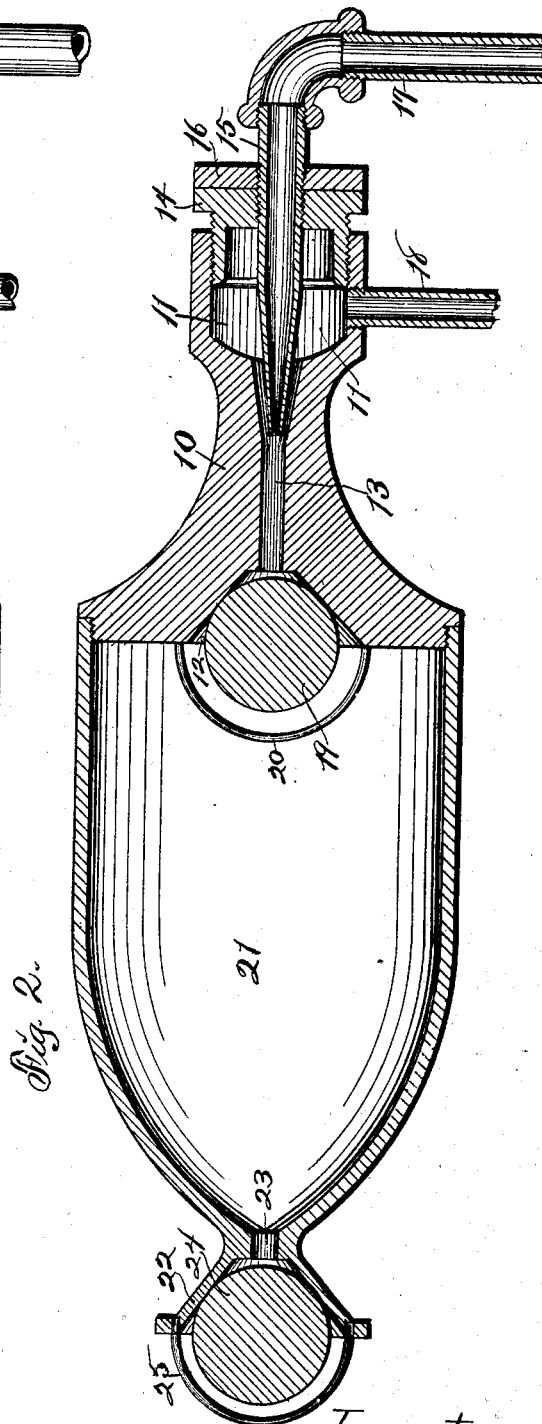
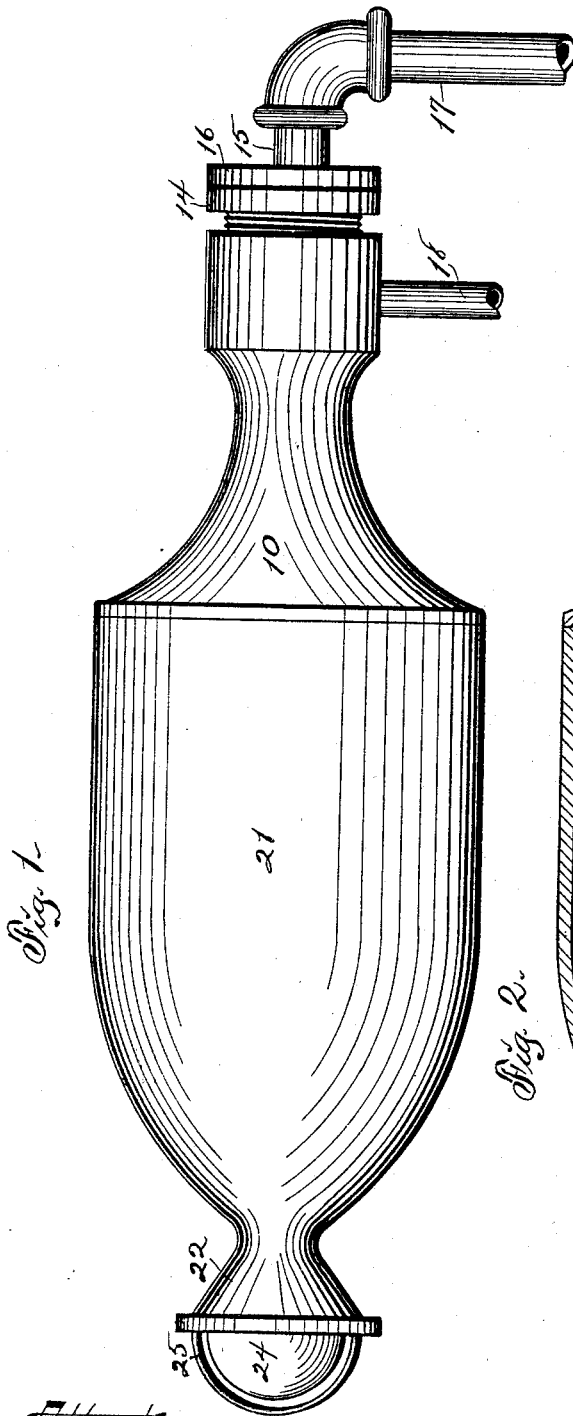


No. 719,573.

PATENTED FEB. 3, 1903.

R. B. FAGEOL.
CRUDE PETROLEUM BURNER.
APPLICATION FILED APR. 18, 1902.

NO MODEL.



Attest.

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CRUDE-PETROLEUM BURNER.

SPECIFICATION forming part of Letters Patent No. 719,573, dated February 3, 1903.

Application filed April 18, 1902. Serial No. 103,500. (No model.)

To all whom it may concern:

Be it known that I, ROLLIE B. FAGEOL, a citizen of the United States of America, and a resident of Des Moines, Polk county, Iowa, have invented a new and useful Crude-Petroleum Burner, of which the following is a specification.

The object of this invention is to provide improved means for vaporizing crude petroleum, mixing the vapor with superheated steam, and discharging the gas formed by the mixture into a furnace-chamber in which said gas will burn and supply heat to a steam-boiler or other apparatus.

My invention consists in the construction, arrangement, and combination of elements hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a side view of the complete burner. Fig. 2 is a longitudinal sectional view of the burner centrally of Fig. 1.

In the construction of the device as shown the numeral 10 designates a stem or body portion formed with a recess or cavity 11 in one end portion, a frustum-shaped recess or mouth 12 in the opposite end portion, and a bore, passage, or conduit 13, extending longitudinally through its central portion and connecting the recess 11 to the mouth 12. The initial end portion of the bore 13 is slightly frustum-shaped and the remainder of said bore preferably is cylindrical in form. A cap or plug 14 is screwed into the recessed end portion of the stem 10, and a steam-nozzle 15 of reducing character is screw-seated in and extends through the central portion of the cap. A lock-nut 16 on the nozzle 15 contacts with the outer face of the cap and locks the nozzle thereto. The body portion of the nozzle 15 is cylindrical in form, and the forward end portion of said nozzle tapers or is reduced in diameter and enters, but does not fill, the frustum-shaped rear end portion of the bore 13 of the stem 10. A steam-supply pipe 17 is attached to and communicates with the outer end portion of the steam-nozzle 15 and leads from a source of steam-supply. (Not shown.) An oil-supply pipe 18 is mounted with one end portion extending through the stem and communicates with the recess 11 therein and

leads from a source of supply of crude petroleum. (Not shown.) Thus it will be seen that the recess 11 forms an oil chamber or receptacle within the stem 10 of the burner and at the rear of the bore 13. A ball 19 is mounted loosely in the mouth 12 of the stem 10, and a keeper 20 is arched across and spaced from the ball and has its end portions fixed in the stem at diametrically opposite points on either side of the mouth. It is the function of the keeper 20 to permit a sufficient play of the ball 19 and yet retain said ball against removal from the mouth 12. A mixing-chamber 21 is screwed or otherwise fixed to and extends forward from the stem 10 and incloses the ball 19 and keeper 20. The rear portion of the mixing-chamber 21 is cylindrical in form and the forward end portion thereof is tapered or reduced in diameter. A bell-shaped mouth portion 22 is formed on the forward end of the mixing-chamber and communicates therewith through a discharge-port 23 in the neck between the bell-shaped mouth portion and the reduced end portion of the mixing-chamber. A ball 24 is mounted loosely in the bell-shaped mouth portion or nozzle 22, and a keeper 25 is arched across and spaced from said ball and has its end portions seated in the rim of the mouth portion. It is the function of the keeper 25 to allow sufficient play of the ball 24 and at the same time prevent the removal thereof from the mouth portion.

In practical use the crude petroleum is admitted to the recess 11 through the pipe 18 and steam is forced through the nozzle 15 from the pipe 17 and discharged through the bore 13 at high velocity. In its passage through the bore 13 the steam creates a suction in the space surrounding the smaller end portion of the nozzle 15, that sucks and draws the oil from the recess 11. Then the steam and oil conjunctively strikes the ball 19 and passes around the ball and into the mixing-chamber in broken or sprayed condition. In the mixing-chamber 21 the steam and oil is swirled, agitated, and thoroughly commingled by the action of the currents of steam force contacting with the reducing-walls of the chamber and at the same time are superheated and vaporized in the chamber by rea-

son of the close proximity of the flame thereto, as hereinafter will appear. The gas formed by commingling the superheated steam and vaporized oil in the mixing-chamber is discharged through the port 23 against the ball 24 and travels around the ball and escapes under great pressure or force and in sprayed or broken condition from the mouth or nozzle portion 22. The gas is ignited adjacent the mouth or nozzle portion 22 and burns at a distance from the burner with a fierce and intense flame, which gives forth great heat.

This burner is intended for use in a furnace-chamber or fire-box, and the number of burners installed in relation to a given furnace or fire-box would be proportioned to the area to be heated and the character of the plant in which it is employed. The proximity of the flame to the mixing-chamber and the location of the mixing-chamber in a furnace-chamber or fire-box insures the application of sufficient heat to said chamber to thoroughly vaporize the oil and superheat the steam therein coincident with the formation or generation of the gas produced by commingling said vapor and steam.

I claim as my invention—

1. The crude-petroleum burner, comprising the stem, formed with a recess at its rear end and flaring mouth at its forward end, and a passage communicating between said recess and mouth, the rear portion of said passage being frustum-shaped, the steam-nozzle, tapering at its forward end and crossing the recess and entering the frustum-shaped rear end portion of the passage of the stem, said nozzle centrally located in the recess and passage and having its periphery spaced apart from the inner surface of the rear end portion of the passage, the oil-pipe communicating with the recess of the stem, the ball mounted loosely in the flaring mouth of the

stem, means for retaining said ball against removal from the flaring mouth, the mixing-chamber, fixed to the extremity of the stem, the body portion of the mixing-chamber cylindrically formed and the forward end portion thereof tapering or reducing in diameter, the reduced neck portion on the forward end of the mixing-chamber and formed with a port communicating with the cavity of the mixing-chamber, the flaring mouth formed in the reduced neck portion of the mixing-chamber, the ball mounted loosely in said flaring mouth, and means for retaining said ball against removal from the flaring mouth.

2. The crude-petroleum burner, comprising the stem, formed in one piece and provided with an oil-chamber or cavity in its rear end, a flaring mouth in its forward end and a passage communicating between said flaring mouth and cavity, an oil-pipe communicating directly with the cavity of the stem, the steam-nozzle mounted axially in the cavity of the stem, the forward end of the steam-nozzle reduced in diameter, tapered and extended within the rear end portion of the passage between the cavity and flaring mouth, means for closing the rear end of the stem around the steam-nozzle, the ball loosely mounted in the flaring mouth of the stem, the keeper inclosing said ball, the mixing-chamber mounted on the forward end of the stem and formed generally cylindrical, tapering to its forward end, the discharge-nozzle on the extremity of the mixing-chamber and communicating therewith through a port, the ball loosely mounted in the discharge-nozzle, and the keeper inclosing said ball.

Signed by me at Des Moines, Iowa, this 1st day of March, 1902.

ROLLIE B. FAGEOL.

Witnesses:

F. R. FAGEOL,
HENRY H. GRIFFITHS.