(No Model.)

J. WILSON & A. MASON.

HYDROCARBON BURNER.

No. 438,513. Patented Oct. 14, 1890.

FIG. 1.

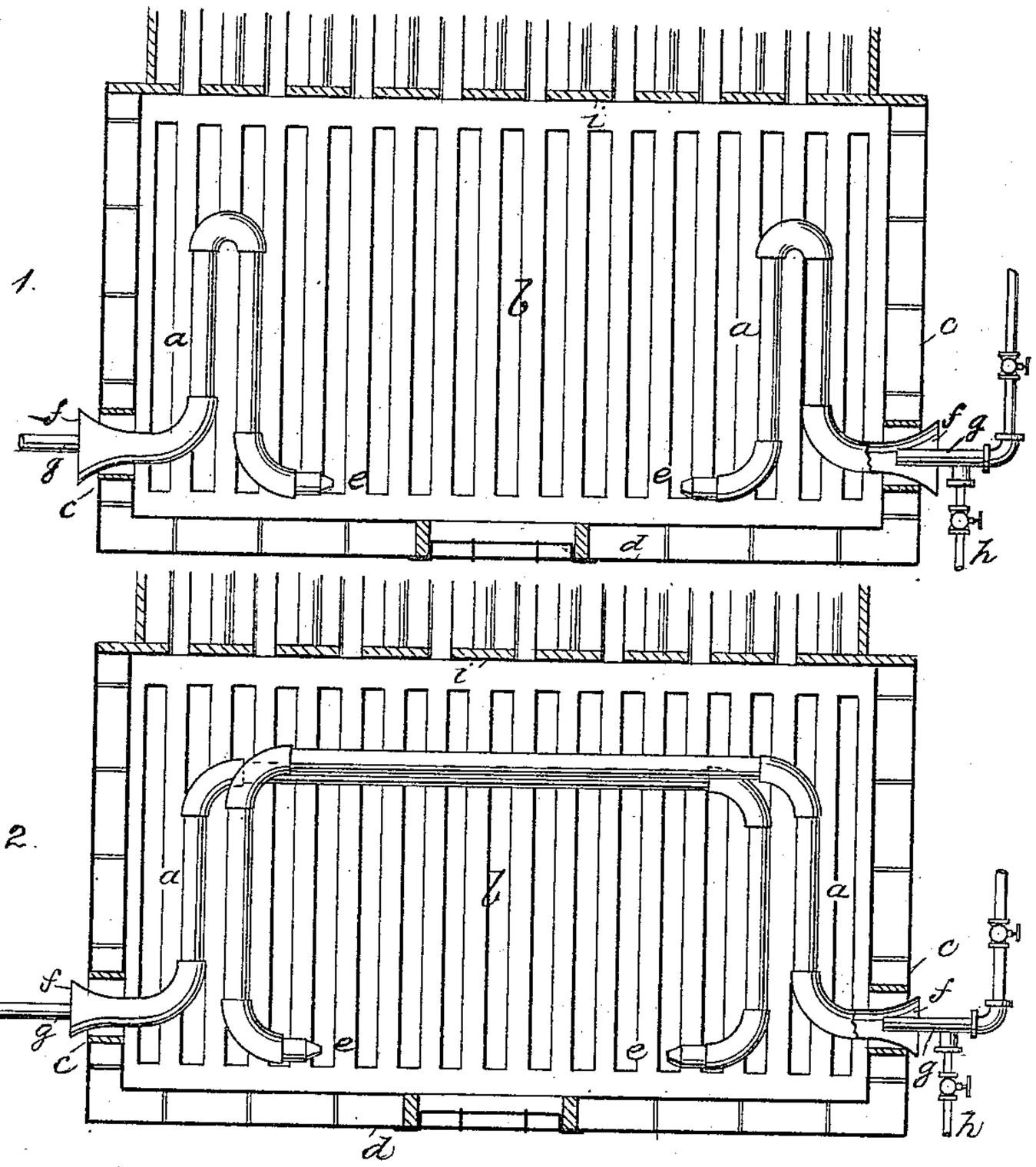

FIG. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

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HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 438,513, dated October 14, 1890.

Application filed June 8, 1888. Renewed March 26, 1890. Serial No. 345,625. (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 improved contrivances of injector-burners for vaporizing the hydrocarbon in advance of the issue at the burners, and for the conjunction of burners in a manner calculated to cause more effective combustion, as hereinafter fully described, reference being made to the accompanying drawings, in which—

Figure 1 is a horizontal section of a boiler-furnace, showing an arrangement of burners in accordance with our invention. Fig. 2 is a similar view of a furnace, showing the arrangement of burners as we prefer to use them. One of the retort-pipes in both the figures is partly shown in section.

We propose to inject the fuel elements of oil and air through retort-pipes *a*, preferably entering the furnace-chamber *b* through the sides *c* near the front in one or more pairs; but they may enter through the front *d*, if desired, which retort-pipes we arrange so as to traverse the furnace-chamber backward nearly to the rear, and thence directly forward again, as in Fig. 1, or backward and across the same from side to side near the back, and thence forward to the front again, as in Fig. 2, where we arrange the issue-nozzles *e* to discharge crosswise of the furnace and in opposition to each other, so that the conflicting jets of vapors generated in the retort-pipes and projected one into the other at the point of combustion will burn with greater intensity through the better admixture of the atoms of combustible elements due to the conflict of jets, and the burning streams or currents will take better effect on the retort-pipes by the turning of the crossing currents backward along the retort-pipes through the influence of the draft in the backward direction, causing two principal streams, one along each retort-pipe, the stream from the burner of one side passing mainly along the retort of the other side, so as to impinge on it and also on the side wall of the furnace-chamber to better advantage, and near the back of the chamber they diverge again to some extent along the tube-sheet *i* and along the transverse extension of the retort-pipes, as arranged in Fig. 2, all so as to have great vaporizing power, intense combustion, and effective impingement on the sides, back, and on the crown-sheet of the furnace as well, to which the heat naturally tends from all parts of the space below.

The outer end of each pipe has a funnel-mouth *f* to favor the induction of the air and oil through the influence of a steam or compressed-air jet from the injector-nozzle *g*, to which oil is supplied through the feed-pipe *h* in any approved arrangement.

We have represented only one pair of retort-pipes; but we may of course employ two or more, as preferred, arranging them in tiers one above another.

By the discharge of the jets against each other at the front of the furnace, and thereby locating the igniting-point at the greatest distance from where the products of combustion enter the flues, more space of the furnace-chamber is available and better combustion is secured than when the igniting-point is at the center or farther back in the chamber.

We are aware of the Hill patent, in which there is a single retort entering the furnace-front at one side and extending along the sides of the furnace back to and so as to discharge against the part entering the furnace from the front wall, and we are also aware that it is not new to arrange several injectors so as to unite the jets at a converging point, and we do not claim such devices, our claims being only intended to cover the special arrangements of the two retorts forward and backward along the two sides of the furnace-chamber and then to discharge in opposition to each other across the front of the furnace.

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

1. The combination, with the fire-box of a boiler or other furnace, of a retort-pipe located in each side thereof and extending from

the front or thereabout backward nearly to the rear, and thence forward again nearly to the front, and having the issue-nozzles discharging transversely of the furnace-chamber and in opposition to each other across the front of the furnace, said retort-pipes having injector attachments for the induction of the combustible substances, substantially as described.

2. The combination, with the fire-box of a boiler or other furnace, of a retort-pipe located in each side thereof and extending from the front or thereabout backward nearly to the rear, thence across from side to side of the furnace-chamber and forward again nearly to the front, and having the issue-nozzles discharging transversely of the furnace-chamber and in opposition to each other across the front of the furnace, said retort-pipes injector attachments for the induction of the combustible substances, 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,
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