

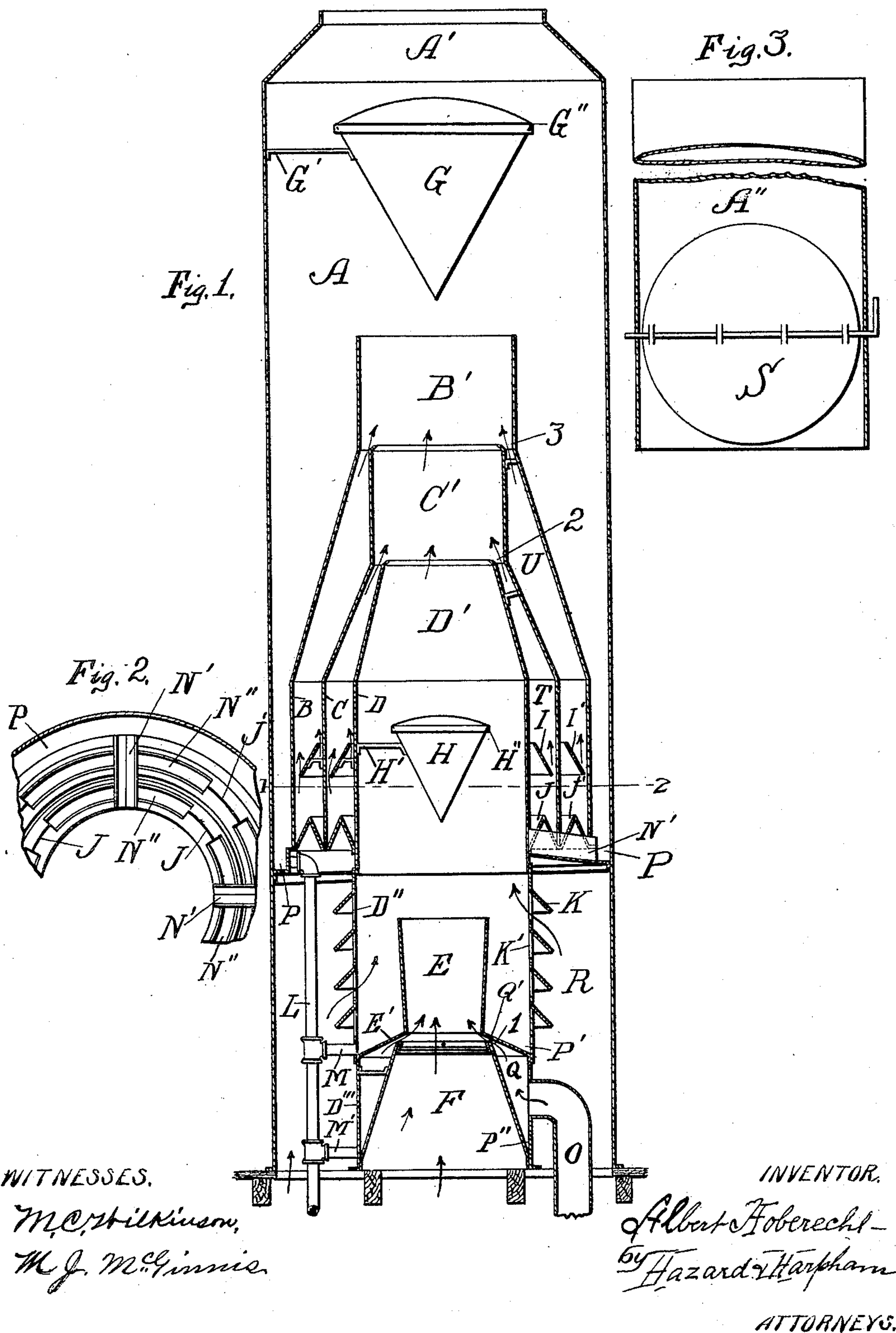
No. 673,984.

Patented May 14, 1901.

A. HOBerecht.
COMBINED STEAM CONDENSER AND AERATOR.

(Application filed Sept. 6, 1899.)

(No Model.)



UNITED STATES PATENT OFFICE.

ALBERT HOBERECHT, OF ENSENADA, MEXICO.

COMBINED STEAM CONDENSER AND AERATOR.

SPECIFICATION forming part of Letters Patent No. 673,984, dated May 14, 1901.

Application filed September 6, 1899. Serial No. 729,650. (No model.)

To all whom it may concern:

Be it known that I, ALBERT HOBERECHT, a citizen of the United States, residing at Ensenada, in the Republic of Mexico, have invented a new and useful Improvement in a Combined Steam Condenser and Aerator, of which the following is a specification.

My invention relates to condensers in which the air is used to cool and condense the steam into water; and the object thereof is to provide means to condense the steam into water by mingling the air freely therewith, so that the water resulting therefrom may be used again for steam purposes, or it may be used for domestic purposes, having been thoroughly aerated. I accomplish this object by means of the mechanism shown in the accompanying drawings, in which—

Figure 1 is a central vertical section of my condenser, the stack removed, the deflectors G and H being shown in elevation. Fig. 2 is a cross-section taken on line 1 2 of Fig. 1. Fig. 3 is a vertical central section of the stack A'', partly cut away, showing the damper S in its open position.

A is the outer shell or casing, cylindrical in form, at the top of which is the cone-shaped extension A', upon the apex of which is mounted the stack A''. Concentrically arranged within the outer shell are a number of inner casings B, C, D, and E. These casings are open at the top and bottom to permit the passage therethrough of steam and air. The top of these three first-named inner shells are contracted, as shown at B', C', and D', for the purpose of imparting to the steam passing therethrough an accelerated motion, and consequently producing a suction on the outside of the shells B and C at their upper or discharge ends. At the bottom of the shells B and C are arranged annular V-shaped troughs J and J', upon which these shells rest. These troughs communicate with and discharge their contents into the radial troughs N, which in turn discharge into the annular trough P, running around and outside of the bottom of the shell B and within the outer shell A. Leading from this trough P is the discharge-pipe L. Connecting with this pipe are branches M and M', leading from the lower troughs P' and P''. These latter troughs are formed, respectively, by attaching the bottom

flange E' of the shell E to the wall D'' of the shell D and by attaching the shell F to the wall D''. Above the trough J and surrounding the shells D and C and affixed thereto are deflectors I and I'. Above the bottom flange E' and surrounding the shell D'' are a series of cone-shaped deflectors K. Below these deflectors are a series of holes K' for the passage therethrough of air. Below the flange E' and between the shells F and D'' is an annular steam-chamber Q, into which the exhaust O discharges. Suspended within the shells A and D, respectively, by suitable brackets are the hollow inverted-cone-shaped deflectors G and H, having aprons G'' and H'', respectively, the purpose of which is to prevent the condensed water from running along down the cone-shaped deflectors to the apices thereof and dropping down the central opening.

The steam entering the steam-chamber Q through the exhaust O will circulate around in the chamber and be discharged therefrom through the passage Q' over the top of the shell F into the shell E, drawing with it the air in the shell F. The passage-way is contracted that the movement of the steam passing therethrough may be accelerated and create a suction, thereby to draw the air in the shell F into the passing steam. It will be observed that at the openings 2 and 3 the same conditions exist as are found at 1 and for like purposes. The mingled steam and air will pass thence into the shell E and be discharged into the shell D. As it passes up the chamber it encounters the inverted-cone-shaped deflector H, around which it passes, being contracted as it passes around the projecting base of the cone, causing the steam and air to more thoroughly commingle. In passing up from the shell D'' into the shell D the combined steam and air will create a suction, which will draw from the chamber R the air therein, which will commingle with the steam and air. In passing through the upper end of the shell D a suction will be created at the passage 2, drawing with it the air contained in chamber T, which will commingle in shell C with the ascending steam and air therein. Passing up out of the shell C it will create a suction in the passage 3, drawing the air contained in chamber U, which will commingle with the ascending steam and air in

the shell B. The steam and air will pass thence up through the shell A and be deflected around the inverted cone G as it passes up into the stack. In the stack is the usual
 5 damper S to regulate the flow of the steam and air therethrough. This damper will operate to fix the amount of air which is fed to the condenser. I do not limit myself to the number of shells shown herein, as in summer
 10 weather or in hot climates more will be required than in winter or cold climates, it being my intention to regulate the number of shells so that all the steam will be condensed before the air passes out of the stack. The condensed water will be precipitated first into
 15 the flange E and pass out. As it passes up out of the shell D the steam will be further condensed in the shells C and B and be deposited on the deflector H. Running over the
 20 top it will drop from the apron H'' around and outside of the shell E. The condensation in the stack will drop upon the top of the cone G, pass over the same, and drip from the apron G'' outside of the discharge B' of
 25 the shell B and be deposited in the trough P, whence it will pass into the pipe L. The condensation taking place in the chambers T and U will be deposited upon and around the deflectors I and I', thence down into the V-shaped troughs J and J', thence into the
 30 troughs N, thence into the trough P, and thence on and out through the pipe L.

It will be manifest that the water produced by the condensation, as above described, will
 35 be thoroughly aerated and fit for domestic use, as well as being entirely freed from all foreign matter, which renders it objectionable for steam purposes.

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

1. A steam condenser and aerator, comprising a casing having a stack at its upper end, openings to admit steam and air at its lower
 45 end, a plurality of inner casings being cone-shaped at their upper ends, open at the bottoms and tops thereof to admit air at the bottom and discharge the same at the top into a central passage-way connecting directly
 50 with the stack; an exhaust-pipe connecting with the central passage-way, whereby steam passing therethrough will be discharged into the central passage-way and create a suction and draw the air in the telescoping casings into
 55 the central passage-way thereby condensing the steam and aerating the water condensed thereby, substantially as shown and described.

2. An apparatus to condense the steam and
 60 to aerate the waters produced thereby, comprising a plurality of casings telescoped one into the other, and being cone-shaped and having central openings at their upper ends registering with each other, the outer casing being
 65 open at the bottom and terminating in a stack at the top, providing thereby a central passage for steam; an exhaust-pipe connecting

directly into the central opening at the bottom thereof and adapted to discharge steam thereinto; openings to admit air at the bottom of the casings below the point of discharge of steam, and openings at the top to discharge the same into the central steam-passage; means comprising inverted-cone-shaped deflectors disposed centrally in the
 70 central opening to collect the condensed and aerated water and to conduct the same from the machine, substantially as shown and described

3. The herein-described condensing and
 80 aerating apparatus, comprising main outer casing A, open at the bottom and having cone-shaped extensions A' at the top thereof; stack A'' superposed thereon; damper S pivoted in the stack; inner casings B, C and D
 85 concentrically disposed inside of casing A, open at both ends and having cone-shaped extensions terminating in hoods B', C' and D' at their upper ends, the same being spaced one from the other, providing thereby passages for the inlet between them of air into
 90 the central opening or passage-way; annular V-shaped troughs J adapted to catch the falling condensed water and divert same into trough N'; radial trough N' adapted to receive and discharge the condensed water into
 95 trough P; the annular trough P for receiving the water from the trough N' and for discharging same into the discharge-pipe L; the discharge-pipe L leading from the trough P; 100
 branch pipes M leading from the trough P'; the annular trough P' surrounding the shell E; the cylindrical shell E disposed concentrically with the casings and forming a part of the central passage-way; the conical shell F 105
 concentrically mounted in the bottom of the condenser; the annular steam-chamber Q surrounding the shell F and having connection with the exhaust O; the exhaust O discharging into the steam-chamber Q; hollow 110
 inverted deflectors G and H having aprons G'' and H'' disposed respectively within the shells A and D; annular air-chamber R open at the bottom and having discharge-openings at the top, permitting the passage of air 115
 therethrough, substantially as shown and described.

4. A condenser and aerator, having a plurality of cylindrical casings disposed concentrically, one within the other, and terminating 120
 at their upper ends in cone-shaped extensions, the cylinders being spaced apart to permit the passage of air from the outside of the casings to the central opening; a steam-discharge connection leading from the steam- 125
 exhaust to a central opening extending from the bottom of the condenser to the top, means to feed the air to the expanding steam, substantially as shown; and means to divert the condensed and aerated water to a discharge- 130
 pipe, substantially as shown and described.

5. A steam condenser and aerator, comprising a plurality of concentrically-disposed casings open at the top and bottom to permit the

entrance of steam into the inner casing and air into the bottom of the surrounding casings, the said casings having conical extensions properly spaced, one from the other, and thereby adapted to cause a suction at the top of each casing to cause the air to commingle with the ascending steam and to aerate and condense the steam, substantially as described.

6. A steam condenser and aerator, comprising a plurality of concentrically-arranged cylindrical casings; the top of the inner casings terminating below the top of the adjacent surrounding casing to create a suction at the top thereof to draw the air in the chamber sur-

rounding the casing into the steam passing out at the top thereof, the main outer casing being provided with a stack of greater dimensions than the steam-inlet, providing means whereby the steam and commingled air are successively discharged into enlarged chambers, substantially as shown and described.

In witness that I claim the foregoing I have hereunto subscribed my name, this 10th day of August, 1899, at Los Angeles, California.

ALBERT HOBERECHT.

Witnesses:

G. E. HARPHAM,
M. J. MCGINNIS.