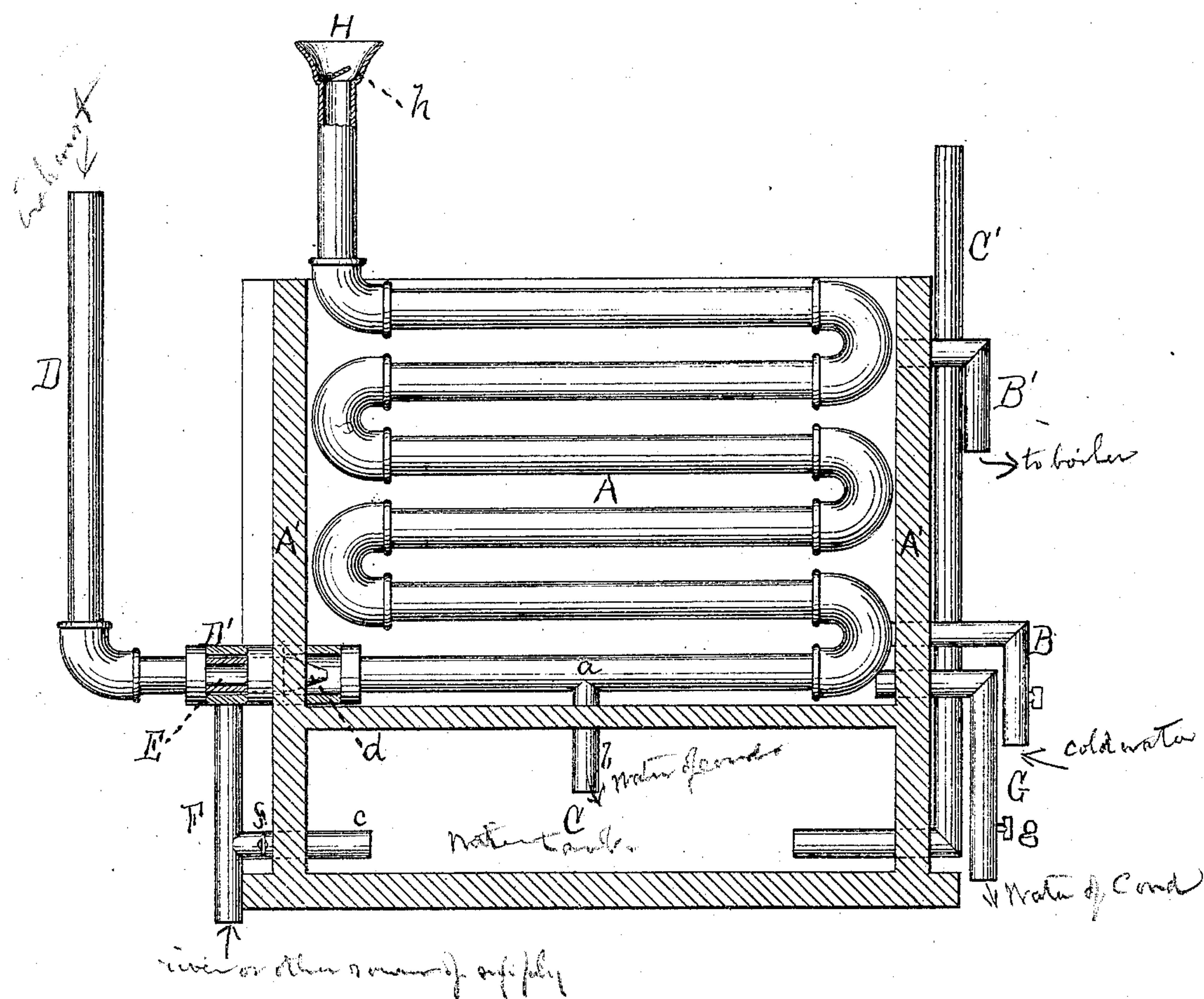


BENJAMIN F. SMITH.

Improvement in Condensing Escape Pipes.

No. 118,885.

Patented Sep. 12, 1871.



Witnesses:

T. C. Brecht.
Edwin James

Inventor.

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UNITED STATES PATENT OFFICE.

BENJAMIN F. SMITH, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN CONDENSING ESCAPE-PIPES.

Specification forming part of Letters Patent No. 118,885, dated September 12, 1871.

To all whom it may concern:

Be it known that I, BENJAMIN F. SMITH, of New Orleans, in the parish of Orleans and State of Louisiana, have invented an Improved Condensing Escape-Pipe, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing and the letters of reference marked thereon making part of this specification, in which is represented a side view of my invention illustrating all its different features.

The nature of my invention consists in securing in the horizontal arm of the elbow of an escape-pipe a vacuum-valve so arranged that it shall, through the action of the steam, automatically force up the water that supplies the boiler-tank or reservoir. My arrangement is such that the water thus fed shall, through its direct action on the steam in connection with the valve, so condense a greater portion of the same that, when it reaches the pipe that leads from the condensing-tube or worm to the tank, it is in condition to pass or flow with the water into the tank and from thence to be fed to the boiler.

The construction and operation of my invention is as follows: A is an ordinary condensing-worm, and is secured in a suitable water-tight box or tub, A'. B is the pipe through which the tub A' is filled with cold water, and B' the pipe by which the same is discharged. C is the tank or reservoir which contains the water that feeds the boiler, and is situated immediately under the box or tub A', and is connected with a tube, a, which may be an independent one or the lower section of the worm A, by means of one or more short vertical tubes, b. D is the ordinary escape-pipe, and is connected with the tube a by means of a sleeve, D'. This sleeve D', in connection with the perforated cone-head d, and in which the horizontal arm of the pipe D terminates, forms the vacuum-valve E. F is an inlet-pipe, and is connected with the horizontal arm of the pipe D. This pipe is also connected with the tank C by means of a short pipe, c. G is an outlet-pipe, through which is discharged the hot water from the pipe a. These pipes F G are each provided with valve-cocks f g by which the flow of water can be regulated, or, if desired, entirely shut off. H is the funnel-mouth of the worm A, and in which is secured a self-acting valve, h, which falls and remains in its seat, except when raised through the pressure of the uncondensed steam.

I have described and illustrated in the drawing as part of my apparatus a worm, but I de-

sire it distinctly understood that it may be dispensed with in many cases; for instance, when the water to be used is pure and clear, and comparatively free from all foreign substances or elements, it is unnecessary, and a simple horizontal tube, such as a, detached from the worm may be used.

From the foregoing description the operation will readily be understood. The apparatus is placed in the hold of a vessel or otherwise conveniently located, the pipe F descending down into the river or other source of supply. The box or tub A' is filled through the pipe B, its contents passing and being discharged by the pipe B'. The pipe D being so connected as to receive the exhaust steam from the engine the automatic operation of the apparatus commences. The steam, coming in contact with the water in the chamber formed by the sleeve D' and the cone-head d, is in a certain degree condensed, which creates a partial vacuum and causes the water to be drawn up through the pipe F, and which, commingling with the steam, condenses a greater portion of the same, and which together flowing through the perforation d enter the pipe a, from which it is discharged by the pipe b into the tank C. The uncondensed steam ascending the worm is partially condensed in its passage, the uncondensed passing out through the valve h, and the condensed returning is conveyed to the tank C through the pipe b. The extra heated portions may be discharged by the pipe G. The pipe c, being open, causes a portion of the contents of the tank to be constantly returned to the pipe F for the purpose of aiding in the condensing of the steam and to avoid the use of cold water as much as possible.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The arrangement of the exhaust-pipe D and sleeve D' with the pipe F, the vacuum-valve E at the entrance of the pipe a or worm A, substantially as shown, and for the purpose set forth.

2. The arrangement of the exhaust-pipe D, valve E, pipe a or worm A, tank C, and pipes G, b, c, and F, when combined and arranged to operate substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BENJ. F. SMITH.

Witnesses:

EDWARD C. FORD,
EDWIN JAMES.