(No Model.)

B. ROBERTS.

FLUID FUEL ATOMIZING AND BURNING APPARATUS.

No. 501,164. Patented July 11, 1893.

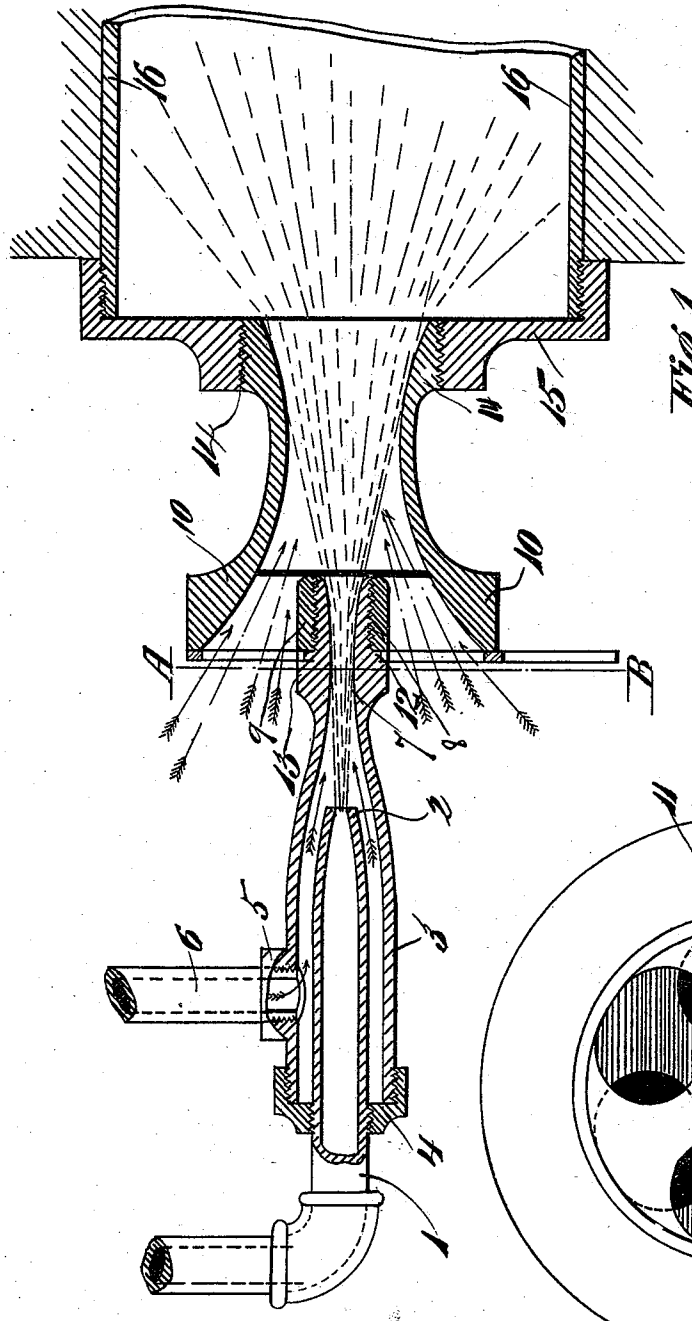

Fig 1

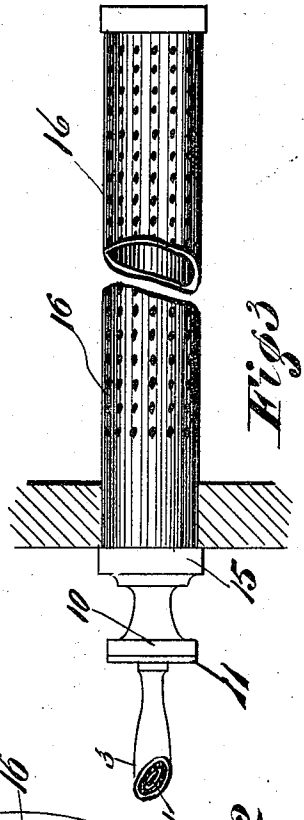

Fig 3

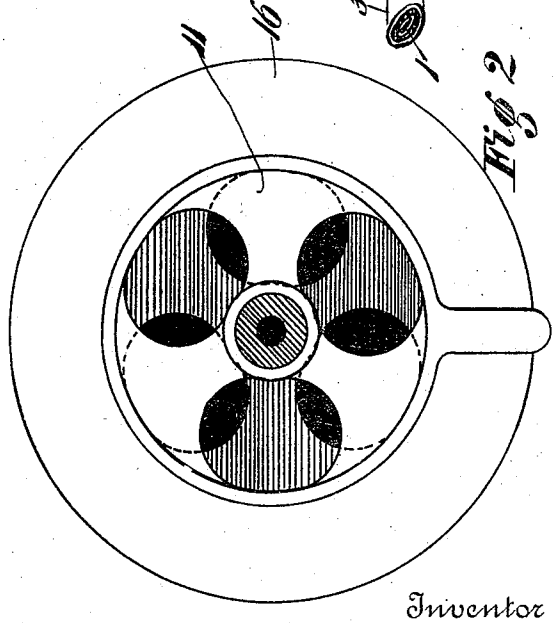

Fig 2

Witnesses

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UNITED STATES PATENT OFFICE.

BENJAMIN ROBERTS, OF INDIANAPOLIS, INDIANA.

FLUID-FUEL ATOMIZING AND BURNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 501,164, dated July 11, 1893.

Application filed January 17, 1893. Serial No. 458,727. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN ROBERTS, 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 Atomizing and Burning Apparatus, of which the following is a specification.

My invention relates to a new and improved apparatus for atomizing liquid or fluid fuel, particularly crude oil, and mixing the atoms or finely divided particles of the fuel with atmospheric air, and finally discharging this semi-gaseous mixture into a perforated chamber from which it escapes through said perforations and is consumed, and will be hereinafter more particularly described.

The objects of my invention are to provide a means whereby the fluid fuel will be readily converted from a liquid to a semigaseous state, of a highly combustible nature, by thoroughly atomizing and mixing said atoms with atmospheric air; also, to provide means whereby the fuel will be first atomized, then mixed with air, and finally discharged into a chamber, or burner to be consumed as a gas. 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 broken sectional side elevation, showing the atomizer, air-mixer, and collecting and distributing chamber or burner. Fig. 2. is a transverse sectional elevation of the same through the line A B. see Fig. 1. and, Fig. 3. is a reduced drawing of the apparatus, showing the burner, and a portion of the atomizer, and mixer attached thereto.

The atomizing apparatus consists of the steam supply nozzle 1. which terminates in the coned or pointed tip 2. inclosed in the oil chamber 3. and secured in or screwed into the end cap 4. of the oil chamber 3. The oil chamber 3. has the boss 5. formed integral thereon and is drilled and tapped or threaded to accurately fit and to receive the threaded end of the fluid supplying pipe 6; said chamber having the interior of its atomizing nozzle or efflux end 7. reduced in the proper proportion to form the proper vena-contracta curve, for the purpose of the more effectually atomizing and effecting the efflux of the atomized fluid passing therethrough. The exterior of the reduced end 8. of the nozzle of the oil-chamber 3. is threaded to neatly and firmly screw into the threaded eye 9. of the air-mixer 10. The profile of the interior of the air-mixer 10. is also curved to conform with the curve of the vena-contracta, and has the register 11. loosely pivoted on the turned neck 12. of the atomizing nozzle, and is held in position thereon by means of the integral collar 13. The opposite end of the mixer is threaded and screwed into the cap 15. of the collecting and distributing chamber or burner 16.

The perforated chamber or burner 16. is inserted and secured in the brickwork of the furnace by which the entire apparatus is held in position; said burner having its opposite end stopped or plugged by means of a suitable cap 18. thereby preventing the semi-gaseous mixture escaping otherwise than through the peripheral perforations of the chamber 16. The atomizing steam is admitted by the steam supply pipe connected to the end of the nozzle 1. and escapes through its reduced end or tip 2. at a high velocity into the throat 7. carrying with it small portions of oil which are broken up into atoms or reduced into a finely divided state in their passage therethrough and into the throat of the mixer 10. where air commingles with the steam and fine atoms of the fluid fuel, all of which semi-gaseous mixture is discharged into the chamber 16. of the burner and escapes therefrom through the numerous peripheral perforations formed in said chamber to be consumed or burned.

It will be readily seen that, with this apparatus the proper amount of air necessary to support combustion can be very readily regulated by means of the register 11. and a flame of intense heat and without smoke can be produced.

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—

In a fluid fuel atomizing and burning apparatus, the combination with a perforated chamber having one end closed, of a steam supply pipe and its nozzle having a reduced

tip, the exterior chamber surrounding said steam nozzle to form an oil chamber and terminating in a reduced throat formed as described and placed in advance of said steam nozzle tip, the air mixer having its interior profile formed as described, and the register 11, pivoted on the end of the atomizing nozzle 12, and having suitable air inlets registering with the similarly formed holes formed in the end of the mixer, all substantially as and for the purpose set forth.

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

BENJAMIN ROBERTS.

Witnesses:

THOMPSON R. BELL,

JNO. GEO. THURBER.