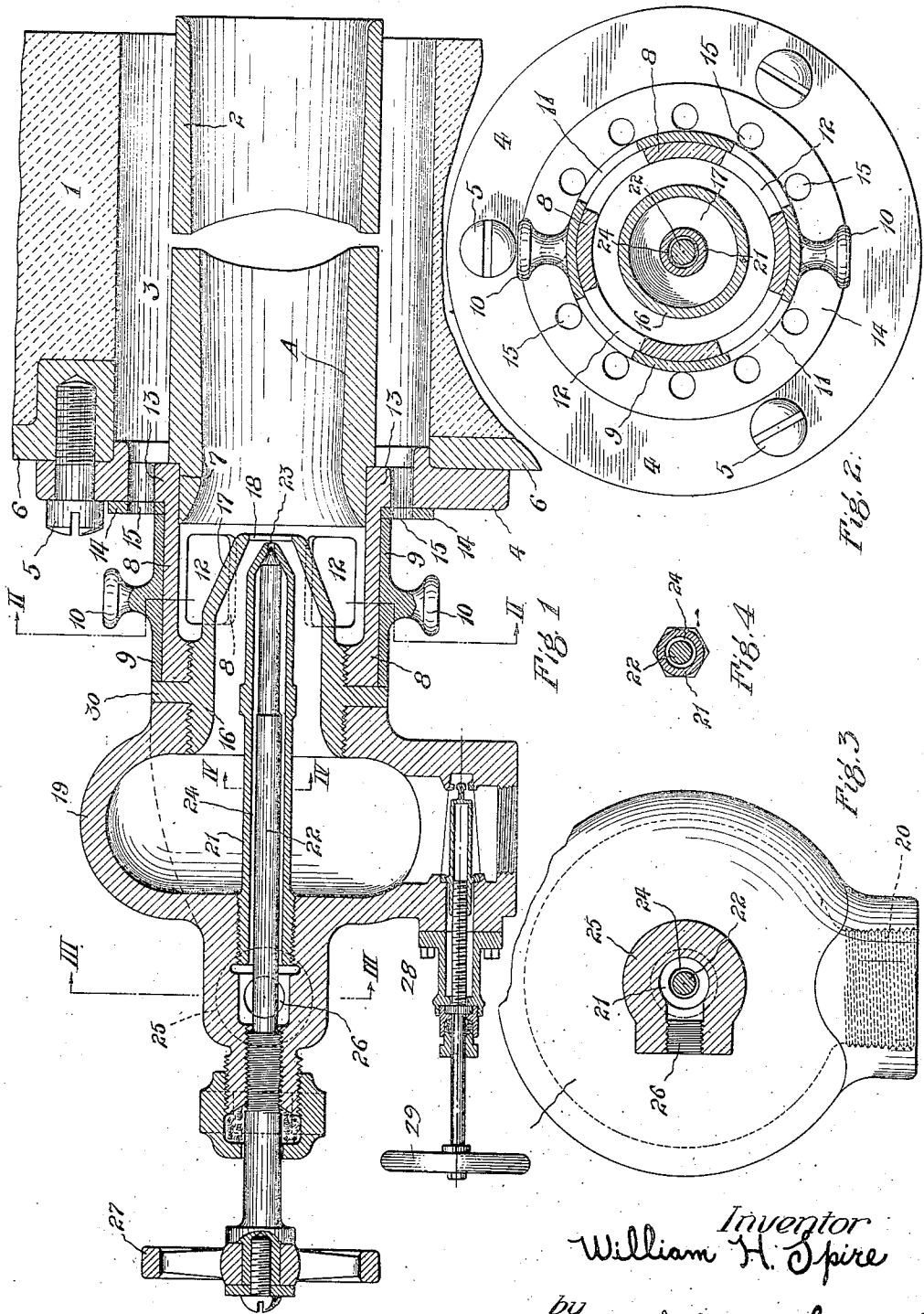


W. H. SPIRE.
COMBINED OIL AND GAS BURNER.
APPLICATION FILED SEPT. 24, 1917.

1,304,402.

Patented May 20, 1919.



Inventor
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UNITED STATES PATENT OFFICE.

WILLIAM H. SPIRE, OF CLEVELAND, OHIO.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM H. SPIRE, a citizen of the United States, resident of Cleveland, county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Combined Oil and Gas Burners, of which the following is a specification, the principle of the invention being herein explained, and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to burners and particularly to that class of such devices which may be used as combined oil and gas burners. More particularly, my invention relates to a burner in which gaseous fuel or a mixture of such fuel and air in any desired proportions and a liquid fuel, may be used independently or together, and also whereby to said fuels or a mixture of said fuels a supply of induced air may be permitted in any desired proportion.

The annexed drawing and the following description set forth in detail certain means embodying my invention, the disclosed means, however, constituting but one of various mechanical forms in which the principle of the invention may be employed.

In said annexed drawing:

Figure 1 represents a central longitudinal section of my improved burner, showing the same in connection with a fragment of the wall of a heating furnace with the usual flaring nozzle for introducing the burning mixture into the furnace; Fig. 2 represents a transverse vertical section taken in the plane indicated by lines II—II, Fig. 1; Fig. 3 represents a transverse vertical section taken in the plane indicated by the lines III—III, Fig. 1; and Fig. 4 represents a fragmentary transverse vertical section taken in the plane indicated by the lines IV—IV, Fig. 1.

In said annexed drawing there is suggested by the numeral 1 the wall of a usual heating furnace provided with the flaring nozzle 2, said nozzle being surrounded by the usual air passage 3. An annular plate 4 is secured by bolts 5 to a face plate 6 of the wall 1, said plate 4 being seated upon a reduced end portion 7 of the nozzle 2 and being provided with an outwardly extending hub member 8. Said hub member 8 provides a journal surface for a surrounding movable valve 9 provided with thumb pieces 10 and air ports 11 adapted to reg-

ister with corresponding ports 12 formed in the hub member 8. Disposed between the inner end of the valve 9 and the shoulder portion 13 of the plate 4 is a manually controllable damper or shutter 14 providing what have heretofore been the usual air ports 15 communicating with the air passage 3, through suitable apertures in the plate 4. The hub member 8 is internally threaded so as to receive an externally threaded portion of a casing 16 provided with a conical end portion 17 formed with an end opening 18 providing a nozzle for the discharge of a gaseous fuel, as hereinafter more fully explained. This nozzle 18 is disposed within the hub member 8 and discharges within the space into which the induced air through the openings 11 and 12 is permitted to enter. Externally threaded to the outer end of the casing 16 is a fitting 19 formed with an internally threaded opening 20 for connection to any suitable source of fuel supply. A flange member 30 of the casing 16 is disposed between the outer ends of the hub member 8 and the valve 9 and the inner end of the fitting 19, as plainly shown in Fig. 1. The said casings 16 and 19 receive a casing 21 provided with a stem 22 which forms a needle valve at the point 23 and an annular passage 24 providing a conduit for a liquid fuel. Said passage 24 communicates through a hub portion 25 of the fitting 19 with an internally threaded opening 26 adapted to be connected to any suitable source of liquid fuel supply. The stem 22 is internally threaded into the hub portion 25 of the fitting 19 and is adapted to be longitudinally reciprocated by means of the hand wheel 27, the usual packing gland, stuffing box and lock nut being provided. It will be noted that the valve 23 controlled by the longitudinal reciprocable stem 22 is disposed adjacently to the nozzle 18 which, as noted above, is disposed within the space furnished with induced air through the openings 11 and 12, so that the fuel furnished from the fuel supplies through the openings 20 and 26, will mix within the same space to which the induced air through the openings 11 and 12 is furnished to them. The connection 20 is intersected by a valve 28 provided with a hand wheel 29, whereby the supply of gaseous fuel can be controlled. The construction of the fitting 19 which I have shown is important, inasmuch as I have extended the same well above the centrally disposed casing 21, so as to present an

elongated semi-elliptical form in cross-section, as plainly shown in Fig. 1. These fittings would normally extend in so far as the top of them, Fig. 1, is concerned, in a slightly curved practically straight line from the hub member 25 to the flange member 30, as shown in dotted line, Fig. 1, which results in the incoming gas impinging upon the comparatively low ceiling thus provided in the fitting 19 and reacting to throw the liquid fuel, issuing from the casing 21, in drops down to about the position A, Fig. 1, instead of tending to atomize said liquid fuel and to carry the same through the nozzle 2 longitudinally thereof. This construction is important whether the outer casing 16 is an air conduit or a gaseous fuel conduit.

By the means above described and plainly shown in the accompanying drawing, I am able to burn a mixture of gaseous and liquid fuels or burn them independently and in either event I can, through the medium of the controlled openings 11 and 12, permit the desired proportion of induced air to mingle with them and can furnish either or both of the fuels initially with the desired proportion of air. This initial ratio, in the case of the gaseous fuel, may be a common one of four to one, known as the Selas mixture, or any other ratio, or if desired, no air at all, by depending upon the induced air through the openings 11 and 12. Either a non-inflammable or inflammable mixture might be furnished. When a gaseous fuel alone is being utilized, it is customary to shut the damper 14 so that no air will be furnished through the openings 15.

What I claim is:

1. In a combined oil and gas burner, the combination with a heating furnace formed with a nozzle for the heating mixture; of a casing disposed adjacent said furnace and formed with an opening communicating with said nozzle; a second casing disposed within said first-mentioned casing and formed with a discharge opening disposed adjacent to said nozzle, both of said casings being formed to communicate with fuel supplies; and a movable valve formed with a plurality of air openings and journaled upon said first-mentioned casing adjacent said furnace, said casing being provided with a plurality of openings adapted to be covered and uncovered by said valve.
2. In a combined oil and gas burner, the combination with a heating furnace formed with a nozzle for the heating mixture; of a casing disposed adjacent to said furnace and formed with a nozzle discharging into said furnace nozzle, said casing forming a conduit for a gaseous fuel; a second casing

and a longitudinally reciprocable stem therein forming a conduit and a needle valve for a liquid fuel; means for reciprocating said stem to control said valve, the latter being disposed adjacent to said gaseous fuel nozzle; and controlled means permitting a supply of induced air to said furnace nozzle, said casings being adapted to be either or both connected with a source or sources, respectively, of fuel supply.

3. In a burner, a casing, a fitting connected to said casing and extending at an angle to the axis thereof, said fitting being formed with a closed portion extended beyond said casing; a second casing; a mixing chamber, said two casings being arranged to discharge into the latter and longitudinally thereof, said fitting and said second-mentioned casing being arranged to communicate with a source of gaseous medium and a source of liquid fuel, respectively.

4. In a burner, a casing; a second casing disposed within and centrally of said first casing; a fitting connected to said outer casing and extending at an angle to the axis thereof, said second casing intersecting said fitting, the latter being formed with a closed portion extended beyond said outer casing; a mixing chamber, said two casings being arranged to discharge into the latter and longitudinally thereof, said fitting and said inner casing being arranged to communicate with a source of gaseous medium and a source of liquid fuel, respectively.

5. In a combined oil and gas burner, the combination of a furnace wall and means forming a mixing chamber intersecting the same; of a member adapted to form a gas passage and arranged to discharge into said chamber; an oil supply member arranged to discharge into said chamber; controlled means permitting a supply of induced air to said chamber; and separate controlled means admitting air to the furnace.

6. In a combined oil and gas burner, the combination with a heating furnace formed with a nozzle for the heating mixture; of a casing mounted upon said nozzle, secured to the furnace face plate, and formed with a nozzle discharging into said furnace nozzle, said casing forming a conduit for a gaseous fuel; a second casing and a longitudinally reciprocable stem therein forming a conduit and a needle valve for a liquid fuel; means for reciprocating said stem to control said valve, the latter being disposed adjacent to said gaseous fuel nozzle; controlled means permitting a supply of induced air to said furnace nozzle; and means for controlling said gaseous fuel conduit.

Signed by me, this 21st day of September, 1917.

WILLIAM H. SPIRE.