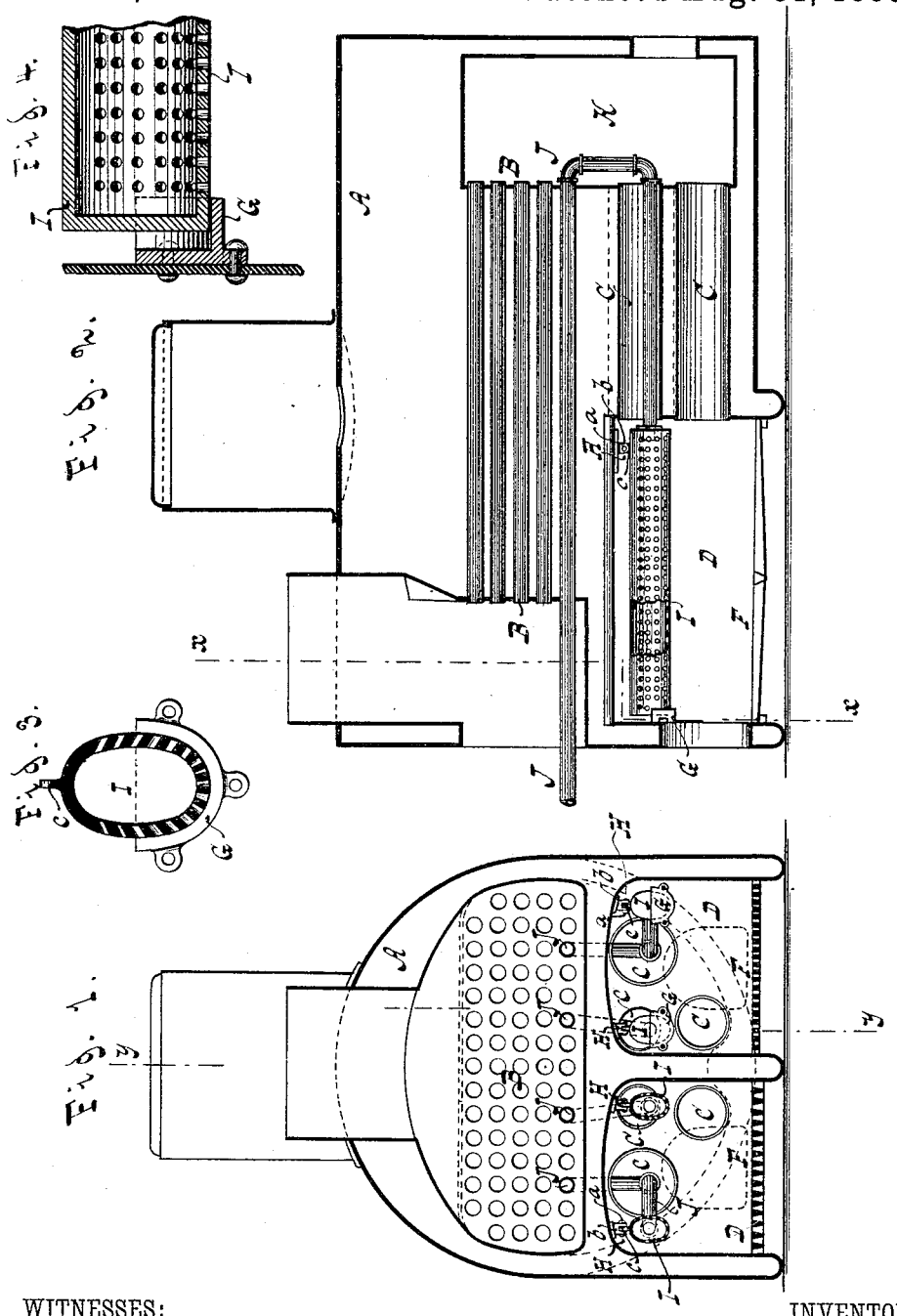
(No Model.)

J. HAM.

STEAM BOILER FURNACE.

No. 348,463. Patented Aug. 31, 1886.



WITNESSES:

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JOHN HAM, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE HAM COAL SAVING COMPANY.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 348,463, dated August 31, 1886.

Application filed December 17, 1885. Serial No. 185,959. (No model.)

To all whom it may concern:

Be it known that I, JOHN HAM, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Steam-Boiler Furnaces, of which the following is a specification.

This invention relates to certain improvements on the devices described in Letters Patent No. 331,635, granted to me December 1, 1885, and has for its object to render said devices applicable to steam-boilers with metallic fire-boxes—such, for instance, as marine boilers.

The peculiar and novel construction of the device which constitutes my present invention is pointed out in the following specification and claims, and illustrated in the accompanying drawings, in which—

Figure 1 represents a transverse vertical section of a marine boiler in the plane *x x*, Fig. 2. Fig. 2 is a longitudinal vertical section in the plane *y y*, Fig. 1. Fig. 3 is a transverse section of the air-distributer on a larger scale than the previous figures. Fig. 4 is a longitudinal section of the same.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates the outer shell of a steam-boiler. B C are the fire-places, and D D are the two fire-boxes, each of which is provided with a doorway, E, and with a fire-grate, F.

To the front wall of each fire-box are secured two brackets, G G, and in the top of each fire-box are fastened two suspension devices, H H, the brackets serving to support the front ends of the air-distributers I I, while the suspension devices serve to support said air-distributers near their rear ends.

The suspending devices illustrated in the drawings consist of pins *a*, which are supported by lugs *b*, secured to the top of the fire-box, and which engage with ears *c*, projecting from the tops of the air-distributers, and they are so constructed that they constitute a flexible or yielding connection which yields if the air-distributers expand or contract by the changes of the temperature to which they are exposed, the front ends of said distributers being placed loosely upon the brackets G G without rigid connection therewith, to allow such expansion and contraction. By referring to Fig. 3 it will be seen that the brackets are concave, so that the air-distributers are not liable to slip off if the boiler is used in a steamship. Said air-distributers consist of boxes made of cast-iron or other suitable refractory material, and their cross-section is, by preference, circular or oval, as shown in the drawings. They are perforated with a large number of holes or air-passages, and the air-passages in their sides are flaring downward, so as to throw the currents of air issuing from them downward into the flame, and cause them to mix with the unconsumed gases rising from the fuel on the fire-grate.

By referring to Fig. 2 it will be seen that the air-distributers extend throughout the entire length of the fire-box, or nearly so, from rear to front, leaving sufficient space for their expansion, and I have shown two air-distributers in each fire-box; but in some cases one air-distributer may be sufficient, and in others it may be desirable to use three or more such air-distributers in one and the same fire-box. Each air-distributer connects with an air-supply pipe, J. In the example shown in the drawings this supply-pipe extends from the front end through the boiler to the uptake K, Fig. 2, and returns through the fire-flue C, its inner end being made to pass through the head of the air-distributer, and by this arrangement the air in passing through the air-supply pipe is heated to a high temperature before it reaches the air-distributer, which is of great advantage.

If desired, the air-supply pipe may be connected to a fan-blower or other air-forcing apparatus.

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

1. The combination, with a steam-boiler, and with its metallic fire-box, of a bracket secured to the front wall of the fire-box, a suspension device secured to the top of the fire-box, an air-distributer having its front end resting upon the bracket, and being supported near its rear end by the suspension device, and an air-supply pipe, substantially as described.

2. The combination, with a steam-boiler and its fire-box, of an air-distributer provided with downwardly-flaring air-jets, a bracket loosely

supporting the front end of the distributer, a yielding or flexible suspension device connected with the top wall of the fire-box, and with the rear end of the distributer, to permit the latter to expand and contract, and an air-supply pipe connected with the distributer, substantially as described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

JOHN HAM. [L. S.]

Witnesses:
A. FABER DU FAUR, Jr.,
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