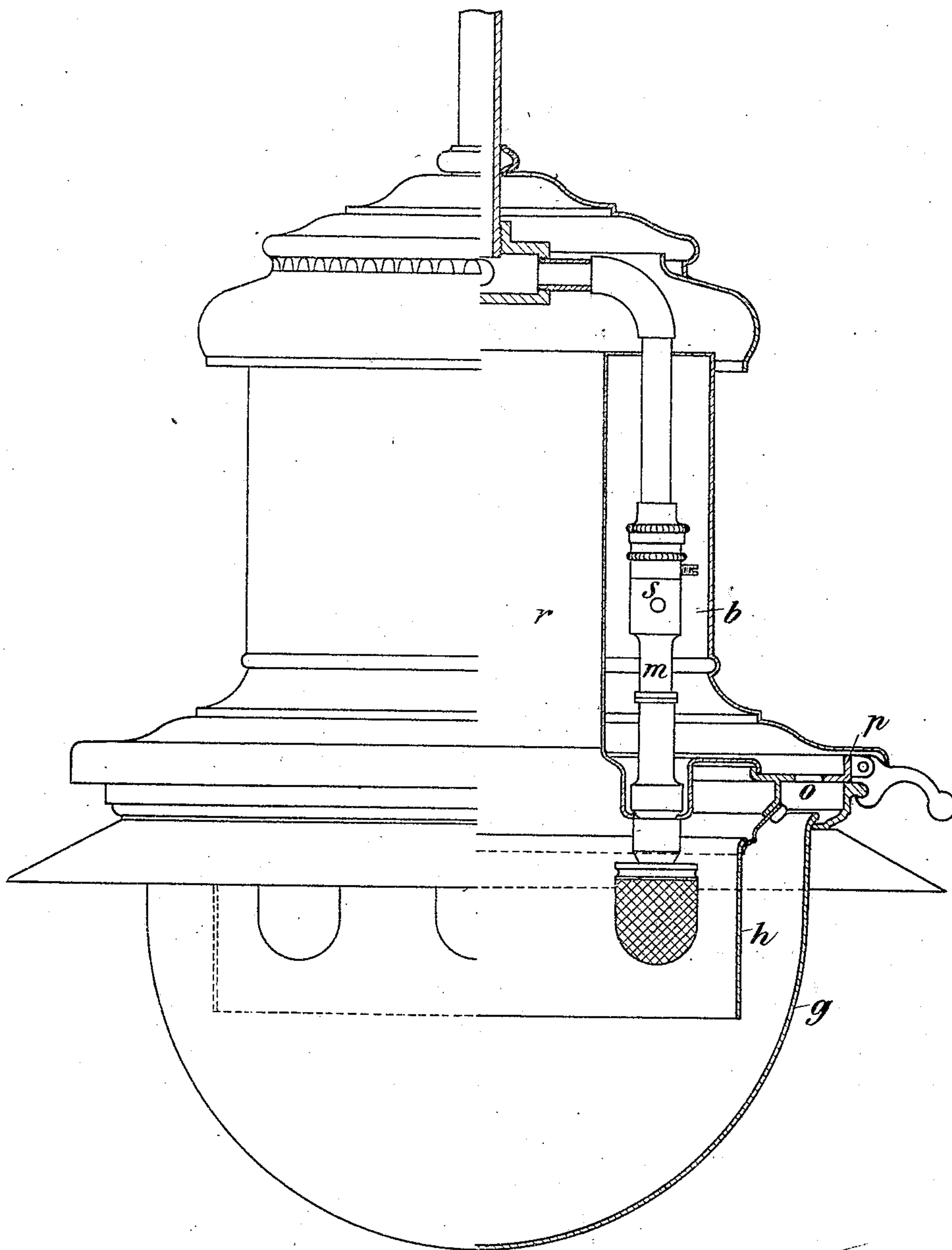


No. 886,271.

PATENTED APR. 28, 1908.

H. SÜSSMANN.
INCANDESCENT GAS LAMP.
APPLICATION FILED JUNE 7, 1906.



WITNESSES:

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INCANDESCENT GAS-LAMP.

No. 886,271.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed June 7, 1906. Serial No. 320,676.

To all whom it may concern:

Be it known that I, HEINRICH SÜSSMANN, a subject of the German Emperor, residing at 144 Alte-Jacobstrasse, Berlin, in the German Empire, manager, have invented certain new and useful Improvements in Incandescent Gas-Lamps, of which the following is a specification.

In incandescent gas lamps in which the mixing tube with the mixing devices are arranged in the passages through which the combustion gases pass away, the known defect exists that in addition to a prejudicial heating of the whole of the lamp casing the mixture of gas and air is excessively heated in the mixing tube, so that in consequence of the increased buoyancy or tendency to ascend, there is produced an increased resistance to the movement of the mixture of gas and air. Owing to the weakening of the action of the jet of gas which is thereby entailed, the suction of air is of course diminished likewise, so that a Bunsen flame which is partially luminous is produced, the unpleasant noise is increased and the incandescent body becomes blackened. This defect arises principally when the gas pressure is comparatively low, or if it falls while the lamp is burning. For the purpose of obviating these defects, provision has already been made for arranging the mixing tube and the mixing device in a special chamber separated from the waste gases, the air being drawn into this chamber while the combustion gases themselves pass out of the lamp through a chimney.

The present invention relates to an inverted incandescent gas lamp of this kind.

The invention mainly relates to the particular formation of the closed air container. This container should be constructed in such a manner as to surround the chimney or chimneys through which the combustion gases are conducted wholly or partially through the incandescent bodies, and which at the same time receives the mixing device and the mixing passage. The arrangement may also be such that only the burner head or heads and the incandescing bodies extend through the bottom of the air reservoir into the combustion chamber of the lamp.

By means of the combination in accordance with this invention, the following advantages are obtained among others:—

The mixing tubes with the mixing device which lie outside and around the discharge passage or chimney, are readily accessible for the purpose of cleaning and placing in position, and are protected from the direct action of the combustion gases and from injury by the same. A particularly effective transmission of heat to the mixing air in the air reservoir, which does not however exceed the permissible amount, is produced, so that by the preliminary heating of the air for the mixture an increased luminous effect is obtained, while, on the other hand, the lamp will not fail owing to low or falling pressure in the gas supply pipe. The outer parts of the lamp are not excessively heated, and owing to the diminished transmission of heat to the outer casing of the lamp the result is attained that the parts are less liable to crack. The supply of air to the mixing air reservoir may be readily regulated and adjusted by appropriately dimensioning the admission openings. Further, the chimney may be given as large a cross section as desired.

Another essential point is that the flue or chimney or chimneys for the combustion gases may be dimensioned in such a manner relatively to the openings of the air reservoir conducting the air into the combustion chamber, that a reduced pressure exists in the combustion chamber, so that a suction effect is exerted on the interior of the mixing tube in the air reservoir, the air suction of the Bunsen burner is largely increased and the efficient action of the Bunsen burner is not so dependent as before upon the suction effect of the jet of gas, that is to say upon the gas pressure. The desired end may advantageously be attained by arranging the upper opening of the discharge passage or chimney higher than the air openings of the combustion chamber.

It is advisable that the air reservoir receiving the mixing tube should communicate with the outer air only at its lower part. The result of this is that when the air reservoir is carried sufficiently high, the air owing to the heating ascends by virtue of its natural buoyancy, and becomes dammed up in the air reservoir, producing a certain excess pressure. This excess pressure propagates itself through the air openings of the mixing tube, and thereby assists the action of the

Bunsen burner. Further, the advantage is obtained that owing to the diminution of the specific weight of the air the injector action of the Bunsen burner is rendered increasingly favorable, as the specific weight of the air approaches that of the gas.

A constructional form of the object of the invention is illustrated by way of example in the accompanying drawing.

10 In the inverted incandescent gas lamp for a number of flames here represented, the mixing tubes *m* and the mixing device are contained in the reservoir *b* which is closed on all sides, and communicates with the atmosphere only at its lower part at *p*. The air entering at *p* becomes divided into a current passing upwards into the reservoir *b* and another current passing downwards through the openings *o* between the two glasses *g* and *h* into the combustion chamber of the lamp. The reservoir *b* is arranged around the discharge passage or chimney *r* for the combustion gases, so that the mixing air is effectually preliminarily heated in the air reservoir *b*, and an increased illuminating effect is obtained. The heated air ascends in the reservoir *b* owing to its natural buoyancy and thereby creates in the reservoir *b* a certain excess pressure which facilitates the suction of the air taking place through the openings *s* of the mixing device. The injector action of the mixing device is further increased according as the specific weight of the mixing air approaches more nearly that of the gas, as a result of the heating.

35 The discharge passage or chimney *r* is made of such a size relatively to the openings *o* admitting the air into the globe *g* that a certain rarefaction of air is obtained inside the globe, and this propagates itself to the interior of the mixing tube *m* and assists the downward movement of the mixture of gas and air. The mixing tube and the mixing devices are protected from the direct action of the hot combustion gases so that the mixture of gas and air does not experience any excessive heating in the mixing tubes, and cannot exert any prejudicial effect upon the movement of the mixture owing to its buoyancy. The air reservoir *b* or its bottom may be covered with any bad conductor of heat, such as asbestos or the like, in order to diminish any excessive heating of the walls of the reservoir and the transmission of the heat to the casing of the lamp.

50 Instead of a single circulation as represented in the drawing several such might be provided; further, in place of several burner tubes only one need be arranged in the reservoir according as the lamp is to burn with one or more flames.

What I claim and desire to secure by Letters Patent of the United States is:—

65 1. An incandescent gas lamp for inverted burners, comprising a combustion chamber,

a chimney through which the combustion gases are conducted to the outside, an air reservoir closed at its top and surrounding the said chimney, and burner tubes provided with mixing devices and arranged in said air reservoir, mantles supported at the lower part of the burner tubes, said burner tubes extending through the bottom of the air reservoir into the combustion chamber of the lamp, as and for the purpose specified.

75 2. An incandescent gas lamp for inverted burners, comprising a burner and mixing tube provided with air inlets and having its outlet lowermost, a combustion chamber, a chimney leading upward from the combustion chamber, and an air reservoir closed at the top and surrounding said chimney; said air reservoir communicating at its lower part with the atmosphere, the burner and mixing tube being arranged in said air reservoir and communicating therewith through said air inlets, the burner and mixing tube having its outlet end extending through the bottom of said air reservoir into the combustion chamber, the air reservoir being provided with openings in its bottom communicating with the combustion chamber, substantially as described.

95 3. In an incandescent gas lamp for inverted burners, a burner and mixing tube having its outlet lowermost and provided with air inlets, a combustion chamber, a chimney leading upwardly from said combustion chamber, and an air reservoir receiving the burner and mixing tube and communicating therewith through said air inlets, the said reservoir surrounding said chimney and being in communication with the outer air only at its lower part, the reservoir being closed at its top and extending upward above the said air inlets of the burner and mixing tube thereby forming a space in which the air accumulates producing excess pressure above said air inlets, substantially as described.

110 4. In a gas lamp, in combination, an upright burner-tube having its outlet lowermost and provided intermediately with air-inlets, a chamber to receive the gases of combustion, a chimney leading upwardly from said chamber, and an air chamber closed at the top and surrounding said burner-tube and chimney directly above said first-named chamber, said air-chamber being open at its lower part and communicating at its upper part by means of said air-inlets with said burner-tube.

125 5. In an incandescent gas-lamp, in combination, a plurality of upright burner-tubes having their outlets lowermost, a chamber to receive the products of combustion, a chimney extending upwardly from said chamber, and a cap surrounding said burner-tubes and chimney above said first-named chamber and forming an air-chamber which is closed at the top and open at its lower 130

edge, there being openings in said burner-tubes at the upper portion only of said air chamber.

6. In an incandescent gas lamp the combination with a burner tube having its outlet lowermost, and provided with air inlets, a combustion chamber, means for conducting the products of combustion upwardly from said chamber, an air reservoir closed at the top and surrounding said conducting means for the products of combustion, the said burner tube being also surrounded by said air reservoir and communicating therewith through said air inlets, a mantle supported

at the lower part of the burner tube, said burner tube extending through the bottom of said air reservoir into the combustion chamber, the said air reservoir communicating at its lower part with the atmosphere and provided with means for communicating with the combustion chamber. 15 20

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses this 25th day of May 1906.

HEINRICH SÜSSMANN.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.