No. 733,693. PATENTED JULY 14, 1903.

J. B. BLADON.

LIQUID FUEL BURNER.

APPLICATION FILED AUG. 25, 1902.

NO MODEL.

FIG. 1.

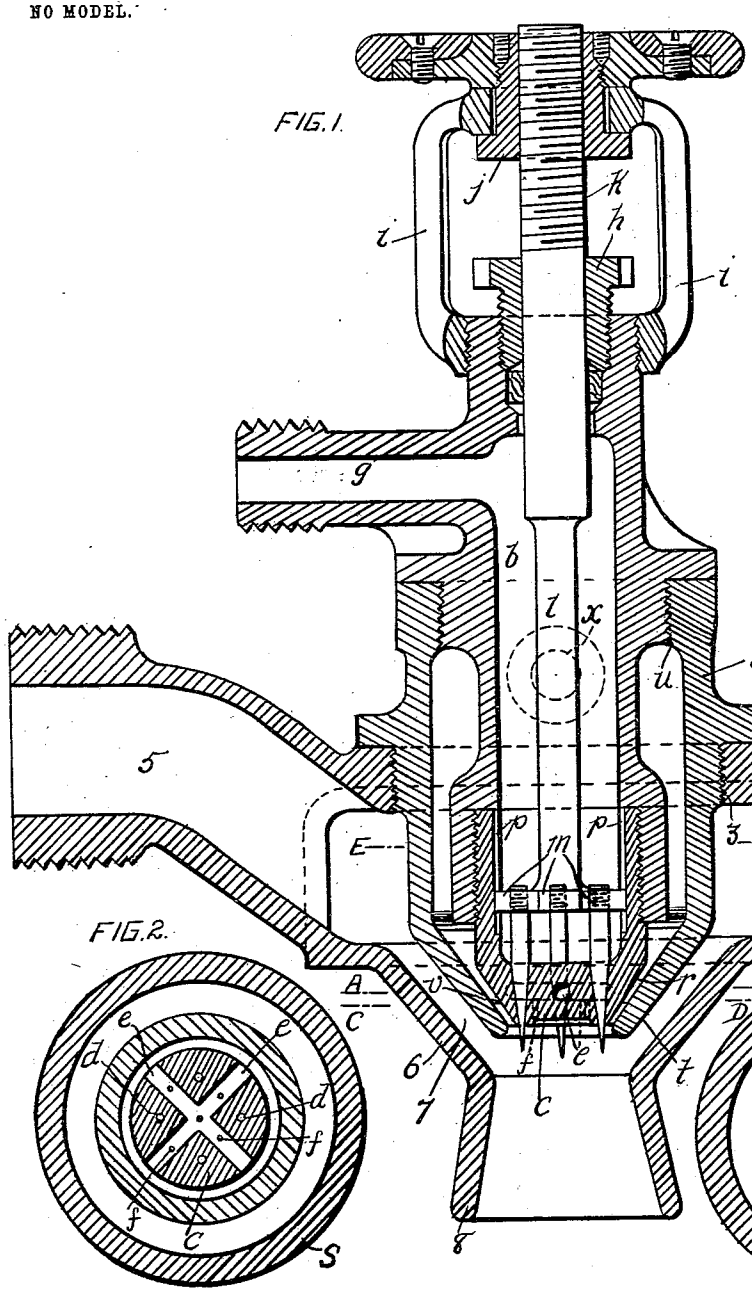


FIG. 4.

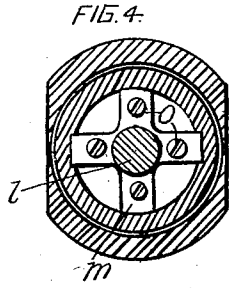
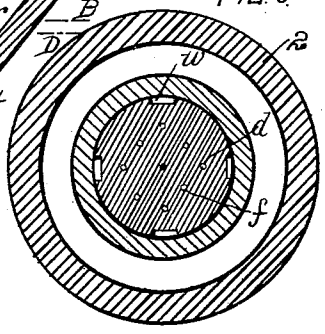


FIG. 2.

FIG. 3.



Witnesses

James B. Bladon

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No. 733,693. Patented July 14, 1903.

UNITED STATES PATENT OFFICE.

JAMES BUCKLEY BLADON, OF MONTREAL, CANADA, ASSIGNOR OF ONE-HALF TO WILLIAM ALEXANDER McKAY, OF MONTREAL, CANADA.

LIQUID-FUEL BURNER.

SPECIFICATION forming part of Letters Patent No. 733,693, dated July 14, 1903.

Application filed August 25, 1902. Serial No. 120,941. (No model.)

To all whom it may concern:

Be it known that I, JAMES BUCKLEY BLADON, of the city of Montreal, district of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Liquid-Fuel Burners; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates particularly to the type of liquid-fuel burners whereby liquid fuel, such as oil, preferably in a heated state, together with a combustion medium, such as steam or compressed air, are caused to mix ready for burning; and it has for its object to more perfectly vaporize the liquid fuel and cause it to be more thoroughly mixed with its combustion medium.

The invention may be said, briefly, to consist in constructing a burner of this type with an elongated oil-chamber having its exit end terminating abruptly in a transverse plate formed with a series of tapered valvular ports controlled by a series of tapered needle-valves carried by a movable stem guided and prevented from turning in said elongated chamber. This chamber is encircled by a jacket, to which a combustion medium is supplied and from which said combustion medium is forced, preferably, through a series of ports. For full comprehension, however, of my invention reference must be had to the accompanying drawings, forming a part of this specification, in which like symbols indicate the same parts, and wherein—

Figure 1 is a longitudinal vertical sectional view of a liquid-fuel burner constructed according to my invention. Fig. 2 is a horizontal sectional view taken on line A B, Fig. 1; and Figs. 3 and 4 are similar views taken on lines C D and E F, respectively, Fig. 1.

The frame of my improved burner comprises an elongated central chamber *b*, having a plate *c* extending transversely to one end and formed with a series of tapered ports *d*, a pair of passages *e* crossing one another and having their ends opening out through the periphery of said end plate, to the outside surface of which a series of ports *f* of diminutive bore, leading from said cross-passages, project. A supply-pipe *g* communicates with the side of the opposite end of said chamber, and a gland *h* is screwed into said end, which is tapped for the purpose, while the exterior thereof is threaded to have a valve-operating handle carrying frame *i* screwed thereon. The handle includes a nut *j* loosely within the frame and has threaded therethrough the shank *k* of a valve-steam *l*, which has a series of four laterally-projecting lugs *m* at its opposite end, into tapped perforations in which the upper threaded ends of a series of four tapered needle-valves *o* are screwed. Two of these lugs are of greater length than the others, and they register with a pair of grooves *p* in the interior and longitudinally of the chamber, and the exterior of the exit end of this chamber is beveled, as at *r*. A cylindrical jacket *s*, with its lower end *t* tapered, incloses this chamber and is secured thereto by having its upper end tapped and screwed upon a threaded portion *u* of the chamber, while an annular flange *v*, having notches *w*, closes the space between the tapered ends of the chamber and jacket except for said notches, which constitute exit-ports, and a supply-pipe *x* communicates with said jacket at the inner end thereof. A second jacket 2 incloses the jacket *s* and is carried thereby by having the interior of one end tapped and screwed upon a threaded portion 3 of said jacket *s*. This second jacket is formed with an annular extension 4, having an air-duct 5 cast in one side thereof, and the portion of this jacket near its end is tapered, as at 6, correspondingly to the tapered end of jacket *s*, but of sufficiently greater diameter to provide a free passage 7, while the end thereof is flared, as at 8, and constitutes the nozzle of the burner.

When in use, the supply-pipe *g* is connected to the liquid-fuel supply, (not shown,) and if steam is to be used as the vaporizing agent the supply-pipe *x* is connected to any available steam-generator, (not shown,) although, if desired, said supply-pipe *x* can be connected to a compressed-air supply, which may be used to advantage under certain circumstances. The steam (or compressed air) finds its way through the ports *w* and the passages *e* and ports *f* and is projected in jets intersecting one another and breaking up and vaporizing the oil-jets projected from the

ports *d*, the oil thus vaporized and the steam (or compressed air) acting as the vaporizing agent, drawing air with them from the jacket 2, and thus when the burner is mounted in place injecting a highly-inflammable and completely-vaporized blast into the combustion-chamber of a furnace or elsewhere to be used.

The complete vaporization of the oil is caused by the division of the body thereof contained in the central chamber into a series of jets and subjecting each of said jets to a series of jets of steam or compressed air, acting thereon from all sides, thereby insuring the complete breaking up of each oil-jet, and consequently all the oil in the blast, into minute particles.

I prefer steam when it is readily available as a vaporizing agent rather than compressed air, because it heats the oil in the chamber and facilitates its vaporization; but compressed air has its advantages in that the burner may then be lighted while cold and the second jacket dispensed with.

Under any circumstances the oil must be held under pressure in its chamber in order to cause it to be projected therefrom in jets.

What I claim is as follows:

1. A liquid-fuel burner comprising an elongated liquid-fuel chamber of greater length in the direction of flow than at right angles thereto and having a liquid-fuel intake at one end and a series of exit-ports at its other end; a series of valves, means for moving said valves into and out of controlling relation with said ports, means for conducting a combustion medium to points adjacent to said ports and a steam-jacket inclosing said liquid-fuel chamber, substantially as described and for the purpose set forth.

2. A liquid-fuel burner comprising an elongated liquid-fuel chamber having a liquid-fuel intake at one end a series of exit-ports at its other end; a series of valves, means for moving said valves into and out of controlling relation with said ports, the metal of the exit end of said chamber having a second series of ports independent of and extending toward said exit-ports, and a conductor for a combustion medium communicating with said second series of ports, substantially as described and for the purpose set forth.

3. A liquid-fuel burner comprising a liquid-fuel chamber having a liquid-fuel intake at one end, a transverse closing part at its other end, said transverse part having a series of exit-ports; a series of valves, means for moving said valves into and out of controlling relation with said ports, said transverse closing part having a second series of ports, and a jacket inclosing said chamber and communicating with said second series of ports and having an intake-port, a second jacket inclosing said last-mentioned jacket and having an exit-port adjacent to the exit-ports of said chamber and other jacket, and a nozzle at the exit end of said second jacket, substantially as described and for the purpose set forth.

4. In a liquid-fuel burner having a series of exit-ports and valves for controlling said ports, of a frame, an interiorly-screw-threaded nut loosely carried by said frame and said frame being carried by the burner, a stem having a portion screw-threaded and extending through said nut and a plate at its opposite end carrying said valves, said burner being formed with a chamber in which the valvular end of said stem is located and with which said series of ports communicate, means for preventing the rotation of said stem, and a handle mounted rigidly upon said nut, substantially as described and for the purpose set forth.

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

JAMES BUCKLEY BLADON.

Witnesses:

WILLIAM P. MCFEAT,

FRED. J. SEARS.