F. P. HARKER.

GAS HEATER.

APPLICATION FILED APR. 12, 1912.

1,044,380. **Patented Nov. 12, 1912.**

Fig. 1.

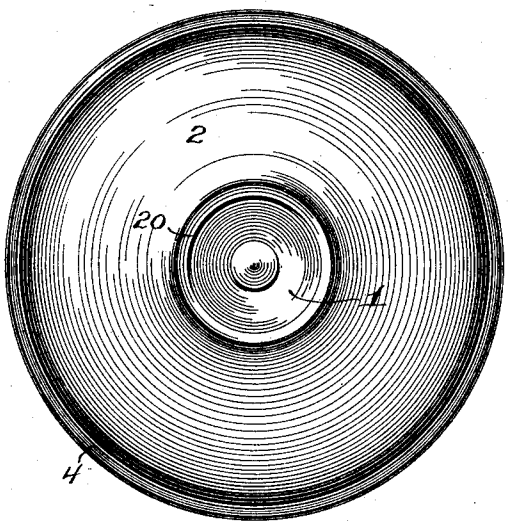


Fig. 2.

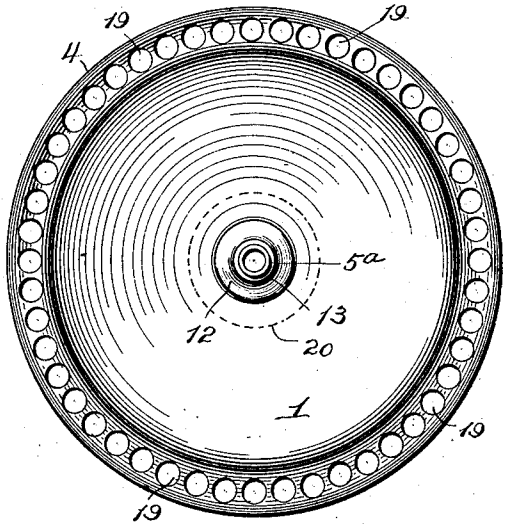
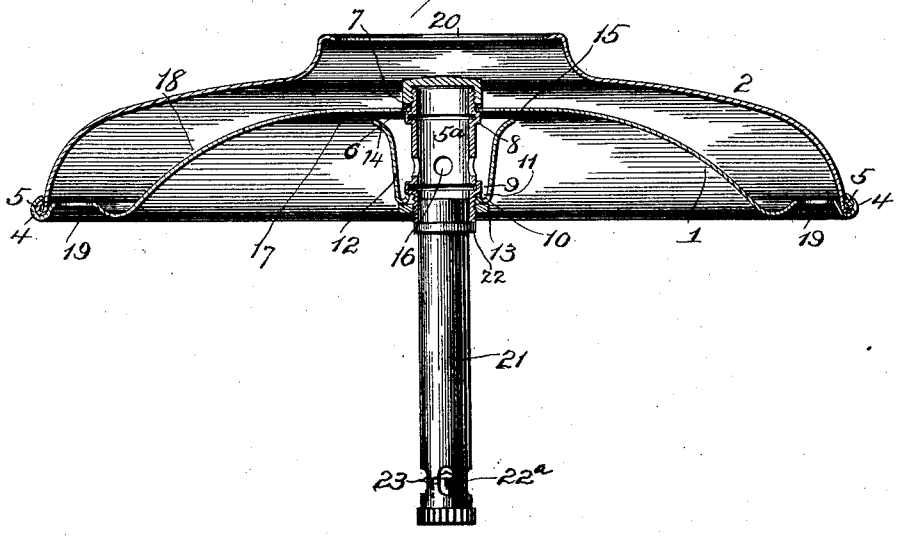


Fig. 3.



WITNESSES

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GAS-HEATER.

1,044,380. Specification of Letters Patent. Patented Nov. 12, 1912.

Application filed April 12, 1912. Serial No. 690,218.

To all whom it may concern:

Be it known that I, FERRIS P. HARKER, a citizen of the United States, and resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Gas-Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to gas heaters, the object of the invention being to provide a gas heating device in which the heating flame will be evenly and uniformly distributed over and in contact with the flame or heater plate.

A further object of the invention is to provide a device of this character with several features of improvement which will be hereinafter pointed out and which serve to simplify the construction and arrangement of its parts and increase its effectiveness in operation.

With these objects in view the invention consists in the several features of construction and combinations of parts which will be hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of the top of the heater. Fig. 2 is a bottom plan view, and Fig. 3 is a vertical section.

The heating chamber consists of the heater or flame plate 1 and deflector plate 2 which are permanently secured together by beading the outer edge of the bottom or heater plate over a bead 5 on the outer edge of the upper or deflector plate, thereby forming a fastening bead 4 which firmly unites the two plates at their outer edges. The flame plate is reversely concaved, forming a depending wall portion 4^a, between which, and the head 4 said flame plate is made with an annular groove or depression 4^b having an annular series of perforations 19.

5^a represents the burner tube which is inserted through a flanged hole 6 formed in the center of the heater or flame plate. The upper end of the burner tube is exteriorly screw threaded and provided with an enlarged closed head or screw cap, the annular shoulder 7 of which, when threaded on the upper end of the burner tube, rests upon the upper surface of the flame or heater plate, and the tube is secured in place by the screw cap drawing a bead 8 formed on the burner tube tightly against and so as to overlap the lower surface of the flame or heater plate around the flanged hole 6 and thus permanently secure the burner tube to the plate. Burner tube 5^a is exteriorly screw threaded at its lower end and is provided with an annular shoulder 9, which constitutes a seat upon which is supported the edge 10 of the upwardly turned flange 11 on the bell shaped gas deflector 12 which is secured in place by means of a nut 13. The upper portion 14 of the gas deflector is outwardly flared, and extends upwardly in close proximity to the surface of the flame or heater plate whereby the upper and outer edges of the gas deflector forms in connection with the flame or heater plate, a thin or narrow annular passage 15 for the escape of the commingled gas and air which is supplied by the burner tube. The burner tube 5^a is furnished with an annular series of camparatively large holes 16 which are located at such a distance from the flame or heater plate, as will cause the gas to freely flow from the burner tube into the lower portion of the bell shaped gas deflecting chamber. As thus constructed the gas deflector serves as a muffler to deaden the noise which is produced by gas burners of ordinary construction and in which the gas escapes through holes in the burner directly into the open air, and this muffling action is due to the fact that the gas as it escapes through the large holes in the burner tube impinges against the upwardly and outwardly flaring wall of the gas deflector and also the confined body of gas in the gas deflector, and is caused to flow upwardly and escape through the thin annular slot formed between the gas deflector and the flame or heater plate. Again the gas, deflector serves to equalize and render uniform the pressure and flow of gas at all points of the annular slot through which it escapes and insures a thorough and complete combustion of the gas by causing it to issue in the form of a thin annular jet and produce a thin radial sheet of flame to which the oxygen of the air has free access and hence insures a substantially complete and perfect combustion of the gas.

The central annular portion 17 of the flame or heater plate 1 is approximately horizontal which permits the flame to extend radially in close or direct contact with

the heater plate and then to impinge upon the downwardly curved portion of the same and finally pass upwardly through the annular series of holes 19 former in the outer edge of the heater plate and over the curved outer wall 18 of the latter, the upward draft causing the flame and heated air and gases to flow upwardly through the chamber between the two plates and escape through the central opening 20 in the deflector plate. It will thus be seen that the construction and arrangement of parts is such that a thin radial flame is produced which flows in direct contact with the entire surface of the heater plate from the burner to its outer edge, which permits of the free commingling of oxygen with the flame and gases and insures a complete and perfect combustion of the gases.

21 represents a Bunsen burner tube the upper end of which fits within the lower end of the burner tube 5^a the latter being supported by a bead 22 on tube 21. The lower end of tube 21 is equipped with a gas jet spud 22^a, and air supply openings 23, for the admission and commingling of air with the gas that is supplied to the burner tube. The lower end of the gas jet spud 22^a is screw threaded to permit it to be removably secured to a gas jet or gas supply pipe.

It is evident that many slight changes might be made in the construction and arrangements of the several parts of my improvement without departing from my invention, and hence I would have it understood that I do not restrict myself to the particular construction shown and described.

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

1. In a gas heater, the combination with the flame or heater plate, of a gas burner tube provided with a screw cap which is seated on the upper side of the flame or heater plate, and with means engaging the lower side thereof, substantially as set forth.

2. In a gas heater, the combination with the flame or heater plate, of a gas burner tube provided with a closed head which is seated on the upper side of the flame or heater plate, and with an annular bead which engages the lower side thereof, substantially as set forth.

3. The combination with a heating chamber consisting of a deflector plate and a flame plate constructed to permit the flame and heated gas to pass upwardly between their depending edges and escape through a central opening in the deflector plate, of a gas burner tube provided with perforations for the escape of gas, and an inverted bell shaped deflector surrounding said tube and constructed to produce in conjunction with the flame plate a thin annular flaming jet of gas, substantially as set forth.

4. In a gas heater, the combination of a heating chamber comprising a flame plate and a deflector plate secured together at their peripheral edges, the deflector plate having a central opening and the flame plate having an annular series of holes near its peripheral edge, and a burner under said chamber and having a flaring part coöperating with the flame plate to form an annular jet outlet.

5. In a gas heater, a heating chamber consisting of a flame or heater plate and a deflector plate secured together at their peripheral edges, and flame or heater plate being provided with an annular series of openings near its outer edge, and with annular depending wall inside said openings, substantially as set forth.

6. In a gas heater, a heating chamber consisting of a deflector plate and a flame or heater plate secured together at their outer edges, the flame or heater plate being formed with an annular groove or depression near its outer edge said groove being provided with an annular series of openings, substantially as set forth.

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

FERRIS P. HARKER.

Witnesses:
JAMES F. DAVIS,
FRANK J. MELLOH.