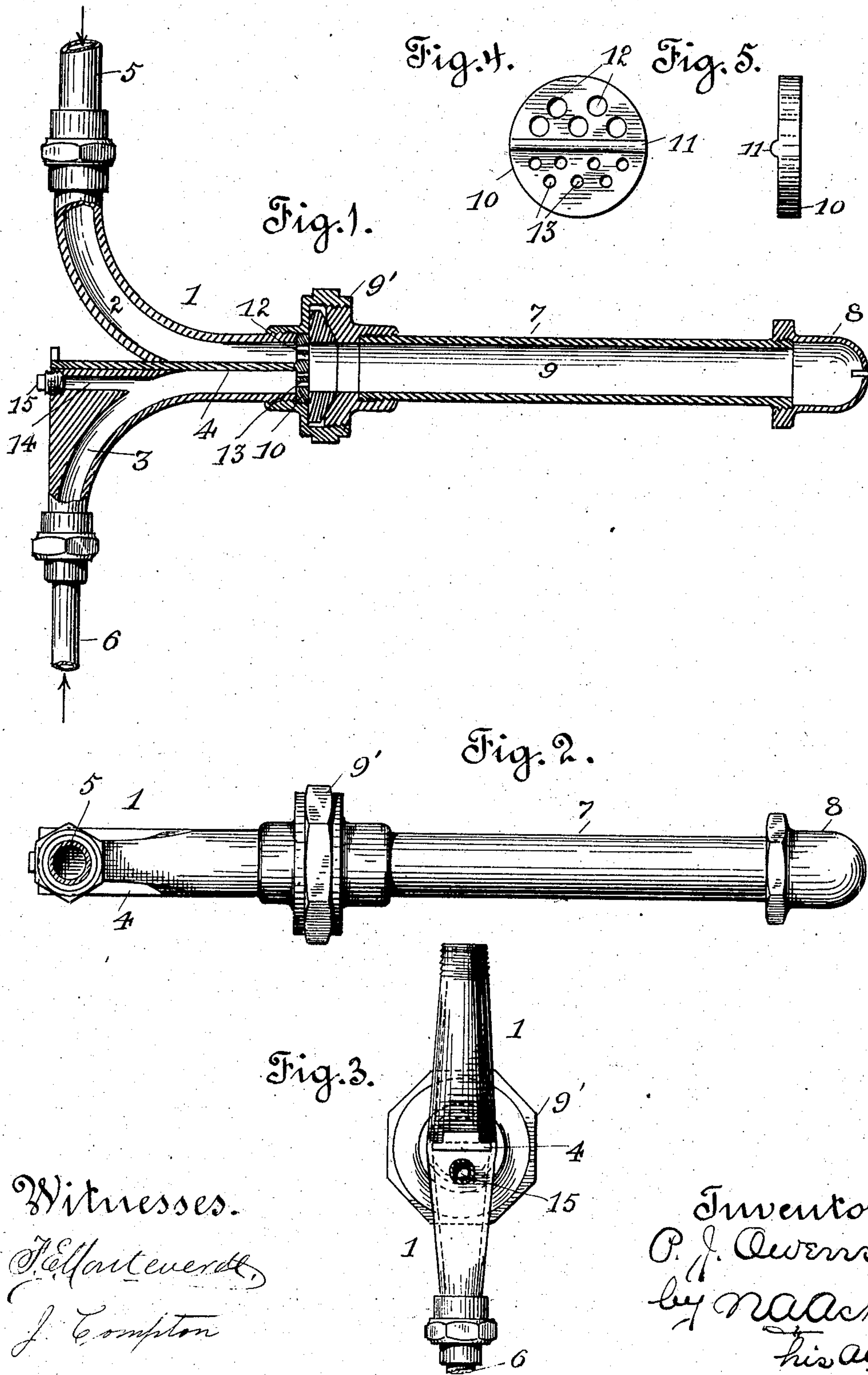


No. 791,205.

PATENTED MAY 30, 1905.

P. J. OWENS.
HYDROCARBON BURNER.
APPLICATION FILED NOV. 3, 1904.



Witnesses.
J. Hart Everett,
J. Compton

Inventor.
P. J. Owens
by N. A. Allen
his atty

UNITED STATES PATENT OFFICE.

PETER J. OWENS, OF SAN FRANCISCO, CALIFORNIA.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 791,205, dated May 30, 1905.

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To all whom it may concern:

Be it known that I, PETER J. OWENS, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented new and useful Improvements in Hydrocarbon-Burners; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates to an improved burner for the formation of a mixed vaporous gas by the combining of either crude, refined, light, or heavy oils with steam or air in order that the same may be burned within a furnace for heating purposes.

The object sought to be accomplished is the perfect combustion of the fuel; hence the greatest quantity of heat, which object is attained by the intermixing of jets of steam or air with jets of oil within a gas forming or mixing chamber, so that the combined mixture is converted into a fuel-gas well back of the outlet-orifice of the burner-tip in order that the escape from the gas forming or mixing chamber will be that of a perfectly-formed gas.

To comprehend the invention, reference should be had to the accompanying sheet of drawings, wherein—

Figure 1 is a longitudinal sectional view of the burner in side elevation, disclosing the construction and arrangement of the various parts. Fig. 2 is a top plan view of the burner. Fig. 3 is a rear end view thereof in elevation. Fig. 4 is a plan view of the perforated disk or diaphragm through which the steam and oil passes or flows into the gas forming or mixing chamber, and Fig. 5 is an edge view of the said perforated disk or diaphragm.

In the drawings the numeral 1 is used to designate what shall hereinafter be termed a "feed-union," which union is formed with a steam passage-way 2, and an oil passage-way 3, said passage-ways being separated by the partition-wall 4. With the passage-way 2 communicates the steam-pipe 5, and with the passage-way 3 communicates the oil-feed pipe 6.

In advance of the feed-union 1 is arranged or located the shell 7, to the outer end of which is attached the slotted burner-tip 8. The in-

terior of the shell 7 constitutes a mixing or gas-forming chamber 9, within which the oil and steam or air commingles as delivered from the feed-union 1. The shell 7 is secured to the feed-union 1 by means of the coupling-ring 9', there being interposed between the outer end of the union and the inner end of the shell the disk or diaphragm 10. This disk is provided with a transverse rib 11 on one face thereof, against which rib abuts the end of the partition-wall 4 of the feed-union.

The steam flowing through the passage-way 2 from the pipe 5 enters the chamber 9 in a series of distinct jets, the solid stream being broken by passing through a series of perforations 12, formed in the upper half of the disk or diaphragm 10 or above the rib 11, while the oil is admitted into the chamber 9 from the oil passage-way 3 through a series of smaller perforations 13, formed in the lower half of the disk or diaphragm 10 or below the rib 11. It will be understood that the sizes of the perforations 12 and 13 are so proportioned that only the requisite quantity of oil and steam for proper combustion enters into said chamber 9.

By discharging the oil and steam into the chamber 9 in the form of spray or minute jet-streams the same quickly commingles and vaporizes into a gas at a point adjacent the disk or diaphragm 10, so that the discharge from the said chamber is fixed gas. Hence approximately perfect combustion takes place at the moment of ignition. This results in economy of the oil fuel, inasmuch as there is no loss by reason of non-combustion, besides preventing the disagreeable suction noise which is generally present in the use of burners of this character.

The admission of the oil and the steam into the mixing or gas chamber in the form of series of distinct jets of oil and steam and the commingling of such jets and the conversion of the commingled atoms into a gas at a point remote from the outlet-orifice of the discharge tip of the burner is believed to be new and novel in the class of hydrocarbon-burners.

For the purpose of cleaning the oil passage-way 3 of dirt and sediment, which tends to foul the same and clog the outlet-perforations

13 for the escape of the oil, there is a bore 14 in the rear portion of the feed-union, Fig. 1 of the drawings, which communicates with the said oil passage-way. This bore or cleaning passage-way 14 is closed by a plug 15, which screws therein. To clean the oil passage-way, the plug 15 is removed, when a cleaning-tool may be inserted within said passage-way through the bore 14, or a steam-pipe may be connected to the screw-threaded end of the bore, so as to permit of a jet of steam being admitted under pressure into the oil passage-way for the cleaning thereof.

It will be readily noted that there are no complicated parts to get out of order in the described burner, nor are the parts utilized of an expensive character. In fact, the parts are mainly of stock material, and for such reason the burner is an exceedingly inexpensive one of manufacture. Inasmuch as the parts of the burner may be easily and quickly separated, it only being required to disconnect the coupling-ring 9', repairs thereto may be readily made and at but little loss of time and expense.

Having thus described the invention, what is claimed as new, and desired to be protected by Letters Patent, is—

1. In a hydrocarbon-burner, the combination with the feed-union having an oil passage-way and a steam passage-way formed therein, said passage-ways being separated by a partition-wall, of a mixing or gas-forming chamber communicating with the passage-ways of the feed-union, a coupling for uniting the shell of the mixing or gas-forming chamber to the feed-union, and a disk or diaphragm interposed between the feed-union and the mixing or gas-forming chamber, said disk or diaphragm abutting said partition-wall and being provided with a series of perforations above and below the separating partition-wall of the feed-union, through which perforations the oil and steam enters the mixing or gas-forming chamber.

2. In a hydrocarbon-burner, the combination with a feed-union, of steam and oil passage-ways formed therein and having aligned outlets, a longitudinally-extended partition separating said passages a mixing or gas-form-

ing chamber in advance of the feed-union, and a disk or diaphragm interposed between the said passage-ways and the chamber, said disk or diaphragm abutting said partition and being provided with a series of perforations for admitting of oil and steam into the mixing-chamber in distinct jets, and an outlet-tip connected to the shell of the mixing-chamber, said tip being located a distance beyond the perforated disk or diaphragm.

3. In a hydrocarbon-burner, the combination with a feed-union composed of oppositely-disposed oil and steam passage-ways separated by a longitudinally-extending portion, all of said parts being separable, a relatively extended mixing-tube communicating with the respective passages of the feed-union, a disk separating the feed-union from said tube and abutting against said partition, said disk having a series of openings above and below the partition; and a coupling member for connecting the two sections of the feed-union together and to said mixing-tube.

4. In a hydrocarbon-burner, the combination with a feed-union comprising oppositely-disposed oil and steam passage-ways separated by a longitudinally-extended partition, of a connected mixing-tube and burner and a transversely-arranged disk separating said passages from the mixing-tube, said disk having a central rib abutting said longitudinally-extended partition, and a plurality of apertures above and below the rib.

5. In a hydrocarbon-burner, the combination with a feed-union comprising oppositely-disposed oil and steam passage-ways separated by a longitudinally-extended partition, of a connected mixing-tube and burner and a transversely-arranged disk separating said passages from the mixing-tube, said disk having a plurality of apertures adjacent the oil-outlet and a plurality of relatively large apertures adjacent the steam-outlet.

In witness whereof I have hereunto set my hand.

PETER J. OWENS.

Witnesses:

N. A. ACKER,

D. B. RICHARDS.