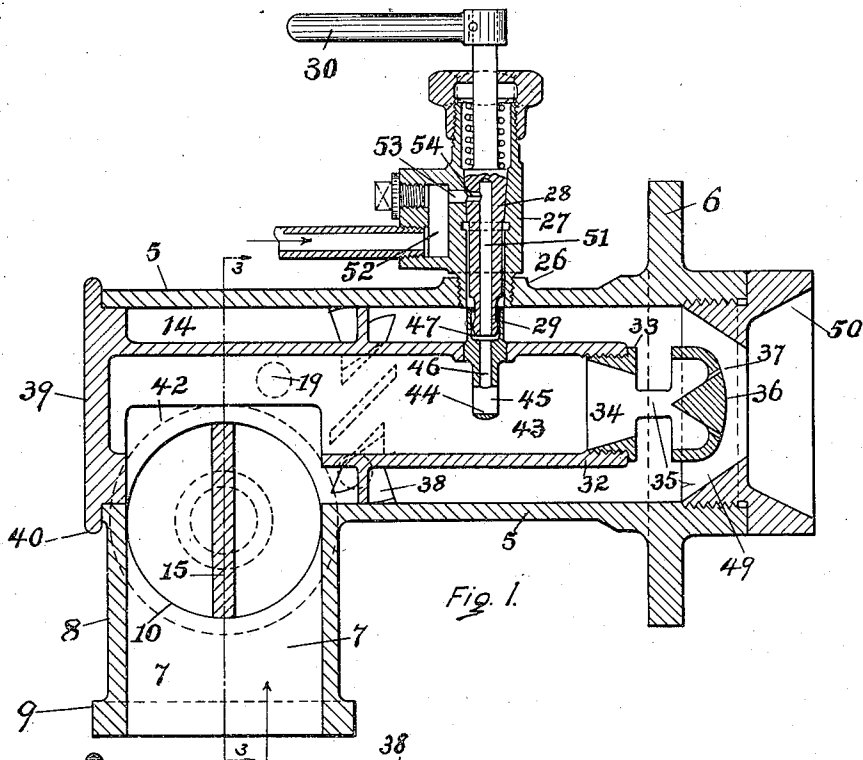
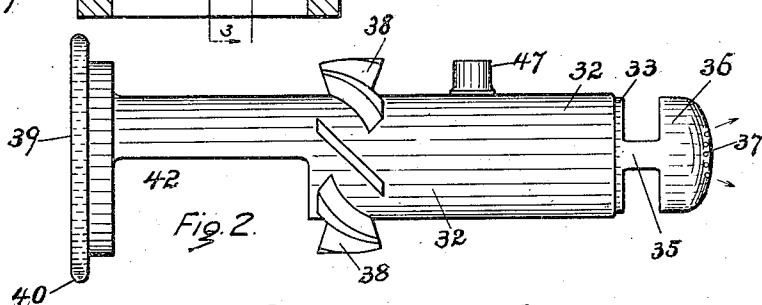
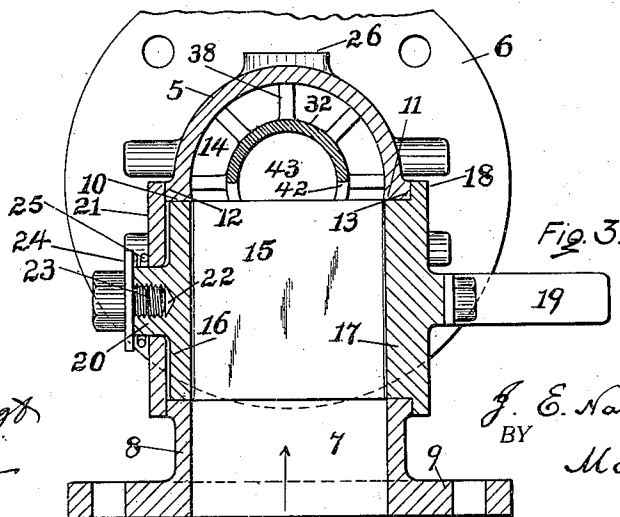


J. E. NAUDAIN.
OIL BURNER FOR HEATING.
APPLICATION FILED FEB. 17, 1914.

1,124,789.

Patented Jan. 12, 1915.



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OIL-BURNER FOR HEATING.

1,124,789.

Specification of Letters Patent.

Patented Jan. 12, 1915.

Application filed February 17, 1914. Serial No. 819,154.

To all whom it may concern:

Be it known that I, JOHN E. NAUDAIN, a citizen of the United States, residing at Sparrows Point, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Oil-Burners for Heating, of which the following is a specification.

This invention relates to an improved construction of oil-burner, and has particular reference to an oil burner of that class wherein the oil is fed in the form of spray into the path of an air-current which in effect absorbs the oil and the commingled oil and air is then passed through a nozzle where it is ignited.

One object of the present invention is to provide an improved construction of burner-casing to which air pipe and oil pipe connections may be made, and which may be attached to a forge, boiler furnace, or other device into which the flame is to be directed, and said construction at the same time to enable the mixing tube to be inserted or removed from the casing without breaking or disturbing any of the pipe-connections or detaching the casing from the forge or other device.

Another object is to provide an improved construction of mixing tube whereby the sprayed oil may be thrown in the path of a current of air so as to be displaced thereby and be moved into a whirling air current where the oil and air will be commingled and driven past the nozzle or cap where it will be ignited.

A further object is to provide an improved construction and arrangement of air-damper and mixing tube whereby a current of air may be divided so that a part of the current will be supplied to the interior and a part to the exterior of the tube, and which will require the closing of the damper to remove the tube.

With these and other objects in view, the invention is illustrated in the accompanying drawing, wherein.

Figure 1, shows in vertical longitudinal section the burner-casing and the mixing tube therein, and also shows the oil supply valve attached to the casing and in register with the mixing tube. Fig. 2, illustrates the mixing tube in side elevation and detached from the casing, and Fig. 3, shows a vertical cross-section through the casing

and damper,—the section being taken on the line 3—3 of Fig. 1.

Referring to the drawing the numeral, 5, designates the cylindrical casing body having at one end a circular attaching flange, 6, and at the under side and opposite end provided with a lateral passage, 7, whose wall, 8, has a flange, 9, to which an air-supply pipe, not shown, may be attached. At opposite sides the wall of the casing has circular openings, 10, and, 11, respectively, on the outer sides of which there are flat circular faces, 12, and 13. The location of these circular side openings is such that their lower portions project into the lateral passage, 7, while the upper portions thereof are in the cylindrical casing. It will thus be seen that the passage, 7, intersects the lower portion of casing chamber, 14. A square damper or valve-plate, 15, is carried between two circular heads, 16, and, 17, respectively,—the one head, 16, snugly fitting the circular opening, 10, at one side of the casing, and the other head, 17, revolvably fitting the opening, 11, at the opposite side of said casing. A circular flange, 18, is provided on the head, 17, to seat against the flat circular face, 13, so as to prevent lateral inward movement of the head, 17, and a crank-like handle, 19, is attached to the outer side of the head, 17, whereby said head, damper-plate and also head, 16, may all be rotated. The damper plate, 15, is reversible.

By referring to Fig. 3, it will be noted that the outer surface of circular head, 16, has position slightly within the opening, 10, and that from the center of said head a circular lug, 20, projects outwardly and sustains a circular plate, 21, whose inner face seats against the flat circular face, 12, on the casing. The lug, 20, projects through the plate, 21, and has a central socket, 22, into which a screw, 23, enters so as to hold a washer, 24, at the outer end of the lug. A coiled spring, 25, encircles the lug and is compressed between the washer, 24, and the plate, 21, so as to press the latter against the face, 12, of opening, 10. It will thus be understood the turning of handle, 19, will more or less open or close communication between air passage, 7, and the chamber, 14.

The upper side of the casing wall is provided with a boss, 26, into which the lower threaded end of the case, 27, of an oil-supply

valve is screwed. This valve has a stem, 28, which extends entirely through its casing and its lower end, 29 (see Fig. 1), extends below the threaded end of the case for a purpose presently to be explained. The valve-stem, 28, has a central bore, 51, that opens out of end, 29, and the stem is capable of a turning movement and also a vertical movement in the casing by simply pulling upwardly on the operating handle, 30. A chamber, 52, is formed at the side of the valve case and ports, 53, 54, communicate from said chamber to the bore, 51, in the stem. The mixing tube carries an oil catcher, 44, which depends within the mixing chamber, 43. This oil catcher has a lateral passage, 45, extending entirely through it so that the air current may pass through and drive out the oil that has been lodged on the upper side thereof. This catcher has the function of a shelf so as to catch the oil about midway, vertically considered, in the chamber, 43, and prevent it dropping onto the lower circular wall of the mixing tube. A passage, 46, extends vertically through the oil catcher and opens into a socket, 47, on the exterior and upper side of the mixing tube,—this socket receives the lower end, 29, of the valve-stem, 28. It will thus be seen that the oil from the valve-stem is received into the socket and is conveyed by the vertical passage, 46, to the catcher, 44, where the lateral current of air passing to the nozzle passage, 34, will catch it and break it up while driving it toward said nozzle passage. The mixing tube, shown separately in Fig. 2, has a cylindrical inner end, 32, in which a plug, 33, is screwed. This plug has a tapered central passage, 34, and also has arms, 35, extending forwardly in front of the passage and carrying a concavo-convex cap, 36, provided with a plurality of perforations, 37. Substantially midway between its ends, the mixing tube has a series of flanges, 38, which are spirally disposed about the circumference of the exterior wall thereof and which snugly fit the interior of the circular casing chamber, 14. The outer end of the mixing tube has a circular head, 39, which snugly fits into the circular opening of the casing chamber and said head has a rim flange, 40, which seats against the end of the casing and forms a stop to limit the inward movement of the mixing tube into the casing. Between the head, 39, at the outer end, and the spiral flanges, 38, the mixing tube has a circumferential cut-away or notched-out portion, 42, this is at its under side and registers with the lateral air-passage, 7, and into which the damper or valve-plate, 15, turns when the latter is opened to admit air from said passage, 7. It will thus be seen that when the mixing tube is inserted in the casing and the damper plate, 15, is turned vertically, or in the open

position, as shown in Fig. 1, the air current from passage, 7, may pass up into the interior or mixing chamber, 43, of the tube, and also pass around the exterior of said tube into chamber, 14, of the casing and the said exterior air current will be caused to whirl by reason of the spiral flanges, 38, and this whirling current is directed by means of a tapered passage, 49, around the nozzle or cap, 36, which further breaks up the oil and causes it to spray through the perforations, 37, and out through the deflector flange, 50, that projects in front of the cap, 36. When it is desired to withdraw or remove the mixing tube from the casing, 14, the valve-stem, 28, must first be drawn upwardly to lift the lower end, 29, from the socket, 47. The damper plate, 15, may then be turned to shut off the air, and the mixing tube can then be drawn out of the casing without disconnecting any pipes. It will thus be seen that the valve-stem, 28, serves to lock the mixing tube in the casing.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. In an oil burner, the combination with a burner casing having an interior chamber with an outlet at one end and an air supply passage between its ends, of a mixing tube in the casing chamber and having a nozzle at its inner end and also having a head at its outer end which closes the end of the casing,—said mixing tube having an opening to receive air from the air supply passage and a movable oil supply means passing through the casing and engaging the mixing tube said movable supply means being movable to enable the mixing tube to be withdrawn bodily from the casing without disconnecting supply pipes.

2. In an oil burner, the combination with a burner casing having an interior chamber with an outlet at one end, an air-supply passage entering the casing; means for controlling the supply of air to said casing-chamber; a mixing tube in the casing-chamber and also having an interior mixing chamber therein said tube provided with means for admitting air into said mixing chamber; an oil retaining means depending into the mixing chamber and means on the exterior of the burner casing and engaging the oil-retaining means on the tube to supply oil to the interior of the body chamber.

3. In an oil burner the combination with a casing having a chamber therein and provided with a lateral air-supply passage, of valve means to control said passage; a mixing tube in the casing-chamber and also having a chamber therein said tube also having a cut-away portion adjacent to the air-supply passage of the casing; oil-supply means attached to the casing; an oil-receiving device carried by the mixing tube

and having a portion extending into the mixing chamber and another portion extending into the casing chamber and engaging the oil-supply means and a perforated cap at the inner end of the mixing tube.

4. In an oil burner the combination with a casing having a chamber therein and provided with a lateral air-supply passage, of valve means to control said passage; a mixing tube in the casing-chamber and also having a chamber therein said tube also having a cut-away portion adjacent to the air-supply passage of the casing; circumferential flanges projecting from the mixing tube into the casing chamber; a perforated cap at the inner end of the mixing tube; an oil supply valve attached to the casing and having a stem that projects into the casing chamber and a nipple carried by the mixing tube and having a socket to receive the valve stem said nipple having a passage for conveying oil to the interior of the mixing tube.

5. In an oil burner the combination with a casing having a chamber therein and provided with a lateral air-supply passage, of valve means to control said passage; a mixing tube in the casing chamber and having a mixing chamber therein which communicates with the air-supply passage; a nozzle at the inner end of the mixing tube; a head at the outer end of said mixing tube which closes the end of the casing chamber; means in the mixing tube between the nozzle and air supply for admitting oil into the mixing chamber, and a yielding valve connecting

the casing and the oil admitting means of the mixing tube whereby the mixing tube may be disconnected from the casing for removal by moving the valve.

6. In an oil burner the combination with a casing having a chamber therein and provided with a lateral air-supply passage,—said casing also having diametrically opposite circular openings at the junction of the chamber with the passage; a circular head in each of said openings; a plate carried by said heads and extending crosswise of the said chamber and passage; a mixing tube extending into the casing and means for supplying oil to the interior of the mixing tube.

7. In an oil burner the combination with a casing having a chamber with a discharge opening at one end and a lateral air-supply passage at the opposite end; of a mixing tube in the casing chamber and having a circular head at one end said tube extending into the casing chamber across said passage and having a mixing chamber which communicates with the said passage; spiral flanges on the exterior of the tube; an oil supply passage leading into the interior of the mixing chamber and a perforated cap at the inner end of the mixing tube.

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

JOHN E. NAUDAIN.

Witnesses:

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LOUIS C. KLERLEIN.