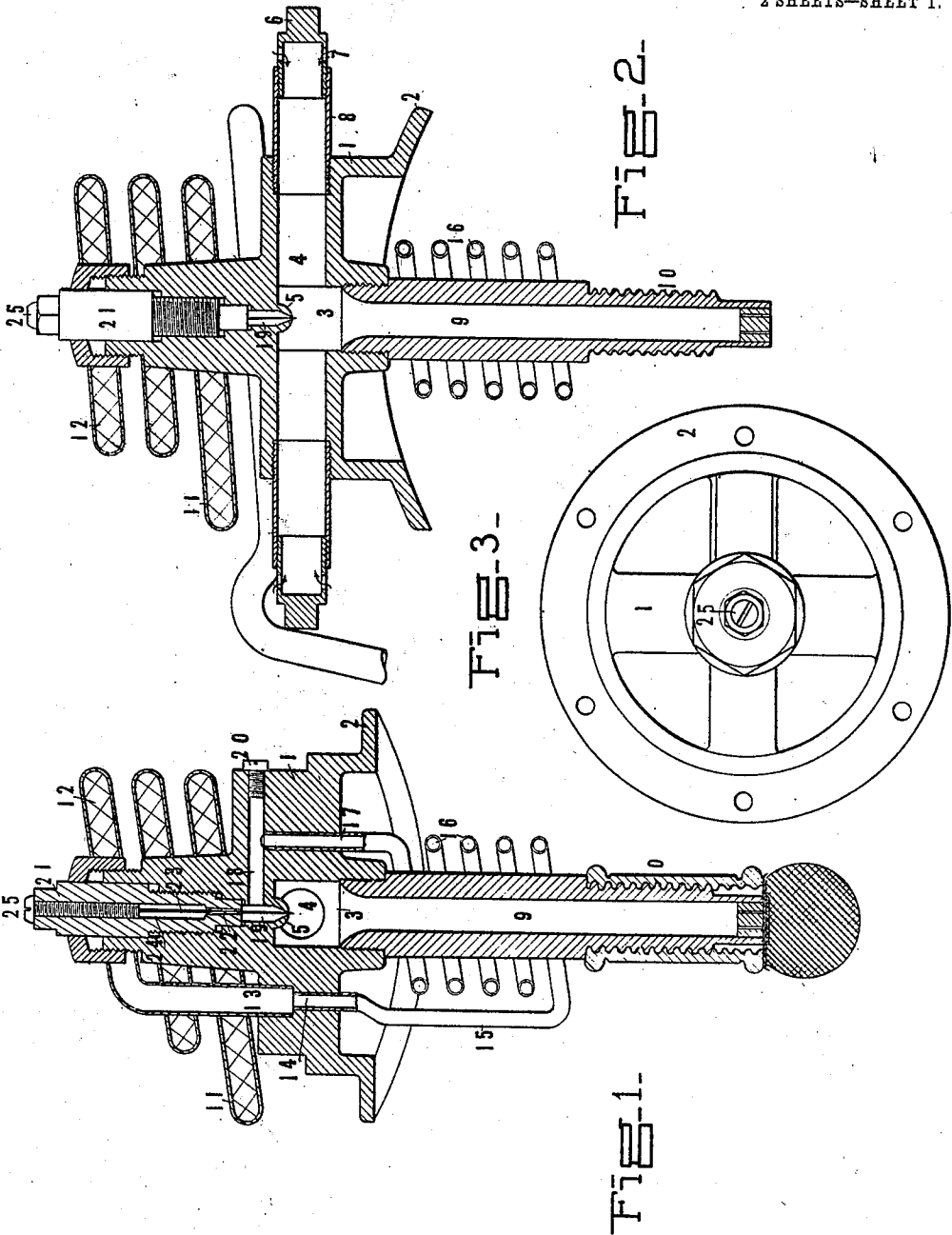


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VAPOR MANTLE BURNER.
APPLICATION FILED OCT. 10, 1907.

948,999.

Patented Feb. 15, 1910.

2 SHEETS—SHEET 1.



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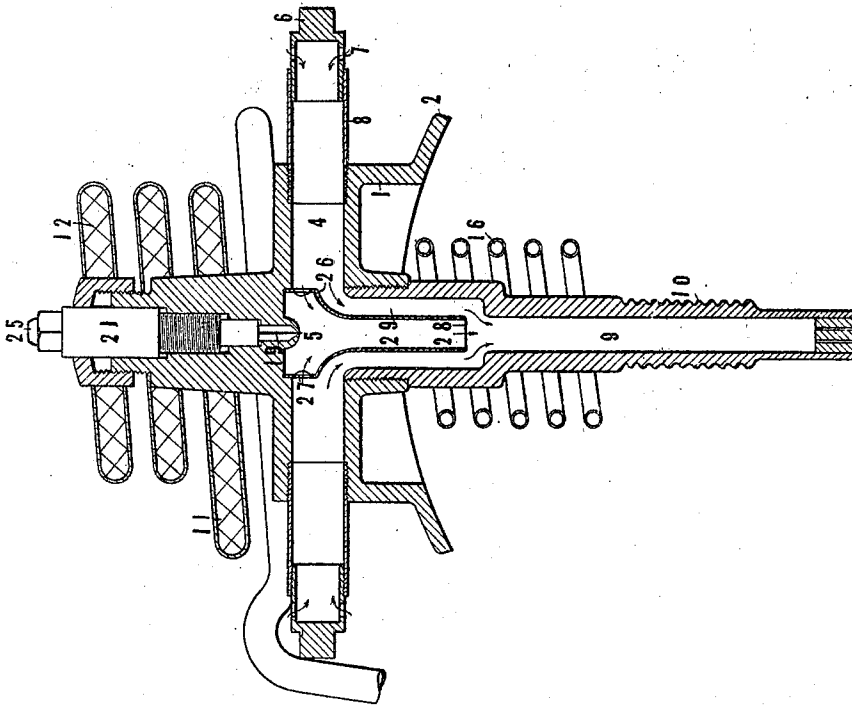


Fig. 4-

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UNITED STATES PATENT OFFICE.

CHARLES M. LUNGREN, OF BAYONNE, NEW JERSEY, ASSIGNOR TO THE RAILWAY UTILITIES COMPANY, A CORPORATION OF NEW JERSEY.

VAPOR MANTLE-BURNER.

948,999.

Specification of Letters Patent.

Patented Feb. 15, 1910.

Application filed October 10, 1907. Serial No. 396,850.

To all whom it may concern:

Be it known that I, CHARLES M. LUNGREN, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Vapor Mantle-Burners, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates broadly to illuminating apparatus, but inasmuch as certain advantages characteristic of the invention prominently appear when it is resorted to as a vapor burner of the inverted type, it will be conducive to clearness to disclose it through one or more of its embodiments in such relation.

This invention has in view, among other objects, the provision of a burner adapted to maintain mantles in a state of incandescence and which is particularly adapted for the use of liquid fuels.

More particularly, this invention aims at a burner construction in which the superheating coils for the liquid fuel will be arranged directly in the path of the rising products of combustion so as to be maintained at a maximum temperature.

This invention in general seeks to provide a vapor burner particularly adapted for the employment of mantles which, from an operative standpoint, will in practical usage possess a high degree of efficiency and durability and which, structurally considered, will be of the greatest possible simplicity.

Other objects and advantages will be in part obvious from the annexed drawings and in part pointed out in the following description.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In order that this invention may be the more fully understood and made comprehensible to others skilled in its relating art, drawings illustrating several of the many possible utilizations of the same are appended as a part of this disclosure.

In the appended drawings, corresponding

parts are similarly referred to by like characters of reference throughout all the figures of which:

Figure 1 is a vertical section of a vapor burner embodying this invention wherein the various parts are shown in their normal relationship. Fig. 2 is a vertical section of the device shown in Fig. 1 taken transversely to the section of Fig. 1. Fig. 3 is a top plan view of the body portion of the burner. Fig. 4 is a view of a device fundamentally similar to that shown by Fig. 2, but showing by way of modification a multiple effect injector.

Continuing now with a more detailed description of the herein disclosed embodiments of this invention, with such occasional reference to the drawings as may facilitate an understanding of the same, 1 denotes the body portion of the burner, which body portion may provide flanges 2 adapted for supporting the same as may be desired. In the center of the body portion there is a mixing and expansion chamber 3 into which the air inlets 4 and the gas inlet 5 open. The supply of air may be easily controlled by means of the valve at the outer end of each air inlet. This valve comprises a cap 6 having one or more apertures 7 and in screw threaded engagement with the member 8 so as to enable the area of the apertures 7 to be reduced or enlarged in capacity.

Depending from the body portion 1 and in communication with the central mixing chamber thereof is a burner tube 9 which preferably has a threaded or otherwise formed shank 10 adapted to detachably receive an inverted mantle.

Since this invention proposes a burner capable of dealing with liquid fuels, it is advisable to have some sort of a device for vaporizing and superheating said liquid fuels prior to feeding such fuel to the injector. To this end, I have arranged a conduit 11 around the upper part of the burner in the form of a coil whose convolutions will lie directly in the path of the hot products of combustion. In order to increase the effective vaporizing area of this upper coil, there is arranged within the latter a reticulated metallic network 12 which may be formed of ordinary brass screening. In this embodiment, the terminal 13 of the upper coil takes into the body portion as shown by Fig. 1, and the complementary terminal 14

of the lower coil 15 receives the preliminarily heated fuel from such end. This arrangement very well serves to tightly connect the larger upper coil to the smaller lower coil. The lower coil 15 convolutes around the upper end of the depending burner tube as illustrated by 16 and finally enters the body portion at 17 so as to communicate with the transverse passage 18, which in turn communicates with the chamber 19 of the needle valve. For convenience in manufacture and cleaning, the outer end of the passage 18 may be closed by means of a screw 20.

15 I have devised a very effective valve for use in connection with my vapor burner and in which I make use of an ordinary needle. Thus, I have provided a needle holder 21 which is in screw threaded relation with the body portion so as to be readily adjustable thereon. The needle holder provides a small bore 22 of sufficient size to permit the pointed end of a needle to emerge therefrom but incapable of allowing the thicker shank of the needle to pass therethrough. The shank of the needle 23 extends into the bore 24, which in turn carries the screw 25 which abuts the end of the needle and keeps it securely in place.

30 In the modification shown by Fig. 4 I have employed a multiple injector so as to better adapt the burner for fuels which are of a comparatively rich nature, such as gasoline and the like. This modification consists in arranging over the nipple 5 a tube 26 having one or more air inlets 27 and terminating at 28. This tube is so arranged and proportioned as to provide a channel 29 for conveying air toward the discharge end of the tube 26 so that the partially completed mixture which emerges from the end of the tube 26 may be admixed with additional air prior to being projected downwardly through the depending burner tube.

45 It will thus be perceived that I have devised a means well adapted to achieve the various objects and ends had in view.

In operation, the liquid fuel first passes around the upper coil of the heater and owing to the fact that it has infiltrated through the reticulated metallic structure therein, such fuel will have become partially, if not entirely, vaporized prior to being received by the lower coil. In passing through the lower coil, the vapor will be brought to a still higher temperature and will ultimately be passed through the injector.

60 Having described my invention what I claim as new and desire to secure by Letters Patent is:

65 1. An apparatus of the nature disclosed comprising in combination, a burner body formed with a transverse air-passage and a vapor outlet adapted to project a jet of

vapor across the end of the air-passage, a depending burner tube for conveying a mixture of air and vapor to the burning point, connected upper and lower coils surrounding the upper part of the burner and burner tube, the upper coil serving to vaporize the liquid and the lower coil being adapted to receive and superheat the vapor formed in the upper coil and means connecting said lower coil with said vapor outlet.

75 2. A burner of the nature disclosed comprising in combination, a body portion consisting of a circumferential supporting portion and a central hub-like portion provided with a central chamber connected therewith by a plurality of spoke-like extensions providing there-between spaces for permitting the escape of uprising products of combustion, one of said extensions being hollow to provide an air inlet leading to said central chamber, the roof of said central chamber providing a vapor inlet for projecting a fine stream of vapor downwardly past said air inlet into said chamber, a burner tube depending from said hub-like portion adapted to receive the downwardly projected combustible mixture, a mantle mounted on the lower end of said burner tube, and a pipe for conveying combustible material to said vapor inlet.

95 3. A burner of the nature disclosed comprising in combination, a body portion consisting of a circumferential supporting portion and a central hub-like portion provided with a central chamber connected therewith by a plurality of spoke-like extensions providing there-between spaces for permitting the escape of uprising products of combustion, one of said extensions being hollow to provide an air inlet leading to said central chamber, the roof of said central chamber providing a vapor inlet for projecting a fine stream of vapor downwardly past said air inlet into said chamber, a burner tube depending from said hub-like portion adapted to receive the downwardly projected combustible mixture, a mantle mounted on the lower end of said burner tube, and a pipe coiled around the upper part of said burner tube for conveying a combustible vapor to said vapor inlet.

115 4. A burner of the nature disclosed comprising in combination, a body portion consisting of a circumferential supporting portion and a central hub-like portion provided with a central chamber connected therewith by a plurality of spoke-like extensions providing there-between spaces for permitting the escape of uprising products of combustion, one of said extensions being hollow to provide an air inlet leading to said central chamber, the roof of said central chamber providing a vapor inlet for projecting a fine stream of vapor downwardly past said air inlet into said chamber, a burner tube de- 130

pending from said hub-like portion adapted to receive the downwardly projected combustible mixture, a mantle mounted on the lower end of said burner tube, and a pipe
5 coiled around said hub-like portion above said central chamber and leading to a second coil circumscribing the upper portion of said burner tube and leading to said vapor inlet.

10 5. A burner of the nature disclosed comprising in combination, a body portion consisting of a circumferential supporting portion and a central hub-like portion provided with a central chamber connected therewith
15 by a plurality of spoke-like extensions providing there-between spaces for permitting the escape of uprising products of combustion, one of said extensions being hollow to provide an air inlet leading to said central
20 chamber, the roof of said central chamber

providing a vapor inlet for projecting a fine stream of vapor downwardly past said air inlet into said chamber, a burner tube depending from said hub-like portion adapted to receive the downwardly projected combustible mixture, a mantle mounted on the lower
25 end of said burner tube, a vaporizing coil arranged above said spoke-like extensions within the path of the products of combustion escaping through spaces there-between, 30 and a second coil connected with said first coil arranged around the upper part of the burner tube and leading to said vapor inlet.

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

CHARLES M. LUNGREN.

Witnesses:

JOSEPHINE STOLLINGER,
H. M. SEAMANS.