

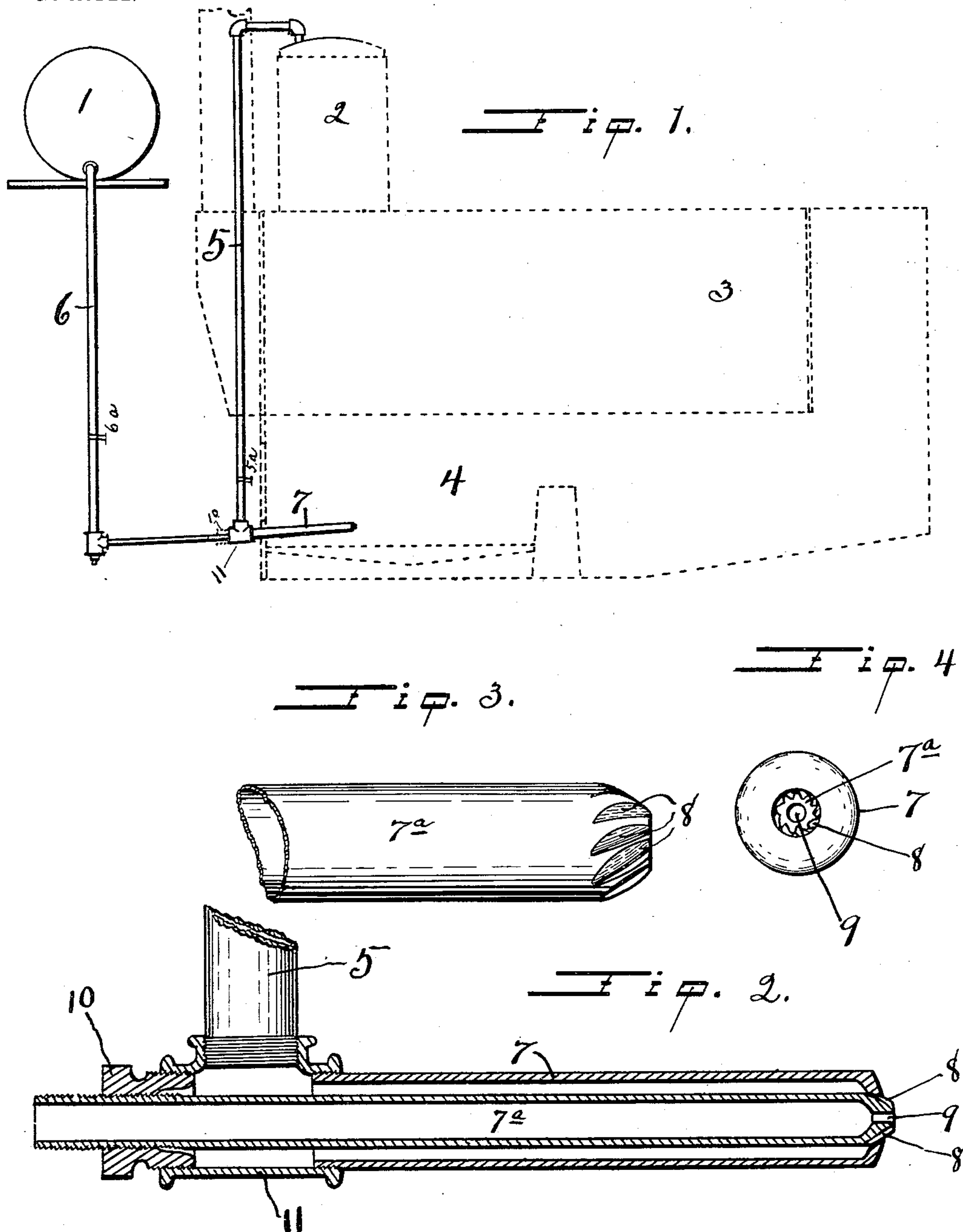
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E. D. DENNISON.  
PETROLEUM BURNER FOR FURNACES.

APPLICATION FILED FEB. 15, 1902.

NO MODEL.



Witnesses  
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# UNITED STATES PATENT OFFICE.

EZRA D. DENNISON, OF STOCKTON, CALIFORNIA.

## PETROLEUM-BURNER FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 733,463, dated July 14, 1903.

Application filed February 15, 1902. Serial No. 94,185. (No model.)

*To all whom it may concern:*

Be it known that I, EZRA D. DENNISON, a citizen of the United States, residing at Stockton, in the county of San Joaquin and State of California, have invented certain new and useful Improvements in Petroleum-Burners for Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to petroleum-burners, and more particularly to that class known as "furnace-burners" from which the oil oozes in connection with a jet of steam.

My object is to furnish a petroleum-burner for furnaces with which the oil may be more thoroughly and effectively scattered as it escapes with the steam from the oil-outlet. This I accomplish by the use of a burner having an extremely-tapered tip furnished with grooves at an acute angle to the longitudinal center of the burner, as shown in Figure 3, and by the use of the peculiar construction, novel combination, and adaptation of parts hereinafter set forth, and particularly pointed out in the claim hereunto annexed, reference being had to the accompanying drawings for a better comprehension hereof, in which—

Fig. 1 is a side elevation of my invention, showing the steam and oil supply apparatus and an outline of the furnace, boiler, and steam-dome. Fig. 2 is a detached sectional view of the burner, its casing, and a side elevation of the steam-supply pipe, the latter being broken off near its bottom. Fig. 3 is a side elevation of a portion of the burner-tube and its grooved end. Fig. 4 is a forward end view of the burner.

Similar numerals indicate corresponding parts in the several views.

A tank 1 for the reception of the petroleum is attached at the top of a vertical feed-pipe 6, the oil flowing from the tank 1 down through the feed-pipe 6 into a horizontal pipe comprising the burner-tube 7<sup>a</sup>. A steam-supply pipe 5 has its upper end connected with a steam-dome 2 and at its lower end by

means of a T-joint 11 is connected with a casing 7. The burner-tube 7<sup>a</sup> is inserted inside the casing 7 and passes through the T-joint 11, its tip, which is tapered slightly, protruding from the front end of the casing 7 within a furnace 4 of a boiler 3. The burner-tube 7<sup>a</sup> at its tip is provided with an oil-outlet 9 and on its tip, around the outlet 9, with grooves 8 and at a point in the rear of the T-joint 11 with a screw-plug 10, having inside threads, which engage with threads upon the tube 7<sup>a</sup>, and having also outside threads, which are adapted to engage with threads within the T-joint 11. The grooves in the tapered tip of the tube 7<sup>a</sup> are disposed at an acute angle to the longitudinal center of the tube, and hence it will be observed that when the tapered tip is disposed in the central opening in the forward end of the casing 7, which opening is also tapered, passages will be afforded between the tip and the wall of the opening through which the steam will escape from the casing 7 in such manner that it will thoroughly scatter and be commingled with the oil passing through the opening 9 of tube 7<sup>a</sup>.

6<sup>a</sup> is a stop-cock suitably located upon the feed-pipe 6, and 5<sup>a</sup> is a stop-cock suitably located upon the steam-supply pipe 5.

The mode of operating my device is as follows: The petroleum intended for combustion is placed within a tank 1 and flows downwardly through the feed-pipe 6, its flow into the burner-tube 7<sup>a</sup> being controlled by the stop-cock 6<sup>a</sup>. An initial fire is started in the furnace 4 and raises sufficient steam in the boiler 3, which steam filling the dome 2 passes downward through the pipe 5, its flow being controlled by the stop-cock 5<sup>a</sup> into the casing 7. The oil and the steam are admitted into the furnace 4 simultaneously. The steam as it escapes through the corrugations 8 of the burner 7<sup>a</sup> atomizes the oil as it escapes through the outlet 9 of the tip of the burner. The initial fire is then allowed to die out in the furnace 4 and the steam is maintained by the consumption of the oil as it escapes through the outlet 9 of the burner-tube 7<sup>a</sup>.

If it is desired to cleanse the casing 7 from any accumulations, the screw-plug 10 is loosened, permitting the burner-tube 7<sup>a</sup> to be moved slightly to the rear. The flow of oil is previously shut off by the stop-cock 6<sup>a</sup>,



and a larger flow of steam is admitted into the casing 7 by the stop-cock 5<sup>a</sup>, having the effect by the force of the steam to cleanse the casing 7. The burner 7<sup>a</sup> is then restored to its working position and the supply of oil is renewed by means of the stop-cock 6<sup>a</sup> being opened.

When it is desired to extinguish the fire, the flow of oil from the tank 1 is shut off by means of the stop-cock 6<sup>a</sup>. The fire in the furnace 4 can also be readily controlled by means of the supply of oil being made greater or smaller, as is desired.

The casing 7 is connected with pipe 5 by the T-joint 11 in order that said casing may be readily removed when worn or broken and replaced with a new casing.

The tip of the burner 7<sup>a</sup>, it will be observed, is tapered and provided with grooves 8. Its surface is flattened to admit of the outlet 9.

I am well aware that petroleum-burners have been made which comprise an oil-feed pipe within a steam-feed pipe, and that feature I do not claim, broadly; but

What I do claim as new, and desire to secure by Letters Patent, is—

The combination of a petroleum-tank, a steam-boiler, the furnace thereof, a pipe 5 connected to the steam-space of the boiler, and

disposed vertically in rear of the boiler-furnace, a T-joint 11 connected to the lower end of said pipe, and having interiorly-threaded forward and rear ends, a burner-casing 7 connected to the forward end of the joint, and extending forwardly into the fire-box of the furnace; said casing having a central opening in its forward end, a pipe 6 connected to the petroleum-tank and disposed in rear of the steam-pipe 5, an interiorly and exteriorly threaded plug arranged in the rear end of the joint 11, and a tube 7<sup>a</sup> of less diameter than the casing 7, arranged longitudinally in said casing, and connected with the pipe 6; the said tube having exterior threads at an intermediate point of its length engaging the interior threads of the plug 10, and also having the tapered tip, disposed in the central opening in the forward end of the casing 7, and provided with the longitudinal central opening 9 for the passage of oil, and also, in its outer side, with grooves 8 for the passage of steam, all as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

EZRA D. DENNISON.

Witnesses:

JOSHUA B. WEBSTER,  
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