

F. A. STEVENS.
OIL BURNER AND DRAFT APPLIANCE.
APPLICATION FILED APR. 22, 1908.

968,281.

Patented Aug. 23, 1910.

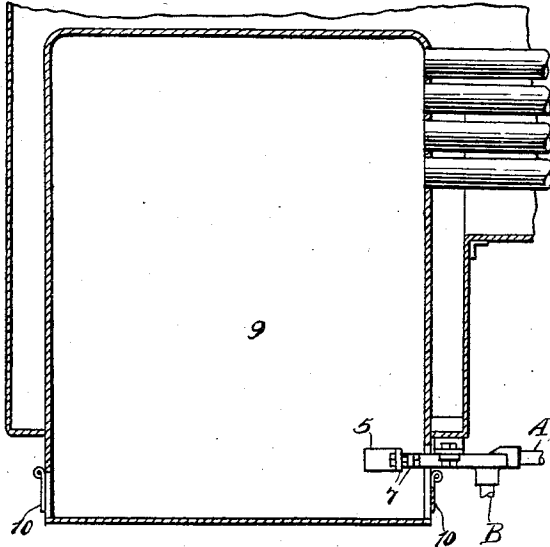


Fig. 1.

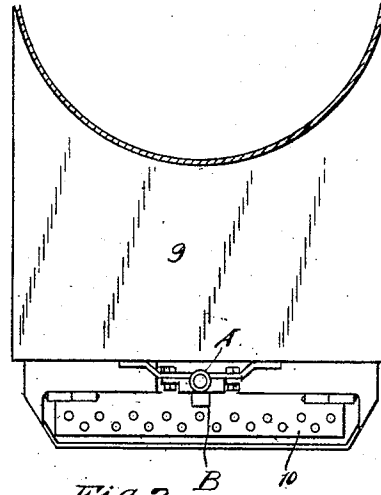


Fig. 2.

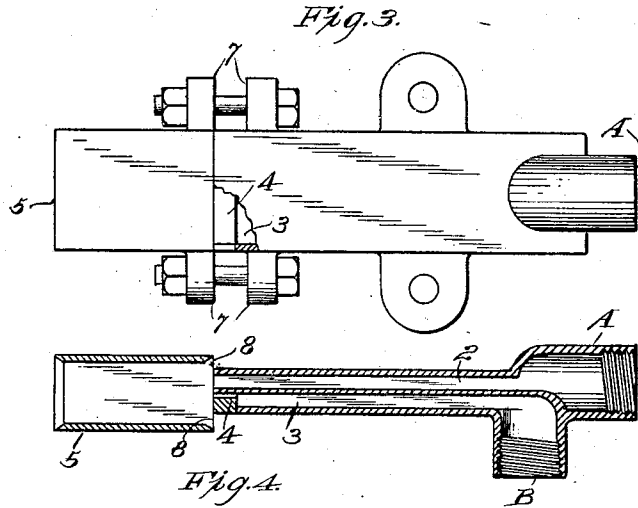


Fig. 3.

Fig. 5.

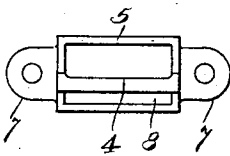
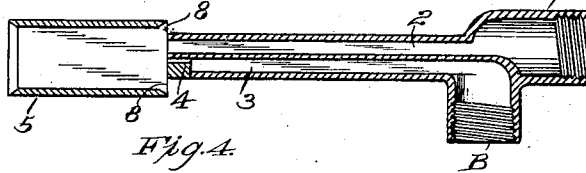


Fig. 4.



Witnesses:

Frederick E. Maynard.
Carnfield

Inventor:
Fred A. Stevens;
By Geo. H. Strong.
Atty.

UNITED STATES PATENT OFFICE.

FRED A. STEVENS, OF SAN FRANCISCO, CALIFORNIA.

OIL-BURNER AND DRAFT APPLIANCE.

968,281.

Specification of Letters Patent. Patented Aug. 23, 1910.

Application filed April 22, 1908. Serial No. 428,582.

To all whom it may concern:

Be it known that I, FRED A. STEVENS, citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Oil-Burners and Draft Appliances, of which the following is a specification.

My invention relates to a device for the combustion of oil, and in a means for automatically regulating the draft to the supply.

It consists in the combination of parts, and in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a sectional view showing the application of the device. Fig. 2 is an end view. Fig. 3 is a plan of the burner. Fig. 4 is a longitudinal section. Fig. 5 is an end view of the extension box.

In the ordinary construction of oil burners in which a liquid hydrocarbon is mingled with steam, or steam and air, and discharged through jet openings, a considerable difficulty arises from the dripping of the oil when the apparatus is being run with a low fire, as in the case where locomotives or other machinery are not running, and it is only required to keep up a light pressure of steam during the period of idleness. In such cases the oil is liable to drip and be deposited in such a manner that gas is often produced when the flame is again turned on at a higher pressure, the result of which produces explosions of varied violence and seriousness.

It is the object of my invention to overcome this objection, to provide for a better combustion under all conditions, and to automatically vary the draft and supply of air.

As shown in the drawings, the oil is admitted into the burner through a pipe A, and is carried through a conducting passage 2 to the front end of the part which conducts the oil to the point of combustion. Steam is admitted through an opening B, and passes through an independent passage 3 to the front where it is discharged over a raised barrier or lip 4, which may be formed on the extension 5, hereinafter described, said lip being located just beneath the discharge end of the oil passage, so that the jet of steam will receive the oil as it is delivered from the passage 2, and will drive it forcibly forward, mingling and atomizing it in this connection. Both steam and oil jet are

of considerable width transversely so that the oil is delivered in a thin flat sheet, and the steam is discharged in a corresponding sheet.

The amount of air which can be supplied either by injecting it through the nozzle, or in allowing it to enter the fire-box in any other way, is not usually sufficient for perfect combustion. I have therefore shown an attachment consisting of a box-like extension 5, which is secured to the oil and steam conducting nozzle by bolts passing through the lugs 7; one pair of which is fixed to the oil and steam conductor, and the other is fixed to the extension 5; the latter fitting and abutting against the end of the conductor, is thus held firmly in position by bolts as shown. This box or casing 5 is a little deeper than the conductor so that openings are exposed above and below the conductor as shown at 8. These openings serve for the admission of air which is drawn in through them by the draft or injector action produced by the jet of oil and steam passing through the interior of the part 5.

The air is converged by the bevel shape of the top and bottom of the admission passages, and thus meets the steam and oil and adds its force to reduce the particles of oil to a fine spray, at the same time supplying sufficient oxygen so that the combustion at the discharge from the box 5 will be sufficiently complete, and if there should perchance be any small drip of oil, it will be received upon the bottom of the box 5, the heat of which will be sufficient to vaporize it, and thus prevent any accumulation which might afterward cause trouble.

I have herein shown my apparatus as connected with the fire-box 9 of a steam boiler, said apparatus being secured near the lower part of the fire-box, and having suitable connections for the admission of oil and steam.

In order to supply an independent draft of air, and to regulate this draft I have shown hinged perforated plates 10, which normally hang from their hinges by gravitation, and substantially close the ash-pan at the bottom. These plates have perforations made through them, and when the fire is maintained at a low condition, and no considerable draft required, sufficient air will be admitted through these holes to supply combustion. When, as in the case of a locomotive, the fire is increased, and by reason

of the increased exhaust which produces the ordinary draft, it is necessary to supply more air, these plates will swing upon their hinges, and will thus allow a sufficient quantity of air to pass beneath and around them, in addition to that passing through the holes to supply the increased demand for combustion.

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

1. In an oil burner, the combination of a pipe, the front end of which is divided by a horizontal partition into parallel steam and oil passages, said passages having greater width than height and one of said passages having a steam inlet and the other an oil inlet, a barrier at the front end of the steam passage extending across the same, to a point adjacent the partition so as to form a narrower passage for the escape of steam, said barrier being disposed just beneath the discharge end of the oil passage whereby the jet of steam will receive the oil as it is delivered from its passage and will drive said oil forcibly forward and atomize it and mix it with the steam, and a casing or box-like extension fitted to the front end of the pipe in line with said passages, said extension having a height in excess of that of the front end of the pipe whereby openings are formed above and below the pipe for the entrance of air for admixture with the oil and steam.

2. In an oil burner, the combination of a

pipe, the front end of which is divided by a horizontal partition into parallel steam and oil passages, said passages having greater width than height and one of said passages having a steam inlet and the other an oil inlet, a barrier at the front end of the steam passage extending across the same to a point adjacent the partition so as to form a narrower passage for the escape of steam, said barrier being disposed just beneath the discharge end of the oil passage whereby the jet of steam will receive the oil as it is delivered from its passage and will drive said oil forcibly forward and atomize it and mix it with the steam, and a casing or box-like extension fitted to the front end of the pipe in line with said passages, said extension having a height in excess of that of the front end of the pipe whereby openings are formed above and below the pipe for the entrance of air for admixture with the oil and steam, said box or casing having its rear edge beveled and adapted to converge the air so that it will meet the steam and oil and assist in reducing the particles of oil to a fine spray.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRED A. STEVENS.

Witnesses:

CHARLES A. PENFIELD,
ALEX CURRIE.