

(No Model.)

J. WILSON & A. MASON.
HYDROCARBON BURNER.

No. 423,011.

Patented Mar. 11, 1890.

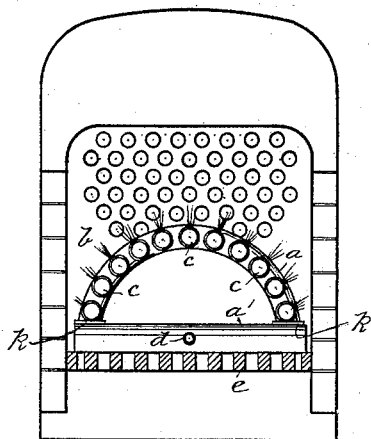


FIG. 1.

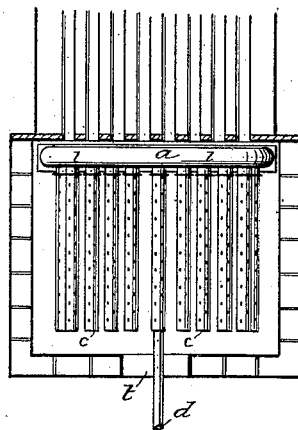


FIG. 2.

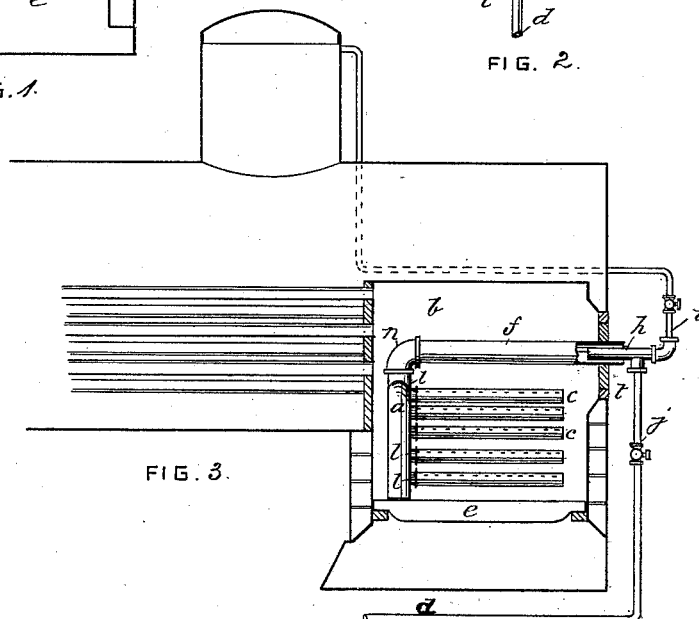


FIG. 3.

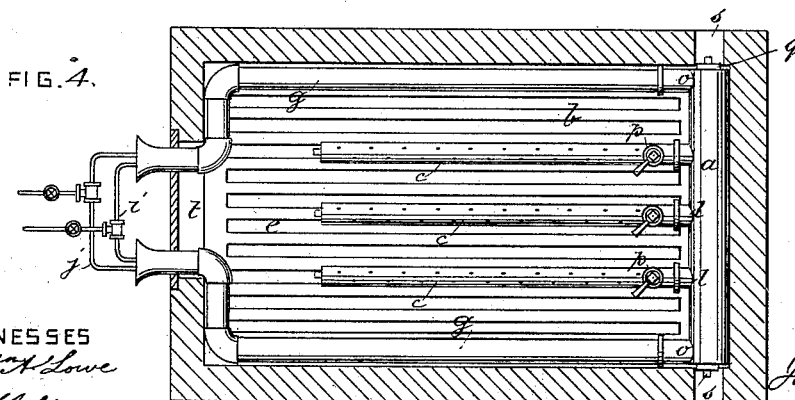


FIG. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN WILSON, OF NEW YORK, AND ALLAN MASON, OF BROOKLYN, ASSIGNORS
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HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 423,011, dated March 11, 1890.

Application filed June 8, 1888. Serial No. 276,528. (No model.)

To all whom it may concern:

Be it known that we, JOHN WILSON and ALLAN MASON, citizens of the United States, and residents of New York city, in the county and State of New York, and Brooklyn, Kings county, New York, respectively, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

Our invention consists of improvements in the construction and arrangement of retort hydrocarbon-burners for boiler and other furnaces which are designed to provide more efficient burners and to facilitate the application of them to fire-boxes and furnace-chambers of common form and to those already in use without alteration of them or additional contrivance, all as hereinafter fully described, reference being made to the accompanying drawings, in which—

Figure 1 is a transverse sectional elevation of a locomotive-boiler furnace with our improved retort-burner apparatus applied to it. Fig. 2 is a horizontal section of the same and plan view of the burner apparatus. Fig. 3 is a longitudinal sectional elevation of the same with the burner apparatus in side elevation and with a retort feed-pipe arranged over the burner, and Fig. 4 is a horizontal section of a stationary-boiler furnace and plan of the burner apparatus with retort feed-pipes arranged along the sides of the furnace-chamber.

The essential feature of the invention consists of the arch-shaped pipe-retort *a*, located in the back part of the furnace-chamber *b*, with the forwardly-projected burner-pipes *c* and means for injecting the fuel elements of oil, vapor, or gas and air into said retort for being combined, heated, and vaporized or gasified therein and distributed to the burner-issues along the burner-tubes and radiating from the axis of the arch. Said means of introducing the fuel elements may consist of a supply-pipe *d*, arranged along on the furnace-grate *e*, as in Figs. 1 and 2, or a larger retort-pipe *f* in the upper space, as in Fig. 3, or a couple of retort-pipes *g*, extending along the space, one each side, as in Fig. 4, all preferably entering the fire-doorway *t* and having injector attachments at the outer open end, comprising the usual injector-burner appa-

tus, as the combining and injecting tube *h*, receiving a jet of steam from the pipe *i*, and also receiving a supply of oil from the oil-feed pipe *d*. Other means of feeding the oil and air into the retort *a* may be employed. The retort *a* may have a base member *a'*, extending from foot to foot, when the feed-pipe *d* is employed, or said pipe may have a branch connecting it with each foot of the arch. The arch *a* and the base-section *a'* will be detachably connected at *k*, when said base-section is used, to facilitate the introduction of the retort through the fire-doorway of a furnace already built.

The retort *a* is constructed with pipe-sockets *l*, adapted for connecting the burner-pipes after being put in place in the furnace, and also with sockets *n* or *o*, according as the retort-pipes *f* or *g* are to be used, enabling them to be likewise put in separately and then connected for the ready application of the apparatus to furnaces in use.

The burner-tubes connecting with the arch-shaped retort in the back part and hottest portion of the chamber and extending forward along the side walls and under the crown-sheet of the furnace of a locomotive or other like arch-shaped furnace, and being perforated for burner-issues at intervals, make a burner of great power and very uniform distribution of the heat.

In the lower burner-tubes the issues are directed laterally toward the side walls to take effect low down on them, and they are gradually less divergent in the tubes above to distribute the heat radially to the axis of the arch. If desired, gas-burner tips may be attached to the burner-tubes in lieu of the mere issue-orifices, and they may have issues or burner-tips at the front ends.

The arch-retort being merely placed on the fire-grate for a seat, is sustained in its upright position by the feed-pipe *d* or the retort-pipes *f* or *g*, either lying on the fire-grate or supported at the front in the front wall or plate of the furnace, and said arch holds up the burner-tubes in their position above the fire-grate by their connection with it and without other support for them, so that no special provision is required for the application of the apparatus to the furnace, and it can be taken

out readily by disconnecting and removing the parts, leaving the furnace ready for burning coal or other fuel, as usual.

The burner-tubes may have a cock *p* at or
5 near the junction with the retort, to be set for regulating the flow of vapor into them when it has been found that the vapor inclines more to one than another, as may sometimes occur.

It will be noted that our improved burner
10 apparatus may be very readily taken apart from time to time for cleaning out the matters depositing in the parts.

When the retort is arranged in the furnace represented in Fig. 4, it may be fitted with
15 hand-holes at *q*, that may be reached through openings in the furnace-walls for clearing it without removing it from its position.

What we claim, and desire to secure by Letters Patent, is—

20 1. The combination, with a boiler or other furnace, of the arch-shaped retort set in the back part of the furnace-chamber, the burner-tubes connected with said retort and extending forward therefrom in said chamber and
25 having burner-orifices radiating from the axis of the arch, a feed-pipe, and injector apparatus adapted for injecting the fuel elements into said feed-pipe and retort, substantially as described.

30 2. The combination, with a boiler or other furnace, of an arch-shaped retort having a base retort-section and set in the back part of the furnace-chamber, the burner-tubes connected with said retort and extending forward
35 therefrom into said chamber, a feed-pipe, and

injector apparatus adapted for injecting the fuel elements into said feed-pipe and retort, substantially as described.

3. The combination, with a boiler or other furnace, of an arch-shaped retort located in
40 the back of the furnace-chamber and having a retort feed-pipe extending along the furnace-chamber from the front, also having the burner-tubes extending along the furnace toward
45 the front and having burner-orifices radiating from the axis of the arch, and the injector apparatus adapted for injecting the fuel elements into said retort-pipe and therethrough to the retort, substantially as described.

4. The combination, with a boiler or other
50 furnace, of an arch-shaped retort located in the back part of the furnace-chamber, a retort feed-pipe extending along each side of the furnace to and connected with said retort, the burner-tubes connected with and extending
55 forward from said retort and having burner-orifices radiating from the axis of the arch, and injector apparatus connected with the retort-pipes and adapted for injecting the fuel elements into said retort-pipes and there-
60 through to the retort, substantially as described.

Signed at New York city, in the county of New York and State of New York, this 12th day of April, A. D. 1888.

JOHN WILSON.
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Witnesses:

W. J. MORGAN,
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