W. H. GUILD.
Surface-Condenser.

No. 163,482. Patented May 18, 1875.

Fig. 1.

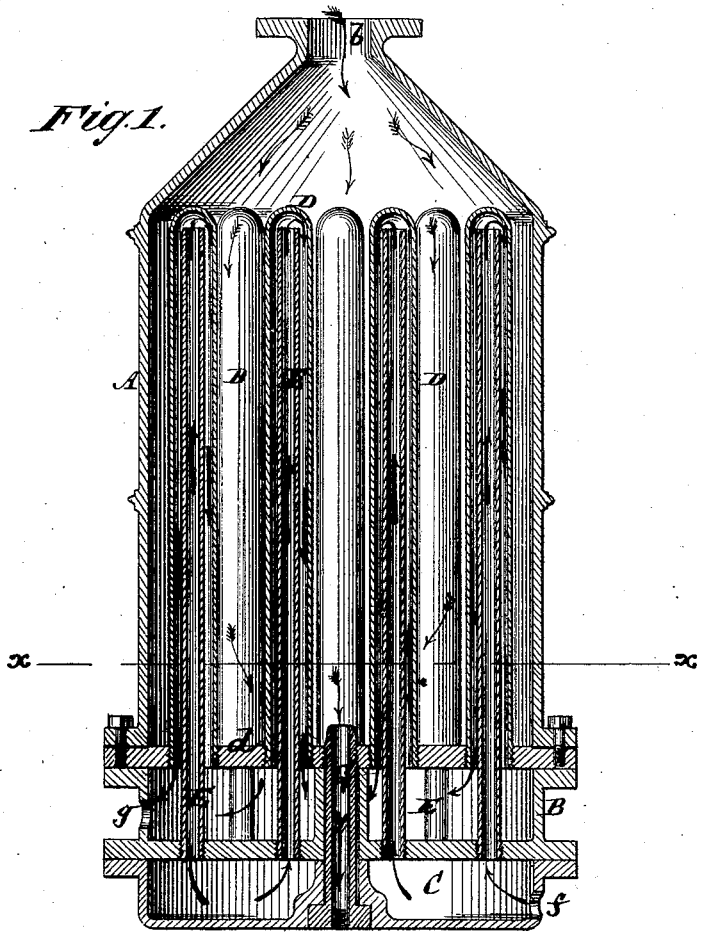
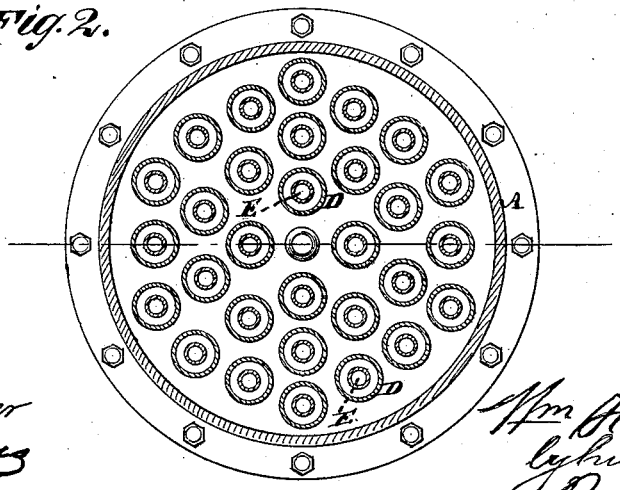


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM H. GUILD, OF WILLIAMSBURG, BROOKLYN, NEW YORK.

IMPROVEMENT IN SURFACE-CONDENSERS.

Specification forming part of Letters Patent No. **163,482**, dated May 18, 1875; application filed February 19, 1875.

To all whom it may concern:

Be it known that I, WILLIAM H. GUILD, of Williamsburg, Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Surface-Condensers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figure 1 represents a vertical section of a condenser constructed according to my invention, and Fig. 2 a horizontal section thereof on the line *x x*.

This invention relates to surface-condensers for steam-engines and other purposes; and the invention consists of a novel construction and arrangement of parts, which will be fully hereinafter described, and the improvements specifically pointed out in the claim; a preliminary description, therefore, being deemed unnecessary.

Referring to the accompanying drawing, A is the outer shell or case of the condenser, to the upper free or scattering space of which the steam to be condensed is admitted by an inlet, *b*. The base of the condenser is composed of two chambers, B and C, arranged the one above the other, either one of which serves to receive and distribute the condensing water to the one set of tubes, while the other of said chambers serves to pass off said water after it has been returned through or down the other set of tubes. D are the surface condensing-tubes, projecting up within the case A. These tubes are open below in communication with the chamber B, but are blind at top. The exteriors of these tubes form the condensing-surfaces, and they are connected with the chamber B at their lower ends, by screwing into a plate or diaphragm, *d*, which separates the chamber B from the case A. E are the inner tubes, open at their opposite ends, and screwing below into the bottom plate of the chamber B, so as to be in free communication with the chamber C. These tubes project upward, within and to nearly the top of the tubes D, but are considerably smaller in diameter than the latter, leaving a free space around them.

This mode of independently connecting the tubes with their respective lower chambers does away with any breaking of the joints, or packing by expansion and contraction of the tubes, and the general construction is such that the several tubes are free to expand or contract without straining one upon the other, and the greatest facility is afforded for putting the whole condenser together or taking it apart, the several tubes D being collectively fitted to their places over the inner tubes E, which are likewise collectively fitted to their places within the tubes D.

G is the tube or passage for escape of the water of condensation from the bottom of the case A, the steam being condensed as it circulates in a downwardly direction among or between the tubes D, on their exterior, and the water of condensation being drawn off by an exhaust-pump connected with the tube G. This tube is fitted to pass up through sleeves in the chambers B C, and into the case A, and may be constructed to bind said chambers and case together.

The condensing water may either be introduced at an aperture, *f*, to the chamber C for circulation up the tubes E, and down the tubes D to the chamber B, from whence it may pass or be drawn off at an aperture, *g*, or the circulation through the tubes D E may be reversed by admitting the condensing water at the aperture *g* to the chamber B, and from thence up through the tubes D, and down the inner tubes E to the chamber C, and out through the aperture *f*. In either of such cases, however, it is desirable to run up the discharge-pipe for the condensing water to, or about, or above the level of the upper ends of the tubes E, to insure a free circulation of the water up the one set of tubes and down the other.

I claim—

In combination with the condensing-tubes D E, rising, respectively, from the top plates of the chambers B C, the escape-tube G, rising from the bottom plate of chamber C, and extending through the same into the interior of the condenser, substantially in the manner herein shown and described.

WM. H. GUILD.

Witnesses:

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