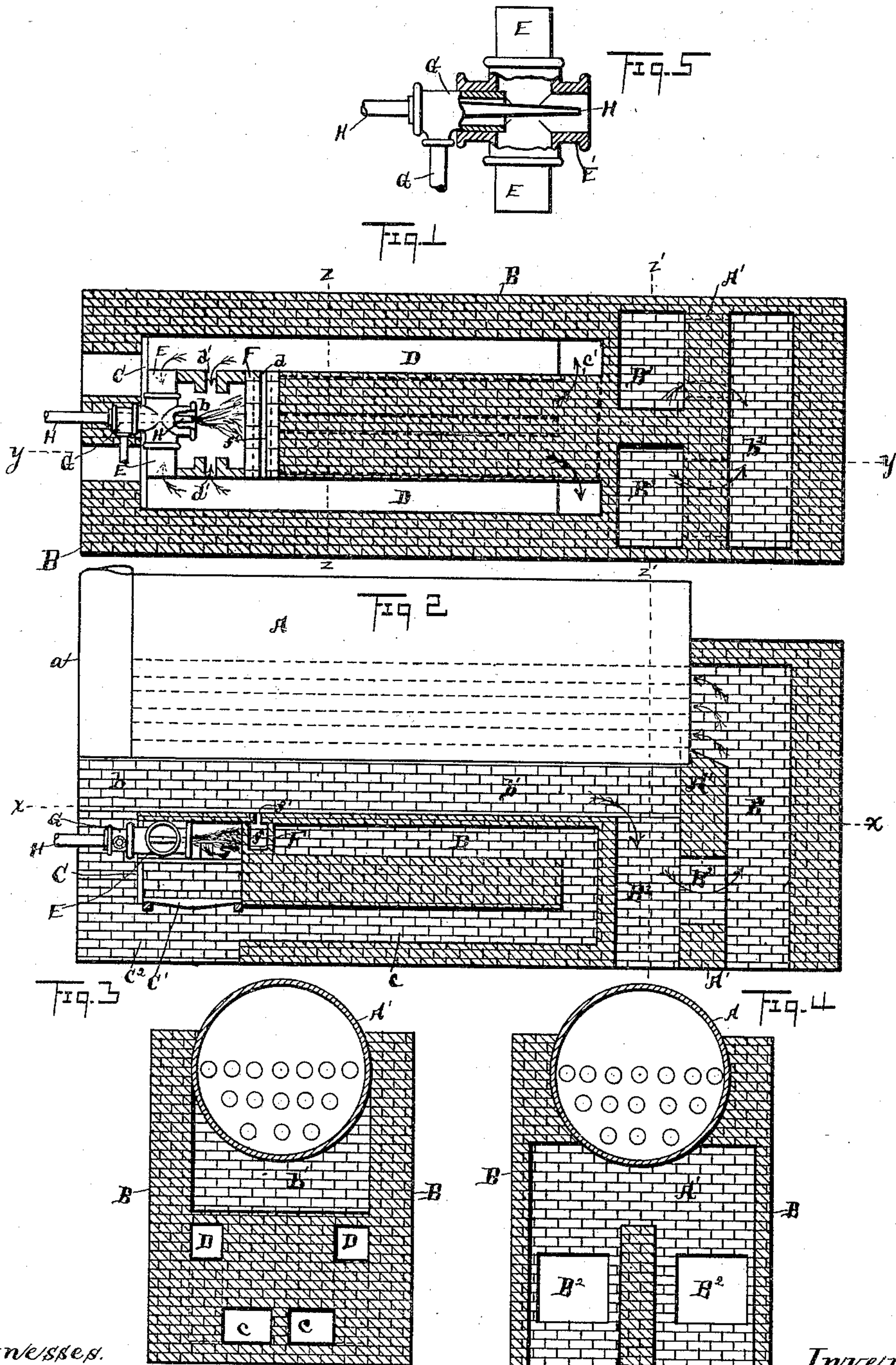


(No Model.)

J. BALMORE & W. S. ROCKWELL.
BOILER SETTING.

No. 409,552.

Patented Aug. 20, 1889.



Witnesses.

C. S. Lowrie
W. R. Edelen.

Inventors.

John Balmore
Walter S. Rockwell.

By Leggett & Leggett.
Attorneys.

UNITED STATES PATENT OFFICE.

JOHN BALMORE AND WALTER S. ROCKWELL, OF NEW YORK, N. Y.

BOILER-SETTING.

SPECIFICATION forming part of Letters Patent No. 409,552, dated August 20, 1889.

Application filed April 26, 1889. Serial No. 308,720. (No model.)

To all whom it may concern:

Be it known that we, JOHN BALMORE and WALTER S. ROCKWELL, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Boiler-Setting; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

Our invention relates to an improved boiler-setting adapted to burn hydrocarbon oil; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan in section on line xx , Fig. 2. Fig. 2 is a side elevation, in section on line yy , Fig. 1. Figs. 3 and 4 are elevations in transverse section, respectively on lines zz and $z'z'$, Fig. 1. Fig. 5 is an enlarged plan, in section, of the burner.

A represents a steam-boiler, the one shown being of the horizontal tubular variety, this variety being more commonly used for the purpose.

B represents the outside walls of the setting, that externally are of ordinary construction.

C is the front plate, C' the grate, and C² the ash-pit. The grates are only used in case it becomes necessary to burn, for instance, coal in generating steam necessary to operate the burner, these grates during the operation of the oil-burner being covered with fire-bricks or tiles to prevent the passage of air from such source. From the rear of the ash-pit lead air-ducts c , the same extending from thence to near the rear of the setting and connecting with lateral ducts c' . Ducts c' at the ends thereof discharge upward into ducts D, the latter being constructed along the side walls of the setting and separated from the combustion-chamber only by thin walls. Ducts D at and near the forward end of the setting connect with lateral pipe E, the latter being of large size. Ducts D have openings d discharging into chamber f of bridge-wall F, the latter having a narrow opening f' on top extending the length of the bridge-wall, such opening connecting with and constitut-

ing the discharge from chamber f . Ducts D, forward of the bridge-wall, are provided with openings d' , discharging into the primary combustion-chamber b , a secondary combustion-chamber b' being located rearward of the bridge-wall. Pipe E has one or more T's E', the side opening thereof presenting toward the bridge-wall, such T's constituting the outer facing of the oil-burner. Located centrally within the T is steam-pipe G, and located centrally within the steam-pipe is oil-supply pipe H, both pipes G and H discharging in the same direction as the side opening of the T—that is, toward the bridge-wall. The jet of oil is thus surrounded by the steam-jet, and both jets are enveloped by the hot-air blast supplied through pipes E. In burning oil, and with the setting constructed as aforesaid, the air passing through the air-ducts becomes heated to a high degree, and by reason of such heated air and steam the oil discharged from the burner is vaporized as it leaves the burner, where it is ignited and burns fiercely, the flame of the burner impinging the bridge-wall. From thence the flame reverberates, enveloping the under side of the boiler as far forward as the setting will admit. Meanwhile the side openings d' admit air to support such combustion. As the products of combustion pass over the bridge-wall another supply of hot air enters through opening f' . The flame from an oil-burner is extremely active, and to prevent the flame from passing too quickly from under the boiler and to cause the flames to envelop the exposed rear portions of the boiler, a cross-wall A' is constructed at the extreme rear end of the boiler, such wall joining the boiler and the side walls of the setting and consequently closing the rear end of chamber b' . Diving-flues B³ are constructed next forward of wall A' and between the latter and duct c' , these diving-flues at the bottom connecting with openings B² in wall A', these openings discharging into chamber b^2 , located at the rear end of the boiler. The resistance to the flame in passing through these diving-flues not only retards the flame, but the reaction thus produced causes the flame to envelop the exposed portions of the boiler located over chamber b' , thus materially increasing the

steam-generating capacity of the boiler. From chamber b^2 the products of combustion enter the boiler-tubes, and from thence pass to the smoke-box a on their way to the smoke-pipe.

5 What we claim is—

1. In a boiler-setting, the combination, with a primary combustion-chamber, a secondary combustion-chamber, and air-ducts located under the secondary combustion-chamber and
10 leading rearwardly and then forwardly to the primary combustion-chamber, of a cross-wall located at or near the rear end of the boiler and provided near its lower end with openings, and diving-flues leading from the sec-
15 ondary combustion-chamber to the openings in the cross-wall, substantially as set forth.

2. In a boiler-setting, air-ducts connecting with the ash-pit chamber and leading from thence rearward and connecting with lateral
20 ducts, the latter opening upward into ducts located along the side walls of the setting,

the latter ducts connecting with air-pipes leading to the burner, substantially as set forth.

3. The combination of oil-burner with ducts 25 c, c' , and D , substantially as indicated, and hollow bridge-wall, the chamber thereof connecting with ducts D , such chamber having a discharge presenting upward, ducts D having lateral openings discharging into the com- 30 bustion-chamber between the line of the bridge-wall and burner, substantially as set forth.

In testimony whereof we sign this specification, in the presence of two witnesses, this 35 8th day of April, 1889.

JOHN BALMORE.
WALTER S. ROCKWELL.

Witnesses:

CHAS. H. DORER,
ALBERT E. LYNCH.