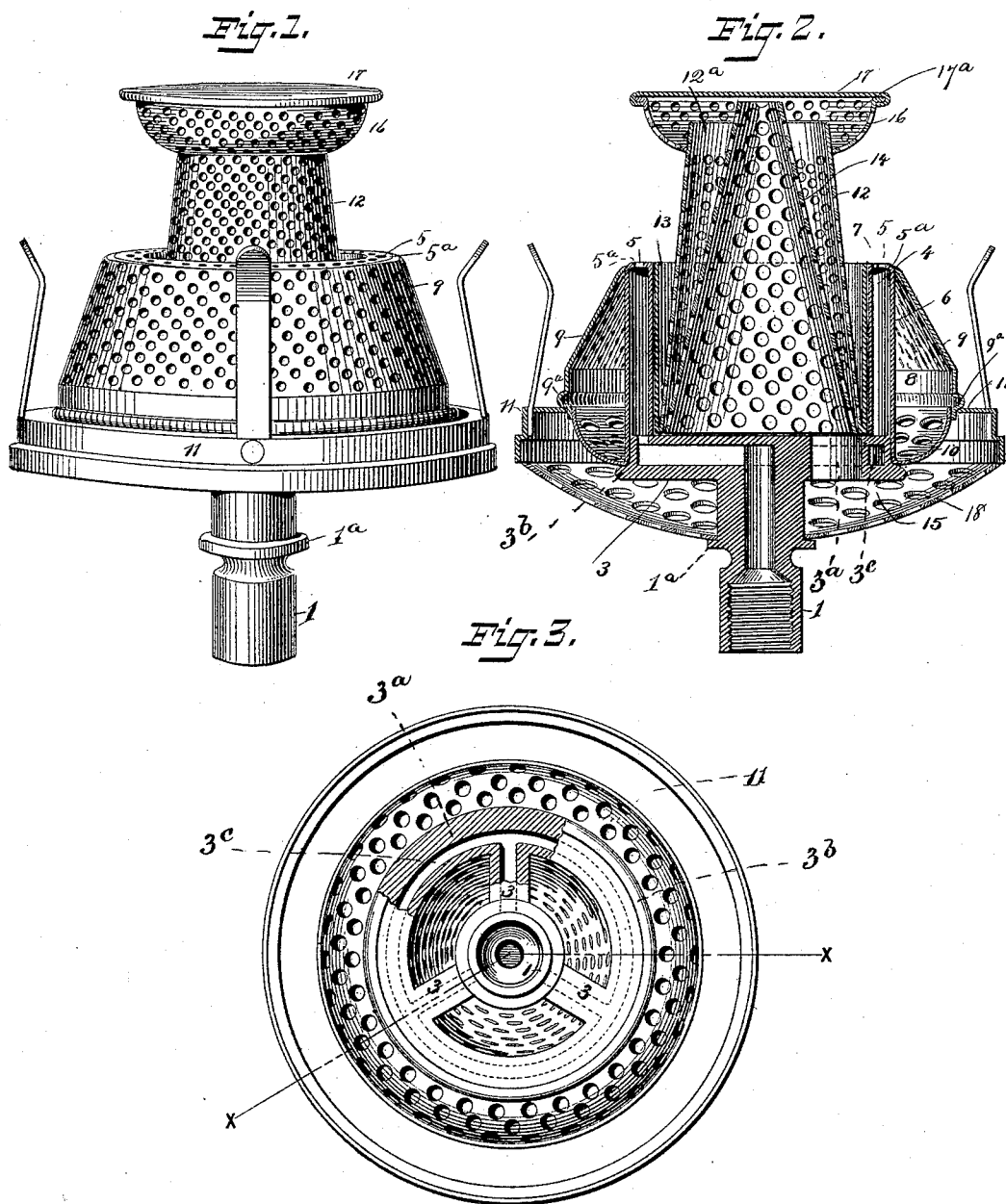


(No Model.)

F. RHIND.
GAS BURNER.

No. 460,054.

Patented Sept. 22, 1891.



WITNESSES:
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UNITED STATES PATENT OFFICE.

FRANK RHIND, OF MERIDEN, CONNECTICUT, ASSIGNOR TO CHARLES STANFORD UPTON, OF NEW YORK, N. Y.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 460,054, dated September 22, 1891.

Application filed July 5, 1888. Serial No. 279,045. (No model.)

To all whom it may concern:

Be it known that I, FRANK RHIND, a citizen of the United States, residing at Meriden, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Gas-Burners, of which the following is a specification.

My invention has for its object a gas-burner in which a full supply of air is conveyed evenly both inside and outside of an annular gas-flame.

My invention relates in part to an improvement on the air-screen shown, described, and claimed in Letters Patent No. 382,270, dated May 1, 1888.

My improvement consists in novel features of construction hereinafter described and claimed.

In order that my invention may be fully understood I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved gas-burner, the lowermost air-screen or perforated shell being omitted. Fig. 2 is a vertical sectional view of the complete gas-burner. Fig. 3 is an under side view, the lowermost air-screen or perforated shell being omitted and a part of one of the gas-supply arms or pipes and part of the ring being broken away to show a gas-duct and a portion of the gas-channel.

1 is a nozzle, which may be screwed onto any ordinary gas-pipe, the ordinary burner having been first removed. The nozzle 1 has a collar 1^a and three or any number of radial gas-supply arms or pipes 3. The latter connect with a ring 3^a, formed with a horizontal flange 3^b, and with a circular channel communicating with the ducts of the arms. The arms and ring support the upper part of the gas-burner and supply gas to the annular chamber 4 thereof, formed by an outer tube or cylindrical wall 6, seated on the flange, and a central draft-tube or cylindrical inner wall 7, supported on the ring. The radial arms and ring serve also as a stop to limit the downward adjustment of the central air-screen, hereinafter referred to. The outer and central tubes have a top 5^a, provided with perforations or jet-apertures 5, and the annu-

lar gas-chamber 4 is formed between and occupies the entire space inclosed by the tubes 6 and 7.

8 is an air-chamber between the tube 6 and the perforated upper or inner shell 9 and the lower or outer perforated shell 10, the upper and lower shells being, respectively, above and beneath a gallery or ledge 11. The chimney (not shown) of the burner seats upon the gallery or ledge, and pressing against the ring 9^a of the upper shell does not allow the air to be supplied to the flame from the outside, and it is therefore compelled to pass through the perforations of the shells 10 and 9. Perforations in the former are made larger than the perforations in the latter, so as to supply air evenly, while interrupting its flow sufficiently to prevent the jets of air from striking the flame with such force as to cause it to flicker. This construction prevents the formation of eddying currents within the burner.

The central air-screen comprises, first, an outer perforated thimble 12, which is conical or slightly converging and extending down to the ring 3^a, as shown in Figs. 1 and 2, and is steadied by being fixed to the lower end of a concentric sleeve or ring 13, adapted to be inserted and slide within the central tube 7, so as to take up all of the air passing between the arms 3. The concentric sleeve or ring, in connection with the air-screen, forms a trough, into which foreign matter carried through the jet-openings by the flow of natural or manufactured gas may fall, and thus be gathered, and the air-screen being removable the foreign matter can be removed, when it is withdrawn from the holder. This trough also forms a receptacle for the crust falling from the inside of a wick when the air-screen is used in connection with an oil-burner, and in either instance the trough forms a depository for insects which fall into the burner. I have also found that the brilliancy of the flame is increased and more perfect combustion is produced than in my patented construction referred to by the provision of the sleeve or ring, though I cannot at present account therefor. A second or inner perforated thimble 14 within the perforated thimble 12 and of greater upward convergence is made with large perfo-

rations, so as to break the force of the air-currents before they strike the outer perforated thimble 12. The latter is provided with small perforations, which supply air evenly to all parts of the flame and insure a complete and steady combustion. The perforated thimbles 12 and 14 and the concentric sleeve or ring 13 are all attached to each other at their lower ends, and they are adapted to seat upon the radial arms or ring, as shown in Fig. 2. The sleeve or ring 13 by reason of its mechanical contact with the central tube 7 and its connection with the perforated thimbles 12 and 14, forming the central air-screen, will convey the heat from the latter to the inner surface of the central tube, and by this means will serve to pre-heat the gas in the gas-chamber 4. The perforated thimble 12 extends above the perforations or jet-apertures 5 to a distance about equal to the semi-diameter of the central tube 7 and is surmounted by an air-distributor consisting of a perforated overhanging shell 16 and a centrifugal disk deflector 17, by which the shell is closed. An air-distributing chamber 17^a is thus formed at the top of the outer perforated thimble 12. The inner perforated thimble 14 extends up to nearly or quite close contact with the deflecting disk deflector 17. The thimble 12 extends up into the chamber 17^a at 12^a and serves to direct the air remaining in the thimble against the imperforate disk deflector 17. To further steady the flow of air both from the inside and the outside, I provide an additional annular chamber 15, formed by an air-screen or perforated shell 18, supported on the collar 1^a of the nozzle and spreading from the nozzle to the gallery or ledge 11 and having large and numerous perforations.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination of a central tube and an outer tube forming an annular gas-chamber and terminating at their upper ends in a top having jet-apertures, a concentric sleeve provided with means for screening the air and directing it horizontally against the flame, and perforated shells forming an outside chamber, and also providing screens, a trough being formed by the sleeve and its screen, substantially as and for the purpose set forth.

2. The combination of a central tube and an outer tube forming an annular gas-chamber having a perforated top, a gallery, outer and inner screens forming a surrounding air-chamber beneath and above the gallery, and a concentric sleeve also provided with outer and inner screens, a trough being formed by the sleeve and its outer screen, substantially as shown and described.

3. The combination of a central tube and an outer tube forming an annular gas-chamber having a perforated top, a concentric sleeve provided with a thimble having perforated sides, the said sides being set inwardly from the line of the flame, and perforated shells forming an annular chamber surrounding the gas-chamber, a trough being formed by the sleeve and the thimble, substantially as described.

4. The combination, with a removable central air-screen, of a concentric sleeve, to the lower end of which the air-screen is secured, a trough being formed between the air-screen and the sleeve, substantially as described.

5. The combination, with a central draft-tube, of a removable central air-screen having a concentric sleeve, to the lower end of which the air-screen is secured, a trough being formed between the air-screen and the sleeve, substantially as described.

6. The combination, with an annular gas-burner, of a removable central air-screen having a concentric sleeve, to the lower end of which the air-screen is secured, a trough being formed between the air-screen and the sleeve, substantially as described.

7. The combination of a central draft-tube, an air-screen located in the central draft-tube, consisting of perforated outer and inner thimbles and a sleeve or ring, the said thimbles being attached to each other at their lower ends and both being attached to the lower end of the sleeve or ring surrounding them and arranged to seat on the radial gas-supply arms or pipes, a trough being formed between the sleeve or ring and the outer thimble, substantially as described.

8. The combination of a sleeve and a perforated thimble of conical shape, diminishing in diameter from its lower end upward, located within and attached to the lower end of the said sleeve and terminating at its upper end in a perforated air-distributor, a trough being formed between the sleeve and the thimble, substantially as described.

9. The combination of a sleeve, a perforated outer thimble of conical shape diminishing in diameter from its lower end upward, located within the said sleeve and terminating at its upper end in a perforated air-distributor, and a perforated inner thimble of greater upward convergence than and located within the said outer thimble, the sleeve and thimbles being secured together at their lower ends, and a trough being formed between the sleeve and outer thimble, substantially as described.

FRANK RHIND.

Witnesses:

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