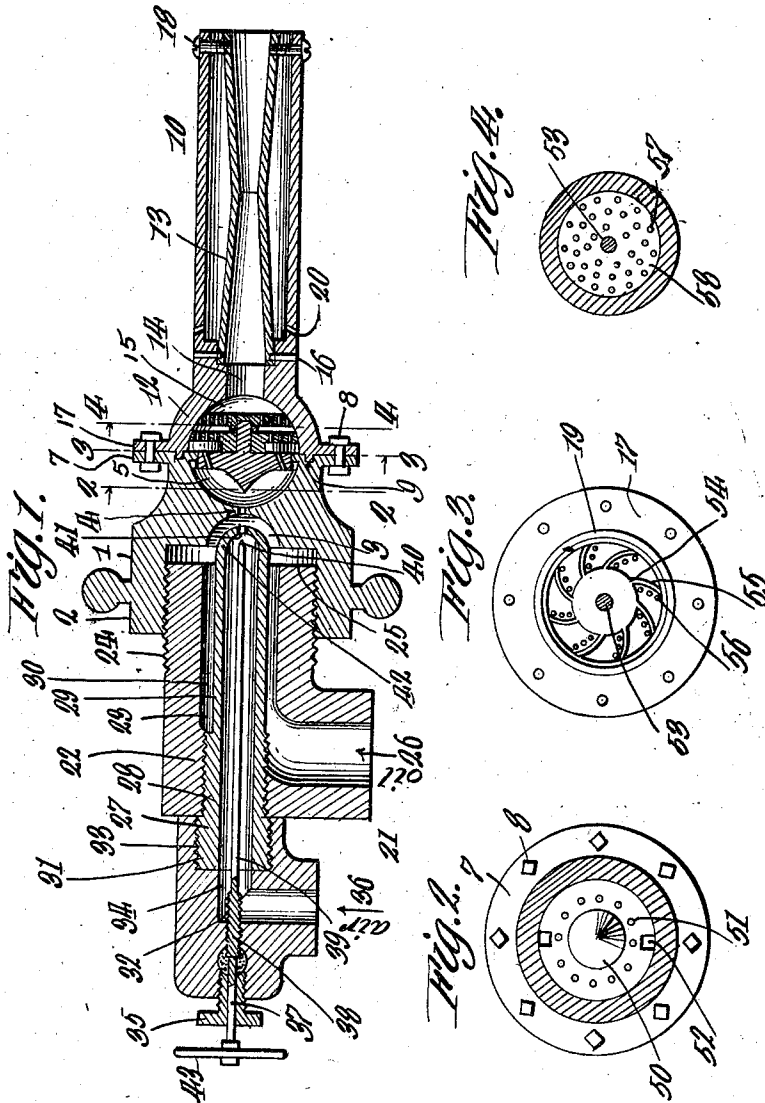


W. L. PERRY.
OIL BURNER.

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1,300,643.

Patented Apr. 15, 1919.



Witnesses
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WILLIAM L. PERRY, OF SAN FRANCISCO, CALIFORNIA.

OIL-BURNER.

1,300,643.

Specification of Letters Patent.

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Application filed October 24, 1918. Serial No. 259,505.

To all whom it may concern:

Be it known that I, WILLIAM L. PERRY, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Oil-Burners, of which the following is a specification.

This invention relates to liquid and gaseous fuel burners, and more especially to those which spray heavy oils and then reduce the spray or vapor to gas before consuming the same.

The object of the invention is primarily to break up crude and heavy oils into very fine spray, initially by a jet of air and subsequently by mechanical means, and then heat the spray so as to convert it into gas before it is finally mixed sufficiently with air to be consumed.

Another object is to render the parts of the burner detachable so that access may be had to the interior for cleaning and repair.

Other objects will appear in the following specification and claims and reference is made to the drawings wherein,

Figure 1 is a longitudinal sectional view of this burner complete.

Figs. 2, 3 and 4 are cross sections on the lines 2—2, 3—3 and 4—4 of Fig. 1.

This device may be said to be made up of four primary parts, viz: the inlet at one end, the nozzle at the other end, and the body between and connecting these members and containing the spreader. All parts are detachably connected, and the outlet end of the body coacts with the inlet end of the nozzle to produce a globular cavity in which the spreader elements are contained. The body 1 is enlarged at its inner end into an internally threaded bell 2 whose bottom is formed with a cavity 3 and in the axial bottom of the cavity is a jet opening 4. The outlet end of the body is formed with a semi-globular cavity 5 with whose axis said jet opening communicates; at opposite sides of said cavity are inwardly projecting lugs 6, and around this end of the body is a flange 7 pierced with holes for bolts or screws 8, while the face of the flange may have a groove 9 for a purpose yet to appear.

The nozzle 10 has a cylindrical body 11 enlarged into a bell 12 at its inner end having an internal semi-globular cavity 15 co-acting with that numbered 5, a flange 17 receiving the bolts or screws 8, and a rib 19

entering said groove 9. The axis of the cavity has a large outlet opening 14 communicating with a Venturi tube 13 which is held within the body 11 by appropriate means such as pins 16 and screws 18, and the body 11 is provided with air inlets 20 to the space between it and the exterior of the Venturi tube.

The inlet member 21 of the burner includes an elbow 22 whose upper horizontal arm is internally enlarged as at 23 and externally threaded as at 24 to screw into the bell between the bottom of which and the end of this horizontal arm is left quite an appreciable chamber 25. The lower and vertical arm of this elbow constitutes an oil inlet as indicated at 26. Through the angle of the elbow is screwed a plug 27, its threaded body 28 engaging suitable threads in said angle as seen and its inner end being reduced as at 29 so that an annular chamber 30 is formed between the inner end of the plug and the wall of the enlarged bore 23 of the horizontal arm of the elbow, this chamber communicating with the chamber 25 referred to. The head 31 of the plug is enlarged and stands behind the angle of the elbow.

A second elbow 32 is provided, its upper and horizontal arm being enlarged and internally threaded as at 33 to screw onto the head 31 against the angle of the first elbow, and its bore 34 communicating with the interior of the plug as shown, while its lower and vertical arm constitutes an air inlet 36. Through a stuffing gland 35 in the angle of this elbow passes a rod 37 having a threaded body 38 engaging the elbow, beyond which it is continued along the axis of the plug in a valve stem 39 having a needle point 40 coacting with a valve seat 41 in the rounded tip 42 of the plug directly opposite the jet opening 4 on the other side of the cavity 3. A handle 43 at the outer end of the rod 37 permits the setting of this stem to open or close the needle valve to a desired extent.

The spreader is made up of three elements best seen in Figs. 2, 3 and 4. A cone 50 stands within the cavity 5, 15 with its tip directly toward and slightly spaced from the jet opening 4, said tip being surrounded by a series of slightly oblique openings or perforations 51, and opposite edges of the cone-plate are notched as at 52 for detachable engagement with the lugs 6. The cone

has a stem 53 projecting to the rear along its axis. The next part shown in Fig. 3 is a disk having a hub 54 provided with a socket to receive said stem, and the parts are shown assembled in Fig. 1. Around this hub the body of the disk is provided with wings 55, between which are perforations 56. The periphery of the disk fits within the cavity 15. Next in rear of this element is another disk best seen in Fig. 4. This also has a socket at its center fitting over the rear end of the stem 53 and its body is perforated as shown at 57. The disk itself is numbered 58, and its periphery fits within the rear portion of the cavity 15, its socket being held on the stem by assembling the two members which make up the complete globular cavity 5, 15 and passing the screws 8 through the flanges.

Crude or heavy oil is now admitted at 26, and air under pressure at 36. The oil flows through the annular chamber 30 and into the chamber 25 around the inner end of the plug and finally into the cavity 30 within the space between the rounded inner end of this plug and the opening 4. Now when air is admitted by adjusting the needle valve, it flows out of the valve in a strong blast and carries a film of oil through the jet opening into the globular cavity. Here it is split up on the cone point and then flows successively through the perforations 51, 56 and 57.

Passing through the opening 14, it flows into and through the Venturi tube 13 and out the outlet end of the same, joining air from the annular space between this tube and the cylindrical body 11, which air was admitted at 20; and the mixed air and gas burn with great heat and intensity at the point of exit at the right of Fig. 1. I have found that a burner of this character, by experience, will burn crude or heavy oils very successfully. It is not the oil which is burned, because the oil is broken up by a blast of air into a spray and the particles still more finely divided by passing through the spreader. The nozzle soon becomes warm and its end 12 therefore heats the particles before they enter the Venturi tube as well as while they are passing through the same. Therefore, it is the gas of the heavy oils which is consumed rather than the spray thereof, and certainly not the oils themselves.

The foregoing description and the drawings have reference to what may be considered the preferred, or approved form of my invention. It is to be understood that I may make such changes in construction and arrangement and combination of parts, materials, dimensions, et cetera, as may prove expedient and fall within the scope of the appended claims.

Having thus fully described my inven-

tion, what I claim as new and desire to secure by Letters Patent is:—

1. In a burner, the combination with a body having a cavity in its outlet end, a nozzle having a cavity in its inlet end, abutting flanges around the cavities of these members, bolts connecting the flanges, and means for admitting oil and air through the body and into its cavity; of a spreader removably mounted within said two-part cavity and pierced with perforations out of registry with each other.

2. A burner comprising a body containing a globular cavity and having a jet opening leading thereto, means for forcing oil through said opening, spreading means within said cavity and including a cone directed toward said opening, and a nozzle consisting of a cylindrical body communicating with the outlet portion of the spreader and a Venturi tube within this body.

3. In a burner, the combination with a body having a semi-globular cavity in its outlet end, a nozzle having a semi-globular cavity in its inner end, means for connecting these members, and means for admitting oil and air through the body and into its cavity, of a spreader contained within said cavity and made up of a plurality of disks with perforations out of registry with each other.

4. In a burner, the combination with a body having a semi-globular cavity in its outlet end, a nozzle having a semi-globular cavity in its inner end, means for connecting these members, and means for admitting oil and air through the body and into its cavity; of a spreader contained within said cavity and comprising an element having a cone directed toward said inlet and surrounded by perforations, and disks in rear of this element and having perforations out of alinement with those first named.

5. In a burner, the combination with a body having a semi-globular cavity in its outlet end, a nozzle having a semi-globular cavity in its inner end, means for connecting these members and means for admitting oil and air through the body and into the cavity; of a spreader contained within said cavity and comprising an element having a cone directed toward said inlet and surrounded by perforations and a stem projecting to the rear from its axis, a disk in rear of said cone and mounted on its stem, its body being provided with perforations, and another disk in rear of the first disk and having a socket mounted on said stem and its body perforated, the peripheries of said disks being held within the cavity.

6. In a burner, the combination with a body having cavities at its inlet and outlet ends connected by an axial jet opening, a groove around its outlet end, and a flange around said groove, a nozzle having a bell

mouth at its inlet end containing a cavity and surrounded by a rib adapted to fit said groove and the rib surrounded by a flange, and means for detachably connecting said flanges; of means for admitting oil under pressure to the inlet end of the body and through said jet opening, and a spreader removably mounted within the cavity between said two members.

7. In a burner, the combination with a body having a bell mouth, a cavity in the bottom of the bell, and a jet opening leading from the center of said cavity, a nozzle secured to the outlet end of the body, said end and the inlet end of the nozzle having registering cavities, and a spreader within these cavities; of an inlet made up of an elbow having one arm screwed into said bell mouth and internally enlarged and the other arm connected with an oil inlet, a plug screwed into the angle of said elbow and extending along its enlarged portion and having a valve opening at its tip standing opposite said jet opening, a second elbow screwed onto the protruding end of the plug and having a bore communicating with that of the plug and its inlet arm connected with an air supply, and a needle valve whose stem is adjustably mounted through the angle of the last-named elbow and whose tip coacts with the valve seat.

8. In a burner for crude oils, the combination with a body having a bell mouth with an inlet cavity in its bottom, an outlet cavity in the rear end of said body, and a jet opening connecting these cavities, and a nozzle having a bell mouth with the cavity thereof coacting with the outlet cavity of the body, means for connecting these elements, and a spreader within the compound cavity thus

produced; of an inlet including an elbow whose horizontal arm is screwed into the bell mouth of the body, leaving a chamber between its inner end and the bottom of said bell, its vertical arm constituting an oil inlet, a plug through the angle of this elbow, the plug having a tubular body with a valve seat at its inner end a needle valve controlling said seat, and means for admitting air under pressure to the bore of the plug.

9. In a burner for crude oils, the combination with a body having a bell mouth with an inlet cavity in its bottom, an outlet cavity in the rear end of said body, and a jet opening connecting these cavities, and a nozzle having a bell mouth with the cavity thereof coacting with the outlet cavity of the body, means for connecting these elements, and a spreader within the compound cavity thus produced; of an inlet including an elbow whose horizontal arm is screwed into the bell mouth of the body, leaving a chamber between its inner end and the bottom of said bell, its vertical arm constituting an oil inlet, a plug through the angle of this elbow, the plug having a tubular body with a valve seat at its inner end, a needle valve controlling said seat, the outer end of the plug being enlarged into a head standing against the angle of said elbow, a second elbow whose horizontal arm is screwed onto said head and whose upright arm constitutes an air inlet, and means in this elbow for permitting adjustment of said needle.

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

WILLIAM L. PERRY.

Witnesses:

A. G. SALA,
M. A. MITCHELL.