

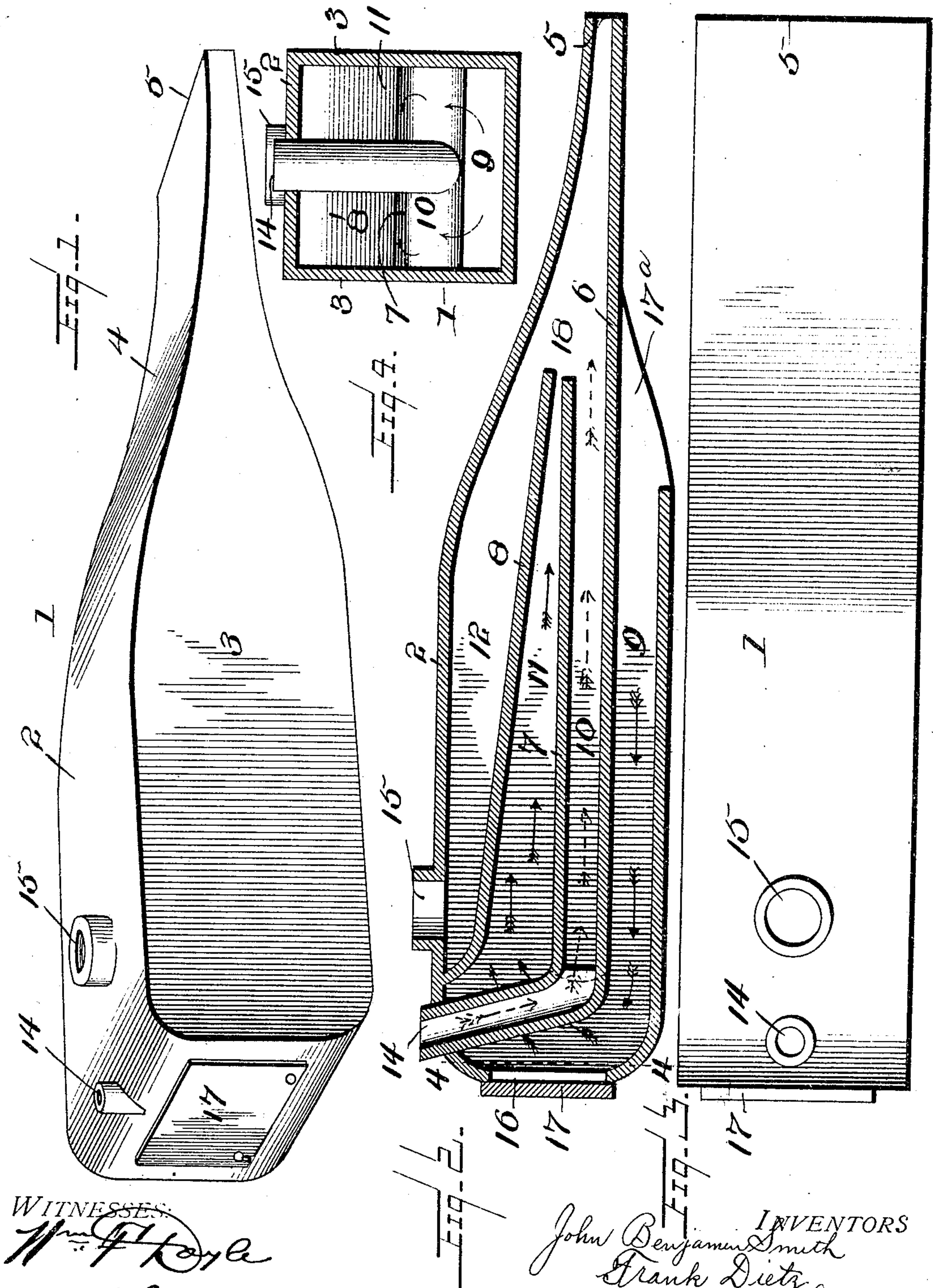
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J. B. SMITH & F. DIETZ.

LIQUID FUEL BURNER.

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# UNITED STATES PATENT OFFICE.

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## LIQUID-FUEL BURNER.

SPECIFICATION forming part of Letters Patent No. 784,525, dated March 7, 1905.

Application filed April 27, 1904. Serial No. 205,220.

*To all whom it may concern:*

Be it known that we, JOHN BENJAMIN SMITH and FRANK DIETZ, citizens of the United States, residing at Tucson, in the county of Pima and Territory of Arizona, have invented a new and useful Improvement in Liquid-Fuel Burners, of which the following is a specification.

Our invention relates to liquid-fuel burners primarily intended for use on locomotives, although, as will be appreciated, the invention is susceptible of various other uses.

The object of the invention is to provide a burner which is particularly simple in construction and highly efficient in operation.

To this end the invention includes the combination and arrangement of component parts to be hereinafter described, and particularly pointed out in the claim.

In the accompanying drawings, which illustrate one embodiment of our invention, Figure 1 is a perspective view of the burner. Fig. 2 is a longitudinal transverse sectional view. Fig. 3 is a top plan view, and Fig. 4 is a rear elevation on the line 4 4 with the rear plate broken away.

The burner includes, essentially, an outer shell having oil, steam, and air passages arranged within the same, all of which discharge at a common point to provide for the thorough intermixing of said elements before the ignition thereof takes place. The outer shell of the burner preferably includes front and back plates 1 2 and side plates 3. The side plates are made tapering near one of their ends, and the plate 2 is provided with a corresponding deflected portion 4, which coacts with the tapering sides 2 and one of the partitions, to be hereinafter described, to form a suitable discharge-nozzle 5.

Arranged within the shell and extending lengthwise of the same are three partition-walls 6, 7, and 8, which divide the chamber within the shell into four passages 9, 10, 11, and 12. The partitions 6 7 coact to form a steam-passage 10, which is closed at its rear end by an end wall 13 and is in communication at said end with a suitable steam-supply pipe 14. The end wall 14 is spaced a distance from the adjacent end wall of the shell, so that a space is

provided between the two which forms a connecting passage-way between the passages 9 11. The partition 6 is spaced a distance from the plate 1 to provide the air passage-way 9 and extends lengthwise of the burner entirely to the nozzle end of the same and coacts with the deflected portion 4 and the tapering portions of the sides 3 to complete the nozzle 5. The partition 7 terminates a distance from the front end of the partition 6 or at the rear end of the nozzle portion 5 and forms, with the partition 8, an air-passage 11, which is in communication at its rear end, as before stated, with the air-passage 9. The partition 8 extends from the wall 2, near the rear end thereof, to a point substantially in alinement with the front end of the partition 7 and forms, with the front wall 2 of the burner, the oil-passage 12, with which a suitable supply-pipe 15 is in communication. In the end wall of the shell a suitable opening 16 is provided for cleaning out the burner when desired, and this opening is normally closed by a cover 17. The front end of the wall 1 terminates a distance back of the nozzle or front end of partition 6 to provide an elongated inlet-mouth 17<sup>a</sup> to the air-passage 9.

As will be appreciated from the foregoing description, the air is drawn in through mouth 17 and passes through passages 9 11 to the point 18, where the air is intermixed with the steam and oil, which are also discharged at this common point. By reason of the fact that the air is circulated about the steam-pipe it is heated before reaching the point 18 and the efficiency of the mixture thereby enhanced. The steam, oil, and air discharging at the point 18 readily intermix with one another and issue together in an intermixed condition through the nozzle 5 in a state to be readily ignited.

The construction and operation of our invention will be readily understood upon reference to the foregoing description and accompanying drawings, and it will be appreciated that the parts and combinations recited may be varied within a wide range without departing from the spirit and scope thereof.

Having thus described our invention, what

is claimed as new, and desired to be secured by Letters Patent, is—

5 In a liquid-fuel burner and in combination, a shell having a tapering nozzle portion, partitions arranged in the shell and forming with each other and the walls of the shell an oil-passage, a steam-passage and an air-passage, the latter passage having portions thereof located on opposite sides of the steam-passage  
10 and having its mouth near the nozzle end of the burner and its discharge end located between the discharge ends of the steam and oil

passages, and pipes communicating with the oil and steam passages, respectively, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN BENJAMIN SMITH.  
FRANK DIETZ.

Witnesses:

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