No. 761,409. PATENTED MAY 31, 1904.

E. RUUD.

GAS BURNER.

APPLICATION FILED DEC. 18, 1903.

NO MODEL.

FIG. 1.

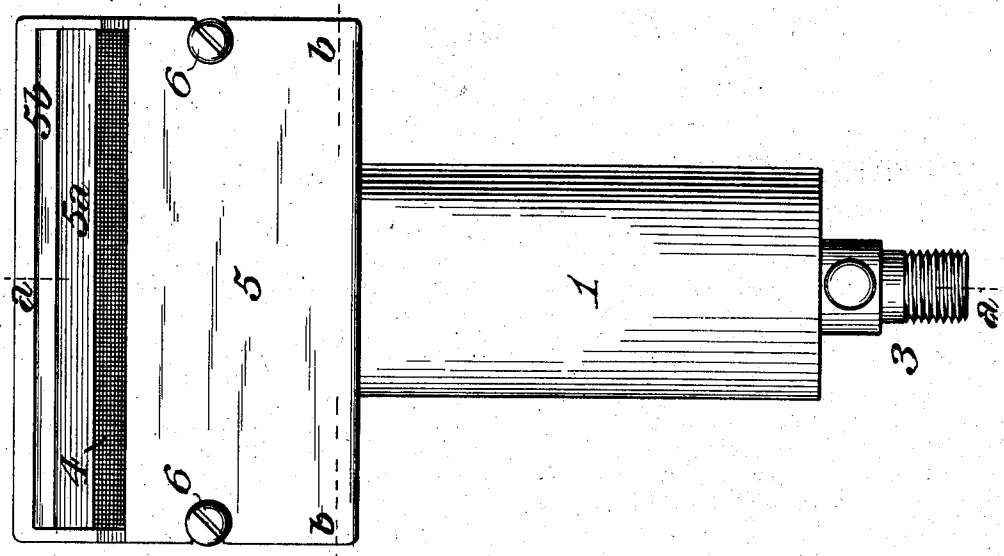



FIG. 3.

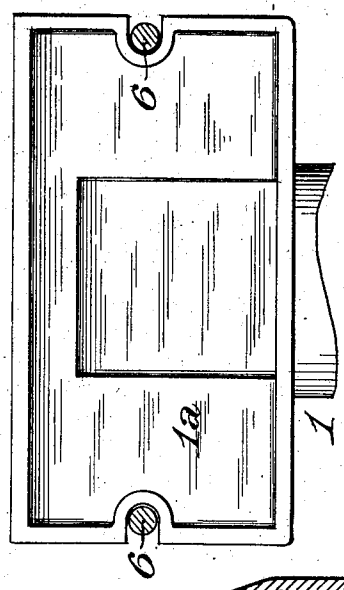



FIG. 4.

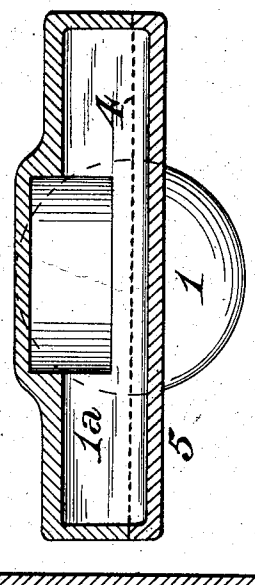



FIG. 5.

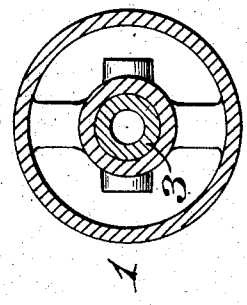
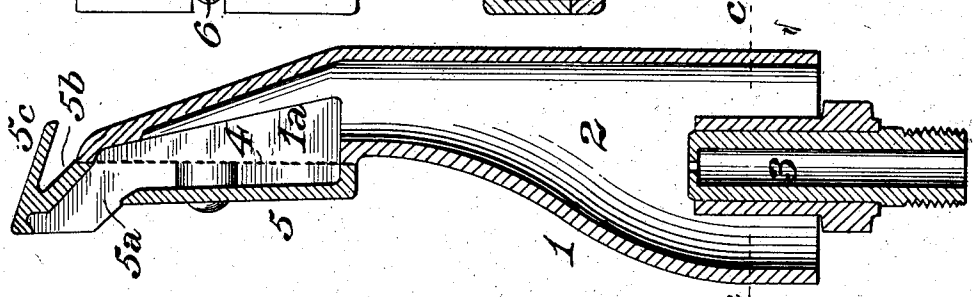



FIG. 2.




WITNESSES

James C. Herron.

S. R. Bell.

INVENTOR

Edwin Ruud

by Andrew Bell

Att'y.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 761,409. Patented May 31, 1904.

# UNITED STATES PATENT OFFICE.

EDWIN RUUD, OF PITTSBURG, PENNSYLVANIA.

## GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 761,409, dated May 31, 1904.

Application filed December 18, 1903. Serial No. 185,637. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN RUUD, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Gas-Burners, of which improvement the following is a specification.

The object of my invention is to provide a gas-burner specially adaptable to application and use in connection with water-heaters and also desirably available in heating apparatus of other descriptions, in the operation of which "flashing" or "back-firing" shall be effectually prevented, the flame of the burner be properly directed upon the object to be heated, and the perforated burner-plate protected from the access of water.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a front view in elevation of a gas-burner, illustrating an embodiment of my invention; Fig. 2, a vertical section through the same on the line *a a* of Fig. 1; Fig. 3, a front view of the upper portion of the burner with the cap-plate removed; Fig. 4, a horizontal section on the line *b b* of Fig. 1, and Fig. 5 a similar section on the line *c c* of Fig. 2.

My invention is herein shown as applied in connection with a gas and air mixer of the ordinary type, the same consisting of a tubular body or shell 1, which surrounds a supply-passage 2 for gas and air and is flared or conically enlarged at its lower end, which is open for the reception of air and into which a gas-supply pipe 3 projects for a short distance. The upper portion of the body 1 is enlarged, so as to form a discharge-chamber $1^a$, which is preferably, as shown, of rectangular section and is entirely open at its front.

A burner-plate 4, which may be either of perforated metal or wire-gauze, is fitted over the open front of the discharge-chamber and is held in substantially vertical position thereon by a cap-plate 5 of similar contour to the discharge-chamber, between which plate and the discharge-chamber the burner-plate is clamped by screws 6. Inturned flanges are formed on the sides of the cap-plate, which abut against the burner-plate at its edges, so as to maintain a space between the cap-plate and the remainder of the burner-plate, as shown in Figs. 2 and 4, and a discharge-opening $5^a$ extends across the upper portion of the cap-plate. An inclined rear wall $5^b$ extends across the cap-plate behind the discharge-opening thereof, said wall being prolonged outwardly beyond the face of the opening, and a guard-plate $5^c$ extends downwardly and rearwardly from the top of the wall $5^b$, terminating in a plane in rear of the joint between the discharge chamber and cap. The guard-plate may, if preferred, be formed by a rearward extension from the end of the wall $5^b$ instead of starting near its top, as shown.

In operation combustion of the mixture of gas and air which enters the discharge-chamber $1^a$ through the supply-passage 2 is maintained at or near the openings in the upper portion of the burner-plate 4, and an unbroken flame is thrown out upwardly through the discharge-opening $5^a$. Sufficient area is afforded by the lateral extension of the discharge-chamber, and the lower portion of the burner-plate being separated from the atmosphere by the cap-plate combustion will not take place thereat. The guard-plate $5^c$ performs an important function in preventing the access of water, which may be condensed or leak from a heater-coil or other part to be heated, to the joint between the discharge-chamber and cap-plate and the interposed burner-plate.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, with a gas and air mixing chamber, of an expanded discharge-chamber having an open front, a direct passage-way connecting said mixing-chamber with said discharge-chamber and open front, a foraminous burner-plate extending across the front of said discharge-chamber, and a cap-plate secured to the discharge-chamber in front of the burner-plate and having an upper discharge-opening.

2. The combination, with a gas and air mixing chamber, of a discharge-chamber extended laterally beyond the body of the mixing-chamber, and having an open front, a direct passage-way connecting said mixing-chamber

with said discharge-chamber and open front, a foraminous burner-plate extending across the front of said discharge-chamber and a cap-plate secured to the discharge-chamber in front of the burner-plate and having an upper and substantially continuous discharge-opening.

3. The combination with a gas and air mixing chamber, of an expanded discharge-chamber having an open front, a direct passage-way connecting said mixing-chamber with said discharge-chamber and open front, a foraminous burner-plate extending across the front of said discharge-chamber, a cap-plate covering the front of said discharge-chamber and having an upper and continuous discharge-opening extending substantially the entire width of the expanded discharge-chamber and connections by which the burner-plate is clamped in position between the discharge-chamber and cap-plate.

4. The combination with a gas and air mixing chamber, of an expanded discharge-chamber having an open front, a direct passage-way connecting said mixing-chamber with said discharge-chamber and open front, a foraminous burner-plate extending across the front of said discharge-chamber, a cap-plate covering the front of said discharge-chamber and having an upper discharge-opening and connections by which the burner-plate is clamped in position between the discharge-chamber and cap-plate.

5. The combination, with a gas and air mixer, of a discharge-chamber having an open front, a foraminous burner-plate extending across the front of said chamber, a cap-plate secured to the discharge-chamber in front of the burner-plate and having an upper discharge-opening, and a guard-plate extending rearwardly on the cap-plate beyond the joint between said plate and the discharge-chamber.

EDWIN RUUD.

Witnesses:
J. SNOWDEN BELL,
JAMES C. HERRON.