

(No Model.)

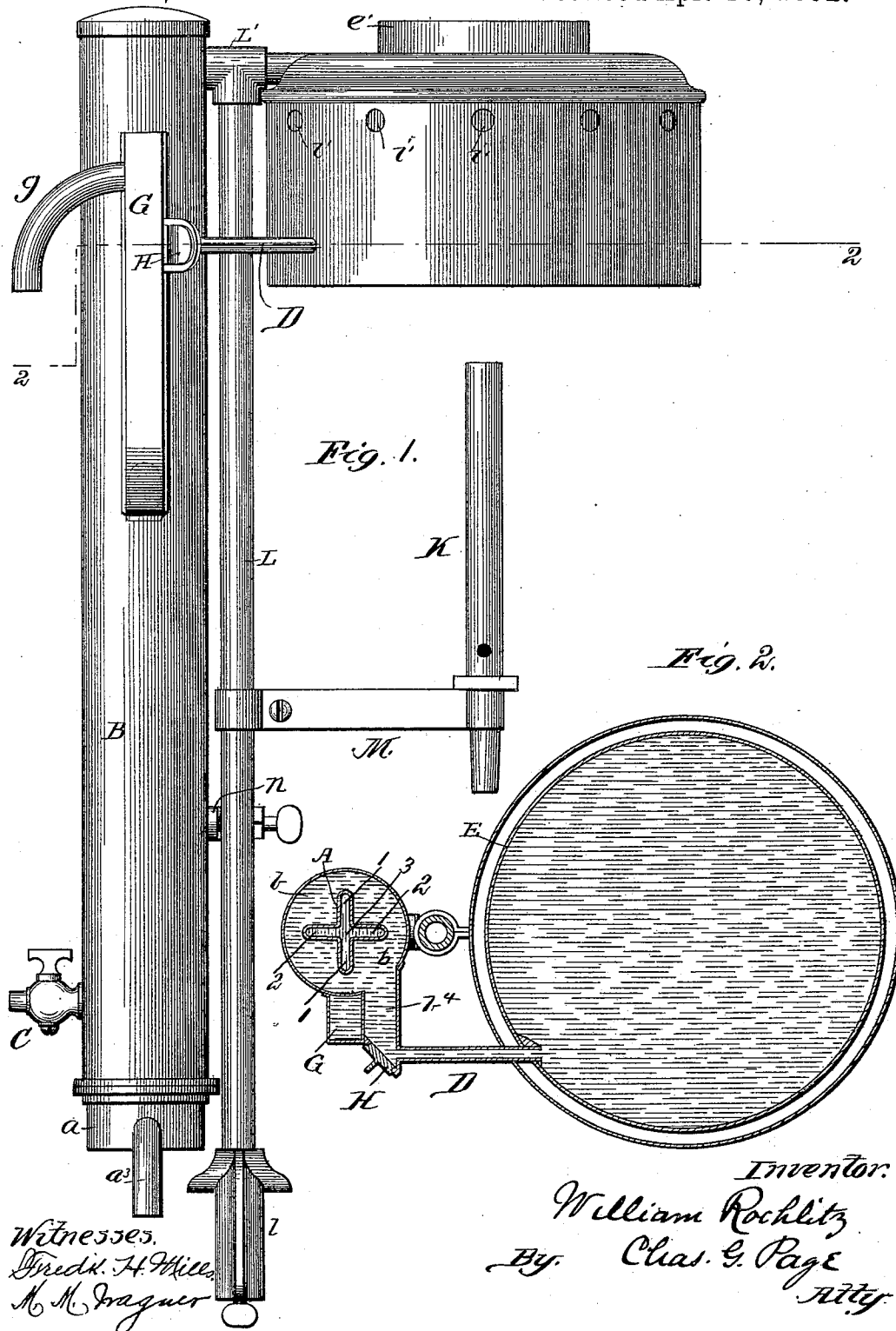
2 Sheets—Sheet 1.

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APPARATUS FOR DISTILLING WATER.

No. 473,164.

Patented Apr. 19, 1892.

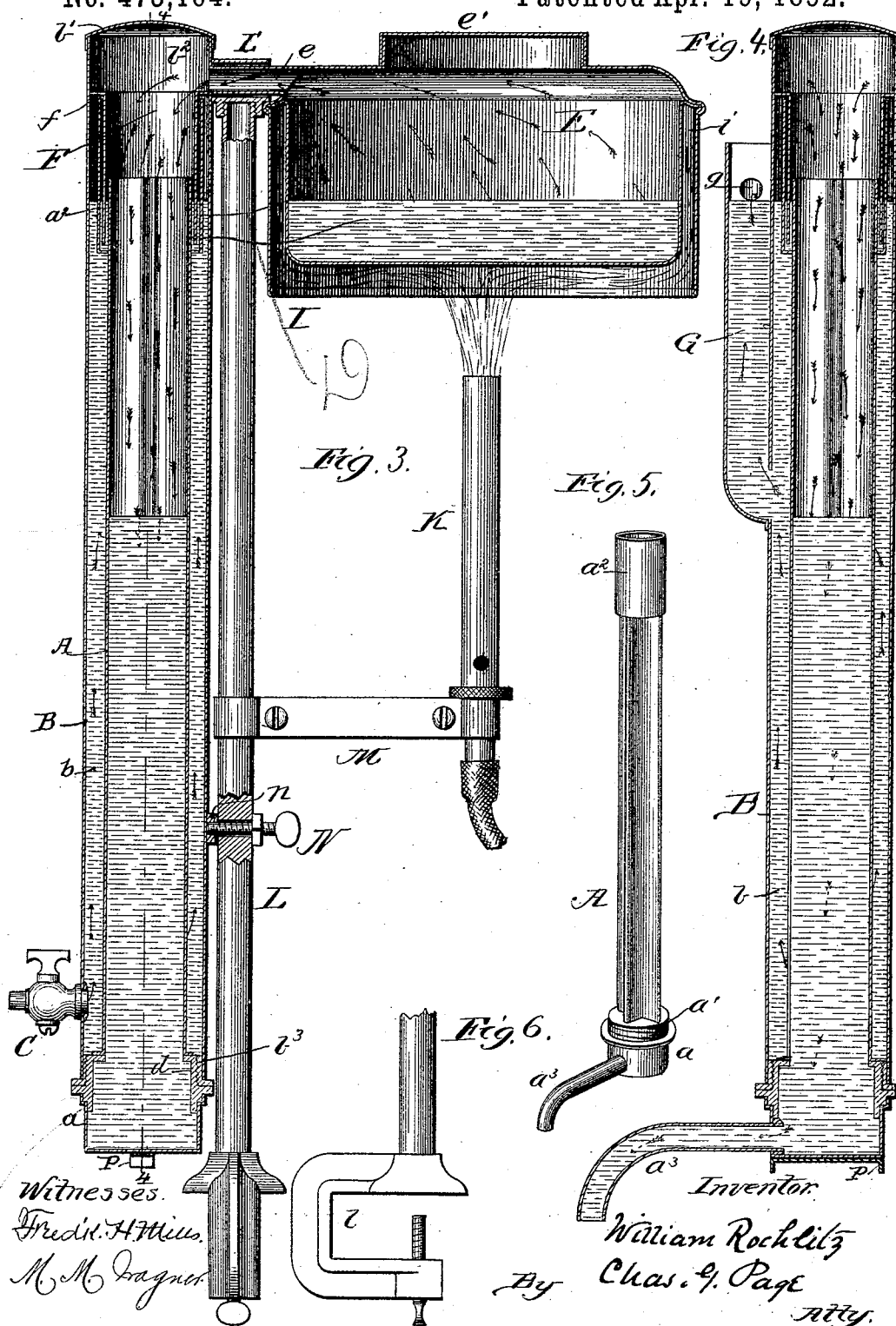


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UNITED STATES PATENT OFFICE.

WILLIAM ROCHLITZ, OF CHICAGO, ILLINOIS.

APPARATUS FOR DISTILLING WATER.

SPECIFICATION forming part of Letters Patent No. 473,164, dated April 19, 1892.

Application filed June 22, 1891. Serial No. 397,160. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ROCHLITZ, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Apparatus for Distilling Water, of which the following is a specification.

My invention relates more particularly to an apparatus for distilling water as a means for obtaining simple distilled water, although, of course, the apparatus can be used for any kind of distillation. It is extremely in the art to provide a condenser which is supplied with steam from a retort or boiler and submerged in a body of water from which the boiler is supplied, the water in the boiler being kept at a certain depth by an overflow-outlet and the supply-chamber containing the water which surrounds the condenser being fed by a supply-pipe, so that while the water will cool the condenser sufficiently for condensing purposes it will also be warmed before entering the boiler.

The object of my invention is to provide various improved features of construction in apparatus based upon the foregoing-described old and well-known principles, as hereinafter set forth.

In the accompanying drawings, Figure 1 represents in side elevation an apparatus embodying my invention. Fig. 2 is a cross-section on line 2 2 in Fig. 1. Fig. 3 is a vertical central section of the apparatus, the standard L being, however, principally in elevation. Fig. 4 is a vertical section through the apparatus on line 4 4 in Fig. 3. Fig. 5 represents in perspective and on a smaller scale the condenser detached from the jacket. Fig. 6 is a side view of the base-clamp for the standard.

The condenser A is arranged within a cylindric jacket B, which is of sufficient diameter to provide a supply-chamber *b* about the condenser. The chamber *b* is at its lower end provided with a supply-cock C, which can be connected with any suitable source of supply by a flexible tube or other convenient connection. The supply chamber *b* is at its upper portion provided with two outlets, the one being a feed-pipe D, leading to the boiler E, and the other an overflow-outlet arranged to maintain within the boiler a comparatively shallow body of water, and thereby secure ready va-

porization. The overflow-outlet and pipe D are arranged to connect with chamber *b* somewhat below the closed top end *b'* of the jacket B, so as to provide for a steam-dome or steam-chamber *b²*, arranged above and in communication with the condenser. The upper portion of the boiler connects with said steam dome or chamber by a short pipe *e*, so that steam generated within the boiler may enter the steam-dome and thence pass down into the condenser, as indicated by arrows in Fig. 3. The upper end of the condenser opens into the space or chamber *b²* of the steam-dome, but is closed to the water-supply chamber *b*. The condenser is detachably held within the supply-chamber, and as a means for thus removably connecting said members the base *a* of the condenser is externally threaded, as at *a'*, and adapted to screw into a threaded bearing *b³* in the lower end of the jacket B, the joint at such a point being made tight by a jacket or other suitable packing. With further reference to the removability of the condenser from the supply-chamber the condenser is at its upper end provided with a coupling-sleeve *a²*, which is open at its top end, but at its lower end closed around the condenser proper at a point below the top end of the latter. The cylindric sleeve *a²* is of greater diameter than the greatest diameter of the condenser, so as to leave between the two a space for a coupling-sleeve F, which is open at both ends and at its upper end united with the inner wall of the jacket B by an annular flange *f*. While, therefore, steam from chamber *b²* can pass down through the sleeve F and enter the condenser, it cannot pass from said chamber *b²* into the supply-chamber *b*. By the foregoing-described arrangement the sleeve *a²* on the condenser can be removably slipped upon the sleeve F of the jacket, and hence the sleeve F will be received between the sleeve *a²* and the upper end portion of the condenser, which extends up through the closed lower end of its sleeve *a²* and projects upwardly to some extent within the same.

While the coupling-sleeve *a²* could be made to fit close upon the sleeve F, I may, as herein illustrated, provide for a water seal between the condenser and joint formed by the two sleeves, and to such end water space is left

both between the sleeve F and sleeve a^2 and also between said sleeve F and the upper end portion of the condenser, the sleeve F being made of a length to terminate short of the closed lower end of sleeve a^2 . Under the aforesaid arrangement the water-space thus provided will be partially filled with water of condensation, and hence a seal provided between the upper end of the condenser and the supply-chamber b .

The condenser A is of a peculiar form in cross-section and is adapted to provide large area of internal condensing-surface and a large area of external heating-surface for warming the water within the supply-chamber b . To such end the condenser is made star-shaped in cross-section, as best illustrated in Fig. 2, by which arrangement it is provided with vertical passages 1 1 and 2 2, which are of narrow oblong shape in cross-section and arranged to intersect one another along the vertical center 3 of the condenser.

The condenser thus constructed may be said to be star-shaped in cross-section, whether the star have four or more points, and hence I have hereinafter so designated the condenser—that is to say, I have referred to it as being made star-shaped in cross-section.

The construction shown in Fig. 1 comprises, as aforesaid, the passages 1 1 and 2 2, which said passages unite along the vertical center 3 of the condenser. These vertical passages therefore are in cross-section lateral to and arranged to radiate from a common central passage, as at 3; and since the side walls of each passage are comparatively close together steam entering the same must necessarily descend in thin sheets, and hence be readily condensed. The base a of the condenser is provided with a suitable discharge-nozzle a^3 , and, if desired, the same can be furnished with a cock.

The overflow is provided with a chamber G, arranged along the outer side of jacket B and at its lower end connected with the supply-chamber b . The outer side of the jacket forms the back wall of chamber G, as in Fig. 4. The chamber G is provided below its open top with a discharge-nozzle g , through which the outflow will maintain the water within the supply-chamber and boiler at a proper level.

As a means for providing between the boiler and the supply-chamber a passage connection to which ready access can be had for cleaning purposes, the supply-chamber b is provided with a lateral extension b^4 , which is connected with the boiler through the medium of the short straight feed-pipe D. The feed-pipe has its inlet end arranged to connect with one side of the extension b^4 , and the latter is at its outer end provided with a removable screw-plug H, arranged opposite the inlet end of the feed-pipe, so that after removing said plug a cleaner can be introduced into the feed-pipe.

The boiler is provided with a detachable cap e' , which can be removed to permit the

boiler to be cleaned, and as a means for economizing heat the boiler is provided with a surrounding jacket I, which is open at its lower end, so as to expose the bottom of the boiler to the flame from a Bunsen burner K or other suitable heating agent. The jacket I is arranged to provide an annular space or passage i around the boiler and is at its upper end secured to an annular flange with which the boiler is provided. The jacket is also provided with openings i' for the passage of the products of combustion which pass from the burner up through the passage i' .

As a simple, compact, and efficient way of supporting the apparatus thus far described, I provide a standard L, either made solid or hollow, (gas-pipe being convenient for the purpose,) and arrange upon the lower end of the same a clamp l , which can be conveniently secured upon the edge portion of a table or the like. The standard is substantially the length of the jacket, and is at its upper end provided with an eye L' , which forms a supporting-bearing for the pipe e , which connects the steam-dome with the boiler. The eye L' is adapted to permit the pipe to turn within it, and hence while the standard may be secured by its clamp in a vertical position the remaining portion of the apparatus can be swung upon its supporting-bearing L' and brought either to an inclined or horizontal position for cleaning purposes. The standard is also provided with a bracket M for the burner K, and in order to lock and steady the apparatus while in its normal position I provide the standard with a set-screw N, arranged to engage a bearing n on the jacket, it being understood that the set-screw can be disengaged from said bearing when it becomes necessary to tilt the apparatus independently of its standard.

In order to permit the condenser to be readily unscrewed from the jacket, I secure on the bottom of the condenser a small bar or oblong plate P, which is bent downwardly at its ends, so that by placing a rod or the like between such ends the same can be turned for the purpose of unscrewing the condenser.

What I claim as my invention is—

1. A distilling apparatus comprising a condenser, the supply-chamber b , surrounding the condenser and provided with a lateral enlargement b^4 , a boiler, a feed-pipe D, arranged to lead from said lateral enlargement b^4 of the supply-chamber to the boiler, and a removable plug H, applied for closing an opening formed through the side of the lateral enlargement of the supply-chamber at a point opposite the inlet end of the feed-pipe, substantially as and for the purpose described.

2. The combination of the condenser arranged with its upper end in open communication with the boiler and provided with a coupling-sleeve a^2 , closed at its lower end about the condenser at a point below the top end of the latter and arranged to provide a space between the two, and a cylindric jacket

B, adapted to provide about the condenser a surrounding supply-chamber *b*, which connects with the lower portion of the boiler, said jacket being provided with an internally-arranged coupling-sleeve *F*, arranged to couple with the sleeve on the condenser, so as to provide a separable joint, substantially as set forth, adapted to prevent steam on its way to the condenser from entering the said supply-chamber, substantially as described.

3. The combination, with the distilling apparatus comprising a supply-chamber connected with the boiler and a condenser with which the boiler is connected by a pipe *e*, of the supporting-standard provided at its upper end with an eye in which the pipe *e* is arranged to turn, and thereby permit the apparatus to be swung independently of standard, substantially as described.

4. The combination of the jacket *B*, adapted to provide about the condenser a supply-chamber *b*, which is connected with the boiler, the condenser removably arranged within the jacket and having a threaded base which is screwed into a threaded bearing in the lower end of the jacket, and a coupling, substantially as set forth, adapted to hold a body of water which shall provide a water seal between the upper open end of the condenser and the supply-chamber *b*, substantially as described.

5. The combination of the boiler, the condenser in open communication with the upper portion of the boiler, and the jacket *B*, adapted to provide about the condenser a chamber *b*, from which the boiler is supplied and provided with a side chamber *G*, communicating at its lower end with chamber *b* and at its upper portion provided with an overflow-outlet, the shell of jacket *B* being employed as the rear wall of said chamber *G*, substantially as described.

6. A distilling apparatus comprising a boiler, the cylindric shell or jacket *B*, the condenser *A*, made star-shaped in cross-section and arranged within the jacket, so as to provide a supply-chamber between the two, and a steam-tight coupling-joint, such as set forth, between the jacket and the upper end portion of the condenser, said condenser being at its lower end connected with the jacket, so as to close the supply-chamber at the bottom, and being at its upper end in open communication with the boiler, but connected below its open end with the jacket by said steam-tight coupling-joint, so as to close the supply-chamber at its top end, substantially as described.

WILLIAM ROCHLITZ.

Witnesses:

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A. WARD.