

(No Model.)

B. BRAZELLE.
APPARATUS FOR BURNING FLUID FUEL.

No. 510,153.

Patented Dec. 5, 1893.

FIG. 1.

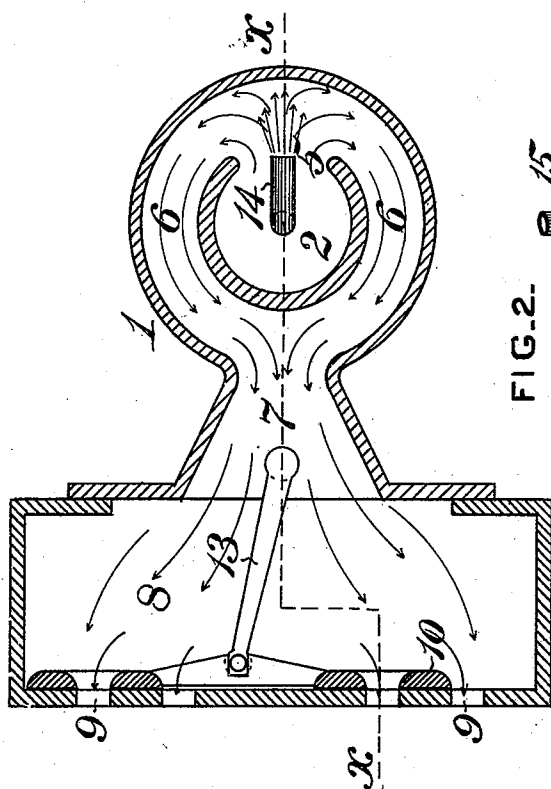


FIG. 2.

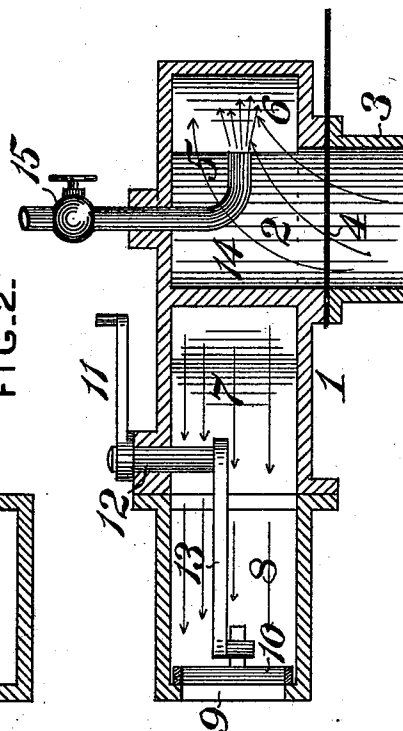
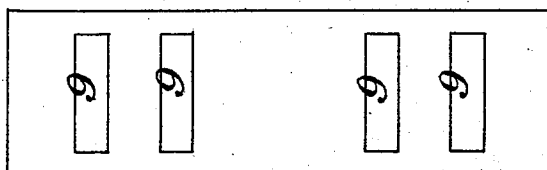


FIG. 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

BENJAMIN BRAZELLE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO FRANK FLANNER, OF INDIANAPOLIS, INDIANA.

APPARATUS FOR BURNING FLUID FUEL.

SPECIFICATION forming part of Letters Patent No. 510,153, dated December 5, 1893.

Application filed February 28, 1893. Serial No. 464,058. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN BRAZELLE, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Apparatus for Burning Fluid Fuel, of which improvement the following is a specification.

My invention relates to the combustion of liquid and gaseous fuels, for the generation of heat in various industrial operations, and its object is to economize, perfect and control the admixture of fuels of such character with air, and their proper distribution and delivery to a furnace or combustion chamber.

To this end, my invention, generally stated, consists in certain novel combinations of devices constituting an apparatus for mixing air and fluid fuel, distributing such mixture within a chamber, and controlling the discharge of the mixture to the point of combustion.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings: Figure 1 is a vertical longitudinal section through an apparatus adapted to the practice of my invention; Fig. 2, a transverse section at the line x, x , of Fig. 1, and Fig. 3, an end view showing the discharge ports.

In the practice of my invention I provide a metallic case 1, having a central receiving chamber 2, which is closed at one end and communicates at the other end with an air inlet pipe 3 leading from a fan or pressure blower and controlled by a valve or gate 4. The chamber 2 communicates by a lateral outlet 5, with an annular mixing chamber 6, by which it is surrounded, the chamber 6 having a throat or outlet 7, which is located about in line longitudinally with the outlet 5 of the chamber 2, but on its side farthest therefrom, so that the body of metal which forms the shell of the chamber 2 is directly interposed between the outlets 5 and 7, and communication between said outlets can be effected only around said shell. The outlet 7 of the mixing chamber 6, leads into a distributing and delivery chamber 8, on the opposite side of which is formed a series of outlet ports 9, which are controlled by a gridiron sliding valve 10, actuated by a handle 11 on one end

of a rock shaft 12 journaled on the case 1, the opposite end of the rock shaft carrying an arm 13, which is coupled to the valve. An oil or gas supply pipe 14, controlled by a valve 15 leads into the receiving chamber 2, its open discharge end being located in or near the lateral outlet 5 of the chamber 2.

In the operation of an apparatus substantially as above described, an opening is cut through the wall of the furnace or heating chamber in which combustion is desired, as for heating iron, generating steam, or other use. The portion of the case 1 which incloses the distributing and delivery chamber 8 is inserted into the opening; and the air inlet 3 and fuel supply pipe 14, are respectively connected to suitable sources of supply. The air inlet valve 4, and the valve 15 of the fuel supply pipe 14 are opened, and the air and fluid fuel which meet in the mixing chamber are mingled together therein at a point opposite the outlet 5 of the central receiving chamber, and the mixture, being forced against and deflected from the opposite wall of the case 1, is divided into two currents which pass through the annular space in the mixing chamber and reunite at the outlet 7 thereof, from which they pass into the distributing and delivery chamber 8, and are thence discharged through the outlet ports 9, into the furnace or combustion chamber in which they are ignited and burned; their discharge being controlled, as desired, by the valve 10.

The apparatus above described while adapted to provide for the combustion of gaseous fuel with great advantage, is designed more particularly for use with oil fuel, such as petroleum, and is also designed to obviate and overcome the objections and difficulties which have been found to obtain in burning oil when using the appliances heretofore generally known and employed for the purpose.

In the operation of prior devices, so far as my knowledge and information extend, both the admission of the air and oil and the discharge of the mixture thereof are controlled entirely by the inlet or supply valves, and when the apparatus is worked at its maximum capacity, the mixture of oil and air is delivered at a high velocity and under more

or less compression, and if allowed to impinge upon the linings of furnaces, or upon metal which is to be heated, it injuriously cuts and oxidizes the same. When working at minimum capacity, the partial closure of the inlet or supply valves, so far reduces the velocity of the mixture delivered to the furnace that the mixture burns too close to the mixing device and burner, rapidly deteriorating the latter and rendering frequent renewals necessary. The above objections I have found to be fully overcome by my improvement.

A pressure of air of about six ounces is preferably used, and the valves 4, 15, and 10 being opened, the mingled air and oil, or air and gas, passes from the mixing chamber to the distributing and delivery chamber and thence through the fully open ports 9 into the furnace where it is ignited and burned.

The high velocity and excess supply if any, of the combustible mixture may be checked and regulated, and a maximum pressure of six ounces per square inch maintained in the chamber 8, by partially closing the outlet ports 9 by the valve 10. When it is desired to reduce the heat in the furnace or to work the apparatus at its minimum capacity, then the valve 10 may be moved so as to close the ports 9 still further, thereby reducing the delivery and maintaining the maximum pressure in the chamber 8, which prevents any tendency of the flame to enter or burn the apparatus. The opening or closure of the ports 9 should be accompanied by a corresponding regulation of the air and fuel supply valves.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, in an apparatus for burning fluid fuels of means for forcing air and fluid fuel together and commingling them, means for causing the mixture to be expanded and distributed prior to its delivery, means for discharging it to a point of ignition and combustion and means for regulating and controlling the delivery at the point of discharge, substantially as set forth.

2. The combination, in an apparatus for burning fluid fuels of means for forcing air and fluid fuel together and commingling them, then dividing the mixture into separate currents, means for reuniting these separate currents and causing the mixture to be expanded

and distributed prior to its delivery, means for discharging it to a point of ignition and combustion and means for regulating and controlling the delivery at the point of discharge, substantially as set forth.

3. The combination, in an apparatus for burning fluid fuel, of a case having a central receiving chamber, an annular mixing chamber with which the receiving chamber communicates by a lateral outlet, a distributing and delivery chamber communicating with the mixing chamber and provided with discharge ports or openings, air and fuel supply pipes discharging into the mixing chamber adjacent to the outlet of the receiving chamber, and a valve controlling the discharge ports of the distributing and delivery chamber, substantially as set forth.

4. The combination, in an apparatus for burning fluid fuel, of a case having a central receiving chamber, an annular mixing chamber with which the receiving chamber communicates by a lateral outlet, a distributing and delivery chamber communicating with the mixing chamber and provided with discharge ports or openings, air and fuel supply pipes discharging into the mixing chamber adjacent to the outlet of the receiving chamber, valves controlling said air and fuel supply pipes, and a valve controlling the discharge ports of the distributing and delivery chamber, substantially as set forth.

5. The combination, in an apparatus for burning fluid fuel, of a case having a central receiving chamber provided with a lateral outlet, a valve governed air supply pipe leading into one end of the receiving chamber, an annular mixing chamber formed in the case and surrounding the receiving chamber, a throat or outlet leading from the side of the mixing chamber farthest from the outlet of the receiving chamber, a distributing and delivery chamber communicating with said throat, and provided with discharge openings or ports, a valve controlling said ports, and a valve governed fuel supply pipe discharging into the mixing chamber adjacent to the lateral outlet of the receiving chamber, substantially as set forth.

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