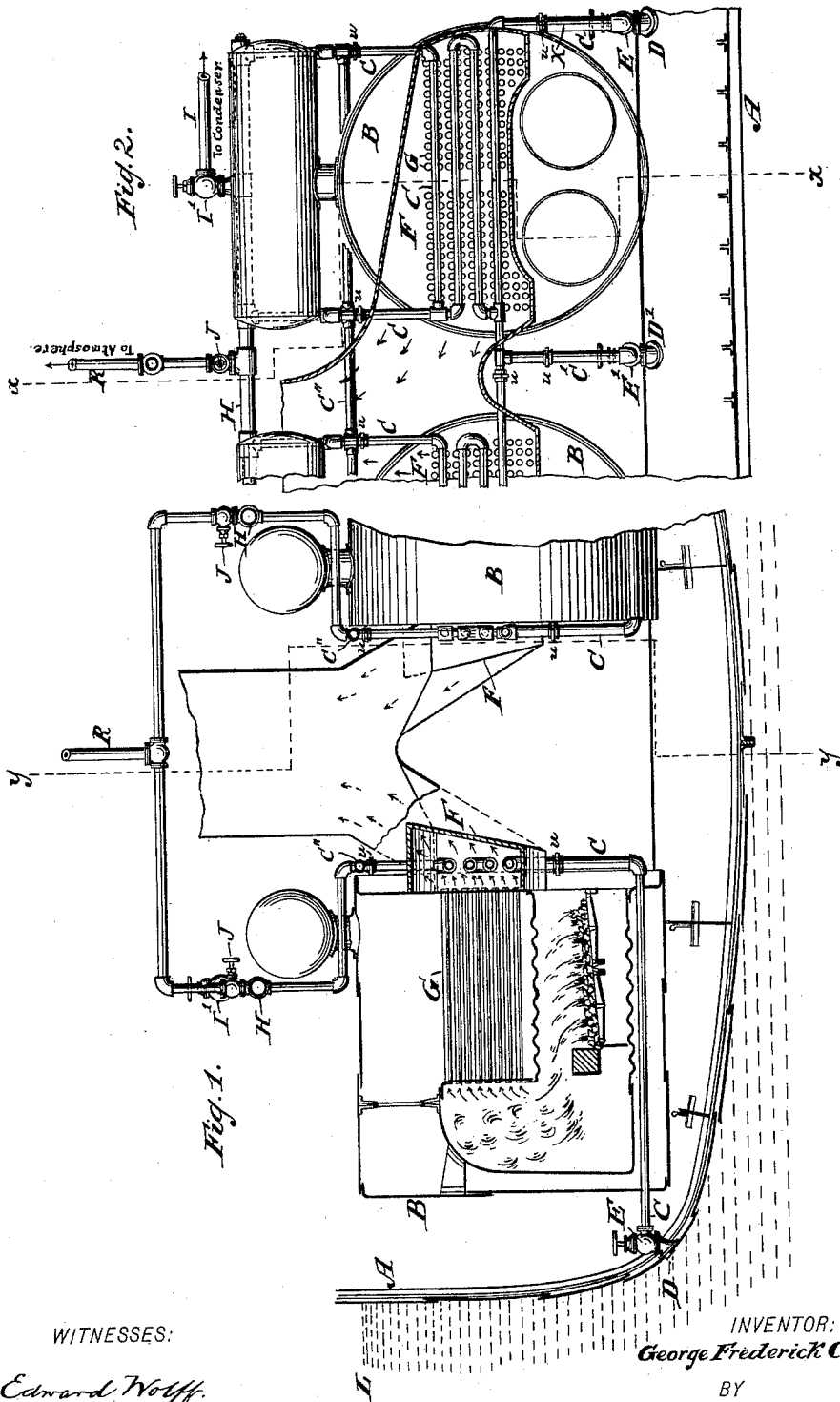


(No Model.)

G. F. COLEMAN.
WATER EVAPORATOR FOR STEAM BOILERS.

No. 467,398.

Patented Jan. 19, 1892.



WITNESSES:

Edward Wolff.
William Miller.

INVENTOR:

George Frederick Coleman.

BY

Van Santvoord & Hauff
his ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE F. COLEMAN, OF MOUNT VERNON, NEW YORK.

WATER-EVAPORATOR FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 467,398, dated January 19, 1892.

Application filed September 3, 1891. Serial No. 404,636. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FREDERICK COLEMAN, a citizen of the United States, residing at Mount Vernon, in the county of Westchester and State of New York, have invented new and useful Improvements in Water-Evaporators for Steam-Boilers, of which the following is a specification.

This invention relates to water-evaporators for steam-boilers; and it consists in certain novel features which are hereinafter fully described in this specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of my improvement applied to a pair of marine boilers, the section being taken on the line *x x* of Fig. 2. Fig. 2 is a front elevation of a section taken on the line *y y* of Fig. 1.

The letter A designates a portion of the hull of a vessel which contains one or more boilers B.

In order to supply the boilers with a sufficient quantity of fresh water, I provide an evaporating-pipe C, which passes through the wall of the ship below the water-line L and at about the level of the bottom of the boiler—say at about the point D—the pipe being provided at its end where it enters the water outside the ship with an inlet-valve or stop-cock E, so that it can be opened or closed at pleasure. The pipe C is conducted thence toward the boiler and up through the flame-space F, in front of the fire-flues G, so that it shall be fully exposed to the heat of the flame. When the pipe has reached the flame-space, it is carried back and forth, so as to make the pipe traverse the flame-space of the boiler and be in such a position as to be fully exposed to its heat. When the pipe C has been thus carried about as high as the upper series or range of fire-tubes, it is then carried vertically upward toward a pipe H, leading to a condenser, with which said pipe H is connected by a suitable pipe I and valve I'. The pipe H connects with a pipe R, which leads into the open atmosphere and is provided with a stop-valve J, so that when a sufficient supply of fresh water is obtained the surplus vapors formed in the evaporator can be permitted to escape into

the open atmosphere. If the vessel is provided with a series of boilers, each boiler may be provided with an evaporating-pipe and all the evaporating-pipes may be connected with each other and with the condenser.

By means of my improvement fresh feed-water for the boilers of sea-going vessels can be easily and readily obtained by the evaporation of sea-water, and the feed-water thus provided is not liable to form a sediment or scale in the boiler.

If any scale or sediment is formed or settles in the evaporating-pipe, I remove the same therefrom by flushing or scouring the pipe as follows: I make another opening D' through the side of the vessel and connect such opening with the evaporating-pipe C by means of a valve or stop-cock E' and pipe C', and by opening the valves or stop-cocks E and E', both of which, as well as the evaporating-pipe C, are below the water-line, the water from without will rush into said evaporating-pipe C, and through the same, with more or less velocity, impelled by the forward motion of the vessel at the time, and the evaporating-pipe C will be scoured out or cleansed by the action of the water, the valve or stop-cock I' in the pipe I, which leads to the condenser, being closed in this operation.

Instead of the foregoing method of scouring out or cleansing any sediment from the evaporating-pipe C, I can accomplish the same object by closing the valve J in the pipe leading to the atmosphere and also closing the valve I' leading to the condenser, by which means pressure can be produced in the evaporating-pipe sufficient to blow out the said pipe C, the valves or stop-cocks E and E' being opened. The evaporating-pipe is so arranged in front of the boiler as not to prevent convenient access to the furnace and furnace-doors, and the parts of the pipe which are carried across and through the flame-space are provided with suitable sectional joints or bends, so that their sections can be easily taken apart or turned on each other when access is desired to the tubes or flues of the boiler to clean or brush them, or said bends can be taken out and replaced by another set, if it is desirable

to do so. In order to be able to do this, the evaporator C is provided with union-joints *u*.

5 The receiving end of the evaporating-pipe C can, if desired, be inserted in a tank or vessel containing the water which is to be evaporated, instead of being passed through the side of the vessel, said tank being placed at a sufficient elevation to enable the water to fill the evaporating-pipes by its own gravity.

10 If desired, suction and discharge pumps may be connected with the evaporating-pipe C at any point in its course below the level of the point X, Fig. 2, for starting or accelerating the circulation of the water in said pipe.

15 The coils of the evaporating-pipe C may be arranged in horizontal or vertical lines, or at any desired angle with each other.

20 The evaporating-pipe C' connects with the coils of the main evaporating-pipe C and serves to enlarge the area of evaporation of the pipe system and to provide more room

for the vapors on their way to the condensing apparatus.

I claim—

The combination, with a steam-boiler located in a ship or vessel, of an evaporating-pipe subjected to heat from the boiler or its furnace and having valves or stop-cocks therein which connect with openings through the sides of the vessel below the water-line, one forward of the other, so that by opening said valves or stop-cocks the evaporating-pipe can be flushed or scoured and the sediment removed therefrom, substantially as shown and described. 35

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

GEO. F. COLEMAN.

Witnesses:

J. VAN SANTVOORD,
E. F. KASTENHUBER.