

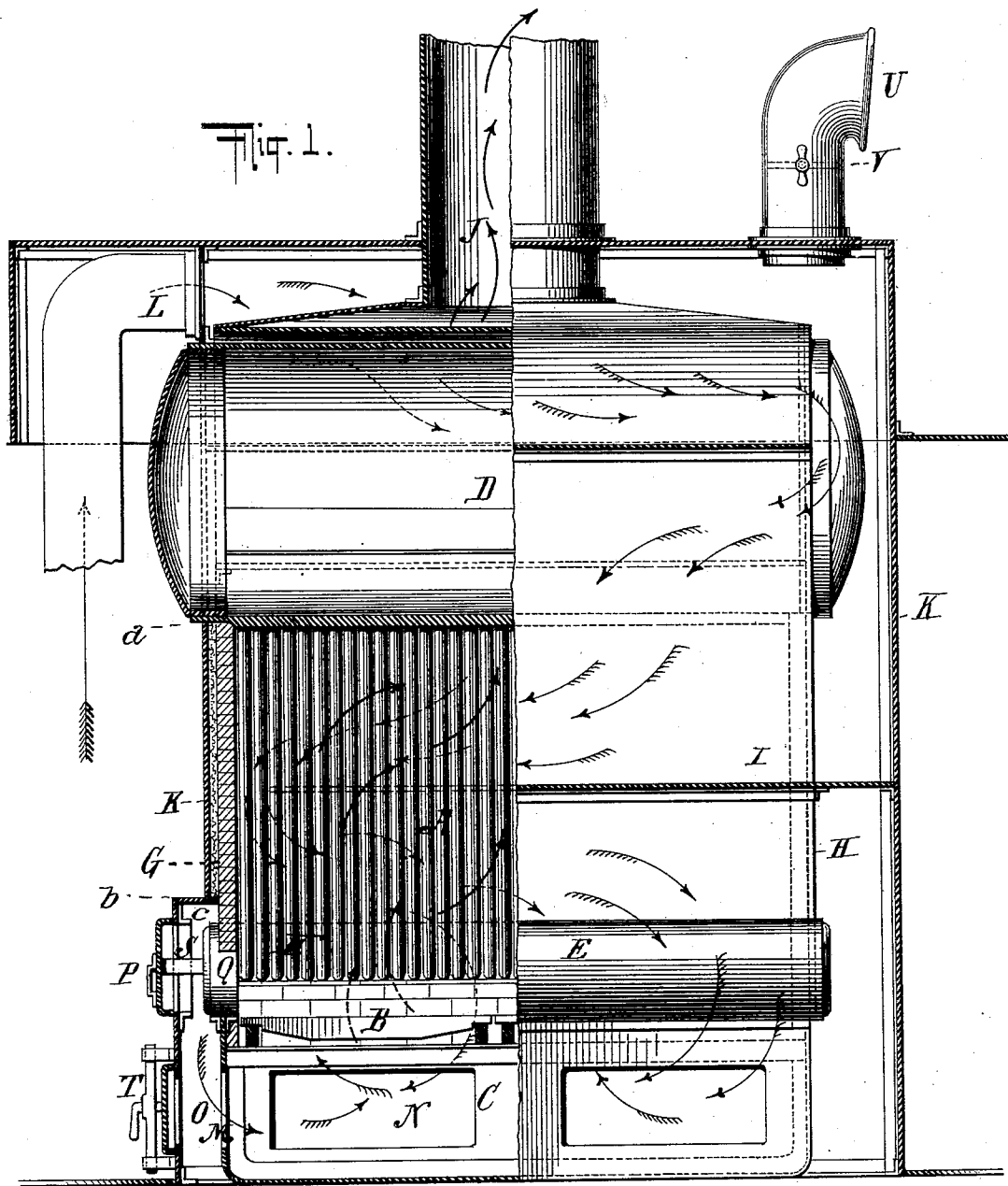
(No Model.)

3 Sheets—Sheet 1.

H. SEE.
STEAM BOILER.

No. 580,060.

Patented Apr. 6, 1897.



WITNESSES:
Gustave Dietrich.
John Kshlenbeck.

INVENTOR
Horace See
BY *Rank Benjamin*
his ATTORNEY.

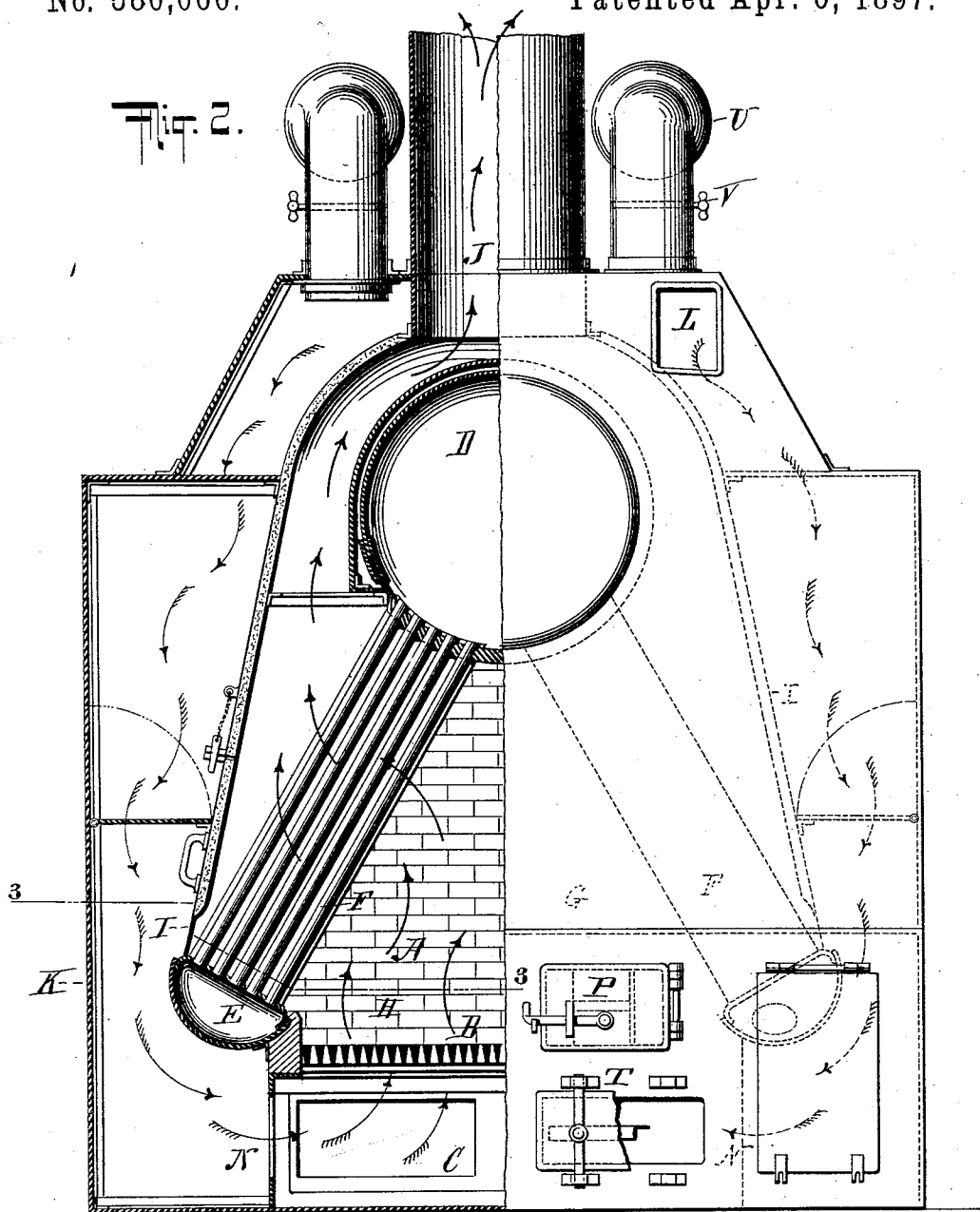
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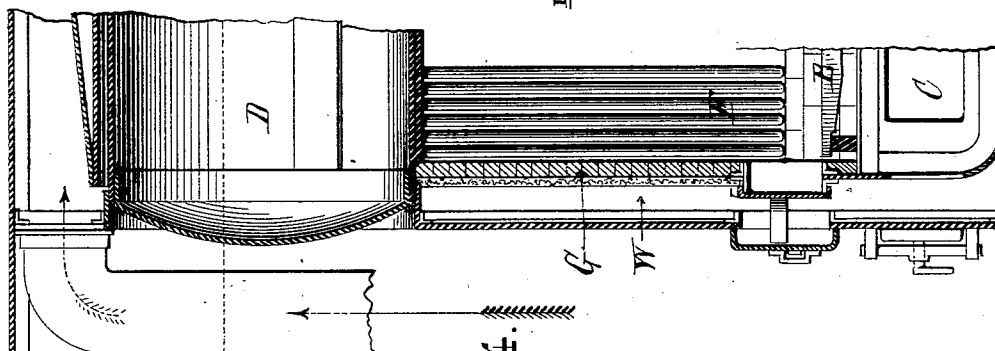
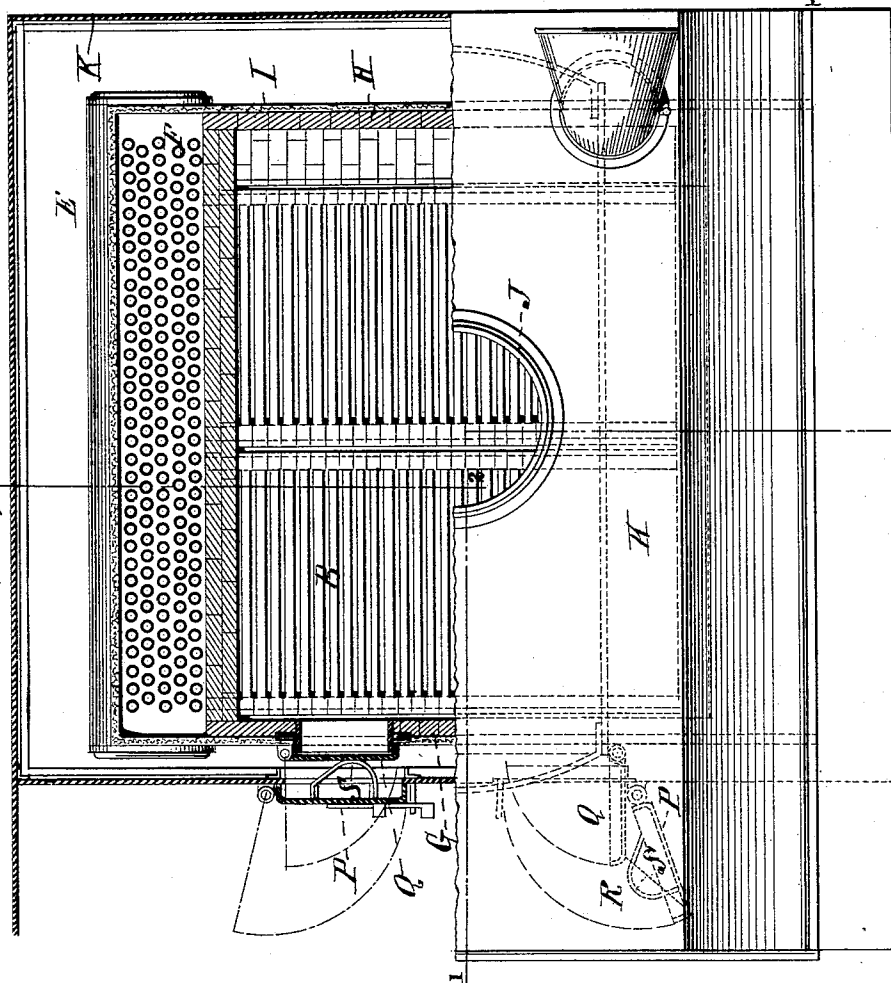
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Fig. 3.



WITNESSES:

Gustave Dietrich.
John Kellenbeck.

Fig. 4.

INVENTOR

Horace See

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UNITED STATES PATENT OFFICE.

HORACE SEE, OF NEW YORK, N. Y.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 580,060, dated April 6, 1897.

Application filed September 12, 1896. Serial No. 605,617. (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 a steam-boiler of the water-tube type, and to its application more particularly to marine use.

My invention consists in the structure hereinafter pointed out in the claims, whereby the boiler is inclosed in substantially a close room, the outer walls of which may be bulkheads of a vessel, so that air-casing intervenes between the boiler-shell and said bulkheads. Into the upper part of the space thus formed air may be forced from a suitable blower or admitted from the atmosphere. The draft, becoming heated by contact with the boiler, passes downward through front and side openings in the ash-pit, and so up through the fire-space to the uptake. The heat radiated from the sides, top, and rear of the boiler is thus taken up by the air-supply, and high temperature between decks of the vessel in which the boiler is placed is thus prevented. The outer casing also prevents escape of steam due to boiler-leakage. The construction is also such that back draft is entirely prevented when the fuel-supply doors are opened.

In the accompanying drawings, Figure 1 is a partial vertical section on the line 1 1 of Fig. 3. Fig. 2 is a front elevation and a partial vertical section on the line 2 2 of Fig. 3. Fig. 3 is on the right-hand side a top view, and on the left-hand side a horizontal section, on the line 3 3 of Fig. 2. Fig. 4 is a vertical section of the front part.

Similar letters of reference indicate like parts.

A represents the fire-space of the boiler; B, the grate; C, the ash-pit, and D the steam-drum.

At E are water-vessels, situated one at each side of the grate B and connected to the steam-drum D by the inclined water-tubes F.

G and H are respectively the front and back walls of the fire-space.

The metal inner casing I covers the sides of the fire-space and the exterior of the front and back walls and extends above the steam-

drum D, where it communicates with the uptake flue or funnel J.

K is an exterior casing forming a chamber inclosing the boiler in such a way that a free air-space is afforded around the boiler except in front of the front wall G and in front of the end of the steam-drum D. Thus, referring to Fig. 1, it will be seen that the outer face of the steam-drum D is directly exposed to the atmosphere and that there is no air-space between the part *a b* of the casing K and the front wall G, or, in other words, there is merely an air-trunk *c*, which extends before the fuel-supply and ash-pit openings only and not before the entire boiler-front. It will be observed, therefore, that I employ no air-casing in front of the boiler to prevent the heat of the fire-space or of the steam-drum to prevent direct radiation from these parts to the outer atmosphere. Hence I do not utilize the heat radiated from the front of the boiler to raise the temperature of the air-supply.

Disposed in front of the outer casing K and communicating with the interior thereof by means of the conduit L is any suitable form of blower or air-forcing apparatus. The blast entering at L follows the course of the arrows and passes downward between the outer casing K and the inner casing I of the boiler, and so becomes heated. It then proceeds into the ash-pit through the side openings N and passing round through the space O, Fig. 1, also enters the ash-pit through the front openings M. The air then passes up through the fire-grate, between the water-tubes F, over the drum D, and so to the uptake J. It will be apparent that the air from the time that it enters the inlet-conduit L until it escapes at the uptake J has an entirely free and unobstructed flow through large passages and spaces, and that it is not choked or impeded in any wise by valves or other regulating contrivances. It will also be seen that I surround the entire boiler—the front portion excepted—with an envelop of cool air, which takes up the radiated heat, and thus prevents the same being communicated to the adjacent atmosphere. This is especially advantageous when the boiler is used for marine purposes. The large heating-surface ex-

posed to the incoming air-blast also insures the elevation of the latter to a high temperature before it passes to the grate. So, also, the inclosing of the boiler in an outer casing or bulkhead prevents any escape of steam due to leakage.

In the front of the outer casing K are hinged doors, as P, and in the inner casing and communicating with the fire-space are hinged doors, as Q. These doors are connected by a chain R, (Fig. 3, dotted lines,) so that the opening of the outer door P also causes the opening of the inner door Q. On the outer door P there is also a cam S, which when said door is closed bears against the inner door and effects the shutting of said inner door at the same time. There are also doors, as T, in the outer casing in front of the openings M, through which access can be had to said openings. By this construction the fireman may manage the fire from outside the outer casing K, which may be the bulkhead of a vessel. It is important to notice also that back draft, when the inner door Q is opened, is entirely prevented, because the incoming blast not only passes unobstructedly below the grate through the ash-pit, but also directly into the space above the grate when said inner door is opened, this current above the grate effectively preventing the current delivered below the grate finding an exit at the opening.

In order to enable the boiler to employ natural instead of forced draft, as hereinbefore described, I provide a ventilator or ventilators, as U, in the upper part of the casing K and arrange regulating-valves V therein. The air then passes downward from these inlets to the ash-pit and through the grate and intervals between the tubes to the uptake, as before.

In Fig. 4 an air-space W is formed in front of the wall G.

I claim—

1. In combination, a steam-boiler having a fuel-supply opening in its front wall and above its grate, draft-openings in both front and side walls and below said grate, a source of air-supply and an air-casing; the said air-casing inclosing all of said openings and conducting the air-supply directly thereto, substantially as described.

2. In combination, a steam-boiler having a fuel-supply opening in its front wall and above its grate, draft-openings in both front

and side walls and below said grate, a source of air-supply and an air-casing inclosing said openings and conducting the air-supply directly thereto and extending around the sides and rear of said boiler, substantially as described.

3. In combination, a steam-boiler having a fuel-supply opening provided with a hinged door, a draft-opening below its grate, an air-casing inclosing said openings and having itself an opening provided with a hinged door in front of said fuel-opening, a source of air-supply communicating with said casing, and a mechanical connection between the said hinged doors whereby the opening and shutting of the outer door causes the simultaneous opening and shutting of the inner door, substantially as described.

4. In combination, a steam-boiler, a bulkhead or partition in front of the fuel-supply and ash-pit openings thereon, an air-blower communicating with the space between bulkhead and boiler, a hinged door closing said fuel-supply opening and a hinged door corresponding thereto in said bulkhead, substantially as described.

5. In combination, a steam-boiler having water-chambers on each side of its grate, a steam-drum above said grate, inclined tubes connecting said drum and said chambers, a casing surrounding the aforesaid parts and communicating with the uptake, openings in said casing above and below said grate, an external casing surrounding said inner casing, and provided with a door for access to the fuel-supply opening, and an air-blower communicating with the upper part of said external casing, substantially as described.

6. In combination, a steam-boiler having an inner casing and an outer casing surrounding its top, sides and rear, and extending in front only of the fuel-supply and draft openings, an air-blower communicating with the upper part of said outer casing, and openings in the front and sides of the ash-pit whereby the blast from said blower is caused to descend between said casings to said ash-pit openings thus becoming heated by contact with the inner casing, and then to rise through the grate and fire-space to the uptake, substantially as described.

HORACE SEE.

Witnesses:

WM. H. SIEGMAN,
I. A. VAN WART.