C. P. VALLELY.

BURNER FOR GAS AND OIL.

APPLICATION FILED AUG. 25, 1920.

1,394,377. Patented Oct. 18, 1921.

Fig. 1.

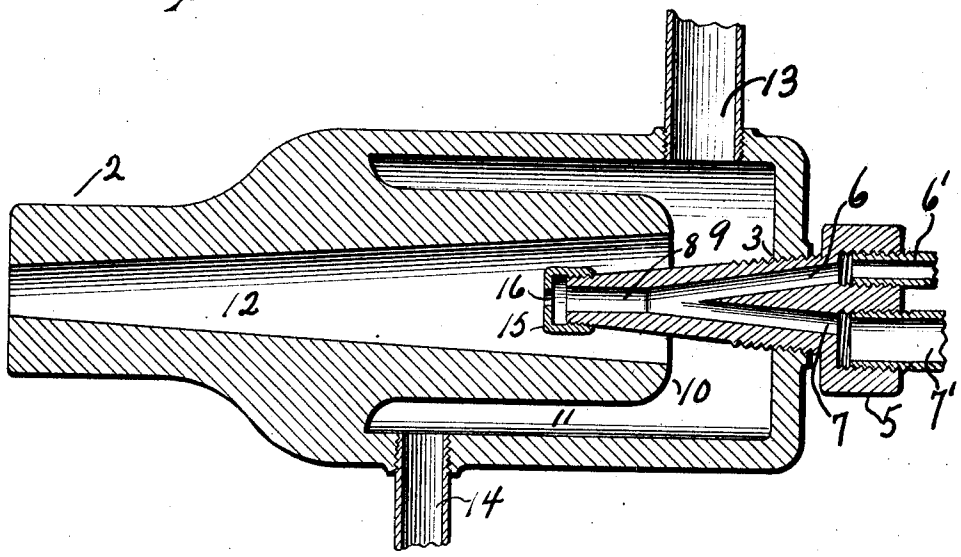


Fig. 2.

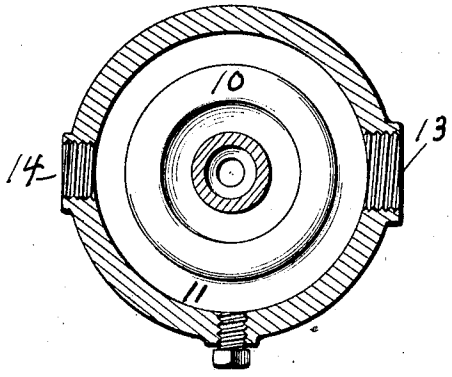
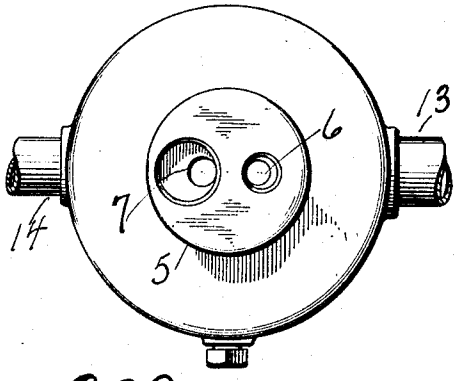


Fig. 3.



C. P. Vallely Inventor

By Adrian Sizer his Attorney

UNITED STATES PATENT OFFICE.

CORNELIUS P. VALLELY, OF BRADFORD, PENNSYLVANIA.

BURNER FOR GAS AND OIL.

1,394,377. Specification of Letters Patent. Patented Oct. 18, 1921.

Application filed August 25, 1920. Serial No. 406,017.

To all whom it may concern:

Be it known that I, CORNELIUS P. VALLELY, a citizen of the United States, residing at Bradford, in the county of McKean and State of Pennsylvania, 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 oil with air in varying proportions to suit the requirements of perfect combustion. Incidentally the means thus provided are by slight modification adapted for use in an improvement in the means set forth in U. S. Letters Patent No. 1,381,144, issued to me on June 14, 1921.

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 the drawings.

In the drawings:

Figure 1 is a longitudinal section of the burner.

Fig. 2 is a cross sectional view of the burner.

Fig. 3 is an end view of the burner.

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

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

Located at the end of the ejecting nozzle 4, and forming a partial closure to the aperture 8, is a cap 15, detachably connected by being screw threaded on the end of the ejector nozzle 4. The cap 15, is provided with a centrally located opening 16 therein. The application of the cap 15, to the ejector nozzle 4, and its resulting effect on the fluid passing through the ejector nozzle 4, form important features of this invention.

Within the enlarged portion of the outer casing 1, is the 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 an enlarged aperture 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 purposes of which will hereinafter be 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 ejector 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 oils.

It is well known in the art, that to convert any liquid into 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 admixture 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. The cap 15, is detachably connected to the injector nozzle 4, in order that it may be readily removed, as the cap 15, is found to be most effective, and to show the highest efficiency when using gas alone, and when so used it carries the steam or compressed air, from the ve tex of the two ducts 6 and 7, through the opening 16, in the cap 15, of the same size as the steam or compressed air duct 7, and when so used gives a better mixture and causes a more perfect combustion, as due to the smaller aperture 16, the steam is not inflated by expansion when it strikes and mixes with the gas drawn through the duct 13, and the atmospheric air through the duct 14.

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

As the combustible mixture is discharged from the end of the nozzle 2, it is projected into the fire box or furnace and therein ignited. The nozzle 2, 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 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 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.

What I do claim and desire to secure by Letters Patent is:

An apparatus of the character described, comprising an internally passaged injector barrel having an enlarged air space therein, an internally apertured 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, a cap detachably mounted on the end of said discharge nozzle having a reduced aperture in axial alinement with the bore of 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.

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

CORNELIUS P. VALLELY.

Witnesses:

F. P. SCHOONMAKER,

E. M. KOCH.