

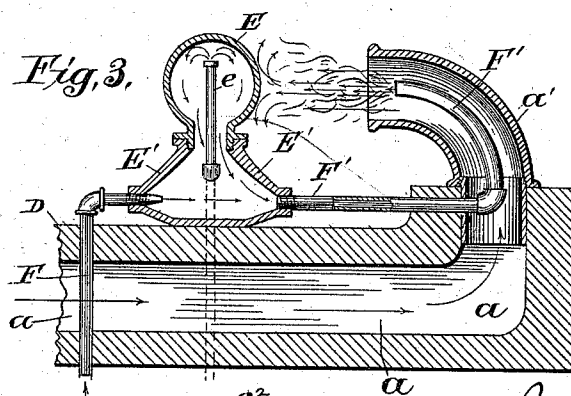
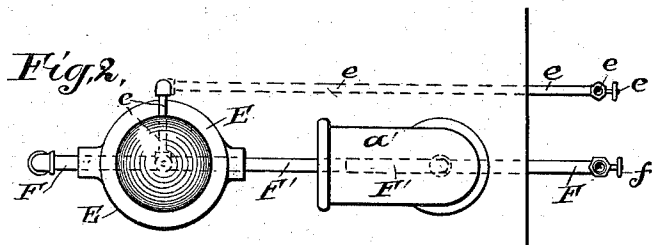
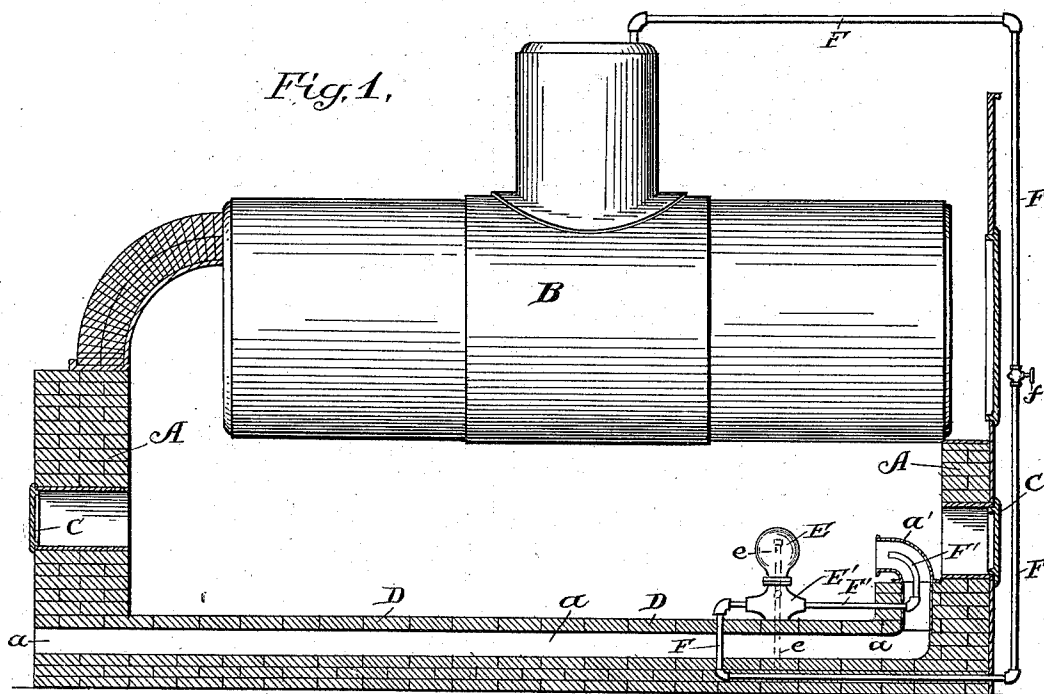
(No Model.)

J. MURPHY.

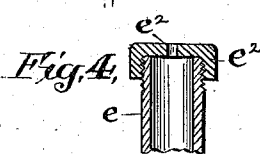
GAS PRODUCER AND BURNER FOR STEAM BOILERS.

No. 573,899.

Patented Dec. 29, 1896.



Witnesses,
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Inventor,
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UNITED STATES PATENT OFFICE.

JAMES MURPHY, OF CHICAGO, ILLINOIS.

GAS PRODUCER AND BURNER FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 573,899, dated December 29, 1896.

Application filed April 15, 1895. Serial No. 545,711. (No model.)

To all whom it may concern:

Be it known that I, JAMES MURPHY, of Chicago, in the State of Illinois, have invented certain new and useful Improvements in Gas Producers and Burners for Steam-Boilers, of which the following is a specification.

My invention relates to means for producing and burning gas from crude oil for the purpose of heating steam-boilers; and the object of my improvements is to provide means for delivering the oil into a retort arranged above a passage-way for steam whereby the gas may be carried and delivered into an air-flue, the end of such air-flue being located in the fire-box of the boiler and opening toward said retort, so that the burning of the gas may be made to take place where the air and steam issue from said air-flue into the fire-box, as hereinafter more fully described. I attain this object by the means illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section representing the brickwork for supporting a tubular flue-boiler and showing the fire-box beneath the boiler, but omitting the upper portion of the brickwork and the flue in connection therewith, which may be of any ordinary construction. Fig. 2 is a detail showing a plan view of the retort and the oil and steam pipes and air-flue. Fig. 3 is a detail showing a vertical longitudinal section of the parts shown in Fig. 2, and Fig. 4 is a detail showing an enlarged section of the upper end of the oil-pipe and its cap.

In the drawings, A designates the brickwork beneath the boiler B.

CC designate doors located in opposite ends of the brickwork for affording access to the fire-box beneath the boiler.

The parts thus described are of ordinary construction, and it is therefore deemed unnecessary to describe them more in detail.

I prefer to construct the bottom D of the fire-box of fire-clay in order to make it better resist the action of the heat. Upon or beneath the upper surface of the bottom of the fire-box I place an air-flue *a*, which communicates with the outer air and extends under the fire in order to heat the air before it is delivered into the fire-box. This air-flue communicates with a pipe *a'*, which is turned

back and faces in the opposite direction from that of said air-flue.

E is the retort, which is connected above an enlarged tube or chamber E', supported on the bottom of the fire-box immediately in front of the open end of the pipe *a'*. The oil-pipe *e* is connected with an oil tank or supply (not shown) placed in the ordinary manner above the point of discharge in the retort and provided with a valve *e'* for shutting off or turning on the supply of oil. Said oil-pipe enters the chamber E' at the side and is then turned up and rises vertically to very nearly the upper part of the retort, as shown in Fig. 3. At its upper end it is provided with a cap *e''*, which has a small opening, through which a small stream of oil may be made to issue and strike the interior of the retort on the upper side.

A steam-pipe F, provided with a valve *f* and leading from the dome of the boiler, is made to enter the chamber E', so that when said valve is open steam will flow into said chamber at the bottom, and F' is a continuation of said steam-pipe, connected at the opposite side of said chamber E' and, passing through the pipe *a'*, is turned back to correspond with said pipe and terminates near the end of the same and conveys the gas and steam from the chamber E' to the fire-box.

The operation is as follows: A temporary fire of wood or other light combustible material is first built on the bottom of the fire-box around or over the retort for the purpose of heating the same and raising steam in the boiler. After such temporary heating the valve *e'* and the oil-pipe is opened, allowing the oil from the tank to pass into the retort. The pressure of oil in the oil-pipe will be sufficient to cause a jet of oil passing through the small opening in the cap *e''* to strike the interior of the retort at the top, causing the oil to be separated into fine globules or spray and to be converted into gas by the heat of the retort. Steam is at the same time turned on, and the force of steam entering the chamber E' will drive the gas out through the gas and steam pipe F', so that the steam and gas will issue from the end of said pipe near the end of the air-pipe *a'*. The air entering through the air-flue will be more or less heated

by this time, so that hot air will issue from the air-pipe *a'* with the steam and gas, and the gas will be ignited and will continue the burning, keeping the heat in the retort and fire-box sufficient to continue the production of steam and gas indefinitely. By a use of the means adapted to operate in the manner described crude oil may be completely converted into gas without leaving any residuum to clog up the apparatus, and the entire gas product may be forced into the fire and completely consumed.

It is contemplated that the apparatus may be applied to all kinds of steam-boilers, including stationary boilers and locomotive-engines, and it is obvious from the foregoing description that it may be applied to any of these.

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

1. A gas producer and burner for steam-boilers comprising a fire-box provided with an air-flue in its bottom adapted to heat the air as it enters the fire-box through the flue by means of the heat communicated to the bottom of the fire-box, a retort arranged in front of the discharge end of the air-flue

within the fire-box, an oil-pipe entering the retort and having a contracted opening adapted to throw a jet of oil against the interior upper surface of the retort, a gas-chamber arranged beneath and communicating with the retort, a steam-pipe communicating with the gas-chamber and a steam and gas pipe communicating with the gas-chamber opposite from the steam-pipe and passing thence to and entering the air-flue and discharging near the discharge end of the air-flue as specified.

2. In a gas-producer for steam-boilers the combination with a fire-box of a retort placed within the fire-box, an oil-pipe entering the retort and adapted to throw a jet of oil against its upper interior surface, a gas-chamber beneath and communicating with the retort a steam-pipe communicating with the gas-chamber near its bottom, and a steam and gas pipe communicating with the gas-chamber on the opposite side from the steam-pipe, said steam and gas pipe being turned back so as to throw a jet of gas and steam upon the retort as specified.

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