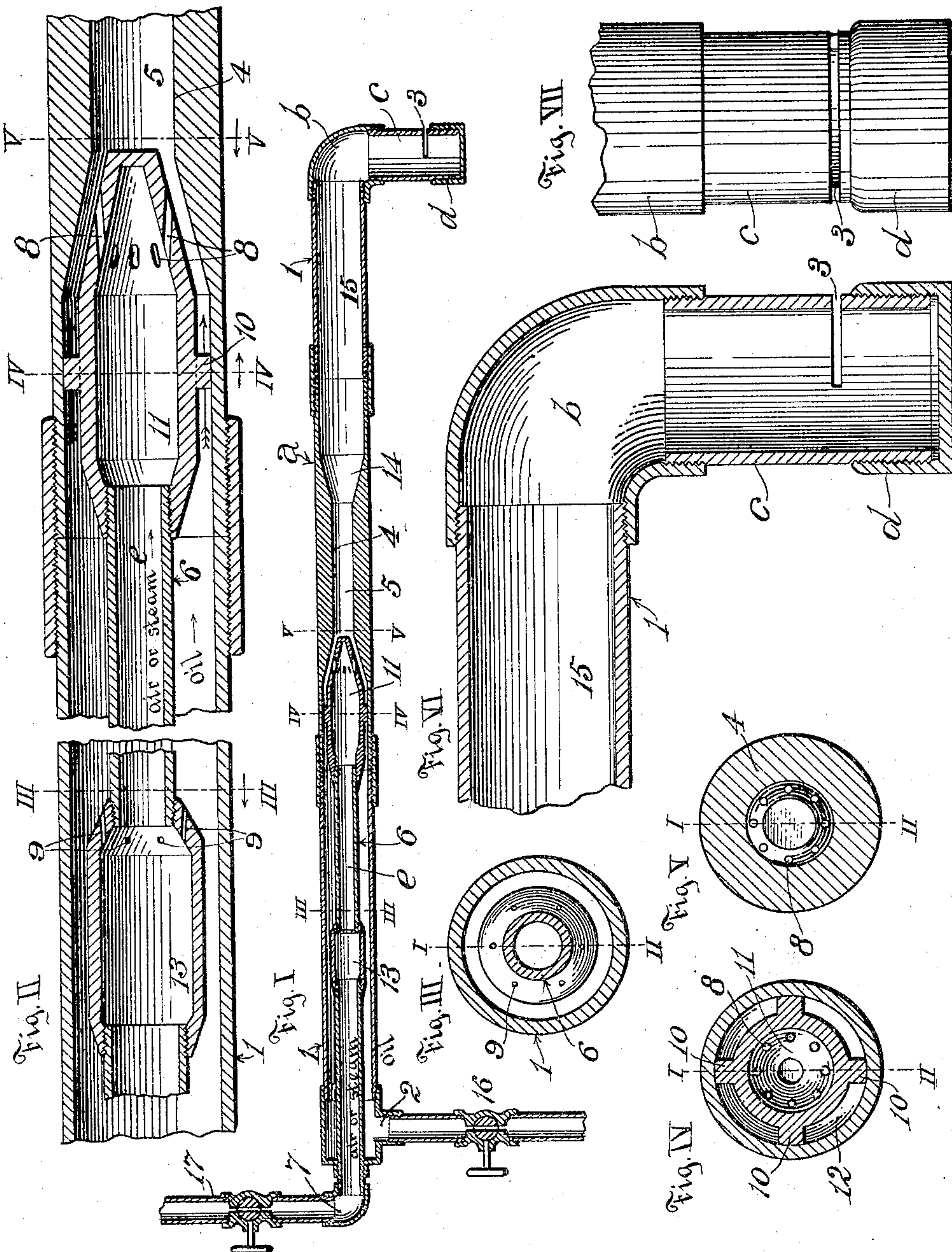


No. 725,134.

PATENTED APR. 14, 1903.

J. PROPER.
NEBULIZING OIL BURNER.
APPLICATION FILED JUNE 26, 1902.

NO MODEL.



Witnesses
C. C. Holly.
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by Townsend Bros.
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UNITED STATES PATENT OFFICE.

JOHN PROPER, OF OCEANPARK, CALIFORNIA.

NEBULIZING OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 725,134, dated April 14, 1903.

Application filed June 26, 1902. Serial No. 113,365. (No model.)

To all whom it may concern:

Be it known that I, JOHN PROPER, a citizen of the United States, residing at Oceanpark, in the county of Los Angeles and State of California, have invented a new and useful Nebulizing Oil-Burner, of which the following is a specification.

This invention relates to nebulizing-burners, and especially to burners particularly adapted for burning heavy asphaltum oils; and its primary object is to provide such a burner in which a thorough admixture of steam or other expansive medium with the oil is effected, whereby the oil is vaporized and the heavy particles carried in suspension, effectually securing the production of a readily-burning product.

An object of this invention is to provide a cheap, simple, and effective oil-burner by means of which a soft and intense heat may be produced without the action of a fierce blast, whereby the furnace or fire-box may be filled with a heat which is effective to a high degree, but which is comparatively free from destructive action upon the walls of the fire-box or upon the flues, tubes, or other parts to be heated.

With these and such other objects and ends in view, as hereinafter appear, my invention consists in the device, constructions, and combinations of parts hereinafter described, and particularly pointed out in the claims.

The accompanying drawings illustrate my invention.

Figure I is an axial section of a nebulizer embodying my invention. Fig. II is a fragmental enlarged detail of a portion of one member of the nebulizer. Fig. III is a cross-section on line III III of Figs. I and II looking rearward. Fig. IV is a section on line IV IV of Figs. I and II looking forward. Fig. V is a section on line V V of Figs. I and II looking rearward. Fig. VI is an enlarged detail of the front end or discharge member of the bent outer pipe. Fig. VII is a fragmental front elevation of the discharge member of the bent outer pipe.

1 is an outer bent pipe having an inlet 2 at one end and an outlet 3 at the other end and an inward extension 4, forming a contraction 5 in the bore of the pipe between said inlet and outlet.

6 is an inner pipe arranged inside the first-named pipe 1 and provided with an inlet 7 and with an outlet opening into the outer pipe 1. Desirably there are a plurality of outlets spaced apart along the pipe 6, and said outlets may be directed toward the discharge end of the outer pipe 1 and they may consist in tubular perforations 8 and 9, which are directed toward the inner wall of the outer pipe 1. The perforations 8, which form the foremost outlet through the pipe 6, are desirably directed toward the wall at the entrance to the contracted bore 5.

10 designates a support formed of lugs or projections extending from the inner pipe 6 to hold said pipe in position.

Desirably the inner pipe 6 is furnished with an enlargement 11 near its end, and the supports 10 may project from said enlargement. Passages 12 may be provided around said enlargement 11, through which the liquid fuel may be driven by the expansive fluid, such as air or steam, issuing through the perforations 9.

13 designates an enlargement in the inner pipe 6, from which the outlet 9 leads. The perforations which constitute said outlet 9 are desirably arranged oblique to the axis of the pipes and directed toward the passage between the forward enlargement 11, and the outer pipe 1 may flare, as shown at 14, to a tubular portion 15 of the main member *a* of the outer pipe, which may be connected by an elbow *b* with the discharge member *c* of said outer pipe, which may be provided with a cap *d* and with a slot formed by a saw-kerf or otherwise to supply the discharge-opening 3, through which the product of the nebulizer is emitted for ignition.

It is to be understood that I do not limit myself to any specific or definite size of parts; but a desirable proportion may be stated as follows: The diameter of the outer pipe may be one inch throughout, except at the contracted portion 4, where the bore 5 may be five-eighths of an inch. The bore of the enlarged portions 11 and 13 of the pipe 6 may be five-eighths of an inch and the intermediate portion *e* may be three-eighths of an inch in diameter, thus giving clearance for the outlet 9. Liquid fuel, as oil, may be supplied to the outer pipe 1 by means of a valved pipe

16, and an expansive fluid, as steam or air, may be supplied to the inner pipe by means of a valved pipe 17. Six perforations 9, each one thirty-second of an inch in diameter, may serve for the rearmost outlet from the inner pipe, and eight perforations 8, each one-sixteenth of an inch in diameter, may serve for the foremost outlet from said pipe. The front end of the enlargement may taper forwardly and terminate at the contracted bore 5.

In practical operation the jets from the perforated inner pipe, acting on the oil supplied through the pipe 16, supply to the bore 5 and to the forward portions of the outer pipe a volume of atomized liquid and expansive fluid, which is held under considerable pressure in the forward portion 15 of the pipe and also in the member c, from which the nebulous product will issue through the slot 3, whereupon the same may be ignited, and the result will be a soft even flame as contrasted with a blast.

The lower portion of the member c may form a reservoir to receive any deposits of liquid from the outer pipe.

By the arrangement shown in practical operation the atomized oil and expansive medium are applied to the pipe on one side of the contraction and, passing through the contraction, expand and become more intimately commingled and are restrained or restricted by the bend at b and by the narrow slot through which the product issues for ignition, so that a superior combustion results in the fire-box. (Not shown.)

What I claim, and desire to secure by Letters Patent of the United States, is —

1. A nebulizer comprising an oil-pipe having an inlet at one end and an outlet at the other and a portion of its mid-length bore contracted, an expansive-medium pipe inside said oil-pipe and provided with an enlargement at its forward end, a series of tangential outlets from said enlarged end adapted to impinge expansive medium against the

contracting walls of said oil-pipe, said expansive-medium pipe provided with an inlet, said expansive-medium pipe provided with an enlargement forming a second enlarged chamber in said pipe between its inlet and outlet, and a series of outlets from said chamber into the inclosing oil-pipe.

2. A nebulizer comprising an oil-pipe having an inlet at one end and an outlet at the other and a portion of its mid-length bore contracted, an expansive-medium pipe inside said oil-pipe and provided with a series of tangential outlets adapted to impinge expansive medium against the contracting walls of said oil-pipe, said expansive-medium pipe provided with an inlet and with a series of outlets arranged between said inlet and said first-named series of outlets.

3. A nebulizer comprising an oil-pipe having an inlet at one end and provided with a bend at its other end, said last-named end being closed, a peripheral outlet in said bent end, said oil-pipe provided with a portion of its straight mid-length bore contracted, an expansive-medium pipe inside said oil-pipe and provided with an enlargement at its forward end, a series of tangential outlets from said enlarged end adapted to impinge expansive medium against the contracting walls of said oil-pipe, said expansive-medium pipe provided with an inlet, said expansive-medium pipe provided with an enlargement forming a second enlarged chamber in said pipe between its inlet and outlet, and a series of outlets from said chamber into the inclosing oil-pipe.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Oceanpark, in the county of Los Angeles and State of California, this 16th day of June, 1902.

JOHN PROPER.

Witnesses:

GEO. D. PHILLIPS,
FRED. BAETZ.