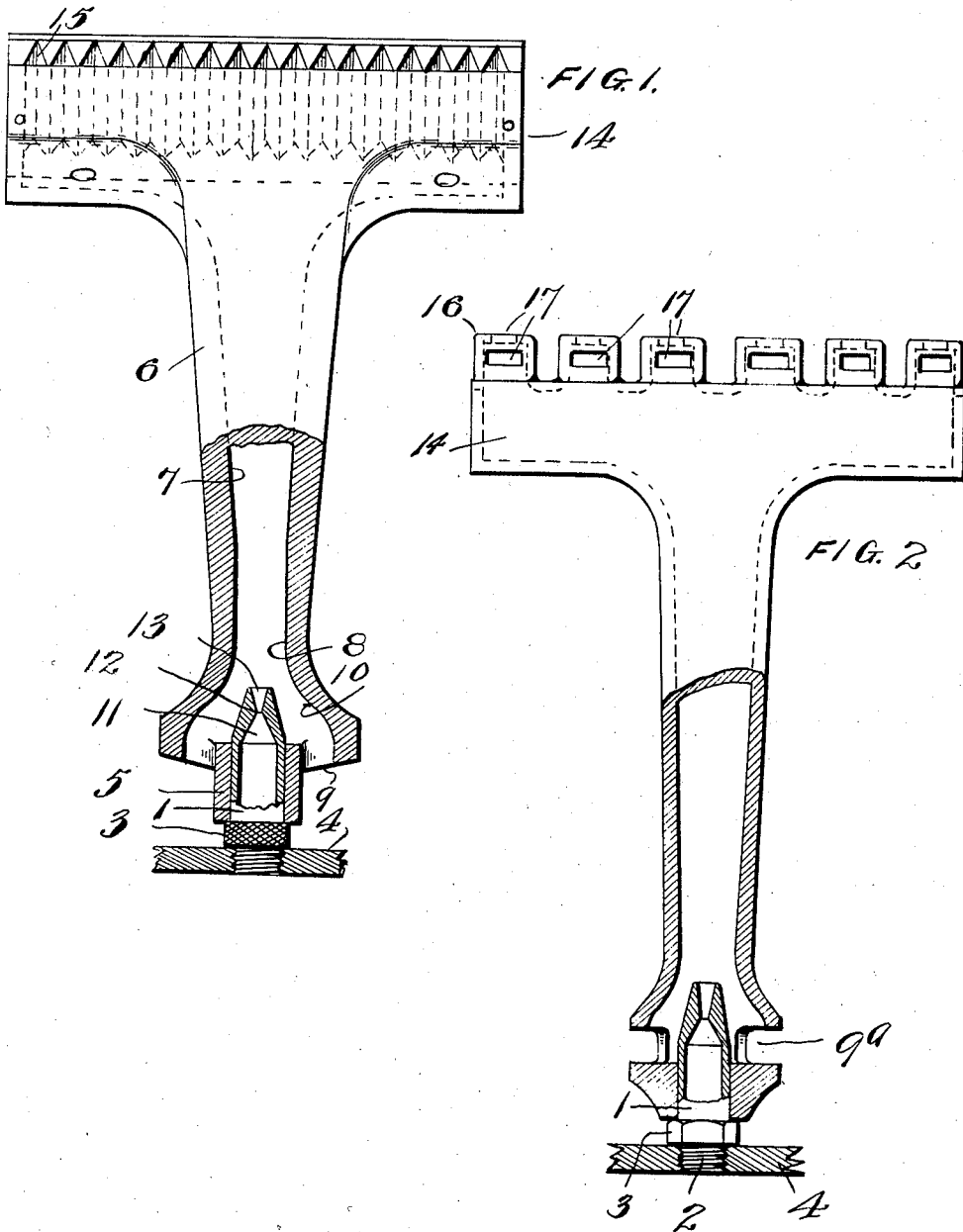


N. G. GOREAU.
GAS BURNER.
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1,049,848.

Patented Jan. 7, 1913.



WITNESSES

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NELSON G. GOREAU, OF NEW ORLEANS, LOUISIANA.

GAS-BURNER.

1,049,848.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, NELSON G. GOREAU, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Gas-Burners, of which the following is a specification.

My invention relates to gas burners of the "Bunsen" or heating type, and provides a burner of this general type having peculiar construction by means of which great economy and efficiency are attained.

Generally described, the invention comprises a burner tube of relatively small diameter, and a gas nipple arranged in proper position with respect to the tube and supplying gas from the nipple to the tube at suitable pressure and with high velocity, so that a large amount of air is injected into the tube, insuring complete combustion. At the same time the proportions of the tube and the rapid travel of the gas therein prevents back-flashing of the flame from the burner without any special mechanical device such as a Davy screen being provided for that purpose. In one of its forms the invention comprises more specifically, the nipple made with a flared nozzle by means of which gas is rapidly expanded as it leaves the nipple and thus acquires the desired velocity. In combination with such a nozzle a burner tube having a constricted throat may be also employed and the tube may be made to diverge upwardly from the throat. In all cases it is desirable to provide ample jet or flame openings to take care of the volume of combustible gas furnished without any undesirable back-pressure.

I will now describe the best forms of my invention that I have up to the present time devised. It is to be understood that these forms are simply exemplifications and that many changes may be made.

In the drawing, Figure 1 is a part side elevation and a part vertical section of a burner embodying the invention. Fig. 2 is a similar view of a modified form of burner.

My burner has been particularly designed for use in water heaters, but, evidently, it may be adapted to many other uses.

In Fig. 1, reference character 6 indicates the burner tube which has a relatively small throat or neck 8 near the base. 14 is a head usually considerably enlarged, at the

top of the tube, and this head is provided with a flame opening of ample area to prevent back pressure. There may be a single opening, but in some forms of the invention a plurality of flame openings 15, as shown, are employed. Within the base of the burner tube is the gas nipple 1 terminating in an outwardly flared nozzle 13 discharging close to the neck 8. The base of the tube is usually considerably flared, as at 10, below the nozzle, so that the tube as a whole takes the general form of a somewhat modified Venturi tube. Suitable means for supplying air, such as openings 9 of ample area, are provided adjacent to the neck 8. In this particular embodiment the openings are provided in the base of the tube below the nozzle. The gas nipple is conveniently provided with a nut or knurled portion 3 by which the nipple is screwed into any suitable pipe or gas conduit, the upper wall of which is indicated by reference numeral 4. For supporting the burner tube, its base is conveniently provided with a sleeve 5 encircling the nipple and resting upon the knurled shoulder 3. The inner end of the gas nozzle 13 terminates in a constricted throat 12. The outer diameter of the cone-shaped nozzle is considerably smaller than the neck 8 of the tube. The air-supply openings are of considerable area and usually at least equal in area to the size of the neck so that a sufficient quantity of air may be drawn into the tube by the action of the gas issuing from the nozzle. Gas under suitable pressure is supplied to the nipple and in passing the constricted throat 12 the gas rapidly expands in the flared nozzle 13 transforming pressure into velocity so that the gas is injected at high speed through the neck 8. The gas draws with it through the supply openings 9 a large volume of air which produces very complete combustion, as is indicated by the completely oxidized blue flame issuing from the flame openings. The velocity of the combustible mixture in the tube above the neck is such that back firing in the tube is completely prevented and there is no necessity for the employment of a Davy screen anywhere in the device. With a minimum amount of gas, greatly improved heat effects are obtained because of the velocity of the mixture produced by the combination of the flared gas nozzle discharging close to

the constricted neck of the burner tube and the ample air openings placed close to the neck.

Fig. 2 shows somewhat modified air openings 9^a entering the burner tube laterally below the nozzle. The head 14 is also provided with projections 16 in which the flame openings 17 are placed.

I claim:

10 1. In a gas burner, the combination of a tubular portion comprising a constricted throat, an enlarged head, a gradually flaring tube leading from the throat to the head, a suddenly flaring portion leading in the
15 opposite direction from the throat, a tip within the suddenly flared portion and an expanding nozzle in the tip discharging immediately in said throat.

20 2. A gas burner, comprising a gas tip having an outwardly expanding nozzle, a burner tube having a constricted throat surrounding the discharge end of the nozzle, said tube having a long outwardly tapering portion extending away from the throat

and terminating in an enlarged head provided with a plurality of flame openings, the tube also having a portion enlarged below the throat and surrounding the tip below its nozzle, said portion being provided with ample air openings.

30 3. In a gas burner, the combination of a burner tube having a constricted neck, an outwardly flaring gas nozzle of area considerably less than the area of said neck discharging into said tube close to the neck, and means for supplying air adjacent to the neck.

40 4. In a gas burner, the combination of a burner tube having a constricted neck and an outwardly flaring gas nozzle discharging into said tube close to the neck, an air supply opening being provided of area sufficient for free supply of air, adjacent to the neck.

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Witnesses:

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