(No Model.) 3 Sheets—Sheet 1.

H. SEE.

STEAM BOILER.

No. 584,419. Patented June 15, 1897.

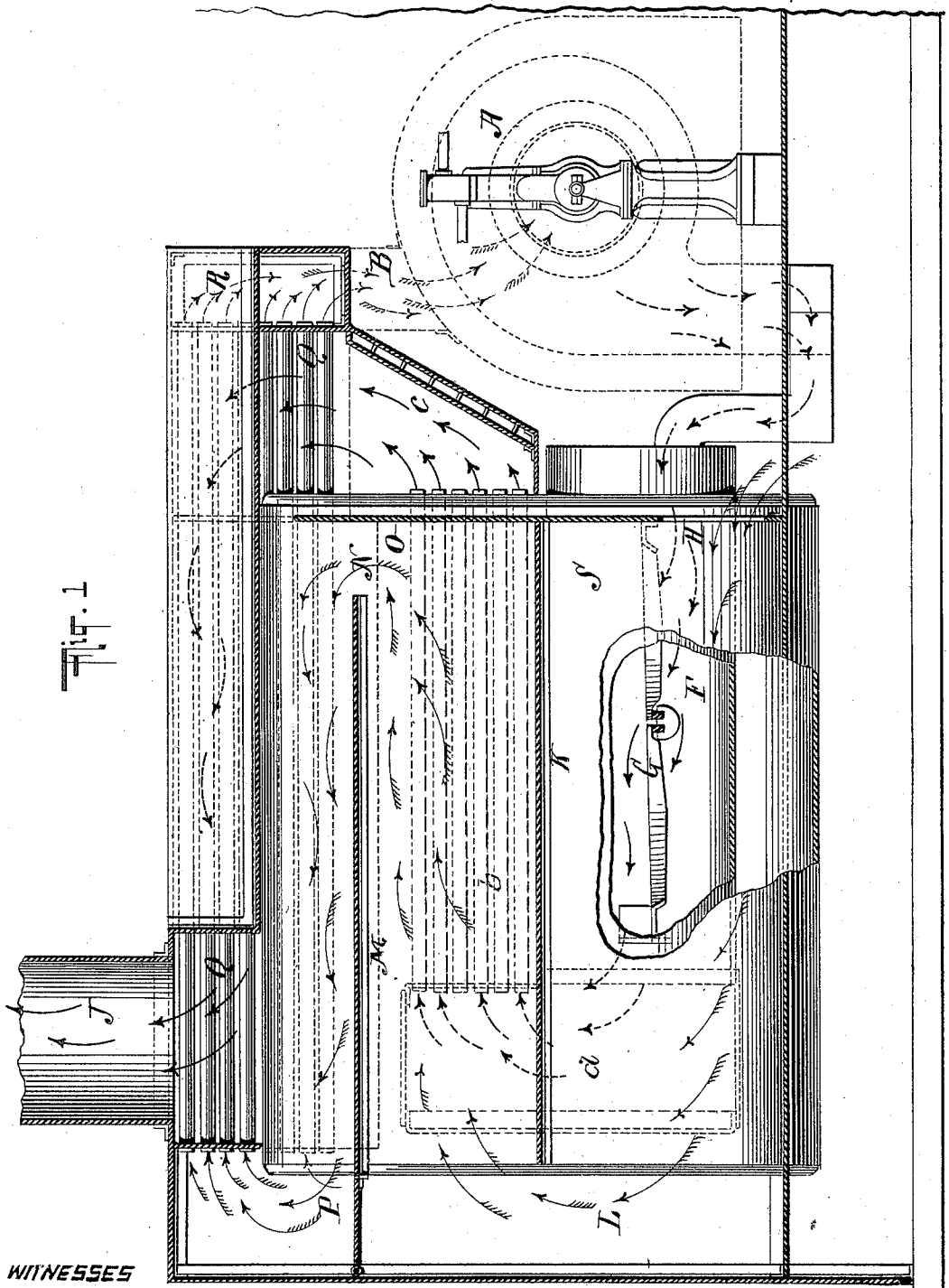

Fig. 1.

WITNESSES

Gustave Dieterich.

John Kehlenbeck.

INVENTOR Horace See

by Park Benjamin

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

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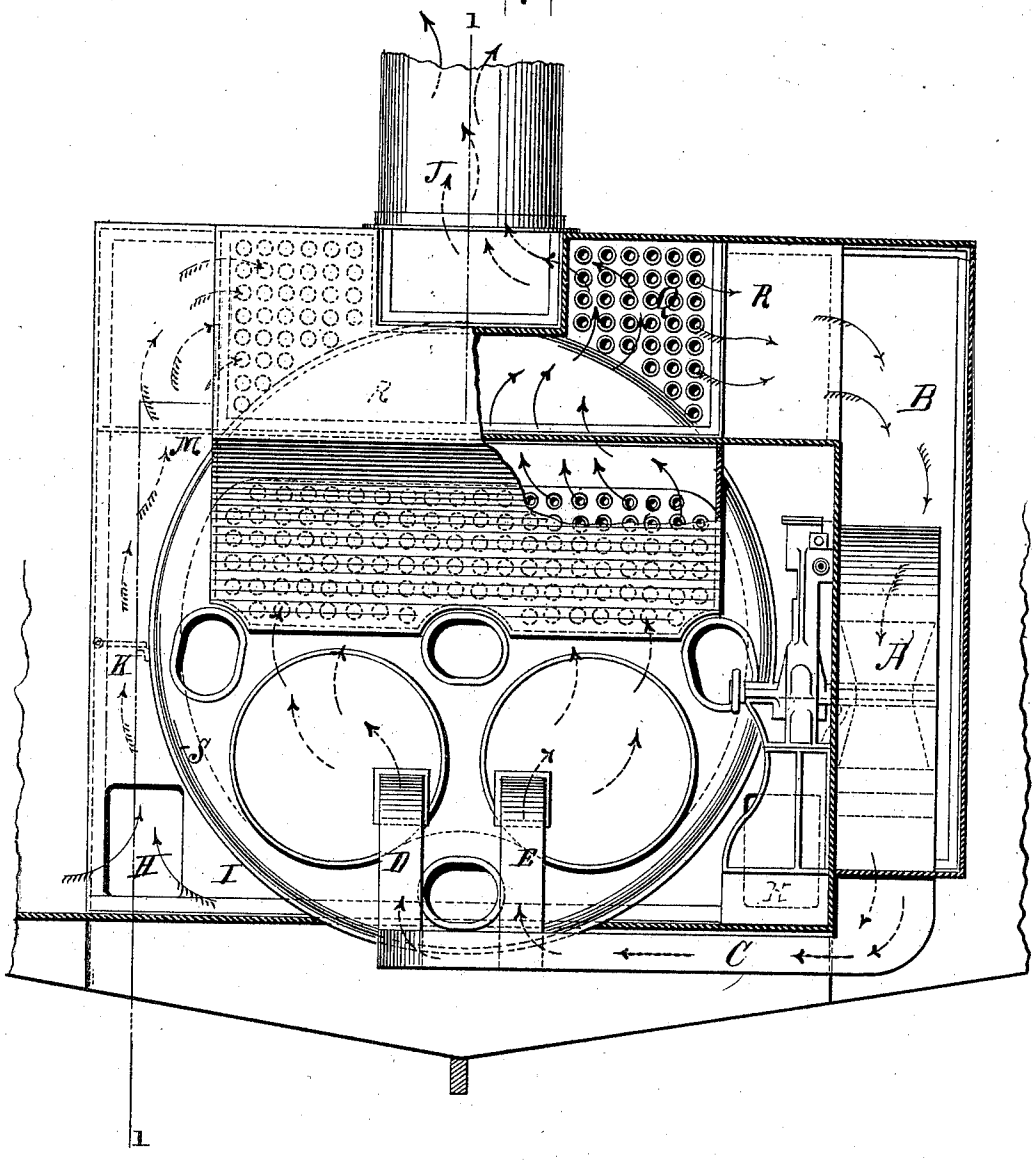
H. SEE.

STEAM BOILER.

No. 584,419. Patented June 15, 1897.

Fig. 2.



WITNESSES:

Gustave Dieterich.

John A. Schlumbeck.

INVENTOR

Horace See

BY Parker Benjamin

his ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 3.

H. SEE.

STEAM BOILER.

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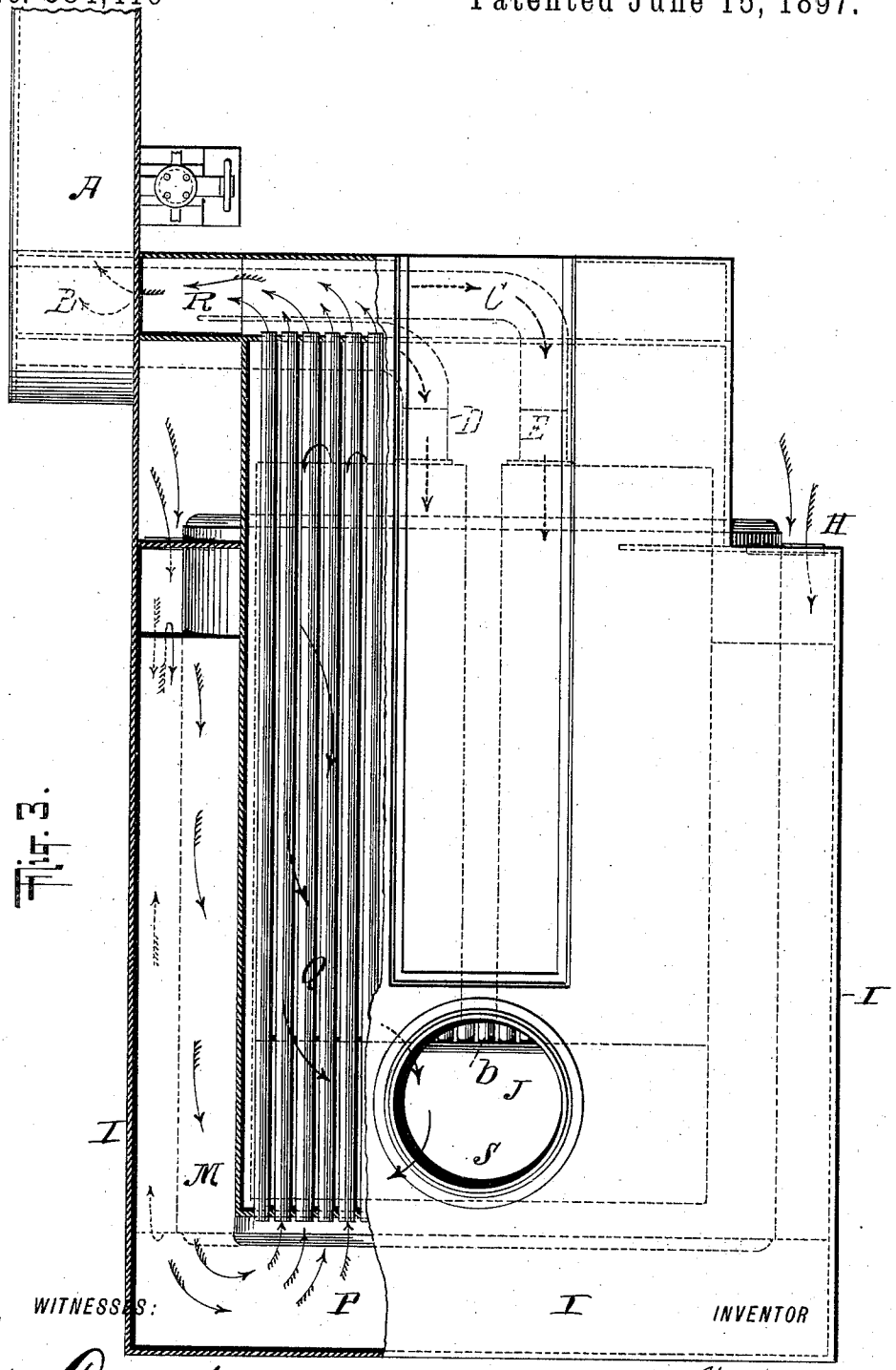

Fig. 3.

WITNESSES:

Gustave Ditterich

John Kehlenbeck.

INVENTOR

BY Horace See

Rich Benjamin

his ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HORACE SEE, OF NEW YORK, N. Y.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 584,419, dated June 15, 1897.

Application filed September 12, 1896. Serial No. 605,618. (No model.)

To all whom it may concern:

Be it known that I, HORACE SEE, of the city, county, and State of New York, have invented a new and useful Improvement in Steam-Boilers, of which the following is a specification.

My invention relates to steam-boilers of the fire-tube type, such as are more especially adapted to marine use.

My invention consists in surrounding the boiler or a sufficient part thereof with an air-tight bulkhead or casing through which air is drawn by any suitable blower or analogous device. The air enters at one extremity of the casing and is drawn out at the other, and during its passage it comes in contact with the hot radiating-surface of the boiler, and also may pass through tubes heated by the escaping gases. This air is then forced by the blower to the grate, whence it passes to the uptake and fire-tubes and so to the stack.

In the accompanying drawings, Figure 1 is a longitudinal vertical section on the line 1 1 of Fig. 2. Fig. 2 is a front view partly in transverse section. Fig. 3 is a top view partly in horizontal section.

Similar letters of reference indicate like parts.

A represents a blower or blast-forcing apparatus which is disposed in front of the boiler. It receives air from the conduit B, as indicated by the downwardly-directed arrows. It delivers air to the pipe C, Fig. 2, whence it passes to the pipes D and E, and thus is conducted to the ash-pit F beneath the grate G.

There are two distinct circulations of air in the apparatus. The current proceeds first from the openings H in the air-casing I to the conduit B, and so to the blower A. It then is delivered by the blower A to the ash-pit, as before described, and proceeds through the grate G and ultimately to the funnel J. The current is thus first heated by being drawn through the apparatus before reaching the blower. It is delivered hot by the blower to the ash-pit, and then mingling with the products of combustion imparts its heat to the water.

I will first describe the parts of the boiler through which the current is drawn by the blower A, so as to become heated.

Fresh air is drawn in at the openings H in the air-casing and passes around the exterior of the boiler-shell S, proceeding below the deflecting-plate K to the compartment L in the rear of the boiler. Thence it passes forward beneath the deflecting-plates M until it reaches the openings N between the forward ends of said plates and the vertical wall O. The current then returns to the compartment P in rear of the boiler and thence proceeds forward through the tubes Q to the compartment R, which extends across the boiler-front and communicates with the conduit B, leading to the blower.

It will be observed that the tubes Q are disposed above the boiler-shell and extend thereto.

The blast having become heated by contact with the boiler-shell and by passing through the tubes is delivered by the blower to the ash-pit and thence passes through the fuel on grate G to the uptake *a*. Thence it proceeds through the tubes *b*, which are in the lower part of the water-space of the boiler, to the front chamber or connection *c*. From said chamber the mingled air and products of combustion pass around the tubes Q and rearward to the funnel J. In this way the escaping draft, passing over the tubes Q, gives up its heat to the air which, passing through said tubes, is proceeding to the blower.

The construction hereinbefore described is especially adapted to marine use, as indicated in the drawings. The boiler is, in fact, disposed in an air-tight room, the walls of which form the air-casing I, through which the blast is drawn by the blower and in which it becomes heated before being forced into the furnace. The boiler is thus continually surrounded with the cool incoming air, which receives and absorbs the heat which otherwise would be radiated into the between-deck space. Furthermore, inasmuch as the air is drawn through the air-casing before it is forced into the ash-pit, any leaking gas or steam cannot escape between decks, but enters into the current which is drawn into the ash-pit.

I claim—

1. In combination with a steam-boiler, an air-chamber inclosing the side and rear walls of said boiler, and an air-forcing device having its suction end communicating with said

air-chamber and its delivery end with the ash-pit; whereby heated air is drawn through said chamber in contact with the heated boiler-shell and then forced into said ash-pit, substantially as described.

2. In combination with a steam-boiler, an air-chamber inclosing the side and rear walls of said boiler, and open to the atmosphere at its lower portion, and an air-forcing device having its suction end communicating with the upper portion of said air-chamber and its delivery end with the ash-pit; whereby air is drawn upward through said air-chamber and into contact with the heated boiler-shell, and after being exhausted from said chamber forced into the ash-pit, substantially as described.

3. In combination with a steam-boiler, an air-chamber, provided with an air-inlet at its lower portion and inclosing the side and rear walls of said boiler and having a deflecting plate or plates forming communicating passages, and an air-forcing device having its suction end communicating with the upper portion of said chamber, and its delivery end with the ash-pit; whereby air is first drawn into said chamber at the bottom and front thereof, and then exhausted upward through said passages in contact with the heated boiler-shell, and then forced into said ash-pit, substantially as described.

4. In combination with a steam-boiler, an air-chamber inclosing the side and rear walls of said boiler, a series of tubes disposed in the uptake of said boiler and communicating with said chamber, and an air-forcing device having its suction end communicating with said tubes and its delivery end with the ash-pit; whereby heated air is first drawn through said air-chamber and said tubes and then forced into said ash-pit, substantially as described.

HORACE SEE.

Witnesses:
WM. H. SIEGMAN,
J. A. VAN WART.