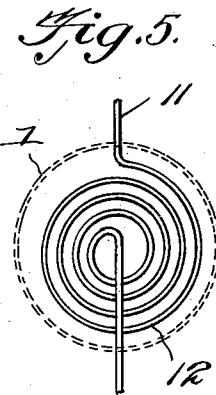
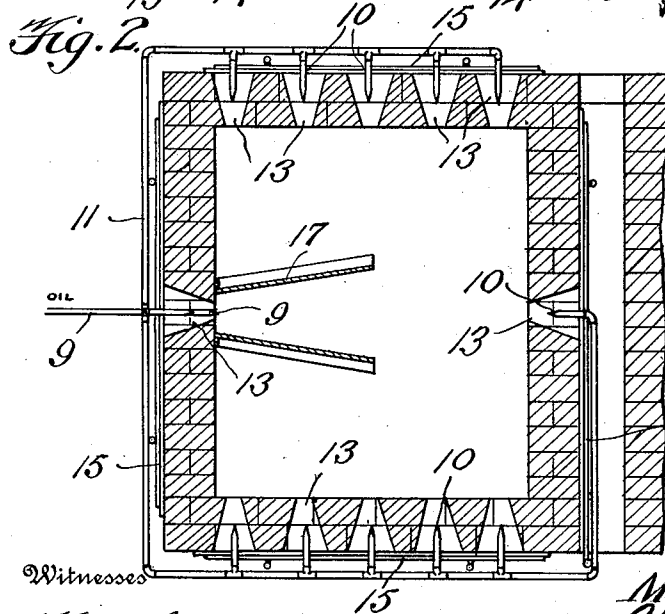
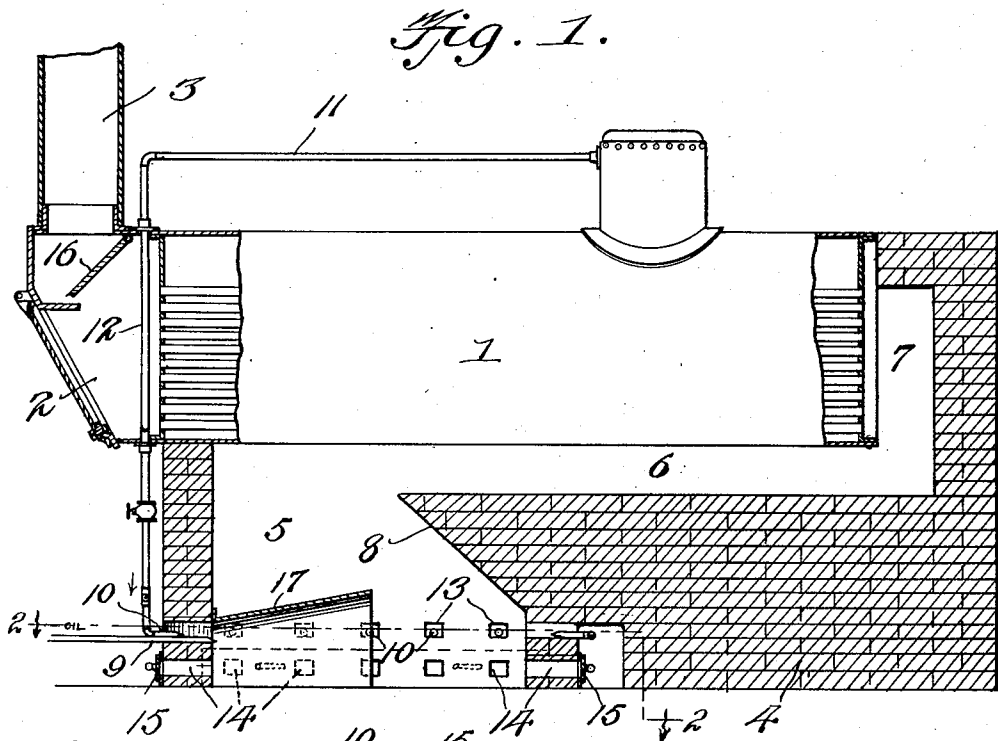


J. A. DARST & M. BRITTAIN.
HYDROCARBON FURNACE.
APPLICATION FILED MAR. 25, 1911.

1,025,054.

Patented Apr. 30, 1912.

2 SHEETS-SHEET 1.



Witnesses

Frank B. Hoffman,
W. B. Hillyard.

Inventors
Jacob A. Darst
Monroe Brittain
By Victor J. Evans
Attorney

J. A. DARST & M. BRITTAIN.
HYDROCARBON FURNACE.
APPLICATION FILED MAR. 25, 1911.

1,025,054.

Patented Apr. 30, 1912.

2 SHEETS—SHEET 2.

Fig. 3.

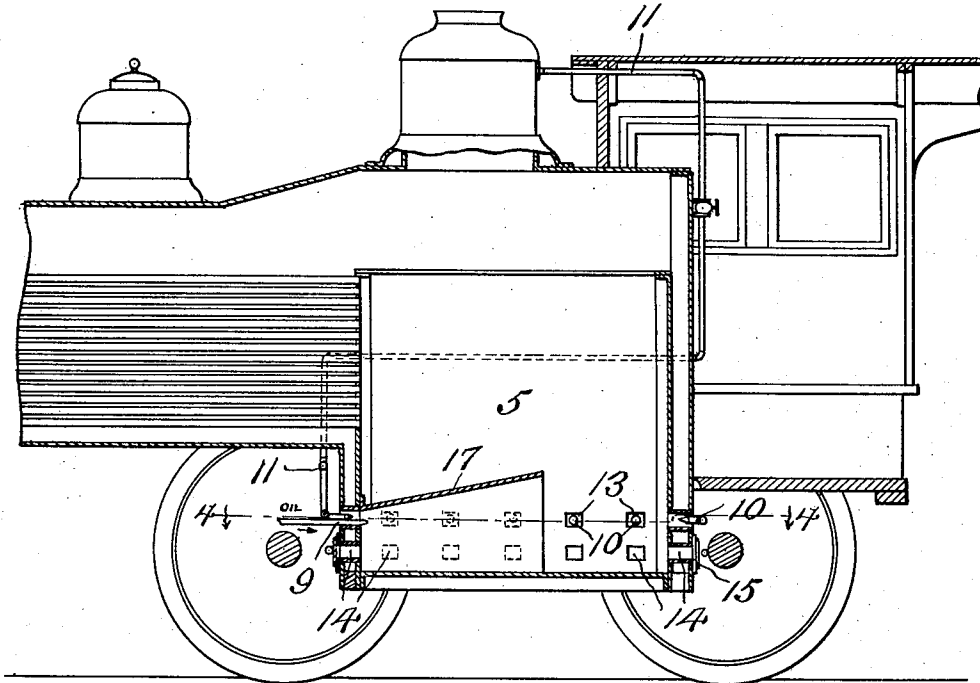
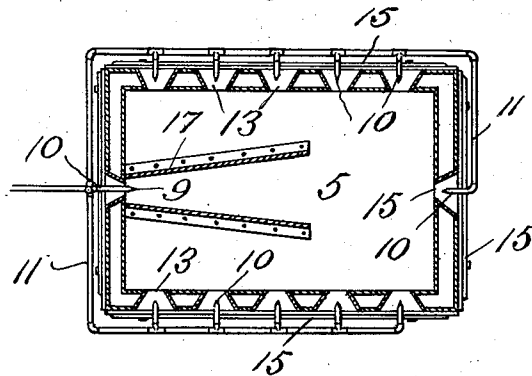


Fig. 4.



Witnesses

Frank B. Hoffman
U. B. Hileyard.

Inventors
Jacob A. Darst
Monroe Brittain
By *Victor J. Evans*
Attorney

UNITED STATES PATENT OFFICE.

JACOB A. DARST, OF CALDWELL, KANSAS, AND MONROE BRITTAIN, OF CHICKASHA, OKLAHOMA.

HYDROCARBON-FURNACE.

1,025,054.

Specification of Letters Patent.

Patented Apr. 30, 1912.

Application filed March 25, 1911. Serial No. 616,962.

To all whom it may concern:

Be it known that we, JACOB A. DARST, a citizen of the United States, residing at Caldwell, in the county of Sumner and State of Kansas, and MONROE BRITTAIN, a citizen of the United States, residing at Chickasha, in the county of Grady and State of Oklahoma, have invented new and useful Improvements in Hydrocarbon-Furnaces, of which the following is a specification.

The present invention relates to furnaces and more particularly to the type of furnaces used in connection with steam boilers and depending upon burners for supplying the heat necessary for converting the water into steam.

The invention provides a novel construction and arrangement whereby jets of air and steam are supplied to promote combustion and intensify the heat so that no free carbon is given off or afforded opportunity for depositing on the walls of the furnace or flues of the boiler, the purpose being to insure a perfect combustion.

The invention consists of the novel features, details of construction and combination of parts, which hereinafter will be more particularly set forth, illustrated in the accompanying drawings, and pointed out in the appended claim.

Referring to the drawings, forming a part of the specification, Figure 1 is a vertical central longitudinal section of a stationary boiler and furnace embodying the invention. Fig. 2 is a horizontal section on the line 2—2 of Fig. 1. Fig. 3 is a view similar to Fig. 1 of a modification, showing the invention adapted to a locomotive boiler and furnace. Fig. 4 is a horizontal section on the line 4—4 of Fig. 3. Fig. 5 is a detail view of the steam coil located in the smoke box of the boiler.

Corresponding and like parts are referred to in the following description, and indicated in all the views of the drawings, by the same reference characters.

The steam boiler 1 is of the tubular type and horizontally arranged and is provided at its front end with a box 2 and stack 3. The masonry 4 may be of any construction generally employed to form a setting for a boiler and incloses the combustion chamber 5 and spaces 6 and 7, the space 6 extending horizontally and connecting with the chamber 5 and the space 7 being located in the

rear of the boiler and connecting with the rear end of the horizontal space 6. A baffle 8 overhangs the rear portion of the combustion chamber 5 and serves to deflect the flame and gases forwardly. The baffle or deflecting wall 8 is required only in furnaces in which the burner is located at the front and is not necessary in the style of furnaces having the burner located at the rear of the combustion chamber. The burner 9 may be of any variety utilizing gas or hydrocarbon and is preferably located at the front of the combustion chamber, although it is to be understood that the burner may be arranged at any convenient position. The burner throws the flame into the combustion chamber in a horizontal direction. Jets are located at the sides of the combustion chamber and comprise air and steam inlets, the steam jets being utilized to induce air currents and the air being heated by the steam so that the combined air and steam will mix readily with the flame to promote combustion and intensify the heat. The jets of steam are supplied by means of pipes 10, which are connected to a main line 11 which leads from the steam dome of the boiler, said main line connecting with a coil 12 arranged in the box 2 so as to superheat the steam after leaving the boiler and preliminary to escape at the outlets. The openings 13 for the ingress of air are outwardly flared and the outlets or nozzle ends of the steam pipes extend into the openings 13 so as to induce currents of air therethrough when the steam is flowing. A plurality of steam jets are located at the front and at the rear of the combustion chamber so as to supply ample vapor and air to promote combustion. A plurality of air openings 14 are provided and are adapted to be controlled by means of dampers 15 so that the effective size of the openings may be regulated to secure the best results.

A damper 16 is located at the juncture of the stack 3 with the box 2 and may be moved to regulate the draft in order to secure the best possible results. It is noted that the draft is not created by the stack, but is rather a forced draft being maintained by the steam and air jets, hence the flame and gases are forced through the furnace spaces and flues of the boiler rather than being drawn therethrough by a forced draft through the stack.

In the form of boiler and furnace illustrated in Fig. 3 the burner 9 is located at the front and directs the flame rearwardly. The flame is not required to be deflected, hence there is no necessity for providing a baffle or deflecting wall. In all other respects the furnace is supplied with steam jets and air openings which are located approximately in the plane of the burner as in Fig. 1.

A hood 17 is located in the lower portion of the combustion chamber and incloses a space adjacent the burner, said hood flaring from its connection with the wall of the combustion chamber having the burner to conform approximately to the spread of the flame. The hood serves to direct the flame to a point some distance from the burner outlet, thereby insuring a maximum heating of the combustion chamber so as to utilize the fuel to the best possible advantage.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while we have described the principle of operation of the invention, together with the device which we

now consider to be the embodiment thereof, we desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claim appended hereto.

Having thus described the invention what is claimed as new, is:—

In a steam boiler furnace, a burner fitted to a vertical wall of the combustion chamber and adapted to direct a flame into the combustion chamber, the latter having openings in the opposite wall, a jet nozzle located in one of said openings, a damper for controlling the other opening, said combustion chamber having a plurality of air openings in its side walls, and jet nozzles applied to the side openings for directing jets into the combustion chamber.

In testimony whereof we affix our signatures in the presence of witnesses.

JACOB A. DARST.
MONROE BRITAIN.

Witnesses:

JAS. A. HUTSON,
C. A. HOUGH,
JAS. A. MATTHEWS,
V. E. MATTHEWS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."