(No Model.)

J. WILSON & A. MASON.

HYDROCARBON BURNER.

No. 438,874. Patented Oct. 21, 1890.

FIG. 1

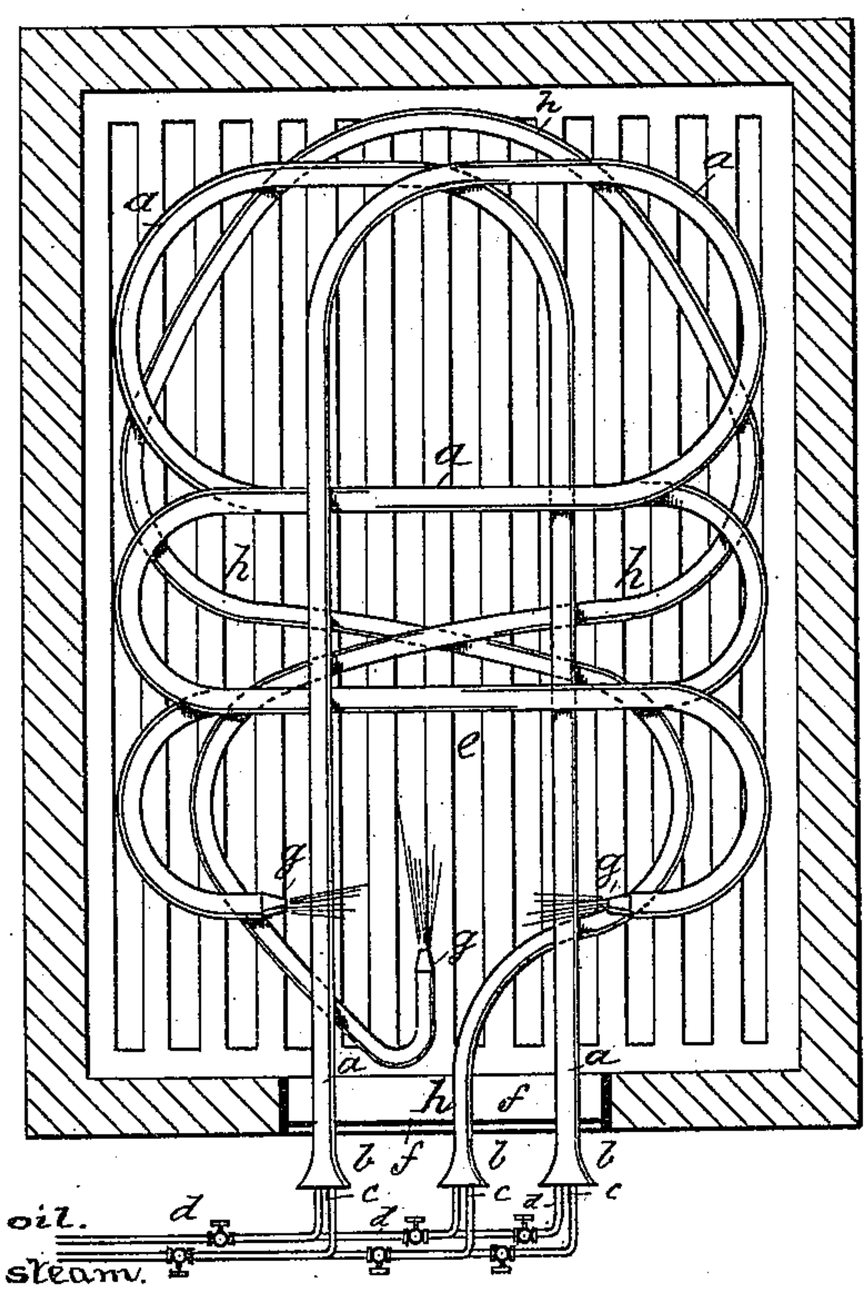
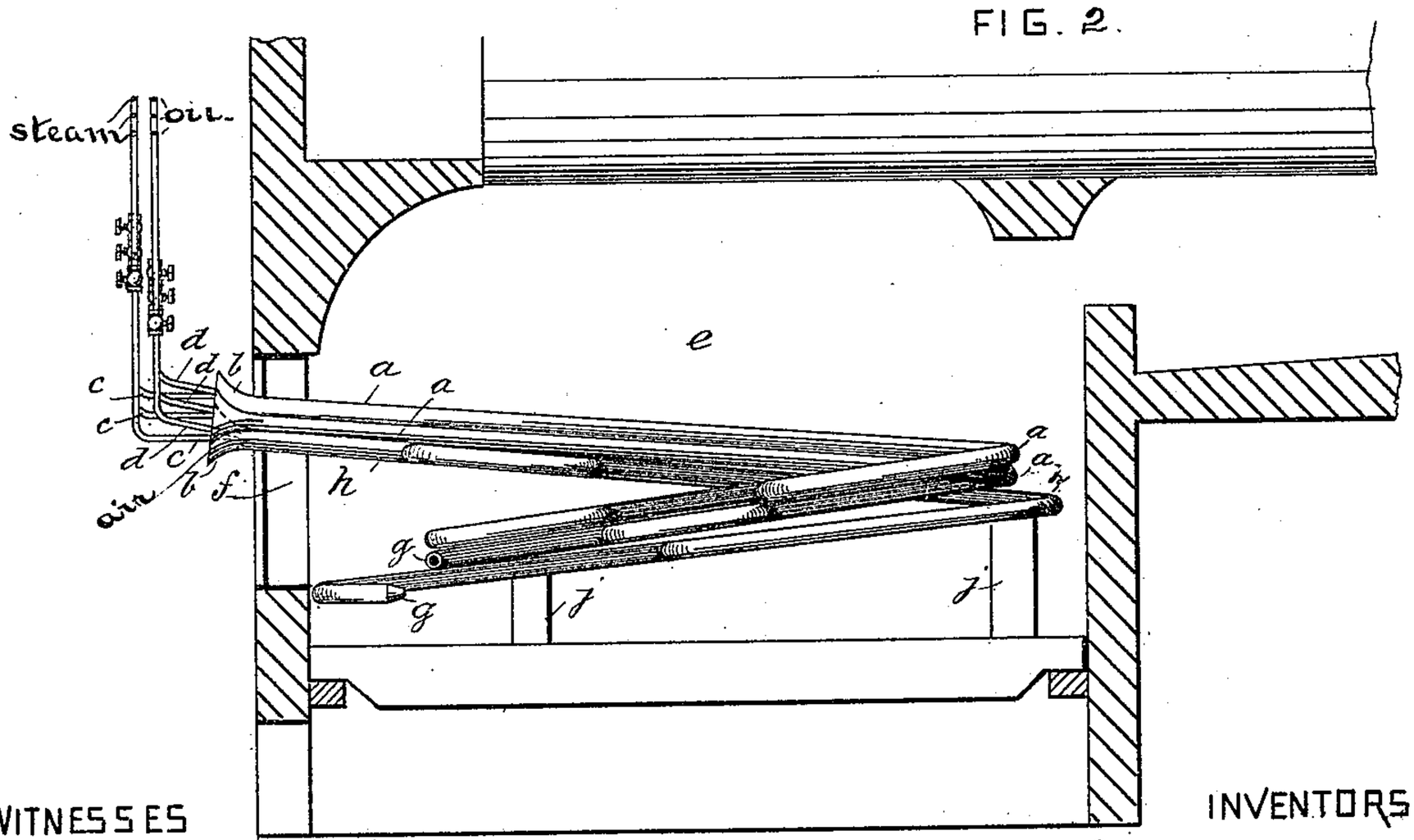


FIG. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 438,874, dated October 21, 1890.

Application filed August 3, 1888. Serial No. 281,895. (No model.)

To all whom it may concern:

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

Our invention consists of an improved contrivance of the inlet-pipe for the combined oil and steam, or oil, air, and steam, of an injector-burner for utilizing said pipe as a retort to more effectually vaporize or gasify the oil previous to the issue at the burner, and so as to effectually prevent lodgment or deposition of any carbon or other matters in the pipe, as hereinafter fully described, reference being made to the accompanying drawings, in which—

Figure 1 is a horizontal section of a boiler-furnace having a hydrocarbon-burner arranged in accordance with our invention, and Fig. 2 is a longitudinal sectional elevation of the same.

We use, preferably, two inlet retort-pipes *a* in our improved burner, but may employ more or only one, according to circumstances, said pipe or pipes preferably having a funnel *b* to facilitate the induction of air by the steam-injector *c*, and the oil, also, which is to be supplied by the feed-pipe *d* and delivered onto the steam-nozzle *c* in any approved way for being injected into the retort-pipe along with the proper quantities of steam and air. We arrange these pipes to enter the furnace-chamber *e* in a somewhat elevated position—say at the top of the fire doorway or opening *f*—and to extend therefrom backward either directly or in a sinuous course to the rear of the fire-chamber or thereabout and in a descending inclination, thence returning by a suitable curve or in a sinuous course and also in a descending inclination nearly to the front of the chamber, where the issues *g* are, when two or more pipes are used directed crosswise of the furnace, one against or in opposition to another. If only one is used, the issue will preferably be directed backward or rearward in the chamber; but we intend to employ two, generally, locating one at each side of the doorway and arranging them reversely as to their curves and sinuosities, so that their issues will terminate in opposition. If more than two are required, two more—that is to say, another pair—will preferably be used in the same arrangement, but in a little lower plane, allowing them to be coiled without interference. In this arrangement it will be seen that with the burners located at the front of the chamber and the coils of pipe mainly back of the same and in the continuous descending inclination throughout their whole course very thorough and effectual vaporization and admixture of the fuel elements will result; but for still greater and more perfect effects we will in some cases employ another pipe *h*, arranged on either side or, say, about midway between the other two at the entrance of the furnace and, like the others, traversing the furnace-chamber sinuously and with the same downward inclination and return to the front, but having its issue *g* directed backward and directly between the issues of the other pipes from a position in advance of them, which arrangement we find a most effective one, producing the best results as to good combustion and for heating and gasifying the fuel elements passing through the pipes, whereon the heat takes effect to the greatest advantage by reason of their traversing the chamber in the most heated parts or where the backwardly-flowing heat elements from the burners are most effective upon them.

While the sinuous arrangement of the pipes is manifestly the best for exposure of the matters passing through them to the heat, we do not confine ourselves to that contrivance, for the direct arrangement of them is substantially the same, the essential feature of the invention being the backward and forward extension and continuously-descending pipe retort or retorts and the issue thereof, located at or in close proximity to the front of the furnace-chamber.

It is to be noted that the apparatus is applicable to furnaces of ordinary construction without change, and so that it can be readily applied or removed at will, merely employing any approved supports *j*, of refractory material, such as may be temporarily placed on the fire-grate, for the pipes to rest on while in use. They will in practice be put together in suit-

able sections that may be introduced through the fire-door into the chamber.

An important feature of our invention is the terminal issue of each pipe in the burner-nozzle lying in the plane of the rest of the pipe and without upward turn, so that there is no obstruction by coking of the less volatile matters and choking up the issue, as they do when there is an upward escape of the gaseous products, particularly as when they issue upwardly through small perforations of a horizontal pipe or tubular fire-grate.

Another important feature of the invention consists of the burner-issues being in the lower position than the rest of the retorts and discharging the fuel elements wholly thereat, so that the heat products discharged thereat and rising, as they naturally do in passing backward along the furnace, impinge with the greatest effect on the retort.

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

1. The improved hydrocarbon-burner consisting of a pipe-retort having backward and forward extension and continuously-descending inclination in the furnace-chamber, with hydrocarbon-fuel-injecting attachments at the outer or front end and a level or downwardly-inclined burner-issue at the inner end, located at or in close proximity to the front of the furnace, substantially as described.

2. The combination, in a hydrocarbon-burner, of two pipe-retorts having backward and forward extension and continuously-descending inclination in the furnace-chamber, with hydrocarbon-injecting attachments at the outer or front ends and level or downwardly-inclined burner-orifices at the inner ends, located at or in close proximity to the front of the furnace and discharging in opposition to each other, substantially as described.

3. The combination, in a hydrocarbon-burner, of three pipe-retorts having backward and forward extension and continuously-descending inclination in the furnace-chamber, with hydrocarbon-injecting attachments at the outer or front ends and level or downwardly-inclined burner-orifices at the inner ends, located at or in close proximity to the front of the furnace, two of which discharge in opposition to each other and one between and at right angles, or thereabout, to the other, substantially as described.

4. The combination, in a hydrocarbon-burner, of two pipe-retorts having backward and forward extension and continuously-descending inclination in the furnace-chamber, with hydrocarbon-injecting attachments at the outer or front ends and burner-issues at the inner ends, located at or in close proximity to the front of the furnace and discharging in opposition to each other, substantially as described.

5. The combination, in a hydrocarbon-burner, of three pipe-retorts having backward and forward extension and continuously-descending inclination in the furnace-chamber, with hydrocarbon-injecting attachments at the outer or front ends and burner-issues at the inner ends, located at or in close proximity to the front of the furnace, two of which discharge in opposition to each other and one between and at right angles, or thereabout, to the other, 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.
ALLAN MASON.

Witnesses:
W. J. MORGAN,
G. T. JANVRIN.