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W. C. ELZE ET AL
BURNER APPARATUS FOR LIQUID FUELS
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1,603,032

Fig. 1.

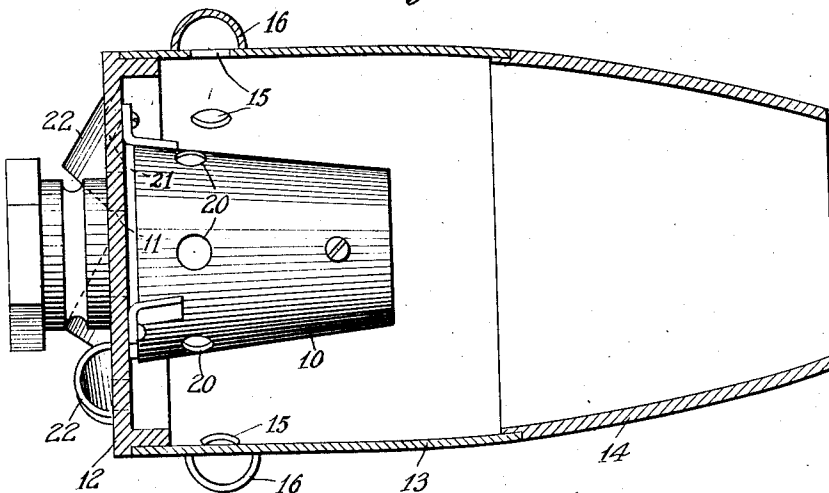


Fig. 2.

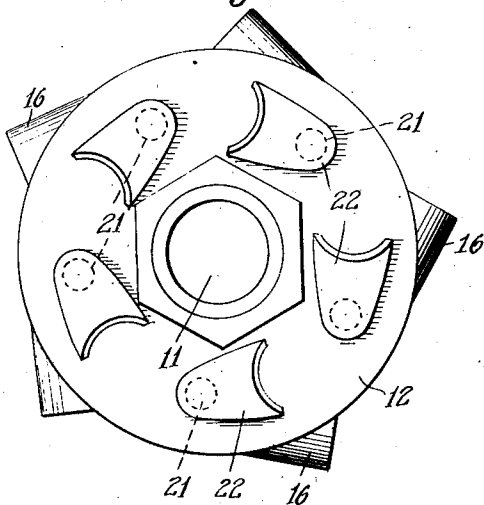
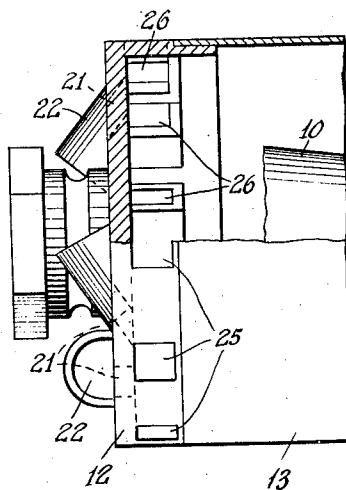


Fig. 3.



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BURNER APPARATUS FOR LIQUID FUELS.

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The invention relates to liquid fuel burning apparatus and more especially to the burner nozzle thereof; and it has for its object a novel type of burner whereby the diameter of the flame for a given length is materially increased. A further object of the invention consists in so effecting the combustion of the liquid fuel that a much greater efficiency is obtained. These advantages are attained by imparting to the gaseous mixture and the resultant flame a whirling motion or helical movement about its longitudinal axis.

The nature of the invention, however, will best be understood when described in connection with the accompanying drawings, in which—

Fig. 1 is a longitudinal section thru the improved burner.

Fig. 2 is an end view thereof.

Fig. 3 is a part side elevation and longitudinal section illustrating a modification.

Referring to the drawings, 10 designates a conical nozzle member forming the preliminary combustion chamber for the gaseous fuel mixture which, in properly atomized condition, is supplied thereto in any well-known manner, an opening 11 being provided therefor in the back plate 12 to which said nozzle 10 may be secured. Surrounding this nozzle is a cylindrical casing or hood 13, with tapered end portion or extension 14 beyond the end of the nozzle 10. This hood 13 provides a suitable chamber into which air is admitted thru a series of equally spaced and circularly disposed openings 15 at the rearward end, the same being tangentially directed into the main combustion chamber. A series of guide walls 16 over the respective openings 15 are provided to assist in directing the stream of inrushing air so that a definite whirl is produced about the nozzle 10, which whirl continues beyond the outlet 14 of the hood and for a considerable portion, if not the entire length, along a flame outwardly projected therefrom. This causes the latter, due to centrifugal action, to materially increase its width; and, moreover, thru the intermixture a more perfect combustion is effected.

The nozzle 10, also, is provided with a series of circularly disposed openings 20 near the back end thereof and thru which air is admitted to assist in the preliminary com-

bustion, the final combustion being completed in the chamber formed by the hood structure 13—14. It has been found advantageous, furthermore, to provide a similar series of tangentially disposed and equally-spaced openings 21 in the back plate 12 about the nozzle 10, the said openings being provided with guide walls 22 and delivering air in a whirling condition into the interior of the chamber at the extreme inner end.

As shown in Figs. 1 and 2, the guide walls 16 project outwardly from the periphery of the hood 13; but in order to avoid having exterior projections from this member, the latter may be provided in its wall with a series of slots 25, as shown in Fig. 3, with wall or guide members 26 set within the body of the hood. The passageways thus formed are tangentially directed into the interior, the air as in the case of the openings 15 being delivered thru the respective outlets 27 and in a whirling condition, which is subsequently imparted to the flame issuing from the mouth of the burner.

Ample air will thus be afforded for the combustion of the atomized oil not only within the nozzle member 10, but also within the chamber formed by the hood 13—14 surrounding said nozzle member; and a hot, efficient and large volumed flame results, the latter, furthermore, being projected outwardly from the tapered outlet portion 14 with a whirling motion about its longitudinal axis.

We claim:—

1. A burner for liquid fuels, comprising: a nozzle member for receiving and discharging atomized fuel thru a forward axial opening and affording a preliminary combustion chamber; and a hood member surrounding said nozzle member and extending substantially beyond the outlet thereof to form a main combustion chamber, said hood member having a contracted outlet opening axially aligned with respect to the nozzle member opening and provided with a series of air openings circularly disposed about the nozzle member and at the rear of the hood only and tangentially directed into the interior of said hood.

2. A burner for liquid fuels, comprising: a nozzle member for receiving and discharging atomized fuel thru a forward axial opening and affording a preliminary combustion

- chamber; a hood member surrounding said nozzle member and extending substantially beyond the outlet thereof to form a main combustion chamber, said hood member having a contracted outlet opening axially aligned with respect to the nozzle member opening and provided with a series of air openings circularly disposed about the nozzle member and at the rear of the hood only and tangentially directed into the interior of said hood; and a back plate closing substantially the rear of said hood member and having a series of circularly disposed openings therein and tangentially directed into the interior of the hood.
3. A burner for liquid fuels, comprising: a nozzle member for receiving and discharging atomized fuel thru a forward axial opening and affording a preliminary combustion chamber; a hood member surrounding said nozzle member and extending substantially beyond the outlet thereof to form a main combustion chamber, said hood member having a contracted outlet opening axially aligned with respect to the nozzle member opening and provided with walled passageways circularly disposed within and tangentially directed into said hood, said passageways being circularly disposed about the nozzle member at the rear of the hood only and open to the atmosphere.
- Signed at Brooklyn, in the county of Kings and State of New York, this 31st day of October, A. D. 1924.
- WALTER C. ELZE.
- Signed at Philadelphia, in the county of Philadelphia and State of Penna., this 28th day of October, A. D. 1924.
- ALFRED F. SCHUMANN.