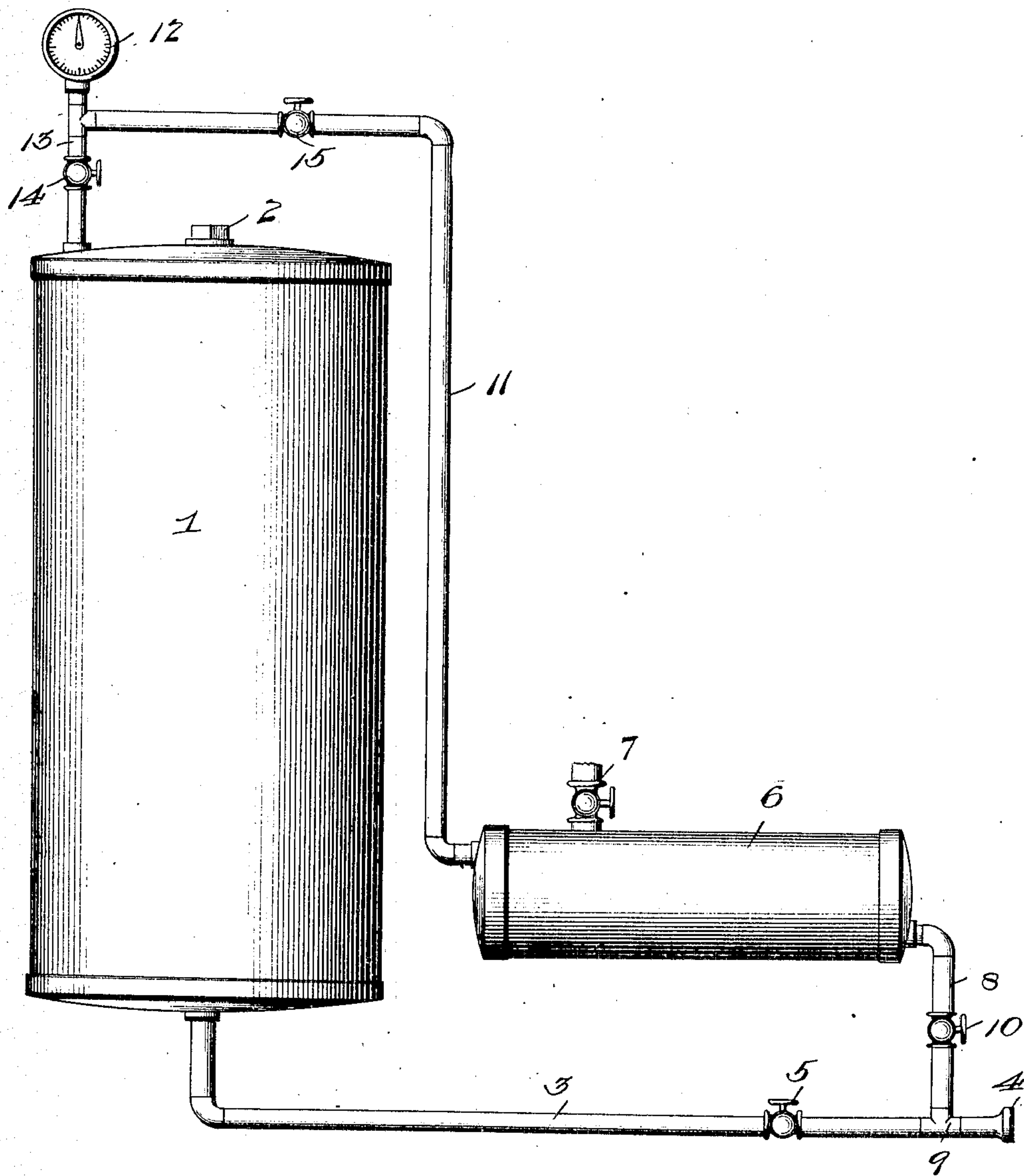


No. 860,419

PATENTED JULY 16, 1907.

J. F. STAFFORD.
APPARATUS FOR BURNING CRUDE PETROLEUM.
APPLICATION FILED DEC. 29, 1905.



Witnesses
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UNITED STATES PATENT OFFICE.

JEROME F. STAFFORD, OF MINNEAPOLIS, KANSAS.

APPARATUS FOR BURNING CRUDE PETROLEUM.

No. 860,419.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed December 29, 1905. Serial No. 293,808.

To all whom it may concern:

Be it known that I, JEROME F. STAFFORD, of Minneapolis, in the county of Ottawa, State of Kansas, have invented certain new and useful Improvements in
5 Apparatus for Burning Crude Petroleum, of which the following is a specification.

The object of my invention is to produce a preferred form of apparatus for the practice of my process or method described in co-pending application, Serial
10 Number 293,807 filed Dec. 29, 1905.

In the application above referred to, the principle of my invention consists in introducing an oxygenous fluid, under pressure, into a confined stream of crude petroleum, or the like, at a point adjacent to but re-
15 moved from its point of combustion.

My present application is intended to comprehend apparatus for the carrying out of that process in simple and, therefore, preferred form of embodiment.

Referring to the accompanying drawing, which constitutes a part of this application and in which a view in side elevation of a preferred form of my apparatus is shown.
20

1 indicates an air-tight tank or reservoir of any desired capacity for holding a supply of crude oil. It is
25 provided with a filling-plug 2, which when in place renders the tank 1 air-tight, but which may be removed for replenishing the tank with oil as often as required. From the bottom of the tank 1 an oil-supply pipe 3 leads to a jet or burner 4, which is also designated as a point
30 of combustion. The burner 4 may be of any desired construction adapted to deliver oil from the pipe 3 in combustible form. It may be located also at any convenient point and as far removed from the tank 1 as convenience may dictate. The illustration presented in
35 the drawing is intended to be only diagrammatical and of suggestive scope sufficient to afford full explication of the principle of my invention.

The pipe 3 is preferably provided with a valve 5 by which the flow through the pipe 3 may be regulated or
40 completely interrupted, at will.

6 indicates an air-tank of any suitable form and dimensions. It is provided with a valve-controlled filling nipple 7, to which a compressor may be connected at will, and it is connected as by a pipe 8 with the
45 pipe 3. The point of connection indicated by the numeral 9 of the pipe 8 with the pipe 3 is preferably between the valve 5 and the burner 4; but it is essential to my process that the point 9 should be located at a distance, preferably in practice a few inches, from the
50 burner 4, so that air under pressure confined within the tank 6 and pipe 8 may be discharged into the body of oil contained within the pipe 3, thereby at the same time subjecting it to pressure by which in passing through the burner 4 it may be comminuted and at
55 the same time supplied with oxygen for the support of its combustion and the promotion of said combus-

tion to substantially the highest degree of completeness.

The pipe 8 is preferably provided with a valve 10 for control or interruption of the supply of air, as desired. 60

I also prefer to provide a pipe 11, affording communication between the tank 6 and the upper end of the tank 1, by means of which air pressure may be supplied to the tank 1 for cleaning it and blowing out the residue, as well as for supplying a force-feed behind the oil con- 65 tained within the tank 1, if the viscosity of the oil render employment of a force-feed necessary or desirable. I also prefer to employ a pressure-gage 12 in connection with the pipe 11 adapted to register the air pressure communicated from the reservoir 6. The pressure-gage 70 is preferably carried upon a branch 13 of the pipe 11, which, upon opposite sides of said branch, is preferably provided with valves 14 and 15, by which the gage 12 may be independently shut off from communication with the tank 1 or the tank 6, at will. 75

From the foregoing specification, the following statement of what constitutes my invention will, it is believed, be clearly intelligible. My invention is based upon the introduction of an oxygenous fluid, under pressure, into a confined stream of oil a short distance 80 before it reaches the point of combustion, which is also the point of its liberation from confinement.

It is found in practice that the result of the process herein defined in the discharge of the oil from the burner, indicated by the numeral 4 in the drawing, in finely 85 comminuted form, or in spray, with the result that a perfect combustion of the oil ensues. The result of discharging the oxygenous fluid into the confined stream of oil at a point approximate to but well removed from the burner 4 is distinct from that obtained by mere 90 atomization, or by atomization derived from discharge of air against or into the oil at its point of liberation. Atomization or comminution of the oil might be derived by pressure only, such as might be produced from discharge of the pipe 11 into the tank 1, for in- 95 stance, and atomization of an air current discharged against the oil at its point of liberation is known in the art. From either or both of these methods my invention is distinguished, both in the mode of operation and in the results obtained. 100

What I claim is:

1. In apparatus for burning crude petroleum or the like, the combination with an oil tank, burner, and oil pipe leading from said tank to burner, of means to supply air or like oxygenous fluid to the oil while yet in liquid 105 form and confined in the pipe before it reaches the burner.
2. In apparatus for burning crude petroleum or the like, the combination with an oil tank, burner, and oil pipe leading from said tank to burner, of means for supplying a force feed of the oil from the tank, and means to supply 110 air or like oxygenous fluid to the oil while yet in liquid form and confined in the pipe before it reaches the burner.
3. In apparatus for burning crude petroleum or the like, the combination with an airtight oil tank, burner, and oil

pipe leading from said tank to burner, of means of supplying compressed air or like oxygenous fluid into the oil pipe between the tank and the burner, and means of supplying compressed air to the tank for feeding the oil
5 thence to the oil pipe.

4. In apparatus for burning crude petroleum or the like, the combination with an oil tank, burner, and oil pipe leading from said tank to burner, of means for feeding the oil from the tank, means of supplying air or like oxygen-

ous fluid to the oil while yet in liquid form and confined 10 in the pipe before it reaches the burner, and means for regulating the flow of oil and air, respectively.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JEROME F. STAFFORD.

Witnesses:

EARL C. SWEET,
J. E. JOHNSTON.

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