C. P. VALLELY.

BURNER FOR GAS AND OIL.

APPLICATION FILED JUNE 3, 1919.

1,381,144. Patented June 14, 1921.

FIG. 1.

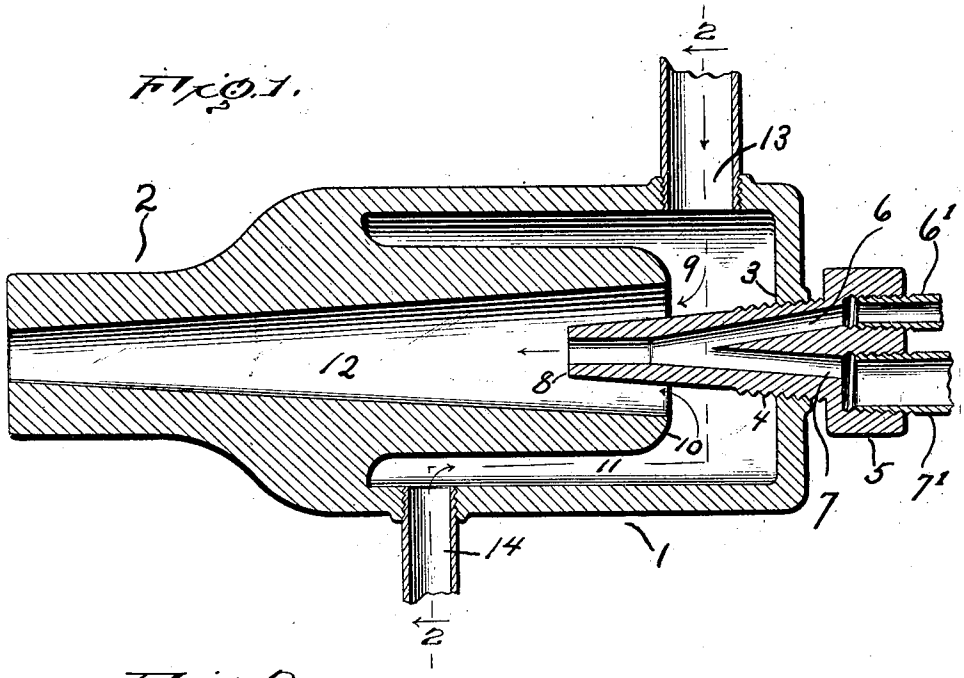


FIG. 2.

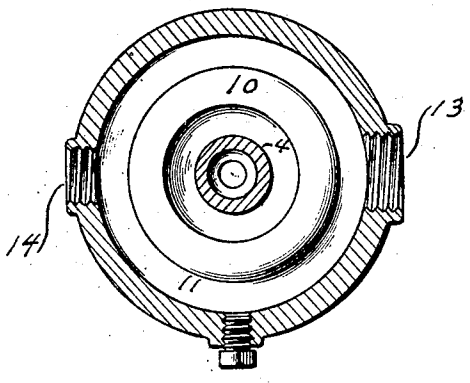
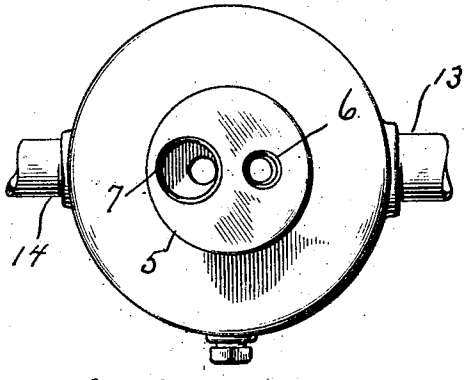


FIG. 3.



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CORNELIUS P. VALLELY, OF BRADFORD, PENNSYLVANIA.

BURNER FOR GAS AND OIL.

1,381,144. Specification of Letters Patent. **Patented June 14, 1921.**

Application filed June 3, 1919. Serial No. 301,469.

To all whom it may concern:

Be it known that I, CORNELIUS P. VALLELY, a citizen of the United States, residing at 120 W. Washington St., Bradford, in the county of McKean and State of Penna., have invented certain new and useful Improvements in Burners for Gas and Oil, of which the following is a specification.

This invention relates to improvements in hydrocarbon burners, and has for its object to provide a simple but efficient burner designed for use in connection with natural gas, crude petroleum and other fuel oils used in a variety of apparatuses for heating or smelting purposes.

The primary object of this invention is to provide means whereby the fuel oil is atomized with steam or other fluid under pressure and there commingled with air or natural gas, or in combination with natural gas and air, in varying proportions to suit the requirements for perfect combustion.

Other objects of the invention will be apparent from the following description and claims.

In the accompanying drawings I have illustrated the preferred embodiment of my invention, and the improved details of construction, and arrangement of parts thereof will be apparent from the specific description hereinafter contained when read in connection with such drawings.

In the drawings:

Figure 1, is a longitudinal sectional view of the burner.

Fig. 2, is a cross sectional view of the burner on the lines 2—2, Fig. 1.

Fig. 3, is an end view.

Referring to the drawings, wherein like reference numerals designate corresponding parts in the several views, 1 represents the outer casing of relatively large size, terminating at the one end in the integral reduced nozzle portion 2, and at the other end in the internally threaded aperture 3, into which is screw threaded the interiorly disposed ejecting nozzle 4.

The nozzle 4, has formed at its enlarged end portion, a flange 5 into which lead the duct inlets 6 and 7. These ducts join in the form of a Y, into the one opening 8, at the mouth of the ejecting nozzle 4.

Within the enlarged portion of the outer casing 1, is a cylindrical shaped cavity 9, into which extends the projecting boss member 10, formed integral with the casing 1, and providing an annular space 11, between the said projecting boss member 10, and the outer shell of the casing 1.

Beginning at the outer end of the nozzle 2, and extending to the end of the projecting boss member 10, is a passage 12 of gradually tapering enlargement, communicating with the cavity 9, within the outer casing 1, communicating with the annular space 11, are ingress ports 13 and 14, the purpose of which will be hereinafter explained.

Referring to Fig. 1, it will be observed that the projecting apertured boss member 10, is circumferentially disposed around the ejector nozzle 4, and that the discharge end of the ejector nozzle 4, is disposed well forward of the axial line of the duct 13, and that the duct 14 is disposed forward of the mouth of the aperture in the projecting member 10. The relative position of the ducts 13 and 14, in connection with the projecting member 10, and the ejecting nozzle 4, constitute important features of this invention.

Connected with the duct 6, of the ejector nozzle 4, is the pipe 6^1, by which fuel oil is drawn from any suitable source of supply (not shown) and is commingled with a suitable fluid under pressure, fed through the duct 7, by the supply pipe 7^1, this fluid may be steam, compressed air, or natural gas under pressure. I prefer to use steam, as the temperature of steam aids in the vaporizing of the fuel oils.

It is well known in the art that to convert any liquid into a vapor, that a cooling effect is created within the immediate zone of operation, tending to cause condensation which is wasteful and detrimental to high efficiency. I overcome this objection by the novel arrangement of the commingling of the various fluids before they are projected from the burner for combustion.

In the operation of the device as described, the oil valve (not shown) is adjusted to feed the desired proportion of oil. Steam or compressed air is then supplied to the duct 7, and is discharged through the

opening 8, under the influence of which a partial vacuum will be caused in the duct 6, causing a siphoning of the oil through the oil supply pipe 6^1 to the point at the intersection of the branches of the Y, where it commingles with the steam and is atomized thereby.

As the mixture of atomized oil and steam passes out of the ejector nozzle 4, it is projected into the aperture 12, causing a suction thereby which creates a partial vacuum in the cavity 9, under the influence of which air will be drawn through the duct 14, to aerate for combustion purposes, and gas will be drawn through the duct 13. It is to be understood that the gas is not essential at all times to secure perfect combustion, but its use is to be determined by the particular effect desired, it being understood that the gas may be used in combustion with the oil, or substituted therefor.

The amount of the air, and the proportion of gas to be supplied will be regulated by the use of valves, (not shown) in manner well known in the art.

As the combustible mixture is discharged from the end of nozzle 2, it is projected into the fire box or furnace and therein ignited. The nozzle 2 being in close proximity to the zone of combustion, will become heated and will radiate heat into the annular space 11, into which is fed atmospheric air through the duct 14, causing a superheating of the air before it is commingled with the gas coming into the cavity 9, through the duct 13. This preheating of the air eliminates condensation and aids in vaporizing the atomized oil before it is discharged into the fire box or furnace.

From the foregoing description it will be seen that the steam or compressed air passing through the duct 7, is the only fluid under pressure, and by the novel arrangement of my device, the oil, air and gas supply are each drawn into the burner by the vacuum effect created by the suction of the steam discharge, whereby an automatic feed of these combustible fluids is provided, self regulated in proportion to the volume and force of discharge of the steam or other fluid under pressure.

While I have herein disclosed a particular embodiment of the invention, it will be apparent to persons skilled in the art that changes and alterations may be made without departing from the spirit of the invention.

Having thus described the invention what I claim is:

1. An apparatus of the character described comprising an internally passaged injector-barrel having an enlarged air space therein, an internally passaged boss formed integral with and extending rearwardly from, said injector-barrel, and projecting into said air space, a forwardly projecting two feed single discharge nozzle extending through said air space and having its discharge end disposed within the aperture in said boss, forming an annular space around said nozzle; ingress ports for admission of air and gas in communication with said annular space and adapted to be drawn therethrough by the discharge of fluid under pressure from said nozzle.

2. In a device of the character described a combined oil and gas burner, comprising a cylindrical formed outer shell having an air-chamber therein, an internally passaged boss formed integral with one end of said shell extending into said air-chamber forming an annular space intermediate of said shell, a lateral ingress port adapted to admit air to said annular space, a single discharge two feed nozzle extending through said air space with its discharge end disposed within the passaged boss, arranged to project therethrough a plurality of fluids by the discharge from said nozzle.

3. In a device of the character described consisting of an outer shell member having an inlet nozzle leading to an air chamber therein; an internally passaged boss extending toward said nozzle and surrounding the discharge end thereof; an air and gas chamber intermediate of the outer shell and said boss adapted to discharge into a space intermediate of the boss and inlet nozzle, separate inlets for air and gas passing through the outer shell and into the air and gas chamber and a steam supply nozzle adapted to discharge an admixture of steam and oil having a discharge jet beyond the point of gas and air supply.

In testimony whereof I have affixed my signature in the presence of two witnesses.

CORNELIUS P. VALLELY.

Witnesses:
M. L. JORDAN,
E. M. KOCH.