

(No Model.)

R. P. BARNSTEAD.
CONDENSER.

No. 456,923.

Patented July 28, 1891.

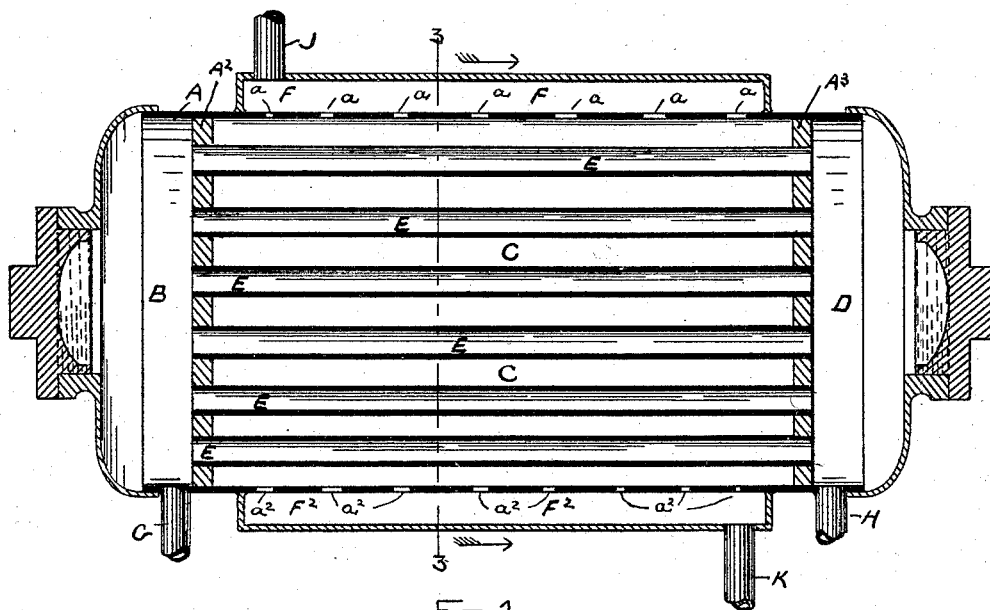


Fig-1.

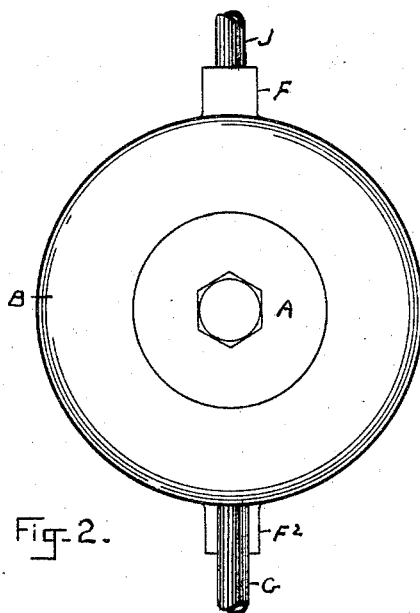


Fig-2.

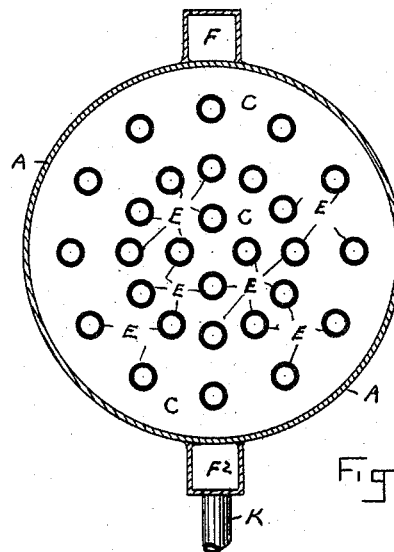


Fig-3.

WITNESSES:

Marion E. Brown.
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INVENTOR:

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by his Attorneys
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UNITED STATES PATENT OFFICE.

ROBERT P. BARNSTEAD, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE BARNSTEAD PURE WATER STILL COMPANY, OF PORTLAND, MAINE.

CONDENSER.

SPECIFICATION forming part of Letters Patent No. 456,923, dated July 28, 1891.

Application filed December 2, 1890. Serial No. 373,367. (No model.)

To all whom it may concern:

Be it known that I, ROBERT P. BARNSTEAD, a citizen of the United States, and a resident of the city of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Condensers, of which the following is a full, clear, and exact description.

The condenser or cooler of this invention was more especially designed for use in an apparatus for distilling water, and, in combination with parts of such an apparatus, it is embraced in an application, Serial No. 346,496, made by me for issue of Letters Patent on such apparatus; but, as will be obvious from the description hereinafter given, it is suitably independent of said apparatus for condensing and cooling vapors and liquids of other kinds. This condenser or cooler is composed of a shell or casing, preferably cylindrical, which is closed on all sides and interiorly is divided into three transverse compartments—to wit, two end and one intermediate—tubular or other suitable communicating passages connecting and open to the two end compartments and passing through, but closed to the intermediate compartment, and two or more (two, however, being sufficient) chambers at the sides and lengthwise of the intermediate compartment of the drum and preferably directly opposite to each other and each having a series of holes, perforations, or ports, &c., making communication between it and said intermediate compartment and those of each chamber of larger superficial area at one than at the opposite end portion, but the reverse in position as to each side chamber, in combination with passages of communication, a separate one for each of said end compartments and of said side chambers, and all otherwise, substantially as hereinafter described.

In the drawings forming part of this specification, Figure 1 is a central longitudinal section of the condenser or cooler of this invention. Fig. 2 is an end elevation; and Fig. 3 is a transverse vertical section, line 3 3, Fig. 1.

In the drawings, A is the drum, preferably of cylindrical shape and closed on all sides.

A² A³ are two transverse partitions dividing the interior of the drum into three transverse compartments B C D, two B D, respectively, at each of the opposite ends, and one C between said end compartments.

E are a series of tubular passages extending lengthwise of and severally closed to the intermediate compartment C, and at their opposite ends severally closely secured in the transverse partitions A² A³ and open to the end compartments B D.

F F² are chambers, one F at the upper and the other F² at the lower side and extending lengthwise of the drum, and a a^2 are two series of perforations, holes, or ports, &c., one a located in and along the lower wall of the upper side chamber F and the other a^2 in and along the upper wall of the lower side chamber F², and those of each series make communication between its side chamber and the intermediate compartment of the drum. Furthermore, each series of ports a a^2 has a larger superficial area at one than at the other end of their side chamber, and preferably those of each series are more or less regularly graded as to their superficial area from end to end. The ports of larger area of the two side chambers F F² are as to each side chamber at an end thereof opposite to that end of the other side chamber at which they are located.

G, H, J, and K are severally communicating openings or pipes, G H for the opposite end compartments B D, respectively, and J K for the opposite side chambers F F², respectively. The pipe G is for entering the vapors to be condensed or the liquid to be cooled into the end compartment B of the drum. The pipe H is for discharging the condensed or cooled vapor and liquid, as the case may be, from the end compartment D of the drum. The pipe K is for entering a cooling-liquid, such as water, into the lower side chamber F², for it thence to pass through its ports a^2 to the intermediate compartment C of the drum around the outside of its tubes E, and thence through

the perforations *a* of and into the upper side chamber F and out at the pipe J. The pipes J K of the side chambers F F² in each instance communicate with their respective chamber at its end portion, having the ports *a* *a*², as the case may be, of the smaller superficial area.

The upper and lower side chambers F F² of the drum and their ports of communication between them and the intermediate compartment C of the drum, severally of different superficial areas and arranged otherwise as to the ends of the drum, in combination with the pipes J K, leading into said side chambers, all substantially as described, secure a most even diffusion of the cooling liquid and confinement of it to and about the tubes of said compartment, and a most perfect and complete action and quick condensation or cooling of the vapors or liquids entered for passage through said tubes from the end compartment B toward the end compartment D of the drum.

The drum A of the condenser described in use is preferably inclined from end compartment B to end compartment D, so as thereby the better to facilitate the passage of the products of condensation or of the cooled liquid along the tubes to the end compartment D for their discharge through pipe H; but this inclination of the drum or of the tubes may be avoided by having the drum horizontal and

its tubes inclined, or by means of pressure on the vapors to be condensed or of the liquids to be cooled.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

A condenser or cooler composed of a drum divided transversely into compartments, one at each of its ends and another intermediate of its length, and tubes extending through and closed to the intermediate compartment and open to both end compartments, in combination with chambers at opposite sides and lengthwise of the drum and each having along its length ports of communication between it and said intermediate compartment, each of larger superficial area at one than at the other end of the chambers, and with communicating passages, one for each of said compartments and of said side chambers, and said passages for the side chambers located at the end of each thereof, having the ports of smaller area, substantially as described, for the purposes specified.

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

ROBERT P. BARNSTEAD.

Witnesses:

ALBERT W. BROWN,
FRANCES M. BROWN.