Nov. 3, 1925.

1,559,625

P. W. KUTIS

BURNER

Filed Feb. 21, 1924

2 Sheets-Sheet 1

FIG. 1.

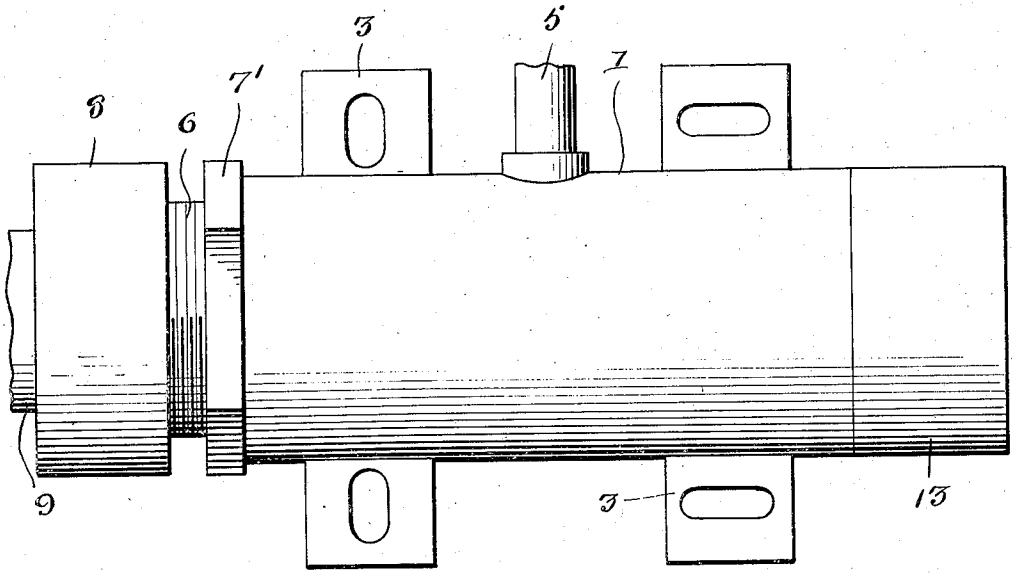
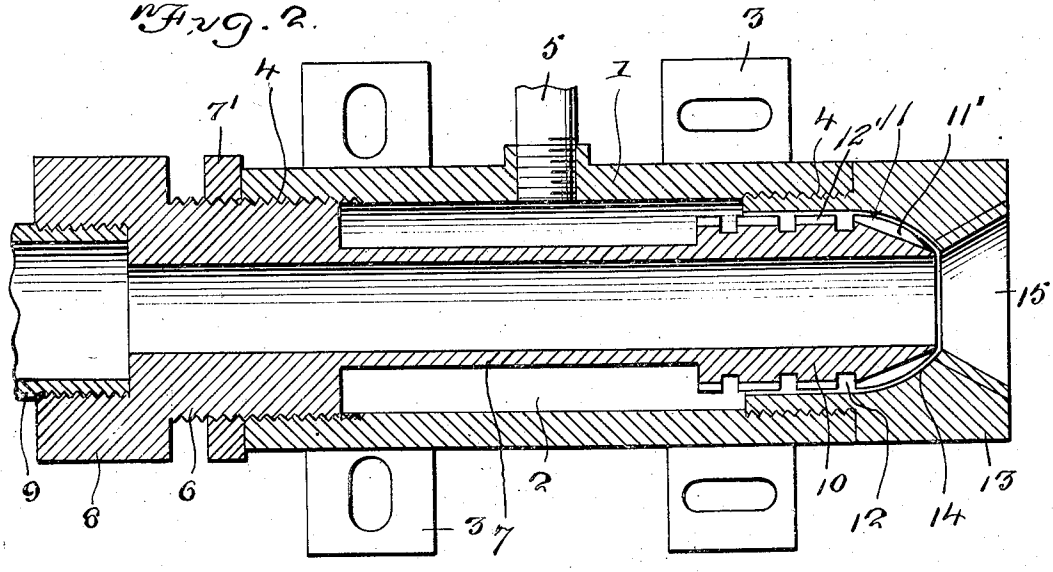


FIG. 2.



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Fig. 3.

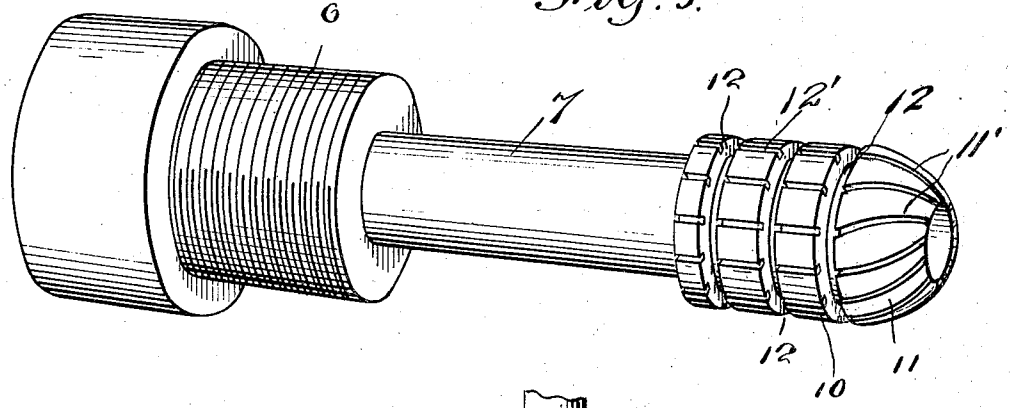


Fig. 4.

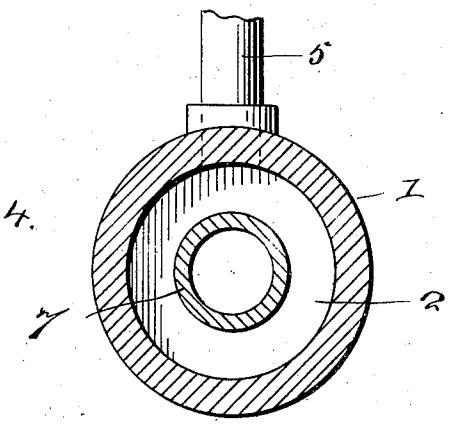
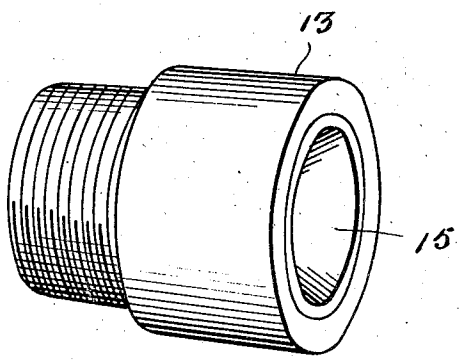


Fig. 5.



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UNITED STATES PATENT OFFICE.

PAUL W. KUTIS, OF PROCTOR, MINNESOTA.

BURNER.

Application filed February 21, 1924. Serial No. 694,336.

To all whom it may concern:

Be it known that I, PAUL W. KUTIS, a citizen of the United States, residing at Proctor, in the county of St. Louis and State of Minnesota, have invented new and useful Improvements in Burners, of which the following is a specification.

My present invention has reference to a liquid fuel burner, and my object is to simplify and improve such class of devices and to produce a burner in which the fuel is heated in its passage through the conducting nozzle therefor to increase the combustibility thereof and subjected, at the outlet of the nozzle, to a fine vapor-like spray of steam or other agent so that the mixed fuel is delivered into the fire box in an atomized condition, and in the form of a whirling spray that fills the entire fire box.

A further object is the production of a liquid fuel burner that may be effectively used in sugar mills and that may employ molasses as the combustible agent, the same being heated in its passage through the burner nozzle for the atomization or the breaking up of the particles of fuel and having directed thereagainst at its outlet through the nozzle a fine spray of steam which is criss-crossed to insure a better atomization of the fuel for directing the said fuel from the nozzle into the fire box, the burner, of course, being susceptible for use in connection with other fuels, such as oil or the like.

With the foregoing broadly stated objects in view and others which will present themselves as the nature of the invention is better understood, reference is to be had to the drawings which accompany and which form part of this application.

In the drawings:—

Figure 1 is a plan view of a burner in accordance with this invention.

Figure 2 is an approximately central vertical longitudinal section therethrough.

Figure 3 is a perspective view of the nozzle.

Figure 4 is a central transverse sectional view through the improvement.

Figure 5 is a perspective view of the nose piece employed.

The heater chamber of the improvement comprises a casting 1 having a central tubular passage 2 therethrough. The casting, has outstanding apertured lugs 3 designed to be secured on a support. The apertured lugs permit the burner to be properly supported and adjusted with respect to the fire box in which the burner is arranged. The ends of the chamber 1 are formed with interior threads 4. As both ends of the chamber 1 are similarly constructed, it will be apparent that the nozzle and nose member, hereinafter to be described may be attached to either of said ends.

One side of the casting comprising the chamber 1 has a threaded opening therethrough, and screwed in this opening there is a pipe 5 connected to a suitable source of steam supply, and whereby steam is let into the chamber. In this connection, I desire to state that in lieu of steam, other vaporized fluids, preferably of a combustible nature, may be employed.

Screwed in one of the threaded ends 4 of the chamber 1 there is the thickened and exteriorly threaded portion 6 of the nozzle 7. The nozzle 7, and its portion 6, are round in cross section. Screwed on the threaded portion 6 of the nozzle and designed to contact with one end of the chamber 1 there is a jamb nut 7′. By this arrangement, the nozzle may be adjustably received in the chamber 1. Outward of the threaded enlarged portion 6 of the nozzle 7, there is a further enlargement, indicated by the numeral 8, provided with interior threads for engagement with a pipe member 9 through which the liquid fuel is fed by gravity into the burner.

The head of the nozzle is indicated, for distinction, by the numeral 10. The head is provided by thickening the body of the nozzle, and the outer end of the head is cone-shaped, as indicated by the numeral 11. The head, is provided with any desired number of annular depressions 12 forming annular shoulders therebetween. These shoulders are provided with longitudinal aligning channels 12′. The conical end 11 is formed with spaced longitudinal channels 11′ the inner walls of which are arranged angularly at approximately 20 degrees.

Screwed in the outer or free end of the chamber 1 there is the reduced end portion of a nose piece 13. The nose piece 13 has a rounded bore to receive the cross sectionally rounded head 10 of the nozzle therein, the said bore being inwardly rounded to provide a conical portion 14 that is disposed adjacent to the conical end 11 of the head 10. The nose piece has an inwardly flared mouth 15 which communicates with its bore

and with the bore of the nozzle. Incident to the threaded engagement of the nose piece with the threads 4 at the outer end of the chamber 1, the said nose piece may be adjusted with respect to the head of the nozzle, so that the passage therebetween may be enlarged or restricted as occasion requires. In a like manner the nozzle may be adjusted with respect to the nose piece, by screwing the end 6 in the chamber. the jamb nut 7′ being, of course, loosened to permit of such adjustment.

Steam or any other suitable heated vaporized agent is let in the chamber 1 through the pipe 5. The steam surrounding the nozzle effectively heats the same, so that the liquid or semi-liquid fuel which is directed by gravity through the nozzle will be heated in its passage therethrough. This tends to atomize such fuel and increase the combustibility thereof. The steam finds an outlet between the bore 14 of the nose piece 13 and the head 10 of the nozzle. The outlet as previously inferred, may be restricted or enlarged. The steam, before reaching the outlet, will be directed through the channels 12′ into the grooves 12 and abutting with the walls thereof will be retarded, and particles of dirt will be prevented from passing into the flared mouth of the nose piece and this serves to impart a criss-cross action to the steam. The steam then passes through the channels 11′ as well as around the conical end of the head 10 so that the same will be forcibly injected into the fuel passing through the nozzle to thoroughly mix therewith, and likewise to direct the fuel through the flared mouth 15 of the nose piece, causing the same to be forcibly ejected therethrough in a copious spray in all directions into the fire box for filling the entire fire box.

From the foregoing description, when taken in connection with the drawings, it will be noted that I have produced a simple burner for liquid fuels which may be cheaply manufactured and readily installed. The nose piece may be arranged on either end of the casing 1, and all of the parts constituting the improvement are interchangeable so that any damaged parts may be readily replaced. I wish to state, however, that I am not to be restricted to the precise structural features herein set forth but may make such changes therefrom as fall within the scope of what I claim.

Having described the invention, I claim:—

A liquid fuel burner, comprising a body having a tubular bore, threaded at the ends thereof, and having a central steam inlet, a liquid fuel conducting nozzle having a thickened portion which is threaded and which is screwed in one end of the body, a jamb nut screwed in the said thickened portion of the nozzle and contacting the end of the body through which the nozzle enters, said nozzle having a headed end, whose outer portion is cone-shaped, said head having spaced circumferential grooves and spaced longitudinal passages for intersecting the circumferential grooves, and the cone-shaped head of the nozzle having passages aligning with the first mentioned passages but which last mentioned passages are struck at angles of approximately 25 degrees, and a nose piece screwed in the second end of the body and having a bore terminating in a conical end to receive the head of the nozzle and the conical end thereof therein, and said nose piece having an inwardly flared mouth which communicates with its bore and with the bore of the nozzle.

In testimony whereof I affix my signature.

PAUL W. KUTIS.