

May 2, 1950

T. B. LAYDEN
VAPOR GENERATOR FOR SUPPLYING VAPORIZED LIQUID TO
FUEL BEDS WITHIN COMBUSTION CHAMBERS
Filed Oct. 27, 1947

2,505,901

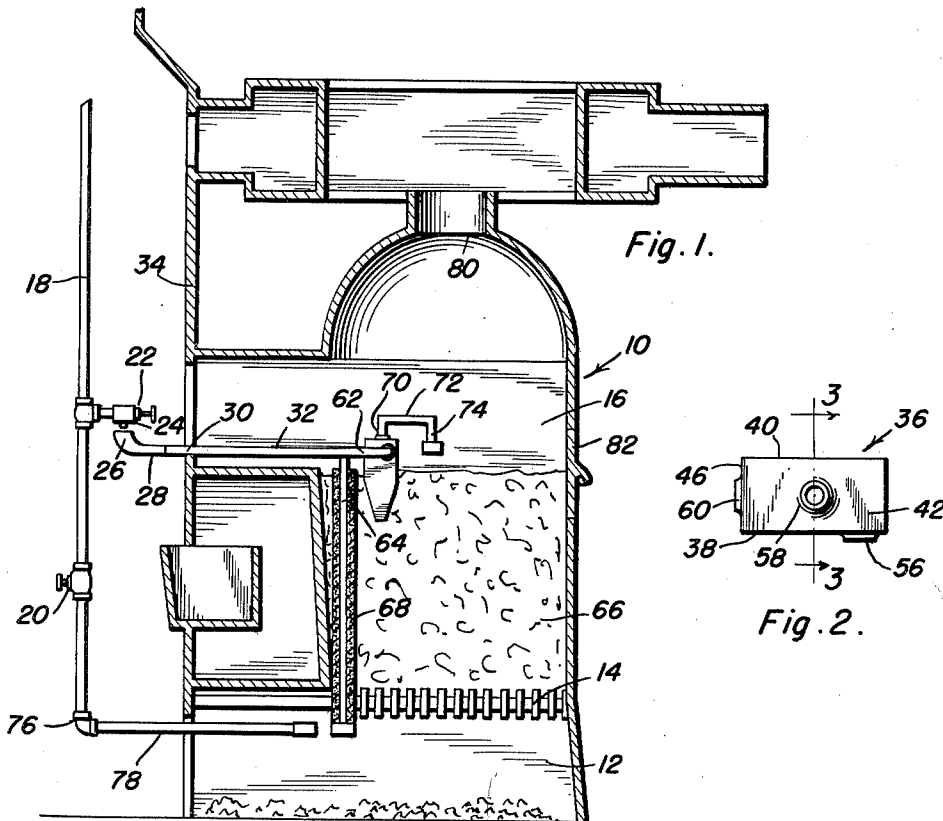


Fig. 1.

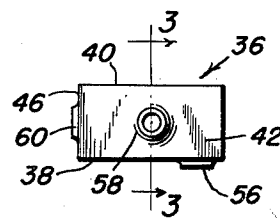


Fig. 2.

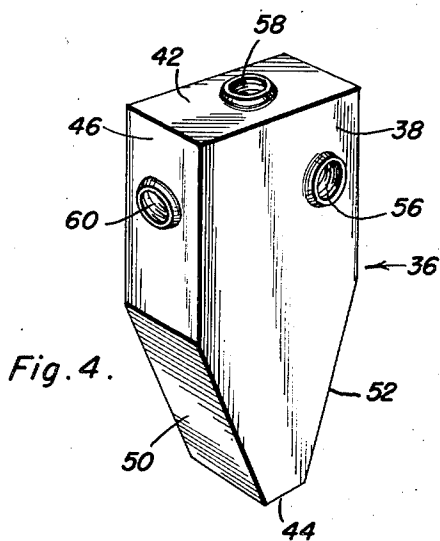


Fig. 4.

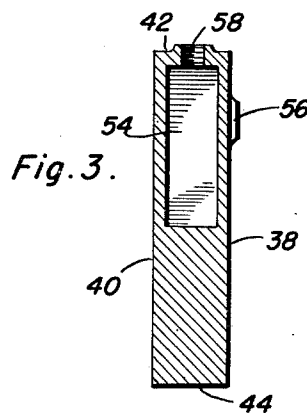


Fig. 3.

Thomas B. Layden
INVENTOR.

BY *Oliver A. O'Brien*
and *Harvey E. Jacobson*
Attorneys

UNITED STATES PATENT OFFICE

2,505,901

VAPOR GENERATOR FOR SUPPLYING VAPORIZED LIQUID TO FUEL BEDS WITHIN COMBUSTION CHAMBERS

Thomas B. Layden, New Brunswick, N. J.

Application October 27, 1947, Serial No. 782,310

2 Claims. (Cl. 110—80)

1

This invention relates to new and useful improvements in vapor generators and gas producers, and the primary object of the present invention is to provide a device which will supply a proper amount of steam or moisture to any boiler or furnace, increasing its combustion and decreasing fuel consumption.

Another important object of the present invention is to provide a device applicable for conventional house furnaces to supply a predetermined amount of dry vapor to the hot coals of a furnace to increase the flame emitted from the coals to the top of the furnace.

A further object of the present invention is to provide a vapor-generating and gas-producing device which is adapted for use with all types and grades of fuel such as coal, wood, and the like and which can effectively be employed in conjunction with warm air, steam, vapor or hot water heating systems.

A still further aim of the present invention is to provide a device of the aforementioned character that is simple and practical in construction, strong and reliable in use, neat and attractive in appearance, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a vertical sectional view of a conventional furnace, and showing the present invention applied therewith;

Figure 2 is a top plan view of the present vapor generator;

Figure 3 is a longitudinal vertical sectional view taken substantially on the plane of section line 3—3 of Figure 2; and

Figure 4 is a perspective view of the present vapor generator.

Referring now to the drawings in detail, wherein, for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a conventional furnace structure including an ash pit 12, grates 14 and a combustion chamber 16.

Leading from a suitable source of liquid is a supply conduit 18 that is provided with a lower control valve 20 and an upper control valve 22 having an outlet nozzle 24 depending therefrom that opposes the upwardly flared end 26 of an elbow pipe 28 receivably engaging the outer ter-

2

55 minial 30 of a conduit or feed pipe 32 that preferably extends horizontally through the rear wall 34 of the furnace and into the combustion chamber 16.

50 The numeral 36 represents the present invention generally, comprising a preferably rectangular casing having spaced parallel side walls 38 and 40, an upper wall 42, a reduced bottom wall 44, upper end walls 46 and 48 and downwardly inclined lower end walls 50 and 52. A substantially rectangular chamber 54 is provided in the casing 36, and communicates with internally threaded nipples 56, 58, and 60 that are respectively located in the walls 38, 42 and 46.

45 The nipple 56, which, for clarity, will be referred to as the liquid supply nipple, receivably engages the externally threaded end 62 of the feed pipe 32 so that liquid may be supplied into chamber 54.

20 Operatively connected to the nipple 60 and depending therefrom is a preferably vertical vapor supply pipe 64 that extends through the coals or the like 66 into the ash pit 12 and which is embraced by a heat resistant asbestos sleeve 68.

45 Receivably engaging the remaining nipple 58 is one of the externally threaded ends 70 of a substantially inverted U-shaped vapor supply pipe 72, the other leg 74 of which terminates above the coals 66 in the combustion chamber.

30 It should be noted that the lower terminal of the supply conduit 18 is coupled, as at 76, to a horizontally disposed spray pipe 78 that extends through the rear wall 34 of the furnace and into the upper portion of the ash pit 12.

35 In practical use of the device, water is supplied to the pipe 32 by controlling valve 22 so that a predetermined amount of fluid will enter the casing 36. It is preferred that the valve 22 be a usual drip valve that will supply approximately 6 to 12 drops of liquid per minute into the pipe 28.

40 Obviously, the heat in the furnace will affect the casing 36 and cause the liquid in the chamber 54 to vaporize. The amount of air which is drawn into the generator with the liquid creates a dry vapor of which approximately ninety per cent is drawn down through pipe 64 to the ash pit 12 and then through the hot coals 66, making gas which increases the normal flame emitted from the coals. Approximately ten per cent of the dry vapor that leaves chamber 54 passes through pipe 72 as a booster for the coals. The intense heat going through the stack 80 creates a natural draft and must be controlled by the turn damper. Any openings in the fire door 82 are sealed or glass inserted so that the operator may see the

3

gas burning. Because of the expansion of the dry vapor, once the fire is started and the generator 36 heated, there is no draft required except that which goes through pipe 32 and the generator, and thus prevents the body of the coals from burning away too quickly. Pipe 78 is only used to wet down ashes before shaking the furnace.

It has been found that the furnace equipped with the present invention will burn efficiently for twelve hours without refueling or attention and that an obvious reduction in the dust from the ash pit and smoke from the stack is apparent.

In view of the foregoing description taken in conjunction with the accompanying drawings, it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention, the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. In combination with a furnace having an ash pit and a combustion chamber, of a vapor generator and gas producer comprising a liquid chamber positioned in the combustion chamber and adapted to be embedded in fuel within the combustion chamber, means for supplying a predetermined amount of liquid to the liquid chamber, and means for conducting vapor formed in the liquid chamber to a fuel within the combustion chamber, said liquid chamber having a tapered end facilitating the same to be extended into a fuel within the combustion chamber, said last-mentioned means including a conduit leading from said liquid chamber and adapted to extend downwardly through the combustion chamber and fuel positioned in the combustion chamber, and a further conduit leading from said

4

fluid chamber and disposed above the fuel in the combustion chamber, said first mentioned conduit having a fire resistant covering.

2. In combination with a furnace having an ash pit, a combustion chamber and a grill mounted in said furnace between said ash pit and said combustion chamber; a vapor generator and gas producer comprising an elongated casing having a tapered lower portion adapted to be embedded in fuel within the combustion chamber, said casing having a liquid chamber in the upper end thereof, a first port provided in said casing communicating with liquid chamber, means for introducing a predetermined amount of liquid into said liquid chamber through said first port, a second port provided in said casing communicating with said liquid chamber, an auxiliary vapor supply pipe leading from said second port and having a delivery end adapted to be spaced above the fuel in said combustion chamber, a third port provided in said casing communicating with said liquid chamber, and a main vapor supply pipe leading from said third port, extending downwardly through said combustion chamber and entering said ash pit for delivering a vapor into said ash pit whereby the said vapor entering the ash pit will rise through the fuel on said grill.

THOMAS B. LAYDEN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
418,104	Alley	Dec. 24, 1889
431,682	Alley	July 8, 1890
431,928	Alley	July 8, 1890
1,135,275	Gareau	Apr. 13, 1915

FOREIGN PATENTS

Number	Country	Date
88,081	Australia	Apr. 25, 1922
465,511	Germany	Sept. 19, 1928
565,627	Germany	Dec. 3, 1932