

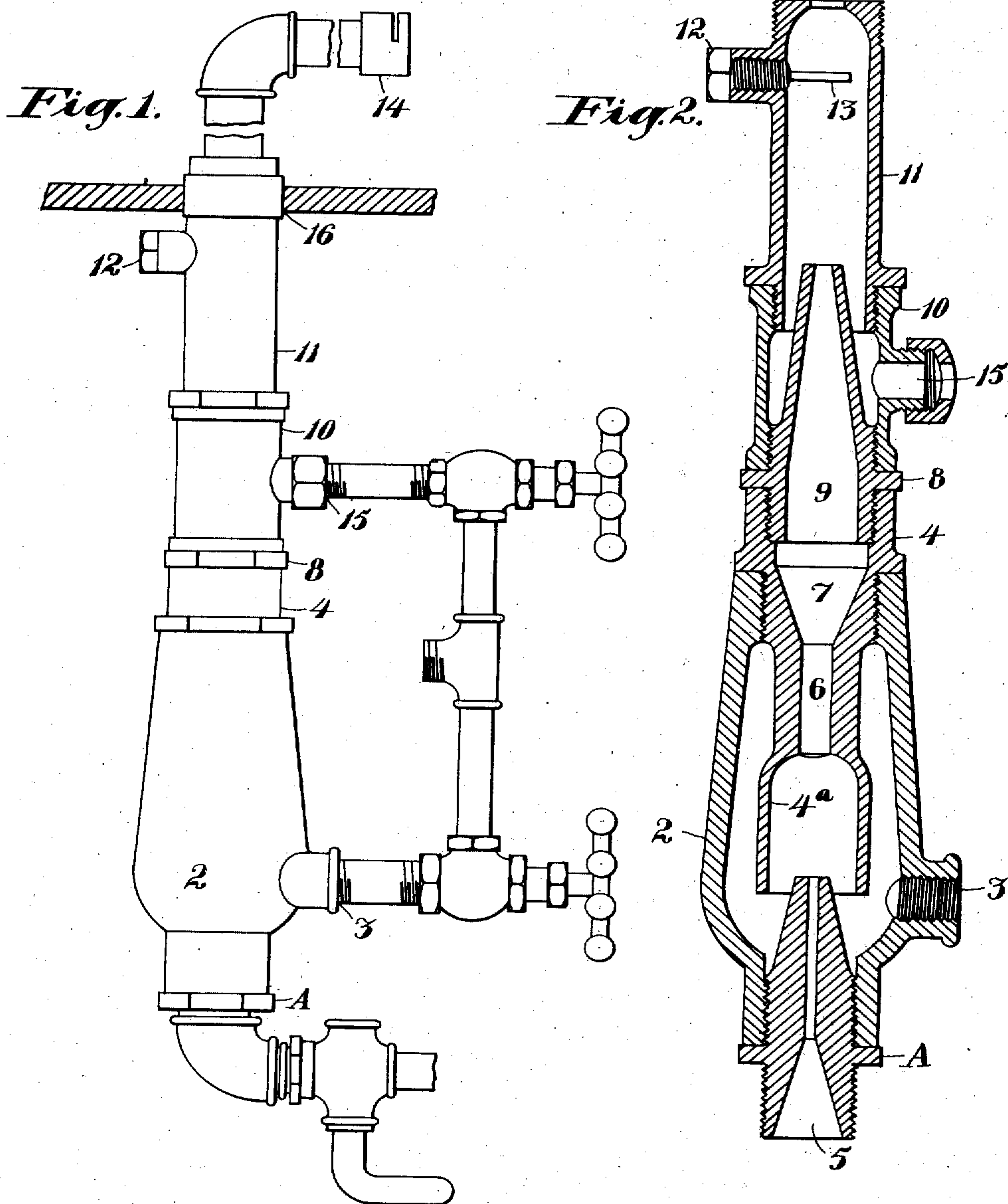
No. 736,664.

PATENTED AUG. 18, 1903.

T. WILLIAMS.
OIL BURNER.

APPLICATION FILED MAY 26, 1903.

NO MODEL.



WITNESSES:

F. C. Fiedner
J. A. Noyce

INVENTOR.
Thomas Williams
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UNITED STATES PATENT OFFICE.

THOMAS WILLIAMS, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO CAESAR R. SPLIRALO, OF SAN FRANCISCO, CALIFORNIA.

OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 736,664, dated August 18, 1903.

Application filed May 26, 1903. Serial No. 158,797. (No model.)

To all whom it may concern:

Be it known that I, THOMAS WILLIAMS, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Oil-Burners; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus for the preparation and combustion of hydrocarbon oils.

It consists in the combination of a shell with oil and steam supply nozzles, an anterior mixing-chamber, a second large chamber with a contracted connection between the two, a final chamber and a nozzle-discharge thereinto, and a second steam-inlet passage acting upon and with the products received at this point and previous to their delivery to the burner opening or discharge.

It also comprises details of construction which will be more fully explained by reference to the accompanying drawings, in which—

25 Figure 1 is an exterior elevation. Fig. 2 is a longitudinal section through the axis.

It is the object of my invention to provide for a series of nozzles, chambers, and connected passages substantially in line and so 30 disposed with relation to oil and steam inlets that the oil when first admitted is subjected to the action of the hot steam and is also mixed therewith in a chamber prepared for the purpose. It is then conducted through 35 a contracted passage and expanded into another mixing-chamber, from which it is delivered through a second contracted passage or nozzle, and is there mixed with a further supply of steam, which serves to further heat 40 and pulverize the oil product before being delivered to the burner. At the end of this chamber a baffle-plate is disposed so that the mixture from the last chamber will impinge upon this plate and be prevented from passing in a direct line to the burner or discharge 45 opening.

As shown in the drawings, 2 is an outer shell, which is here shown as being substantially pear-shaped, having the larger diameter 50 toward the inlet end of the apparatus. Into

this inlet end, which is screw-threaded or otherwise provided with a coupling device, is fitted the nozzle A, having a convergent opening 5, through which and the subsequent narrow passage the oil is admitted substantially 55 axially or in center line of the shell 2. The opposite end of this shell has fitted into it a mixing-chamber 4^a, which opens in a bell-shaped form toward the oil-admission nozzle, which nozzle is here shown as extending 50 slightly into the bell-shaped chamber 4^a. This chamber forms a continuation of the threaded sleeve or collar 4, which is screwed into the outer end of the shell 2, so that the bell 4^a projects into the shell and has its open mouth 65 located within the larger diameter of the shell.

3 is a steam-passage opening transversely into the side of the shell 2 and in such relative position with the oil-admission nozzle and the bell 4^a that the steam thus admitted will enter 70 the bell and mingle with the oil therein and will also fill the space within the shell 2, surrounding the bell, this space extending nearly to the front end of the bell. The steam entering this annular or surrounding chamber 75 serves to heat the oil which is discharged into the bell 4^a and to maintain the oil and steam which are mixed therein at a sufficiently high temperature to commence the proper mixing of the two. In addition to this the size of the 80 shell 2 causes it to act as a sort of reservoir of elastic medium, which prevents a pulsating or puffing movement of the vapors which are passed through the apparatus to the burner. The size and shape of the bell 4^a are such that 85 the jet of oil and the steam enter with a swirling movement, which movement also takes place in the surrounding chamber of the shell 2. From the bell 4^a a contracted passage 6 passes toward the forward portion of 90 the part 4, and at the front it is expanded into a divergent chamber 7, so that the oil and steam first mixed and heated in the bell 4^a are driven together through the passage 6 and allowed to again expand in the chamber 7. 95

9 is a chamber convergent toward the front and having its base and larger portion opening into the chamber 7. This chamber 9 is screw-threaded on the outside and is fitted into corresponding threads within the part 4, a flange 100

or collar 8 serving for the application of a wrench by which to turn it in or out. On the exterior of this part 9 is fitted a T 10, having a transverse inlet-passage 15 opening into the side. The interior diameter of this T is greater than the convergent chamber or nozzle 9, so that the steam admitted thereinto fills the chamber in line with the steam-inlet and surrounds the chamber 9, so that the steam and oil, having expanded into the chamber 7 and the first portion of the chamber 9, are again converged through the forward portion of this chamber 9 and subjected to the additional heat of the steam entering through 15.

To the front of the T 10 is connected a cylindrical or other chamber 11, and into this chamber, which is of considerable length, the contracted front end of the chamber or nozzle 9 discharges.

All of the passages 5, 6, and 9 are substantially in line, having a common axis, and the enlargements intermediate between the inlet and the outlet, as previously described, serve for the expansion and mixing of the steam and oil as they pass through.

To the front end of the chamber 11 is fixed a burner or nozzle 14, and this burner or nozzle is the only part which enters the fire-space of the furnace, being extended through a suitable opening in the furnace-front, as shown at 16, the remainder of the apparatus being outside the furnace-front and within easy reach.

The discharge-nozzle may be of any well-known or suitable form not material to the present application.

In the side and near the front of the chamber 11 is an opening having a screw-plug 12 threaded therein. This screw-plug carries a baffle-plate 13, which when the plug is in place stands directly in the line of discharge of the chamber 9.

The steam which is admitted through the passage 15 and which surrounds the chamber 9 also passes forward around this chamber into the chamber 11, so that the oil and steam which pass out through the contracted front of 9 are again allowed to expand within the chamber 11, and by reason of the baffle-plate 13, against which they impinge, they are checked, and a final mixing and heating takes place within the chamber 11, after which the surplus, passing around the baffle-plate 13, will escape to the burner under such pressure as may be maintained within the apparatus.

It will be seen by this construction that the long threaded joints by which the parts are united will maintain themselves without leakage, and these joints enable the apparatus to be easily taken apart for inspection or repairs.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination in an oil-burner of an exterior pear-shaped shell convergent from

the rear to the front, a bell-shaped chamber within the shell having its open mouth presented toward the rear thereof and a contracted discharge-passage toward the front, an oil-admission nozzle opening into the rear of the bell, a steam-inlet opening transversely across the mouth of the bell and the oil-nozzle whereby steam is admitted into the interior of the bell to mix with the oil and also exterior thereto to surround and heat the bell.

2. The combination in an oil-burner of an exterior pear-shaped shell convergent from the rear toward the front, a screw-threaded oil-admission nozzle fitted axially into the rear of the shell, a screw-threaded sleeve or collar fitting the front end of the shell having an extension inwardly toward the rear, said extension being enlarged to form a bell into the open mouth of which the oil-inlet discharges, a contracted passage leading forwardly from the bell and a divergent expanded chamber within the sleeve, into which the passage opens, a steam-passage opening transversely into the shell whereby steam is mixed directly with the oil in the bell and also surrounds the bell, a second mixing-chamber axially in line and in front of the sleeve or collar, and a second steam-inlet contiguous thereto.

3. The combination in an oil-burner of a pear-shaped shell convergent from the rear toward the front, an oil-inlet passage opening into the rear of the shell a sleeve or collar fixed to the front of the shell having a bell-shaped chamber projected interior to the shell and into the open mouth of which the oil is delivered, a passage opening into the side of the shell admitting steam to surround the bell within the shell and to mix with the oil within the bell, a contracted passage leading forwardly from the bell, a second divergent mixing-chamber in the forward part of the sleeve, a forwardly-converging chamber connecting therewith and fixed within the sleeve or collar, a T having a steam-inlet passage at one side into which the convergent chamber projects and a final mixing-chamber into which said convergent chamber discharges and in which steam from the second inlet is mixed with the oil and steam arriving from the rear of the apparatus.

4. The combination in an oil-burner of an exterior pear-shaped shell convergent from the rear toward the front, oil and steam inlets into the rear of the shell, successive mixing-chambers substantially axially in line within the apparatus having intermediate connecting passages, a final mixing-chamber to the front of which the burner is connected, a baffle-plate extending transversely in the chamber in front of the burner-discharge, a contracted discharge through which oil passes into the last mixing-chamber, and a second steam-inlet passage transverse thereto.

5. The combination in an oil-burner of a bell-shaped receiver, an oil-delivery nozzle

axially in line therewith, a chamber inclosing
the receiver and nozzle and having a fluid-
inlet transverse to the junction of the two, a
second chamber with an opening to connect
5 with a burner and in line with the first cham-
ber, successive divergent and convergent
chambers located between the bell and the sec-
ond chamber and having connecting pas-
sages, a steam-inlet transverse to the rear of

the second chamber and a baffle-plate across
the front of said chamber.

In witness whereof I have hereunto set my
hand.

THOMAS WILLIAMS.

Witnesses:

FRANK CURRY,
GEO. ROBERTSON.

Correction in Letters Patent No. 736,664.

It is hereby certified that the name of the assignee in Letters Patent No. 736,664,
granted August 18, 1903, upon the application of Thomas Williams, of San Francisco,
California, for an improvement in "Oil-Burners," was erroneously written and printed
"Caesar R. Spiralo," whereas the said name should have been written and printed
Caesar R. Splivalo; and that the said Letters Patent should be read with this correction
therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of September, A. D., 1903.

[SEAL.]

F. I. ALLEN,
Commissioner of Patents.

axially in line therewith, a chamber inclosing the receiver and nozzle and having a fluid-inlet transverse to the junction of the two, a second chamber with an opening to connect
 5 with a burner and in line with the first chamber, successive divergent and convergent chambers located between the bell and the second chamber and having connecting passages, a steam-inlet transverse to the rear of

the second chamber and a baffle-plate across the front of said chamber.

In witness whereof I have hereunto set my hand.

THOMAS WILLIAMS.

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