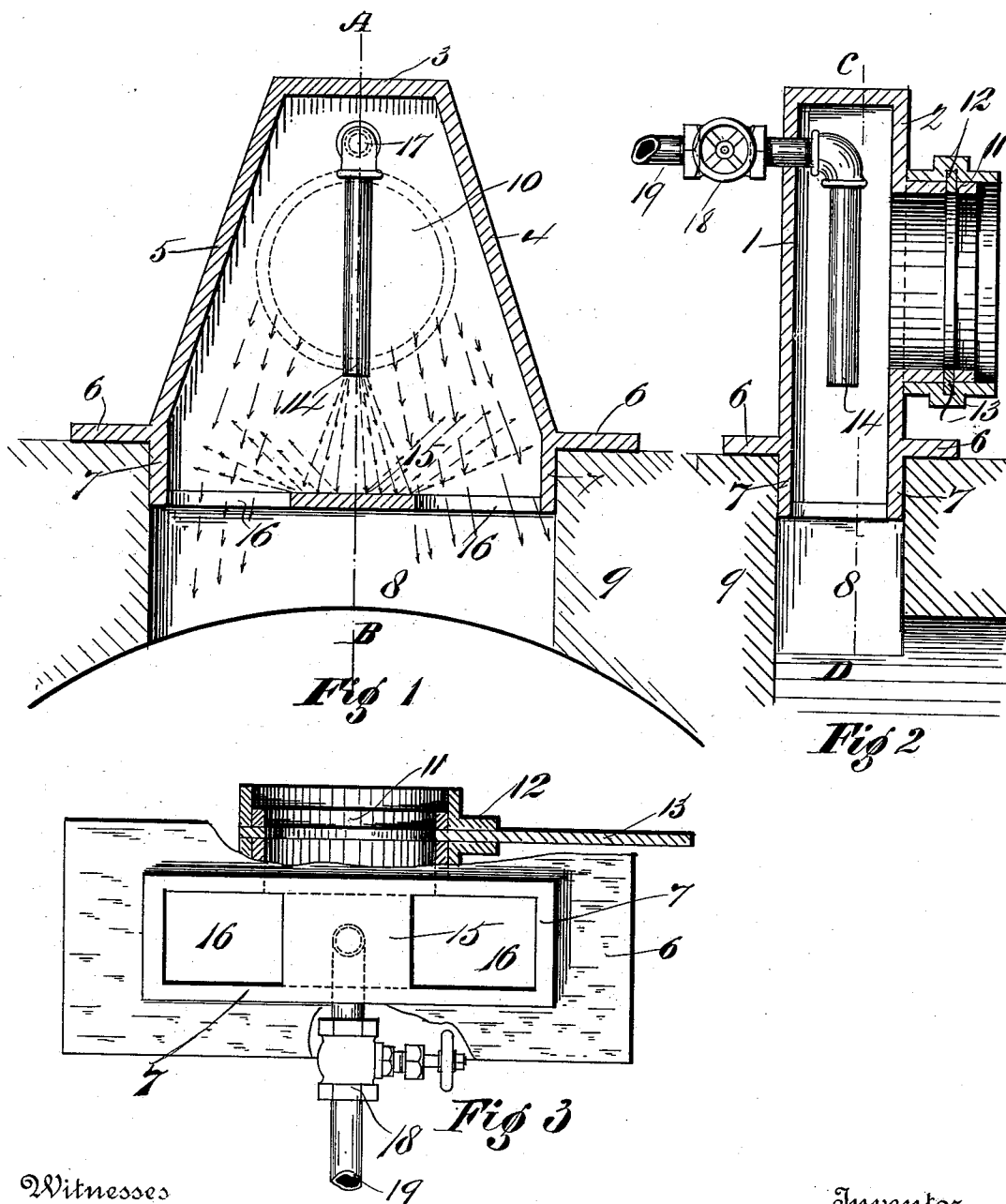


(No Model.)

F. W. FLANNER.
FLUID FUEL BURNER.

No. 508,130.

Patented Nov. 7, 1893.



Witnesses

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Inventor

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UNITED STATES PATENT OFFICE.

FRANK W. FLANNER, OF INDIANAPOLIS, INDIANA.

FLUID-FUEL BURNER.

SPECIFICATION forming part of Letters Patent No. 508,130, dated November 7, 1893.

Application filed September 13, 1892. Serial No. 445,740. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. FLANNER, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented new and useful Improvements in Fluid-Fuel Burners, of which the following is a specification.

My invention relates to an improved apparatus for burning fluid fuel and consists in the novel construction of a burner hereinafter more fully described.

The object of my invention is to provide a simple and effective fluid fuel burner wherein the fluid fuel will be reduced to a finely divided state and thoroughly mixed with a proper amount of atmospheric air to maintain perfect combustion without the application of a forced draft or jet of an extraneous fluid under pressure; also, to provide means whereby the fluid fuel will be thoroughly atomized by means of the combined action of the fall of the fluid through space, the force of the fall being produced either by the gravity of the body or by applying pressure, by any suitable means, to accelerate its flow, if a semi-liquid fuel, as crude petroleum, and causing the fuel to impinge against an intercepting plate, or cupped or flat surfaced body, and a flow or current of air passing through the interior of the burner casing which current is induced by the natural draft of the furnace to which the burner is applied; also, to provide means whereby the supply of the fluid fuel, the force and velocity of its exit, and the volume of air passing through the burner may be readily adjusted to regulate the intensity of the flame. I attain these objects by means of the apparatus illustrated in the accompanying drawings in which similar numbers of reference designate like parts throughout the several views.

Figure 1. is a front sectional elevation of the burner through the line C—D. (See Fig. 2.) Fig. 2. is an end sectional elevation of the same through the line A—B, (see Fig. 1.) and Fig. 3. is an inverted plan view of the same partly in section.

The burner is composed of a casing which may be either rectangular, circular, or oval in cross section; but I prefer to construct it in the form shown in the drawings in which the burner comprises the parallel sides 1. and

2., the crown or top 3., the outwardly inclined sides 4. and 5. and the supporting flange 6. extending completely around the casing and formed integral thereon at or near the base thereof. The bottom sides and ends 7 of the casing are preferably projected slightly beneath the bottom surface of the flange 6. and at right angles therewith for the purpose of conveniently applying the same to the aperture or mouth 8. formed in the crown or top of the furnace 9. Integral with the side 2. and around the side or vent opening 10. is formed the spout 11. whereon the gate casing 12., having the regulating gate 13. adapted to slide in suitable ways formed therein, is mounted.

14. designates the nozzle for supplying the liquid fuel to the interior or mixing chamber of the burner, and which extends downwardly (preferably) a short distance from the top of and within said burner, and having its discharge opening preferably central with and above or opposite the spray or atomizing plate 15. a distance sufficiently great to cause the fluid to fall by its own gravity with a sufficient amount of force against the said plate 15. to finely divide or atomize the fuel. When it is found that the force of gravity is not sufficient to effectually atomize a semi-liquid or viscous body, as crude petroleum, pressure may be used to accelerate the discharge to atomize the body. The spray or atomizing plate 15. is preferably formed integral with the casing of the burner and is made to extend horizontally along a portion of the base opening of the burner equally distant from the ends thereof to form the base openings 16. the combined areas of which may be equal to the maximum area of the air supply or vent opening 10. and will be hereinafter more particularly referred to. The upper portion of the nozzle 14. is provided with an elbow or bend 17. which is connected by a nipple in the usual manner to the valve 18. communication being had with the source of supply of the fuel by means of a suitable connecting or supply pipe 19. shown in Figs. 2. and 3. broken off.

The operation of my apparatus is as follows:—A starting fire, composed of waste or wood shavings saturated with oil, is made in the combustion chamber or hearth of the furnace 9. to which the burner is applied, to rarefy

the air confined therein and thereby produce a natural draft of air through the vent opening 10 of the burner, the gate 13 being opened to its fullest extent as shown particularly in Fig. 3. to permit a free supply of air being admitted to and through the burner into the furnace. The full force of the natural draft having been attained, the valve 18. is gradually opened to permit the requisite amount of fluid or liquid fuel to be supplied to the burner, which supply is regulated according to the intensity of heat required. When liquid fuel or oil is used in connection with this burner, the oil in the course of its fall, is intercepted by the plate 15. against which it impinges, and by the force or moment the fluid has attained in its fall due to gravity or by direct pressure, is sprayed or atomized and scattered over the base openings 16. through which it is carried by the natural draft of the air passing through the burner to the combustion chamber of the furnace 9. said air and liquid fuel commingling to form a perfectly combustible mixture to produce an intense heat in the furnace to which the burner is applied.

It is evident that the volume of air, being thoroughly mixed and saturated with the finely divided particles of fuel in its passage through the burner into the combustion chamber of the furnace, will cause the rate of combustion throughout the hearth of the furnace to be perfectly uniform and the regulation of its intensity is under complete control of the attendant or operator.

It is obvious that means may be employed whereby the fuel may be sprayed or finely divided in its passage through or from the supply nozzle by forming obstructions in the interior thereof or attaching a spraying piece to the discharging mouth of said nozzle in which cases the intercepting plate can be dispensed with. It is also clear that steam or air under pressure may be introduced into the fuel supply nozzle to accelerate the flow of the fuel therefrom and to more thoroughly effect the process of atomization. I do not

confine myself, however, to the specific form of burner herein described, nor to the relative positions of the fuel discharging nozzle and the intercepting plate, as the said nozzle may have its discharge end or opening located either above or beneath, or horizontally and in front of said spray plate provided said supply pipe is so directed to cause the fuel to impinge against the surface of an obstructing body and the said intercepting plate may be placed at any suitable distance above or below the base opening of the burner, and the base plate may be either formed integral with the burner, suspended from the base thereof, or detached therefrom, and supported in any manner in position to intercept the fuel to produce the desired amount of atomization, without departing from the spirit of my invention.

Having thus fully described the nature and operation of my invention, what I claim as new and useful, and desire to cover by Letters Patent of the United States therefor, is—

1. In a fluid fuel burner, the combination of a casing, suitable means for supplying fluid fuel and air to said casing, discharge openings in one side of said casing, and a spraying plate intermediate of said discharge openings.

2. In a fluid fuel burner, the combination with a casing having its base open and an air inlet above said base opening, of a spraying plate extending horizontally and partially along said base to form a duplex opening equal in area to the maximum area of said air inlet and a fluid-supplying nozzle projecting downwardly within said casing and having its discharge opening directly above and central with said plate.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FRANK W. FLANNER.

Witnesses:

THOMPSON R. BELL,
JOHN G. THURTH.