

(No Model.)

2 Sheets—Sheet 1.

N. W. PRATT.

INTRODUCING AIR INTO BOILER ROOMS AND FURNACES.

No. 580,895.

Patented Apr. 20, 1897.

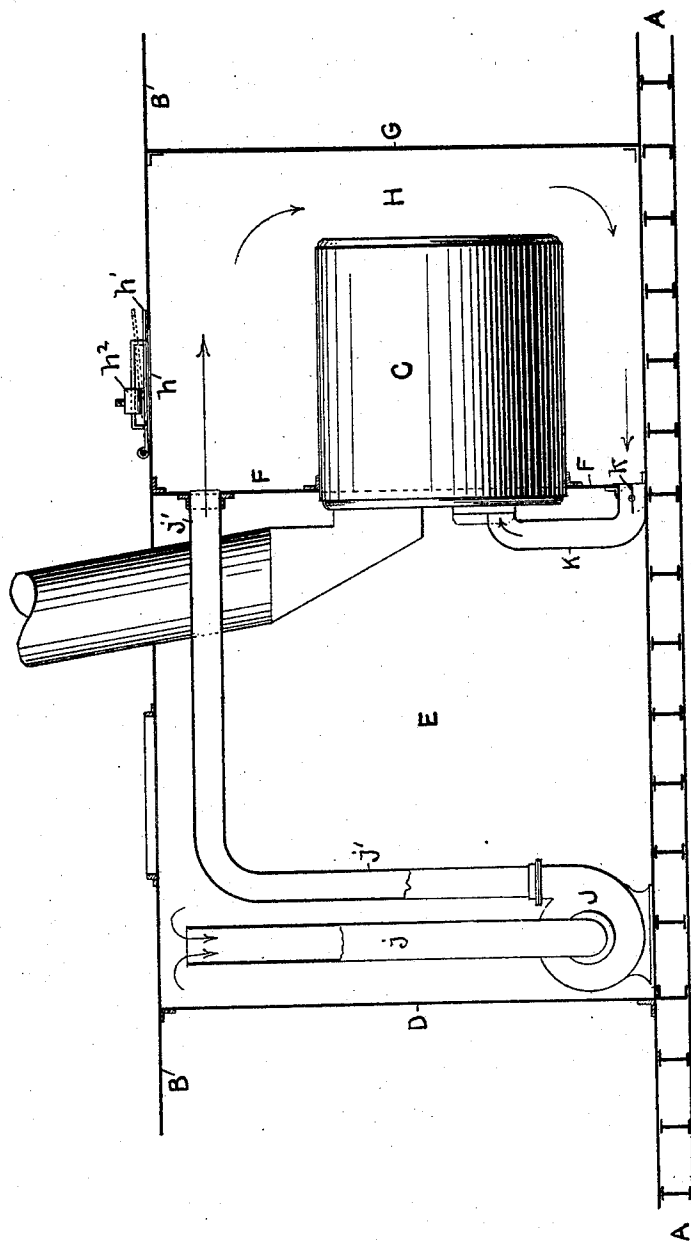


Fig. 1.

Witnesses
Chas Hanimann
Edson Salisbury Jones

Pat M. Pratt
Inventor.
By His Attorney Chas M. Pratt

(No Model.)

2 Sheets—Sheet 2.

N. W. PRATT.

INTRODUCING AIR INTO BOILER ROOMS AND FURNACES.

No. 580,895.

Patented Apr. 20, 1897.

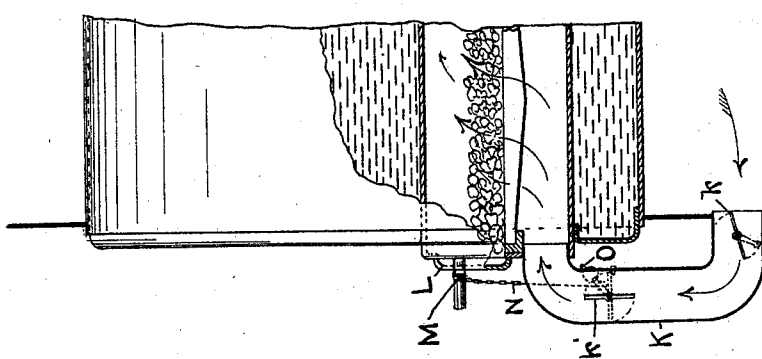


Fig. 3.

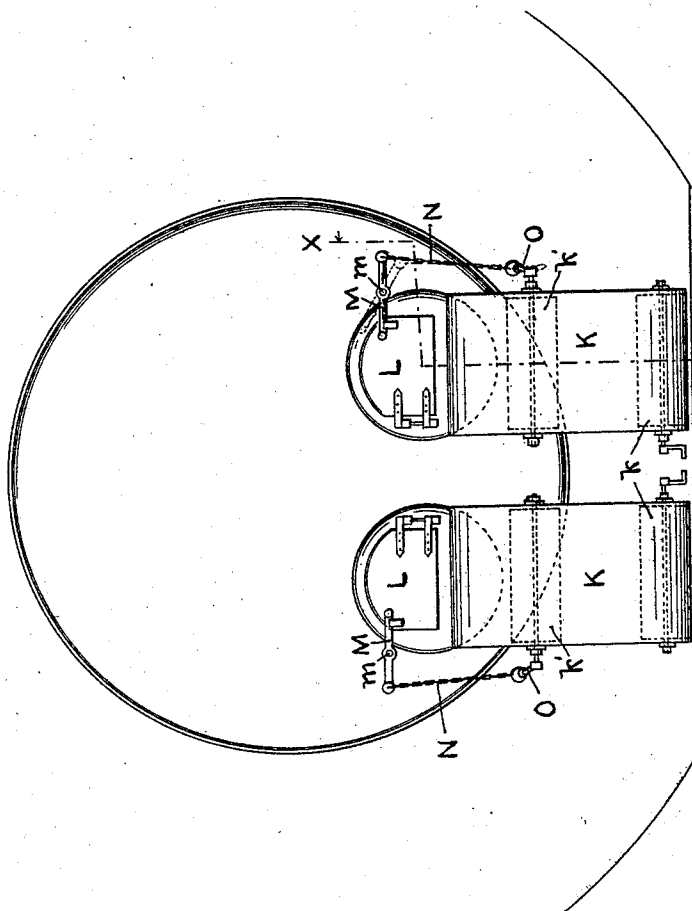


Fig. 2.

Witnesses
Chas. Heunemann
Edson Salisbury Jones

Nat W. Pratt Inventor
By his Attorney Chas W. Jordan

UNITED STATES PATENT OFFICE.

NAT W. PRATT, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE BABCOCK
& WILCOX COMPANY, OF NEW YORK, N. Y.

INTRODUCING AIR INTO BOILER-ROOMS AND FURNACES.

SPECIFICATION forming part of Letters Patent No. 580,895, dated April 20, 1897.

Application filed November 23, 1895. Serial No. 569,894. (No model.)

To all whom it may concern:

Be it known that I, NAT W. PRATT, a citizen of the United States, residing in the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Introducing Air into Boiler-Rooms and Furnaces, of which the following is a specification.

The improvements are particularly adapted to boilers located in the holds of steamships, although they may be used with boilers elsewhere situated, as underground, &c.; but for the purpose of illustrating and describing the invention a steamship-boiler has been chosen.

When a steamship is run at a high rate of speed under a forced draft, it is usual to close the stoke-hole to force into the same the air which is to supply the furnaces and to open dampers between the stoke-hole and the ash-pits of the furnaces. At best the stoke-hole of a steamship is a hot place; but under such circumstances all the air the firemen get is that which feeds the furnaces, and the increased radiation from the furnaces and boilers is such that the fire-room becomes more highly heated than usual, to the still greater discomfort of the stokers. If during these conditions any accident happen to the boiler, (as the blowing out of a tube or a breaking down of a furnace,) life is quite liable to be lost or great injury to the firemen result, because, the stoke-hole being closed, they cannot get out quickly.

One of the objects of the invention is such a construction and arrangement as will secure a cooler fire-room, not only under ordinary circumstances, but during the use of a forced draft, and so that the usual means of egress from the fire-room can be left open at all times.

Another object of the invention is the provision of means whereby when the fire-door of a furnace is opened the damper which governs the admission of the air-blast to the furnace will be automatically closed, and the blowing of hot gases and coals into the fire-room will be thereby prevented.

To these ends the improvements consist in certain features of construction and arrangement hereinafter described and claimed.

In the accompanying drawings, Figure 1

represents in vertical longitudinal section a portion of a steamship constructed in accordance with the first feature of the invention. Fig. 2 shows a front view of a boiler provided with means embodying the second feature of the invention. Fig. 3 represents the boiler, partly in side view and partly in vertical section on line *x x* of Fig. 2.

A denotes the boiler deck or floor, B the ceiling thereof, and C the boiler, of any preferred type.

Athwartship three tight bulkheads or partitions are constructed, one, D, at that end of the fire-room E farthest from the boiler, a second, F, at the front of the boiler, and a third, G, in the rear of the boiler, thereby dividing that portion of the ship occupied by the fire-room and boiler into two distinct compartments or chambers E H. The compartment E is supplied with the usual opening *e* in the deck above, which may always remain unclosed for the ingress and egress of the firemen.

For the production of a forced blast a fan-blower J is located in any convenient place, as in the fire-room, and air to supply the same is preferably taken, as through a pipe *j*, from near the ceiling of said room, which is the hottest part thereof. From the blower a pipe *j'* extends to and connects with the bulkhead F, so as to deliver the blast into the compartment H, where it will be still further heated on its way to the furnaces. As many pipes K as there are furnaces connect the ash-pits thereunder with the compartment H, and each of said pipes is preferably provided with a damper *k* for governing the supply of air to the fire.

When the ship is to be run under a forced draft, the fan-blower is started. Air will then be drawn into the blower from the hottest part of the fire-room (thereby bringing fresh air into the room to ventilate it) and will be delivered into the boiler-compartment, the usual pipes which supply the stoke-hole with air, as well as the usual passage for ingress to and egress from the fire-room, being left open. With my improved construction and arrangement therefore the fire-room will be much cooler than has heretofore been the

case, and should any accident happen to the boiler the firemen will have all the chance possible to escape speedily from the room.

An arrangement is preferably made, also, so that the blower can be run continuously for the purpose of ventilating and keeping the fire-room cooler, even when a forced draft is not being employed. For this purpose there is located somewhere on the air-passage between the blower and the damper which governs the supply of air to the furnace a suitable relief-valve which will open when the pressure exceeds a proper amount. In Fig. 1 the escape for excessive pressure is shown as provided for by an opening h in the top of the compartment or chamber H, the said opening being normally closed by a relief-valve in the form of a hinged plate h' , which is preferably lightly loaded with an adjustable weight h^2 . The position of the damper k is regulated to supply the fire with the desired amount of draft, and any excess of air-pressure will be relieved by the automatic rising of said valve-plate. The construction and arrangement also allows the fires to be supplied with air even when the blower is not running, for air will be sucked down the pipe j , through the blower and pipe j' , into the compartment H, from whence it will pass through the pipe K to the fire. If desired, however, dampered draft-openings may be placed in the bulkhead F or in the pipe K to provide an additional supply, if needed.

The arrangement whereby hot gases and coals are prevented from being blown into the fire-room during the use of a forced draft is represented in Figs. 2 and 3. The arrangement shown is a preferred one, but it may be considerably varied without departing from the spirit of the invention, as will be readily understood.

The fire-door L of a furnace is held in a closed position by a locking-bar M, which is pivoted at m . The outer end of this bar may be connected, as described below, with an arm on the damper k ; but I prefer to employ a second damper k' in the pipe K and to connect the bar therewith, as by a chain N or other flexible connection attached to a weighted arm O on the damper-shaft. When the fire-door is to be opened for stoking or otherwise, the outer end of the bar M is pulled downward, when the weighted arm O will turn the damper to a closed position and preferably before the bar disengages the door. The door may then be opened without any danger of gases or coals being blown into the fire-room. If desired, a rigid link may be employed in place of the chain N and the weight

on the arm O be dispensed with. During the time the damper is closed the air-pressure may be relieved by any suitable valve on the air-passage between the blower and the damper, as will be readily understood. After the stoking has been completed and the fire-door has been closed a movement of the locking-bar M to a closed position will automatically open the damper k' and the air-blast to the fire will be reestablished.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A fire-room, having a chamber or compartment separated therefrom by a bulkhead or partition, in which chamber the boiler is projected; an air-blast device arranged to take air from the fire-room and deliver it to said chamber; and a return air-passage from said chamber to the boiler-furnace, substantially as set forth.

2. A fire-room having a chamber or compartment separated therefrom by a bulkhead or partition, in which chamber the boiler is projected; an air-blower arranged to take air from the fire-room and deliver it to said chamber; a dampered air-passage from said chamber to the boiler-furnace; and an air-pressure-relief valve located on the air-conduit between the blower and damper, substantially as set forth.

3. The combination, with a furnace fire-door and a draft-passage leading to the furnace and having a damper therein, of a device for holding said door closed; and means connected with said device and with said damper, whereby when the device is moved to unlock the door the damper will be automatically closed, substantially as set forth.

4. The combination with a furnace fire-door and a forced-draft passage leading to the furnace and having a damper therein, of a device for holding said door closed; means connected with said device and with said damper, whereby when the device is moved to unlock the door the damper will be automatically closed; and a pressure-relief valve on the draft-passage, substantially as set forth.

5. The combination, with a furnace fire-door, of a bar for locking the door in a closed position; an air-passage leading to the furnace and furnished with a damper having a weighted arm; and a flexible connection between said bar and arm, substantially as and for the purposes specified.

NAT W. PRATT.

Witnesses:

C. W. FORBES,
CHAS. HARRIMANN.