

P. BROWN.
CONDENSER.

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900,827.

Patented Oct. 13, 1908.

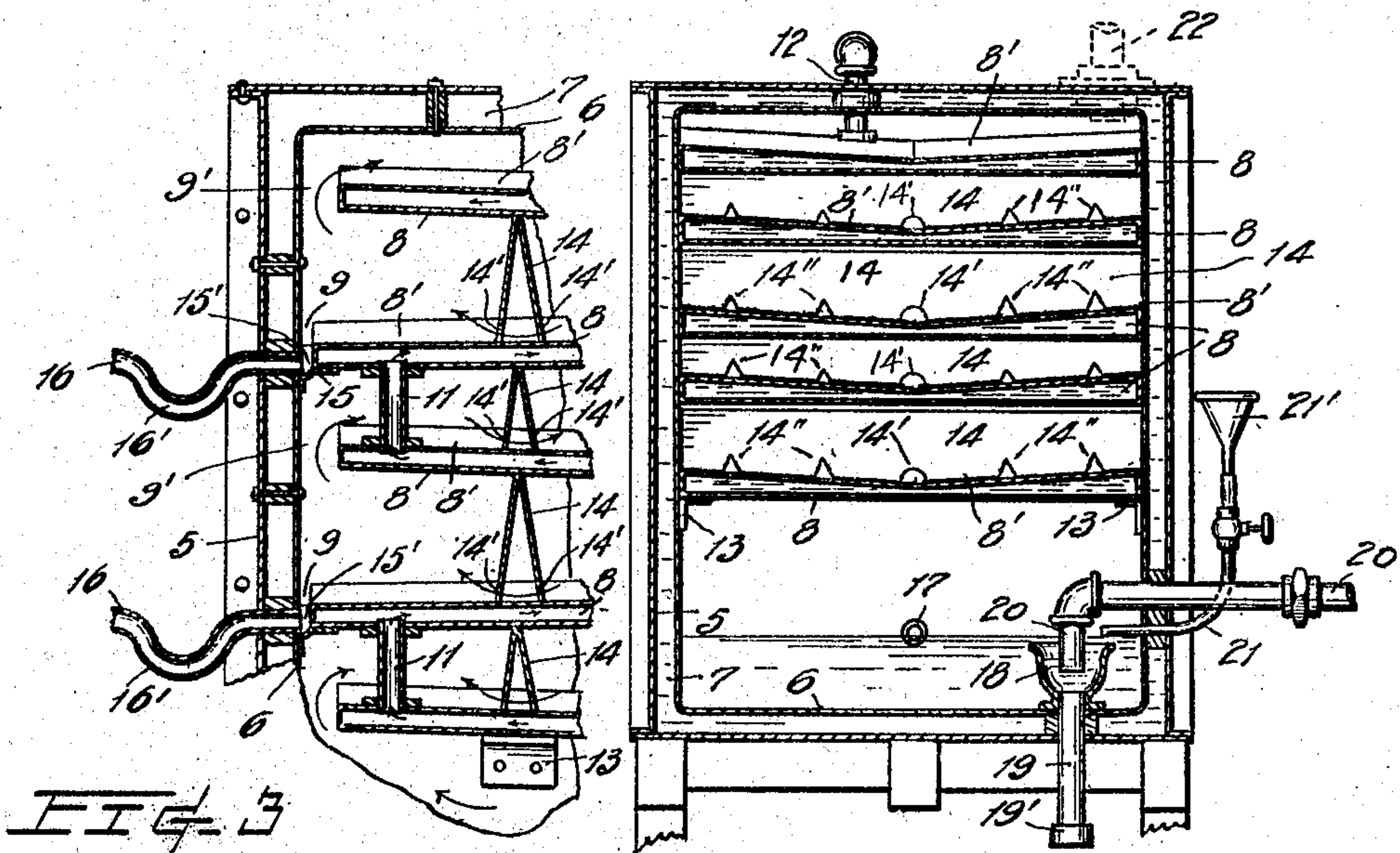
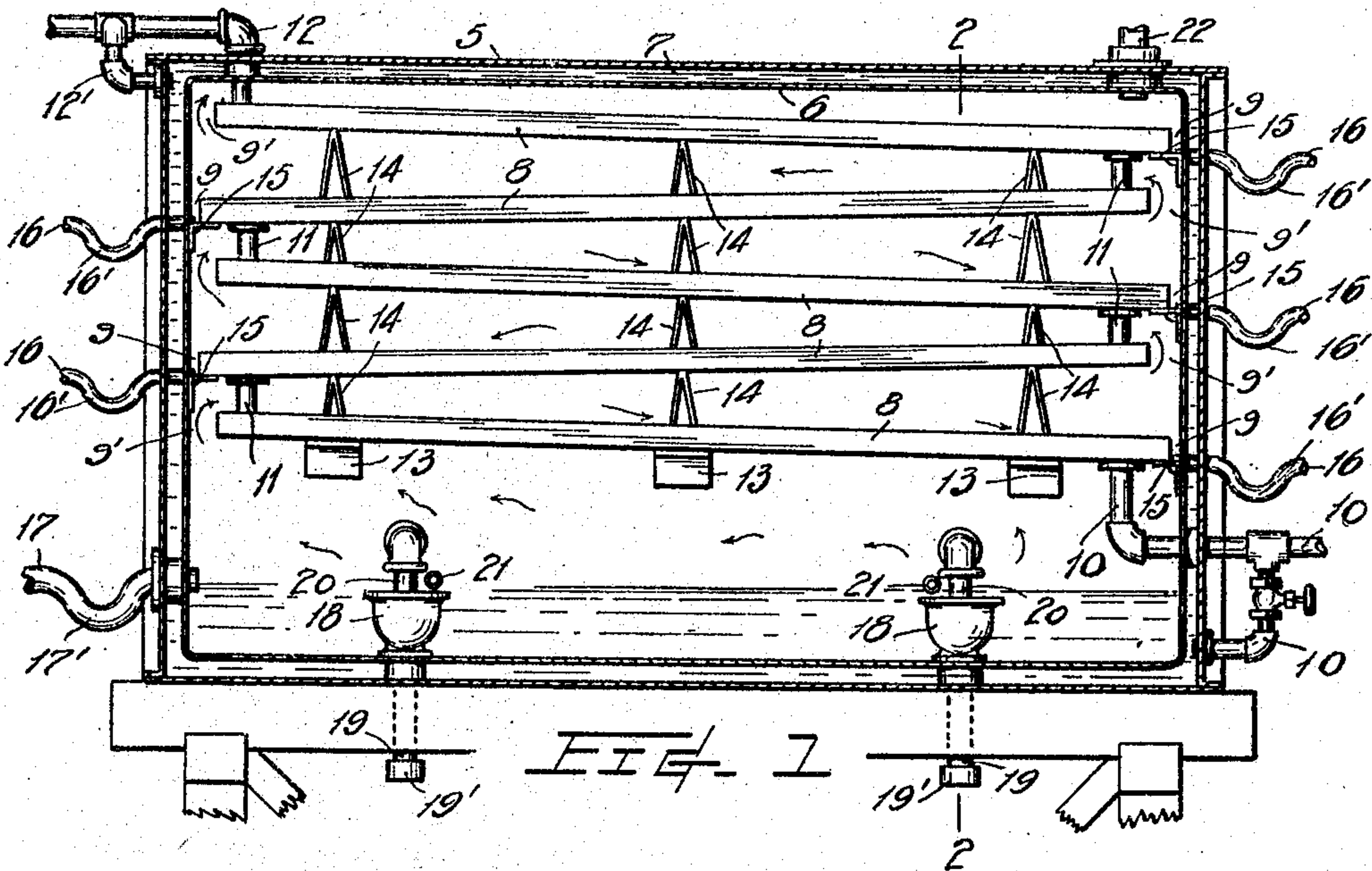
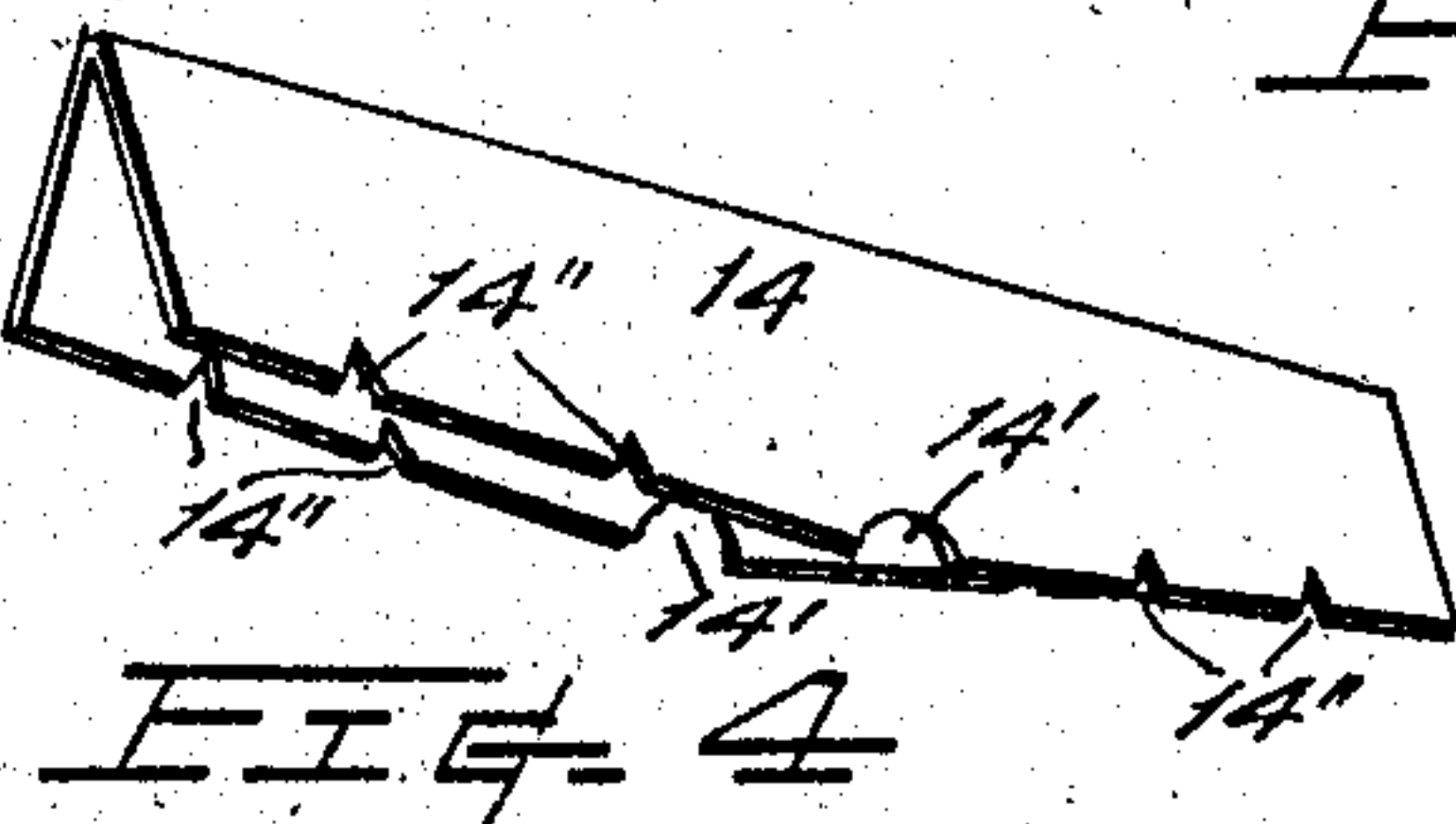


FIG. 3

WITNESSES:
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PETER BROWN, OF TROY, IDAHO.

CONDENSER.

No. 900,827.

Specification of Letters Patent.

Patented Oct. 13, 1908.

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To all whom it may concern:

Be it known that I, PETER BROWN, a citizen of the United States, residing at Troy, in the county of Latah and State of Idaho, have invented certain new and useful Improvements in Condensers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to condensers and, more particularly, to that class which are used in connection with retorts employed in the distillation of resinous wood.

The object of the invention is the provision of apparatus of this nature wherein the vaporous distillate is not only acted upon by a cooling agent to cause the vaporous portions thereof to be disassociated from the permanent gases but likewise enables the former, or liquefied, products to be withdrawn in the shape of various fluids, such as turpentine, tar-oil, etc.

With these and other objects in view, the invention consists in the novel construction and adaptation of devices, as will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal elevation of a condenser embodying my invention but with the containing case in section. Fig. 2 is a transverse section of the same taken through 2-2 of Fig. 1. Fig. 3 is a fragmentary longitudinal vertical section of the apparatus. Fig. 4 is a perspective view of one of the members employed in supporting the cooling receptacles.

The reference numeral 5 designates the outer shell and 6 the inner shell of the condenser-casing and are each made watertight and of such relative sizes as to provide a space 7 for water therebetween. Within the shell 6 are a series of water-tight receptacles 8 of a width to make a nice fit between the side walls of this shell, but of lengths so as to furnish spaces 9 and 9' between their opposite ends and the adjacent end walls of the shell. These closed pans are each made with its top 8' bent to slope downwardly from the opposite sides to a medial plane and afford a gutter whereunto the condensations which may occur or be precipitated thereupon will flow toward the longitudinal axes of the respective pans. The pans are furthermore inclined so that the condensations will also flow towards their lower ends, and which, for convenience, are arranged to be alternately at the

opposite ends, that is to say, the lower end of the lower pan will be at one end of the casing, that of the next above at the opposite end, and so on. The lowermost pan is connected by a pipe 10 with a source of water-supply and each pan communicates at its upper end with the lower end of the pan next above by tubes 11, while from the upper end of the top pan is a discharge pipe 12.

The space 7 intermediate the casing shells may be charged with water in any suitable way, as by branches 10' and 12' of the aforesaid pipes 10 and 12 and respectively extending through the outer shell of the casing at or near the top and bottom.

The pans are retained in their inclined relative positions by means of supports, such as bracket pieces 13 secured to the inner shell to bear the lower pan and transversely disposed bridge members 14 interposed between the pans. These members are desirably formed with two legs to afford stability, and are formed to have their edges fit with the juxtaposed pans and also with the side walls of the inner shell. Along the lower edges of these members they are provided with notches 14' and 14'', which are respectively located centrally of the width of the pans and to each side thereof.

At the lower end of each of the pans and closing the space 9 between the same and the adjacent wall of the shell 6 is a ledge 15 having at its mid-length a depression, or receptacle, 15' whereinto flow the condensations from the pan supported by the ledge. 16 are pipes extending into said receptacles for draining the liquids which collect therein, but to prevent an accompaniment of the gases with the liquid each of these pipes is provided with a downwardly directed U-shaped bend 16' where the liquid collects to form a seal.

Extending through the casing shells and at some distance from the bottom is a pipe 17 which is bent at 17' to furnish a seal to prevent the escape of gases therethrough with the heavier oils which would be drawn from the condenser through the pipe.

Upon the bottom of the casing-shell 6, are bowls 18 which are each provided with a depending pipe 19 which passes through the casing and is provided with a cap or other detachable closure. Protruding into each of these bowls is the end of a pipe 20 which leads from the retort to convey the gases

therefrom into the condenser. 21 are tubes leading from the outside of the casing and terminating above said bowls so that the latter may be charged with a liquid to submerge the lower ends of the pipes 20 and seal them against the return flow of the gases when they have escaped into the condenser. I illustrate in Fig. 2 a funnel 21' attached to one of these tubes into which the liquid may be conveniently poured for filling the respective bowl, but any other means may be used instead. 22 represents a pipe leading from the top of the condenser whence the permanent, or residual, gases are conducted to a gasometer or to a service pipe.

The operation of this invention may be described as follows: The volatile products of the distilling apparatus, with which this invention coöperates, discharge into the condenser through the pipes 20 and then ascend into the space below the bottom pan wherein the gas through its contact with the surrounding cooled walls of the casing and the lowermost of pans 8 is disintegrated and a precipitation of the liquid into the bottom of this space ensues. The remaining gas then ascends through the space 9' at the end of this pan and thence passes between the lower two pans to the opposite end of the condenser where it enters through the next space 9' to between the second and third pans and so ascending successively in reverse directions, with recurrent removals of the liquefiable portions by encountering the successive pans in its course to the gas delivery pipe 22. The flow of the gas is obstructed by the members 14 and by which the gas can only pass through the notches 14' or 14'' of the same, and by so doing the gas is longer subjected to the condensing action of the pans within the various compartments. The liquid thus obtained will be collected upon the tops of the pans from which it flows into the respective receptacles whence it may be drawn off through the trap-pipes 16. The nature of the liquids deposited upon the various pans differs, and is of unequal commercial value, consequently by thus providing means to separate the same the usefulness of the condenser is increased.

The purpose of the bowls 18 is to provide means to entrap sedimentary matter which may accompany the gases as they enter the condenser, and this matter is removed from time to time through the connecting pipes 19. Some sediment will also collect in the pipes 20, and for this reason, the latter should be so arranged at a point outside the condenser as to afford means for introducing a scraper or brush to clean the interior of these pipes.

The advantages of the invention reside in the adaptation of the various parts of the apparatus whereby distillate gases are not

only separated through a process of condensation, but such function is accomplished in such manner as to readily save the component oils, or acids, without becoming commingled.

Having described my invention, what I claim, is—

1. In a condenser, the combination with the casing provided with intake and discharge pipes, of a series of closed pans within the casing, the said pans inclining alternately towards opposite sides of the casing and each pan having the top surface thereof inclined from opposite sides to a medial plane, each of said pans communicating at its upper end with the lower end of the pan next above, bridges between said pans, means to supply water for condensation purposes to said pans, and means to individually draw off the condensed liquids which collect upon each of said pans.

2. In a condenser, the combination with the casing provided with intake and discharge pipes, of a series of closed pans within the casing, the said pans inclining alternately towards opposite ends of the casing and each pan having the top surface thereof inclined from opposite sides of the pan to a medial plane, each of said pans communicating at its upper end with the lower end of the pan next above, bridges between said pans, means to supply water for condensation purposes to said pans, receptacles to receive the condensations upon the respective pans, and a draw-off for each of said receptacles.

3. In a condenser, the combination with the casing provided with intake and discharge pipe connections, of a series of closed pans within the casing and arranged one above another in alternating inclined positions, the top of each pan besides inclining towards one end of the casing being inclined from opposite sides of a medial plane tubular connections between the pans, means to supply water interiorly of the pans for condensation purposes, and a draw-off pipe for each of the pans.

4. In a condenser, the combination with the casing having a double shell to furnish a water-space therein and provided with intake and discharge pipe connections, of a series of closed pans within the casing and arranged one above the other in alternating inclined positions, a plurality of bridges interposed between the pans and acting both as supports and as obstructions to the free flow of gas between the pans, tubular connections between the pans, means to supply water interiorly of the pans for condensation purposes, and a draw-off pipe for each of the pans.

5. In a condenser, the combination with the casing provided with intake and discharge pipe connections, of a series of closed

5 pans within the casing and arranged one above the other in alternating inclined positions, bridges interposed between each pan and the adjacent pan above the same tubular connections between the pans, means to supply water interiorly of the pans for condensation purposes, and a draw-off pipe for each of the pans.

10 6. In a condenser, the combination with the casing provided with intake and discharge pipe connections, of a receptacle in which said intake pipe terminates, means to withdraw sedimentary deposits from said receptacle, means to fill said receptacles with
15 a liquid, a series of closed pans within the casing and arranged one above the other in alternating inclined positions, the upper and lower faces of each pan inclining in the same direction, tubular connections between the
20 pans, means to supply water interiorly of the pans for condensation purposes, and a draw-off pipe for each of the pans.

7. In a condenser, the combination with the casing provided with intake and discharge pipe connections, of a series of closed
25 pans within the casing and arranged one above the other in inclined positions, the upper face of each pan inclining in the same direction as the lower face thereof, tubular connections between the pans, means to supply water interiorly of the pans for condensation purposes, receptacles to respectively receive the condensations from the aforesaid
30 pans, and a draw-off pipe for each of the receptacles.

8. In a condenser, the combination with the casing provided with intake and discharge pipe connections, of a series of closed
40 pans within the casing and arranged one above the other in inclined positions, a plurality of bridges arranged between the pans tubular connections between the pans, means to supply water interiorly of the pans for condensation purposes, a draw-off pipe for
45 each of the pans, and bridge members interposed between each of said pans to support the superposed ones and obstruct the flow of the gases in their course of travel through the condenser.

50 9. In a condenser, the combination with the casing having a double shell to furnish a water space therein and provided with intake and discharge pipe connections, of a receptacle in which said intake pipe terminates, means to withdraw the sedimentary deposits from said receptacle, means to fill said receptacle with a liquid, a series of closed pans within the casing and arranged one above the other in alternating
60 inclined positions, a plurality of bridges between the pans acting both as supports for the pan and as obstructions to the free flow of gas over the top of the pans tubular connections between the pans, means to supply
65 water interiorly of the pans for condensa-

tion purposes, and a draw-off pipe for each of the pans.

10. In a condenser, the combination with the casing having a double shell to furnish a water space therein and provided with intake and discharge pipe connections, of a series of closed pans within the casing and arranged one above the other in alternating inclined positions, the upper face of each pan inclining in the same direction as the lower face thereof, tubular connections between the pans, means to supply water interiorly of the pans for condensation purposes, receptacles to respectively receive the condensations from the aforesaid pans, and
80 a draw-off pipe for each of the receptacles.

11. In a condenser, the combination with the casing having a double shell to furnish a water space therein and provided with intake and discharge pipe connections, of a series of closed pans within the casing and arranged one above the other in alternating inclined positions, a plurality of bridges interposed between each pan and the one thereabove and supported on said pan tubular
90 connections between the pans, means to supply water interiorly of the pans for condensation purposes, a draw-off pipe for each of the pans, and bridge members interposed between each of said pans to support the superposed ones and obstruct the flow of the gases in their course of travel through the condenser.

12. In a condenser, the combination with a casing provided with intake and discharge pipe connections, of a receptacle in which said intake pipe terminates, means to withdraw sedimentary deposits from said receptacle, means to fill said receptacle with a liquid, a series of closed pans within the casing and arranged one above another in alternating inclined positions, tubular connections between the pans, means to supply water interiorly of the pans for condensation purposes, receptacles to respectively receive the condensations from the aforesaid pans, and a draw-off pipe for each of the last named receptacles.

13. In a condenser, the combination with the casing provided with intake and discharge pipe connections, of a series of closed pans within the casing and arranged one above the other in alternating inclined positions, tubular connections between the pans, means to supply water interiorly of the pans for condensation purposes, receptacles to respectively receive the condensations from the aforesaid pans, a draw-off pipe for each of the said receptacles, and bridge members interposed between each of said pans to support the superposed ones and obstruct the flow of the gases in their course of travel through the condenser.

14. In a condenser, the combination with the casing provided with intake and discharge

charge pipe connections, of a receptacle in which said intake pipe terminates, means to withdraw sedimentary deposits from said receptacle, means to fill said receptacle with
 5 a liquid, a series of closed pans within the casing and arranged one above the other in alternating inclined position, tubular connections between the pans, means to supply water interiorly of the pans for con-
 10 densation purposes, a draw-off pipe for each of the pans, and bridge members, interposed between each of said pans to support the superposed ones and obstruct the flow of the gases in their course of travel through
 15 the condenser.

15. In a condenser, the combination with the casing having a double shell to furnish a water space therein and provided with intake and discharge pipe connections, of a
 20 receptacle in which said intake pipe terminates, means to withdraw the sedimentary deposits from said receptacle, means to fill said receptacle with a liquid, a series of closed pans within the casing and arranged one
 25 above the other in alternating inclined positions, tubular connections between the pans, means to supply water interiorly of the pans for condensation purposes, receptacles to respectively receive the condensations from the
 30 aforesaid pans, a draw-off pipe for each of the last named receptacles, and bridge members interposed between each of said pans to support the superposed ones and obstruct the flow of the gases in their course of travel
 35 through the condenser.

16. In a condenser, the combination with the casing provided at its top with a discharge pipe and a supply pipe entering the casing in proximity of its bottom, of a series
 40 of closed pans arranged one above the other in inclined positions and disposed so as to allow of the flow of gases therebetween but from alternately opposite ends of the successive pans, a plurality of bridges inter-
 45 posed between each pan and the one thereabove and acting as obstructions to the free flow of gas between the pans communicative connection between the higher end of each pan with the lower end of the pan next above,
 50 intake and discharge pipes respectively connecting the lower and upper of said pans, receptacles to receive the liquid collected upon each pan, and a draw-off pipe for each such receptacle.

17. A condenser, comprising a casing 55 formed with a double shell to provide a space for water therebetween, inlet and outlet pipe connections for said space, a bowl shaped receptacle in the bottom of the condenser, a
 60 pipe entering the casing and terminating within said receptacle, a pipe leading from the bottom of said receptacle and passing through the bottom of the casing, a detachable closure for the last named pipe, a pipe for gas lead-
 65 ing from the top of the condenser, a series of inclined closed pans within the casing and provided with tops severally formed with a centrally disposed and longitudinally arranged gutter inclining in the same direc-
 70 tion as the pan, pipes for the supply and discharge of water respectively connected with the bottom and top pans of the series, bridge members separating the said pans from the adjacent ones and provided with notches in
 75 their lower edges, tubes communicatively connecting the successive said pans of the series, a ledge at the lower edge of each of said pans and provided with a recess in each, a draw-off pipe having a bent portion for a
 80 water seal communicating with each of said recesses, and another like pipe entering the condenser in proximity of its bottom.

18. In a condenser, a series of closed pans, arranged in alternating inclined position, each pan communicating at its upper end 85 with the lower end of the pan next above, and each pan having the top surface thereof inclined from opposite sides of the pan to a medial plane to form a longitudinally-disposed gutter. 90

19. In a condenser, a series of closed pans arranged in alternating inclined positions, the top of each pan inclining in the same direction as the bottom thereof and formed with a centrally-disposed longitudinal gut- 95 ter, and a plurality of bridges arranged between each pan and the one thereabove, said bridges spanning the spaces between the pans and having notches in their lower edges to allow the gases flowing between the pans 100 to pass the bridges.

In testimony whereof I affix my signature in presence of two witnesses.

PETER BROWN.

Witnesses:

PIERRE BARNES,
 ROBT. B. GILLIES.