No. 737,977. PATENTED SEPT. 1, 1903.

J. R. TYSON.

GAS HEATER.

APPLICATION FILED FEB. 14, 1903.

NO MODEL.

Fig. 1

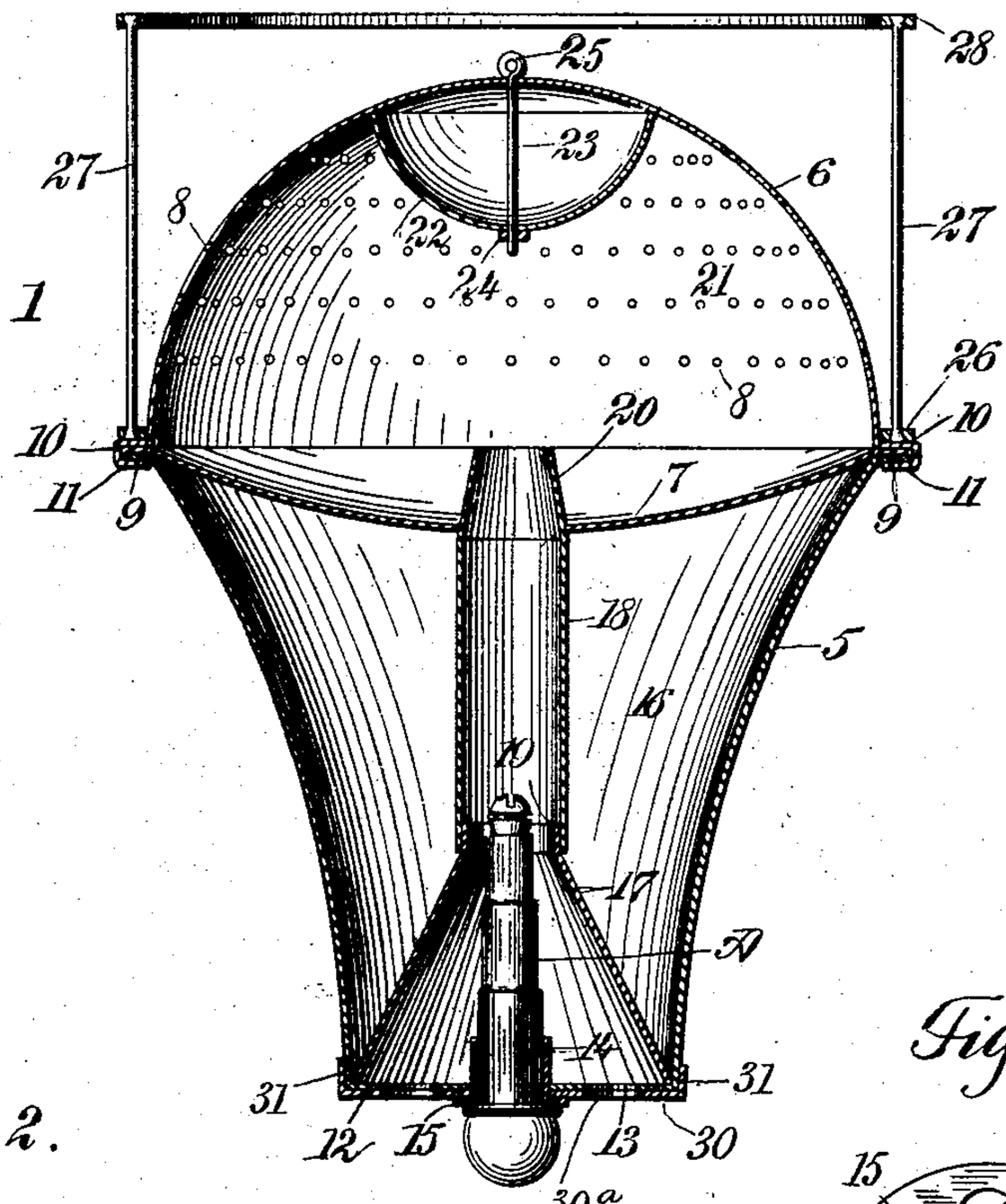


Fig. 2.

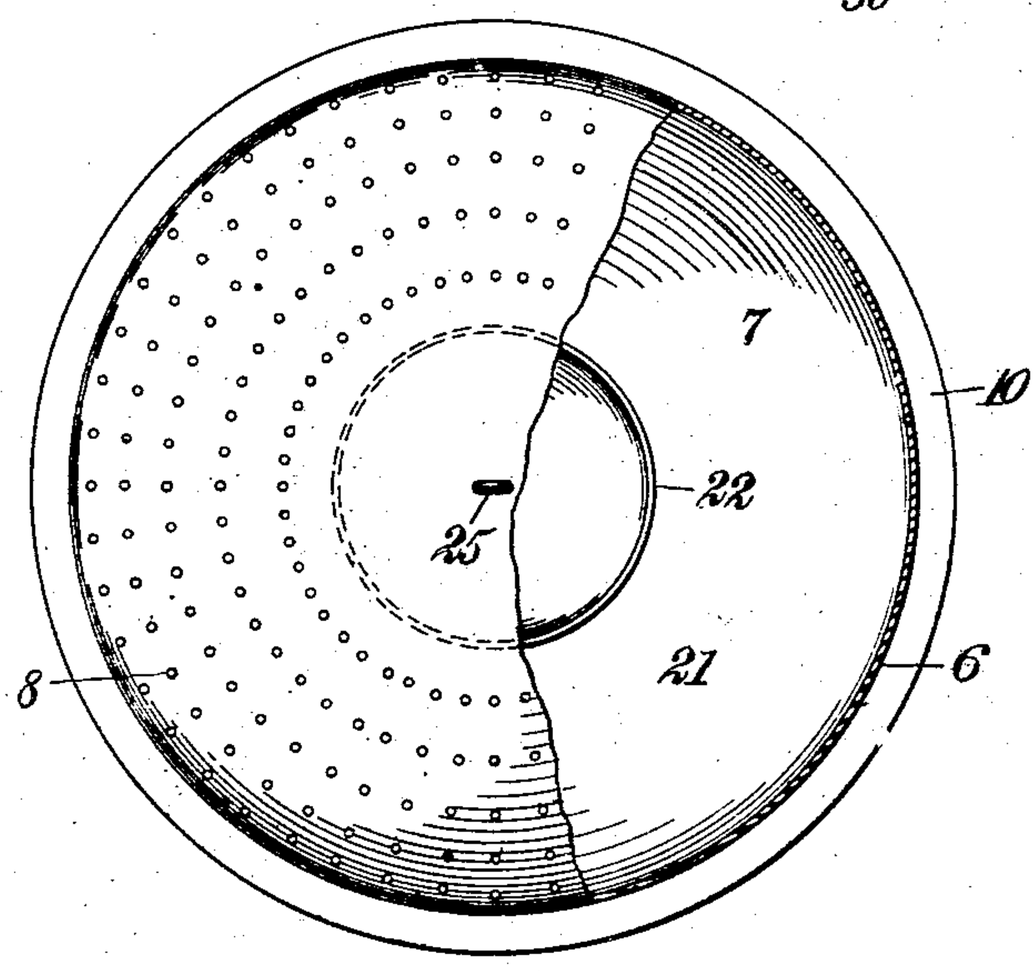
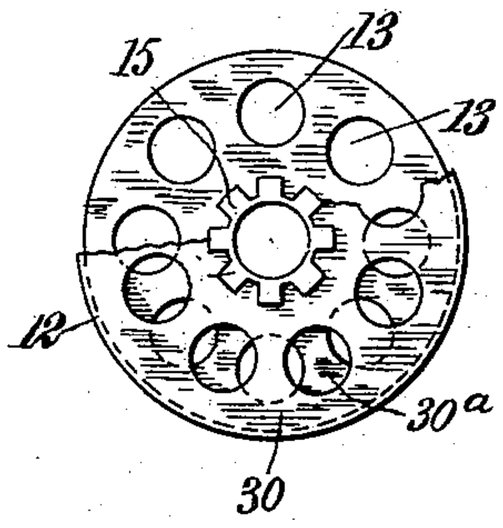


Fig. 3.



WITNESSES:

A. B. Mattingly

H. J. Bernhard

INVENTOR

James R. Tyson

BY

Munn & Co.

ATTORNEYS.

No. 737,977. Patented September 1, 1903.

UNITED STATES PATENT OFFICE.

JAMES R. TYSON, OF READING, PENNSYLVANIA.

GAS-HEATER.

SPECIFICATION forming part of Letters Patent No. 737,977, dated September 1, 1903.

Application filed February 14, 1903. Serial No. 143,296. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. TYSON, a citizen of the United States, and a resident of Reading, in the county of Berks and State of Pennsylvania, have invented a new and Improved Gas-Heater, of which the following is a full, clear, and exact description.

My invention relates to improvements in heaters of that kind which are especially designed for use on gas-fixtures to utilize the flame resulting from the combustion of gas as a means for heating and ventilating rooms or apartments.

In the present invention I seek to produce a simple and compact construction, adapted to be easily slipped into place on a common gas-jet, and equipped with means for supplying atmospheric air to a current of gas so as to produce an aerated combustible mixture, which is diffused uniformly over a large area, to the end that it may be consumed to good advantage and with a blue flame for rapidly heating and ventilating a room. The heater has its parts so assembled as to dispense with rivet-fastenings and solder-joints, thus simplifying the construction and increasing the durability of the article. The current of mixed gas and air is injected under pressure against a part which protects the same from deterioration under the injurious effects due to the impact of a concentrated heated current, and this device also diffuses the gaseous current uniformly in all directions toward the perforated dome of the heater.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the novelty will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical central section through a gas-heater constructed in accordance with my invention and showing it applied to a common gas-jet. Fig. 2 is a top plan view, partly broken away to show the internal construction; and Fig. 3 is an inverted or bottom plan view illustrating the bottom plate of the heater.

The heater of my invention has a shell or casing comprising two members 5 6, which are joined together in a way to hold an intermediate diaphragm 7 in place. The lower member 5 is in the shape of an inverted bell, or said member may be described as flaring upwardly from its lower toward its upper portion, said member being imperforate throughout its area. The other member 6 is dome-shaped, and it is formed with a plurality of minute flame-orifices 8, the same being arranged in circular rows and extending from the top portion thereof toward the bottom, substantially as indicated by Figs. 1 and 2. The diaphragm 7 is of concavo-convex form in cross-section, and it is arranged substantially at the meeting line of the upper and lower members. Said diaphragm curves downwardly and inwardly relative to the enlarged upper end of the imperforate lower member 5, and these three parts are united securely by seaming them together, thus dispensing with the use of soldered joints, rivet-fastenings, or other means for uniting the parts, which would tend to deteriorate under the influence of heat.

As shown by Fig. 1, the lower member 5 is provided at its upper edge with a radial flange 9, and on this flange is arranged to rest the edge portion of the diaphragm 7. The upper member 6 has an outwardly-extending flange 10, which laps the edge portion of the diaphragm and is bent or doubled at 11 around the flange 9 of the lower member 5, whereby the upper and lower members are securely united, and the diaphragm is fixed in position by clamping it between the flanges of the two members. I do not desire, however, to strictly confine myself to this special form of joint, because the flanges may be otherwise arranged to couple the members and hold the diaphragm in place.

The member 5 is provided at its contracted lower end with a head 12, which may be made in one piece with said member, or it may be formed in a separate piece and united by seaming the head and the member together. This head 12 is provided with a number of air-inlet openings 13, each of large area, as shown by Fig. 3, and said head is also provided with a central opening adapted to receive the lower portion of a short internal tube 14. This tube is shown as having its lower end split at a number of points in order

to produce a series of lips 15. The slitted end of the tube projects through the central opening of the bottom head 12, and the lips 15 are thereafter bent into interlocking engagement with the head for the purpose of coupling the tube fixedly to the head. It is evident, however, that the length of the tube 14 may be modified, as desired, and that said tube may be attached in any equivalent way to the bottom part of the heater.

The employment of the diaphragm 7 and the head 12 forms a chamber 16 in the lower member of the heater, and in this chamber is arranged an air-induction cone 17 and a jet-tube 18. The cone 17 is hollow and fitted snugly within the lower contracted part of the flaring member 5, the edge portion of said cone resting snugly in the angle formed by the union of the member 5 and the head 12. The upper portion of the cone 17 terminates in an annular flange 19, on which is fitted the lower end of the jet-tube 18. The jet-tube 18 is cylindrical for a part of its length, but the upper part of this tube is tapering to form a nozzle 20, said nozzle projecting through the diaphragm 17 and into the chamber 21 of the dome-shaped perforated member 6 of the heater.

An important feature of the present invention resides in the employment of a deflector 22 in the upper part of the perforated dome-shaped member 6, said deflector being disposed directly opposite to and in alinement with the nozzle of the jet-tube 18, as shown by Fig. 1. The deflector is hemispherical and disposed in an inverted position within the chamber 21 of the perforated upper member, the open end of said deflector resting against the imperforate central upper portion of the member 6. This deflector may be fastened in place by any suitable means within the perforated member, but, as shown by the drawings, I employ a threaded rod 23, which passes through suitable openings in the deflector and in the center of the dome 6. The lower end of this rod 23 is equipped with a clamping-nut 24, while the upper protruding end of the rod is furnished with an eye 25, the latter serving as a convenient means for the insertion of any suitable instrument to lift the device while in a heated condition off the gas-fixture, if desired.

The joint formed by the union of the members forms an annular ledge or shoulder on the outside of the heater, and this shoulder is utilized as the means for holding a skeleton support in operative position over and above the heater, whereby a vessel may be upheld over the dome 6 and exposed to the action of the flame thereof. This vessel-support in one embodiment of the invention consists of a base-ring 26, having a series of rods 27 fastened thereto, such rods extending upwardly from the base-ring and attached to a ring 28, or, if desired, a plate may be used in lieu of this ring. The parts 26 27 28 are coupled rigidly to enable the entire vessel-holder to be applied easily and quickly to the heater or to be removed therefrom.

In the manufacture of the improved heater the diaphragm 7 is arranged to fit on the tapering nozzle 20 of the jet-tube 18, and this diaphragm is adapted to press upon the jet-tube and the induction-cone 17 in a way to clamp these parts immovably in place in the chamber 16 of the lower member 5, thus dispensing with the use of separate devices for holding the cone and jet-tube in operative relation to each other and to said member 5. The diaphragm also serves another useful purpose in that it prevents the pressure of the combustible mixture from accumulating below the lowermost row of flame-orifices 8 in the perforated dome shaped member. The deflector 22 serves several important purposes in my improved gas-heater, among which may be mentioned the protection of the dome 6 from deterioration under the impact of the heated gaseous current.

It will be understood that in the operation of the structure the gas from a burner, such as A, is allowed to flow into the jet-tube 18, and the upward movement of this current of gas induces a like flow of currents of air through the openings 13 in the bottom head and the cone 17. The air and gas thus admitted to the tube 18 are intimately combined or mixed therein, and this current of mixed air and gas is condensed or compressed by passing through the tapering nozzle 20 of said tube. In the absence of the deflector 22 the gaseous current will impinge directly against the top of the dome-shaped member 6, which would result in rapid burning out of said member. The employment of the deflector 22 overcomes this serious objection, because it affords a double thickness of metal at the point of impact of the current of combustible mixture. The deflector also diffuses the current of air and gas uniformly in all directions within the chamber 21 of the dome-shaped member, this air and gas being distributed in equal proportions around the inner surface of the perforated dome, whereby the ignition of the diffused combustible mixture will insure the burning thereof with a blue flame equally through all the perforations 8 of the dome and prevent any flickering on the outside of the heater, and overcomes the escape of unconsumed gas through any one of the multiplicity of perforations. Another advantage secured by the employment of this deflector is that the combustible mixture is discharged through the perforations under regular or equal pressure, because the current is diverted from a straight line by striking against the deflector and the uniform consumption of the gas is thus insured, thereby greatly increasing the heating capacity of the structure. The upward tendency of the burning gas on the external surface of the member 6 causes a concentration of the heat and flame at the top portion of the burner, and by the use of the double thickness of

metal at this point of concentration the durability and service of the heater is increased. The compression of the gas and air due to its passage through the tapering nozzle 20 focuses the heat at the central part of the heater.

Any suitable means may be employed to regulate the volume of air admitted to the cone 17 at the bottom of the heater. I may employ a regulating-plate 30, having openings spaced to register more or less with the holes 13 in the bottom head. This plate has a flange 31, which fits snugly to the lower member 5, and said plate has a central opening to loosely receive the member 14, the prongs or lips 15 of which confine the regulating-plate against the bottom head. The plate 30 may have any suitable handle or finger-piece to change its position.

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

1. A heater having a dome-shaped perforated member provided with an external flame-surface, a diaphragm united to the lower edge of said dome-shaped member and forming therewith an intermediate chamber, a deflector supported by the middle part of said dome-shaped member, and a combining-tube projecting through said diaphragm and disposed opposite to the deflector.

2. A heater having a dome-shaped perforated member provided with an external flame-surface, a diaphragm forming a chamber with the dome-shaped member, a deflector suspended in said chamber from said dome-shaped member and having a convex surface, and a combining-tube projecting through the diaphragm and disposed opposite to the deflector.

3. A heater having a casing, a diaphragm fixed therein and dividing the casing into compartments, a cone open to the admission of the air and disposed in one of said compartments, a combining tube or nozzle confined in place between the cone and the diaphragm, said tube or nozzle communicating with the cone and projecting through the diaphragm, and means for feeding fuel to said cone.

4. In a heater of the class described, a casing consisting of a flaring lower member and a perforated upper member united one with the other by an interlocking seam-joint, and a diaphragm held in place between said members, combined with a combining-tube projecting through the diaphragm and extending into the perforated dome-shaped member.

5. A heater of the class described, comprising a casing having a diaphragm, an air-induction cone in the lower part of said casing, and a combining-tube fitted to the diaphragm and the cone, said cone and combining-tube being confined in place between an end portion of the casing and the diaphragm.

6. A heater of the class described, comprising a casing having a perforated lower head and a perforated dome, a diaphragm within the chamber of said casing, a cone engaging with the lower head of the casing, a combining-tube fitted to the cone and the diaphragm and projecting through the latter, and a deflector within the perforated dome of the casing and opposite to the outlet from said combining-tube.

7. In a heater of the class described, the combination of a casing having a perforated crown, a diaphragm secured in the casing and dividing the latter into upper and lower chambers, a flaring air-inlet tube in the lower chamber of the casing, and a nozzle communicating with the air-inlet tube and having a contracted discharge end which projects through said diaphragm.

8. In a heater, a casing comprising a lower imperforate member having a free air-inlet, a perforated dome, and a diaphragm united with the lower member and the dome to produce an external ledge or shoulder, in combination with a jet-nozzle projecting through the diaphragm and communicating with said air-inlet, and means within the dome-chamber for diffusing therein a combustible vapor supplied by the nozzle.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES R. TYSON.

Witnesses:
ISRAEL H. ROTHERMEL,
WILSON H. ROTHERMEL.