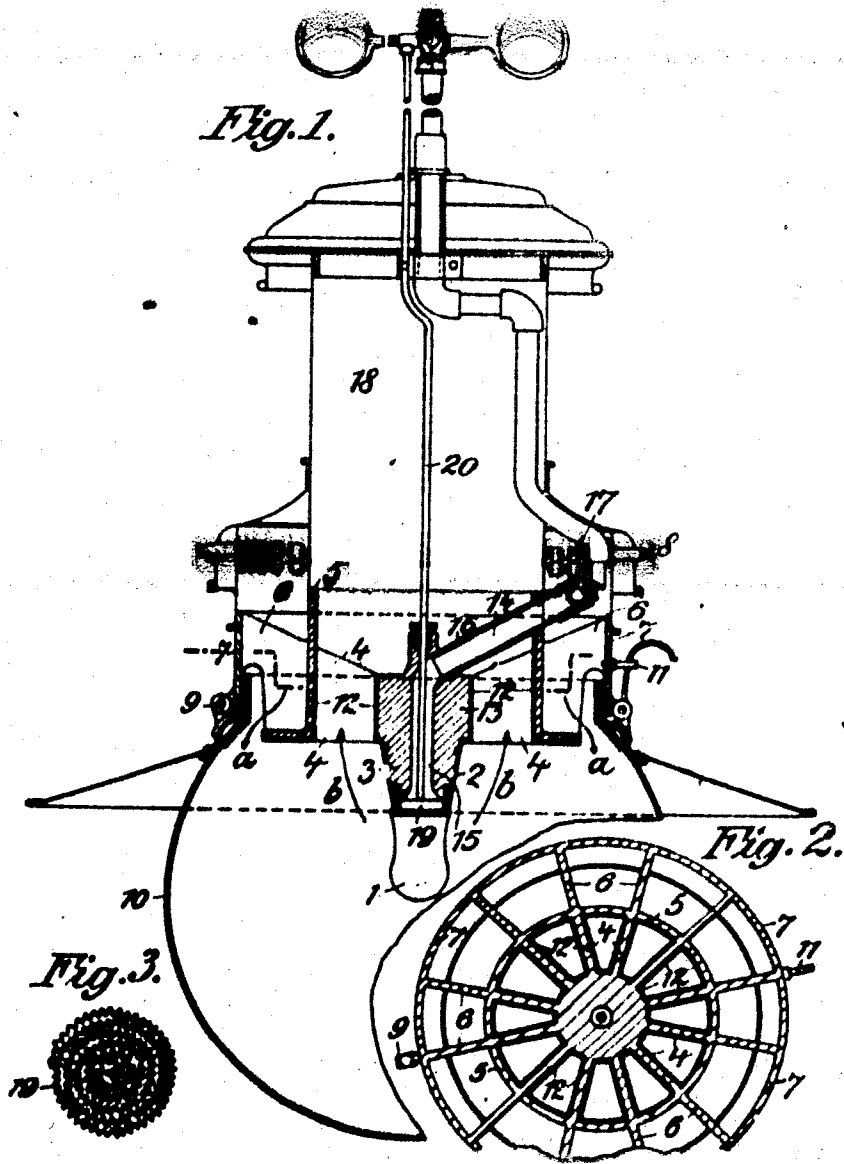


G. RAAP.
 INVERTED INCANDESCENT GAS LAMP.
 APPLICATION FILED FEB. 7, 1907.

949,547.

Patented Feb. 15, 1910



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INVERTED INCANDESCENT GAS-LAMP.

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Specification of Letters Patent.

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Application filed February 7, 1907. Serial No. 356,132.

To all whom it may concern:

Be it known that I, GUSTAV RAAP, a subject of the Emperor of Germany, residing at 36a Blumenstrasse, Berlin, Kingdom of Prussia, Empire of Germany, engineer, have invented certain new and useful Improvements in Inverted Incandescent Gas-Lamps, of which the following is a specification.

This invention has for its object an inverted incandescent gas burner, in which by making the metal walls of the burner head and of the mixing tube of appropriate thickness, and if desired in combination with means for conducting away the heat, a regulation of the heating effect is obtained. It is essential that a large amount of metal should be available for the quantity of heat supplied to the burner head, and that the quantity of heat conducted to this mass of metal should be carried off in a reliable manner. By this means numerous advantages are secured. The burner head and mixing tube are prevented from being rendered incandescent or from being heated to an extent endangering the durability of the metal. The conduction of the combustion gases to the outer side of the burner head carrying the incandescing mantle can then be carried out in such a way that the burner head is heated to the smallest possible extent. As a result an extremely hot flame may be employed and a larger illuminating power may be secured at ordinary gas pressure or by means of high pressure gas.

In order to obtain a specially high luminous efficiency, it is necessary to supply rather more air to the combustible at the burner nozzle than is ordinarily the case, in order that while employing a relatively great discharge velocity at the mouth piece of the burner head, a short thick flame may be produced. Such a flame naturally has a tendency to light back through the mixing tube toward the nozzle. It is therefore necessary, if it is desired to use such a flame (if exception be made of special small types of burners) to insert at the mouth of the burner head an effective sieve. Owing to the fact that the combustion gases do not ascend into the interior of the mantle, excessive heating and burning away of the sieve inserted in the gas supply pipe is avoided.

Other important advantages are likewise

secured, as will appear from the following description.

The invention is illustrated by way of example in the accompanying drawing, in which:

Figure 1 illustrates the incandescent gas burner in vertical section. Fig. 2 represents a horizontal section through the burner head. Fig. 3 shows on an enlarged scale a constructional form of the sieve inserted in the novel lamp.

Radial ribs 4 proceed from the mouth 3 of the burner head and are connected one with the other by means of a cylindrical portion 5. Further radial ribs 6 proceed from the exterior of the cylindrical portion 5 and are connected one with the other by a ring 7. The ring 7 is connected with the lamp casing 8, and by means of a hinge 9 or the like carries the lamp globe 10 which when the catch 11 is loosened may be swung downward in the known manner.

As shown in Fig. 2 the radial ribs 4 of the burner head are covered with heat insulating material 12. In the same manner the inner face of the cylindrical part 5 and the outer face of the cylindrical portion 13 of the burner head which fits the conical mouth-piece 3 are covered with insulating material 12. Preferably insulating material is likewise provided on the lower side of the burner head. In the constructional form here represented the upper end of the mixing tube 14 which opens into the gas supply pipe 15 of the burner head is likewise externally covered with insulating material 16.

In order that small incandescing mantles may be employed, the mantle 1 is connected with the obturating sleeve 2 provided with heat insulating material, and which may be fixed to the mouth 3 of the burner head in any appropriate known manner, for example by means of a bayonet joint. The sleeve 2 fits snugly upon the mouth 3 of the burner head, so as to form a tight joint between the mantle and said mouth, whereby the combustion gases are forced to pass through the mantle, and ascend on its outer side.

When the lamp is burning, the gas, such as high pressure gas for example, is supplied through the supply pipe 11 and the passage 15 to the mantle 1. The necessary air passes through the openings 17 of the casing 8 of the lamp into the interior of the lamp and

passes in the direction indicated by the arrow *a* between the ribs 6 of the burner head. The combustion gases ascend on the outside of the mantle in the direction indicated by the arrow *b* and pass through the ribs 4 into the chimney 18.

It will be obvious that owing to the thickness of the walls, that is to say, to the amount of metal comprised in the burner head, and owing to the metallic conduction of the heat by this metallic mass, the heating effect is regulated, because on the one hand a sufficient amount of metal is available over which the heat may be distributed, and on the other hand this mass of metal is able to carry off the heat. The effect is still further increased owing to the fact that by the insulation of the burner head the combustion gases in ascending to the burner head are able to give off little or no heat to the quantity of metal which the burner head comprises. In addition to this, by means of the heat conductor 6, a preliminary heating of the air flowing in the direction indicated by the arrow *a* is effected, while on the other hand, the outer edge of the burner head is cooled by the flow of air.

In order to restrict the transmission of heat from the mantle 1 to the mouth 3 of the burner as much as possible, and prevent lighting back of the flame toward the burner nozzle, an effective sieve 19 is inserted in the gas supply passage 15. This sieve which is represented in Fig. 3 in plan on a larger scale consists in the known manner of a strip of metal arranged edge-wise and spirally wound. In the constructional form here represented, it is assumed that a corrugated strip of metal is employed. It will be obvious that this sieve insertion 19 owing to its protracted height and owing to its large metallic mass, assists the regulation of the heating effect and is prevented from being burned away on the side directed toward the mantle, as the current of gas flowing through the passage 15 is able to exert a vigorous cooling action upon the sieve insertion. This cooling effect is increased, if, as in the example here illustrated, the gas supply pipe 14 is insulated. Both the insulation of the mixing tube by coating with a quantity of substance which is a bad conductor of heat, and also the connection of the mixing tube with large heat radiating surfaces are known *per se* in inverted burners.

A by-pass passage 20 may be provided in the known manner for kindling the lamp; in the present case this by-pass is carried through the center of the casing of the lamp.

The air drawn in by the injector action of the burner nozzle is taken from a place which no combustion products are able to reach.

The details of the incandescent gas lamp described above may be modified. The form

of the burner head may vary as desired. Annular insertions between the rings 5 and 7 or between the ring 5 and the cylindrical portion 13 of the burner head may likewise be provided for distributing the air current and for distributing the current of combustion gases passing off. The sieve may be formed of sheet metal, arranged edgewise, or may be constituted by a finely perforated cylindrical body, a number of metal cylinders arranged one within the other and so forth. If desired, and particularly in the case of small lamps, the insulation of one or other of the heat conducting means may be dispensed with. The lamp may be utilized for any combustible, such as gas, gas mixture, gas and air mixture, vapor mixture (benzin vapor, spirit vapor). The supply of combustible (gas) of any appropriate pressure may also be effected in any suitable way other than that here illustrated. The invention is likewise independent of the special form of mantle. In place of a glass globe of spherical shape, a globe of any other form may be employed.

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

1. An inverted gas burner for high-pressure lamps, comprising a metal burner head having a passage therethrough and a thick wall, a mantle having its upper rim secured upon the burner head so as to form a tight joint therewith, the upper part of the said mantle inclosing tightly the lowest part of the burner, a sieve arranged in the lowest part of the burner head, and means for discharging a combustible mixture into said burner head.

2. The combination of a burner head having a passage therethrough, said burner head having also a comparatively thick wall and a plurality of thick ribs integrally connected with said wall and radiating outwardly therefrom so as to equalize the heat received by said wall and said ribs, and an obturating sleeve connected with said burner head for the purpose of conducting a combustible mixture to a point lower than said burner head.

3. The combination of a burner head, heat conducting members connected therewith and radiating therefrom for the purpose of protecting said burner head from excessive heat, and a coating of protecting material mounted upon said burner head and said conducting members.

4. The combination of a burner head having a cylindrical wall made comparatively thick so as to resist the effects of excessive heat, and an obturating sleeve mounted upon said wall and formed of material which is a bad conductor of heat, said sleeve being for the purpose of directing gases of combustion to a point removed from said wall.

5. The combination of an inverted burner

head having a comparatively thick metal wall and a plurality of ribs radiating from said metal wall, a mantle having its upper rim secured upon the burner head to form a tight joint therewith, and a sieve arranged intermediate of said burner head and mantle, said sieve being formed of strips of sheet metal having corrugations disposed in a di-

rection crossing the length of said strips, the strips being coiled spirally.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

GUSTAV RAAP.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASFER.

10