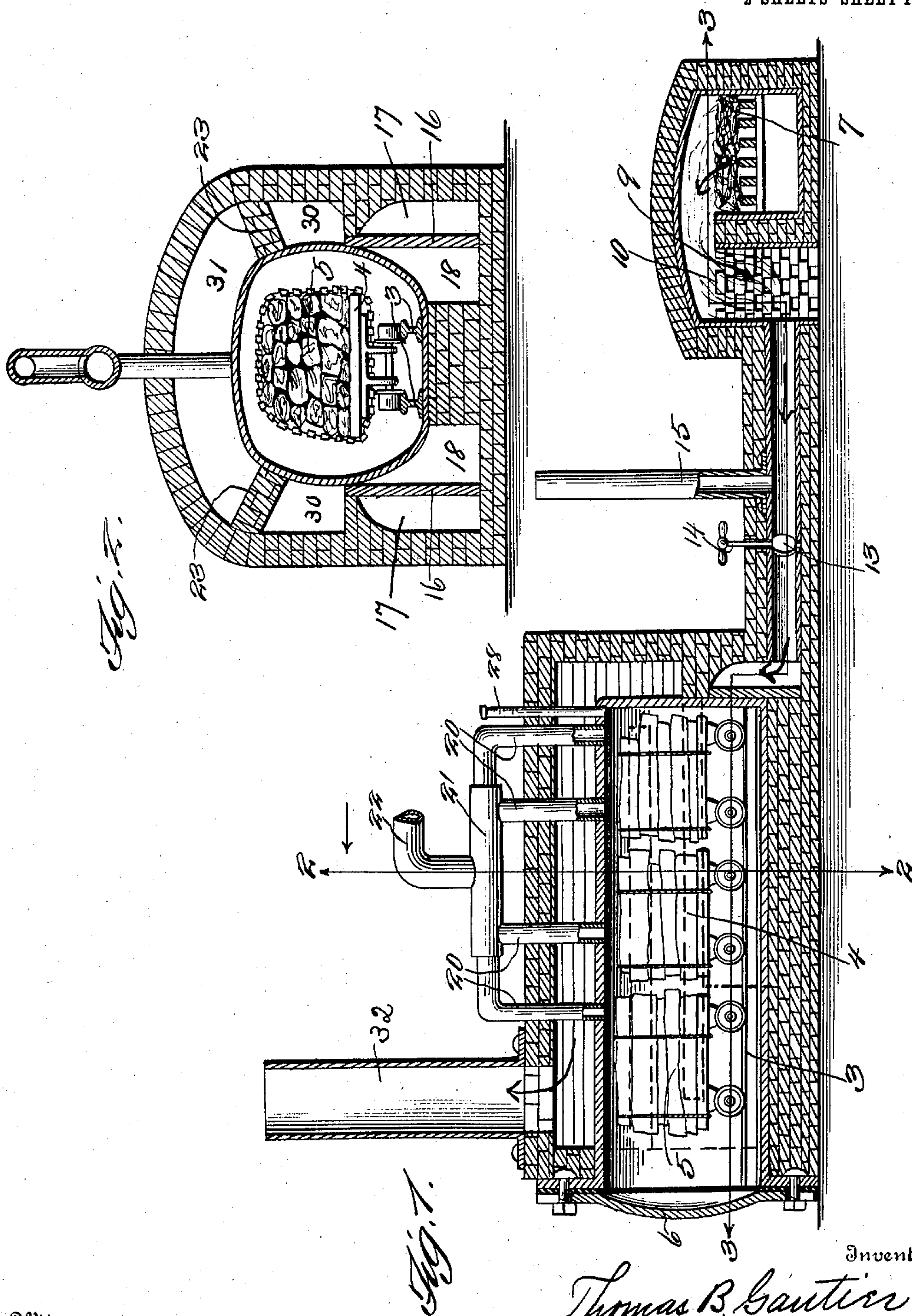


T. B. GAUTIER.  
DISTILLING APPARATUS.  
APPLICATION FILED JAN. 21, 1909.

980,509.

Patented Jan. 3, 1911.

2 SHEETS—SHEET 1.



Witnesses

*R. H. Boswell.*  
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By

*Thomas B. Gautier*

Inventor

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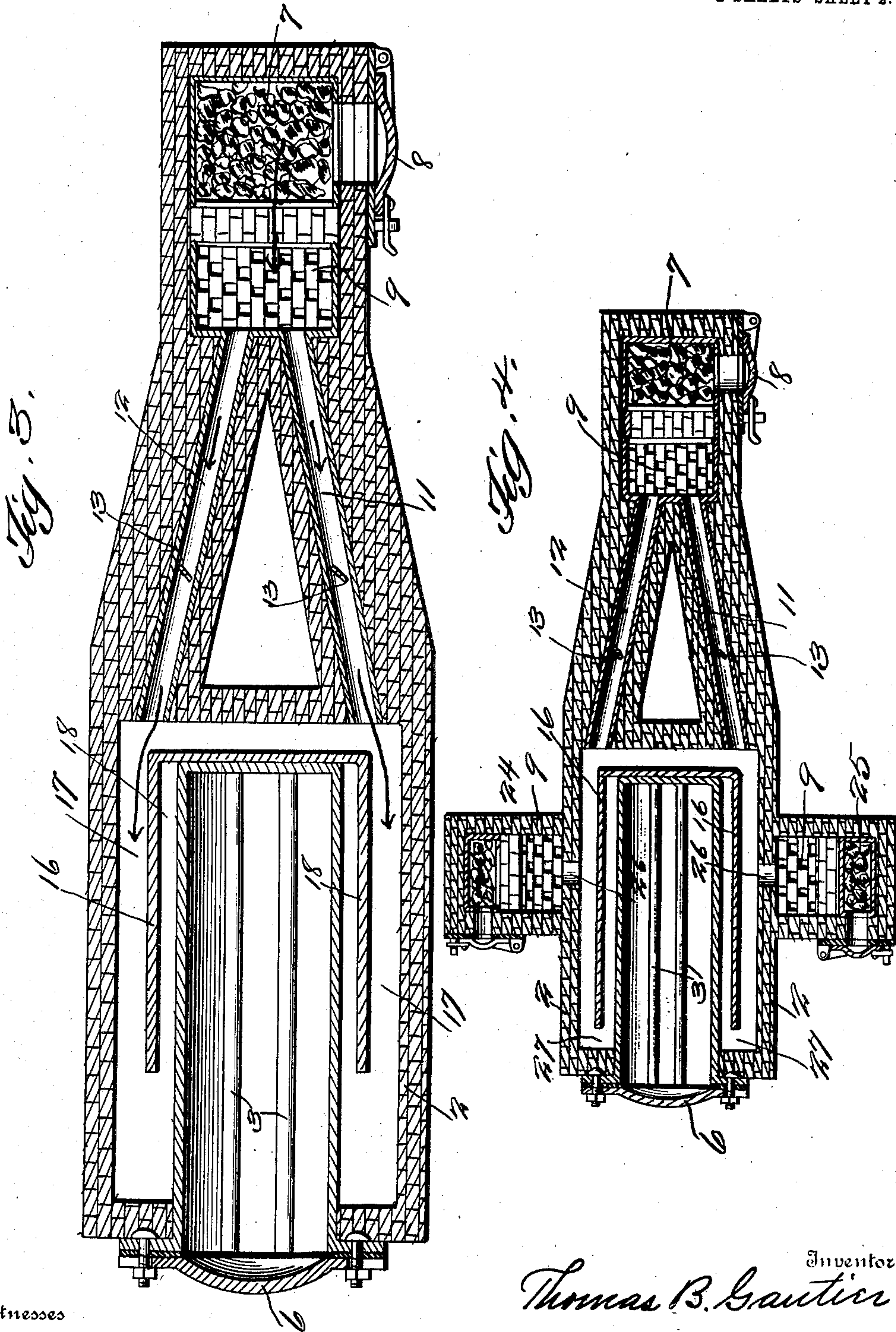
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# UNITED STATES PATENT OFFICE.

THOMAS B. GAUTIER, OF HICKOX, GEORGIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO NATIONAL TURPENTINE COMPANY, A CORPORATION OF DELAWARE.

## DISTILLING APPARATUS.

980,509.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed January 21, 1909. Serial No. 473,599.

*To all whom it may concern:*

Be it known that I, THOMAS B. GAUTIER, a citizen of the United States of America, and resident of Hickox, in the county of Wayne and State of Georgia, have invented certain new and useful Improvements in Distilling Apparatus, of which the following is a specification.

This invention relates to certain new and useful improvements in apparatus for distilling turpentine from pine wood and extracting pitch without destroying the wood, and it has for its objects, among others to provide a simplified and improved construction in which the retort is arranged to be heated externally by the products of combustion or combustion gases which are made to impinge against a radiating wall extending along the major portion of the retort. After passing this wall, the products of combustion impinge against the retort. I find that by this means I am better able to regulate the temperature within the retort and keep the same practically at about 390 degrees Fahr. and keep the same at all times within from 20 to 30 degrees Fahr. either side of the desired temperature. I found that where the products of combustion are brought into direct contact with the walls of the retort, the temperature is much greater at the point nearest the entrance of the product of combustion, which is undesirable for obvious reasons. By providing a deflecting and radiating wall between the passage for the products of combustion and the wall of the retort, I am enabled to prevent undue heating of the retort and to regulate the heat so that the entire contents are kept at substantially the same temperature.

The essence of the invention is capable of embodiment in a variety of forms, some of the most efficient only of which are herein illustrated but which are deemed sufficient to clearly demonstrate the principle and a practical form of its embodiment.

Suitable means are provided for the outlet of surplus heat when necessary and between the flues I provide a brick wall and means for indicating the temperature so that it may be kept uniform.

I aim further at improvements in the details of construction whereby improved results are attained.

Other objects and advantages of the invention will hereinafter appear and the

novel features thereof will be particularly pointed out in the appended claims.

The invention, in its preferred form, is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a substantially central vertical, longitudinal section through my improved distilling apparatus. Fig. 2 is a vertical, cross section on the line 2—2 of Fig. 1. Fig. 3 is a horizontal longitudinal section on the line 3—3 of Fig. 1 looking down. Fig. 4 is a view similar to Fig. 3 but on a smaller scale, showing a different form of the embodiment of the invention.

Like numerals of reference indicate like parts throughout the several views.

Referring to the drawings 1 designates the retort and 2 the outer surrounding brick wall thereof of any well-known or usual form of construction. Within the retort are arranged tracks 3 upon which are run the tracks 4 containing the wood 5 to be treated.

6 is a closure for the end of the retort which may also be of any well known or suitable form of construction.

7 is the fire box, access to which is had through the fire door 8.

9 is the combustion chamber and heat accumulator which is filled with fire brick or any other refractory material 10, through which the products of combustion pass from the fire box of the furnace. This accumulator is designed to take up excess heat, and to give off same when supply of heat is deficient. From the lower portion of this combustion chamber pass the flues 11 and 12, which as seen best in Fig. 3, diverging from their point of connection to the combustion chamber and in each flue I place a damper 13, said dampers being independently movable and adapted to be actuated in any suitable manner, as by suitable stem and handle 14, as seen clearly in Fig. 1.

From each of the flues 11 and 12, there extends a stack 15 which serves for the outlet for the surplus heat.

I have found that where the products of combustion come into direct contact with the walls of the retort, the results are not so satisfactory as desired for the reason that the temperature within the retort is not kept uniform. I therefore provide a



radiating wall which is disposed between the retort and the surrounding brick wall Fig. 2. This radiating wall is seen clearly in Fig. 3, at 16. As seen in said view, it  
 5 extends upon both sides of the retort and at the end adjacent the flues. This leaves a passage 17 between the brick wall 2 and the wall of the retort and the radiating wall. In the form illustrated in Fig. 3, this  
 10 wall does not extend the entire length of the retort, for an obvious purpose. The products of combustion after passing through the combustion chamber and heat accumulator, pass through the flues 11 and 12, and,  
 15 instead of impinging directly against the wall of the retort, they impinge against the radiating wall and the heat therefrom is radiated to heat the retort. As the products of combustion and gases approach the  
 20 end of the retort farthest from the furnace, the same has lost part of the heat and it is for this reason that I omit this radiating wall at such end of the retort. The products of combustion at this point are about  
 25 sufficient temperature so that when coming in direct contact with the wall of the retort it serves to raise the temperature thereof at that end to substantially the same degree as the heat within the retort at the  
 30 other end which has been furnished by the radiation from the radiating wall.

19 is the stack and 20 are the pipes leading from the interior of the retort and joined to the common pipe 21, from which  
 35 leads the discharge 22 for connection with the condenser to which the vapors from the interior of the retort are conducted in the usual manner.

23 are the brick walls between the flues around the retort so as to cause the products of combustion to take a circuitous passage before reaching the smoke stack.

In Fig. 4 I have shown a construction embodying the same principles as hereinbefore described in connection with the other figures of the drawing. In this form, however,  
 45 I employ two additional furnaces 24 and 25, similar in all respects to the furnace shown and described in connection with Figs. 1 to  
 50 3. One of these I arrange at each side of the retort, the products of combustion from the fire boxes, after passing through the combustion chambers, find their exit through  
 55 the flues 26 where they impinge against the radiating wall 16, similar in all respects to the radiating wall of the form hereinbefore described. In this form, however, the radiating wall extends nearly to the front end  
 60 of the retort, there being only a small passage 27 at such end through which the products of combustion pass after passing the end of the radiating wall and thence come in contact with the wall of the retort. This  
 65 is necessitated by reason of the employment of the additional furnaces at the sides of

the retort, whereby the products of combustion are effective for a greater distance than where the single furnace is employed, as in Fig. 3. In this form, the valves or dampers 13 are employed in the flues 12 for the  
 70 same purpose as in form shown in Fig. 3.

If at any time the heat becomes too great, the dampers 13, one or both, are closed, when the surplus heat escapes through the stack or stacks 15. 75

Registering thermometers may be employed, if desired, so that the temperature within the retort may be readily determined, one of such is indicated at 28 in Fig. 1.

The operation will be apparent from the  
 80 foregoing description when taken in connection with the annexed drawings and a further detail description thereof is not deemed necessary.

From the above, it will be seen that I have  
 85 devised a simple and efficient device for the dry distillation of wood, whereby the temperature can be kept comparatively uniform and the turpentine and other products obtained are of better quality because the tem-  
 90 perature in the middle of the retort is not allowed to exceed 390 degrees Fahr. thus avoiding any burning or scorching of the turpentine vapors, also because no attempt is made to produce charcoal and tar, thus  
 95 further avoiding any contamination of the turpentine vapors. The wood after treatment is unchanged save that the turpentine and pine oil are removed, no charcoal or tarry products being produced, and while  
 100 the structural embodiment of my invention as herein described is what I at the present time consider preferable, it is evident that the same is subject to changes, variations and modifications without departing from  
 105 the spirit of the invention or sacrificing any of its advantages. I therefore do not wish to be restricted to the details of construction herein disclosed, but reserve the right to make such changes, variations and modifica-  
 110 tions as come properly within the scope of the appended claims.

The combustion gases leaving the fire box pass into and through the heat accumulator  
 115 9, thence are split and passed through the flues 11 and 12, thence into the passage 17 and forward to the door-end of the retort. From thence they pass up into the flues 30, traveling back toward the furnace and when  
 120 they have reached the back end of the retort, that is the point farthest from the door, they pass forward again in the flue 31 and thence back the full length of the retort to the door-end and out of the stack 32. The  
 125 course of the products of combustion will be understood from the arrows in Figs. 1 and 3.

No claim is made herein to the method herein described, as the same forms the basis of a separate application, filed June 9, 1910,  
 130 Serial No. 565,983.



What I claim as new is:—

1. In a device for the dry distillation of wood, a furnace, a retort, flues leading from the furnace and a radiating wall outside said retort, and extending lengthwise of and for the major portion only of the length thereof.

2. In a device for the dry distillation of wood, a furnace, a retort, flues leading from the furnace, a radiating wall outside said retort and extending lengthwise of and for the major portion only of the length thereof, and means in said flues for controlling the products of combustion.

3. In a device for the dry distillation of wood, a furnace, retort flues leading from the furnace, a radiating wall outside said retort, and extending lengthwise of and for the major portion only of the length thereof, and means in said flues for controlling the products of combustion, said flues being provided with the outlets for the surplus heat.

4. In a device for the dry distillation of wood, a retort, furnaces, upon a plurality of sides thereof, and a radiating wall, arranged to receive the direct impingement of the products of combustion, from all of said furnaces, said furnaces being disposed at different distances from said retort.

5. A retort for the production of turpentine and other products, from pine wood, a wall outside said retort extending for the major portion only of the length thereof, and means whereby the products of combustion, impinge against said wall, to heat the retort by radiation, and means whereby the hot gases, afterward come in direct contact with the walls of the retort at the point farthest removed from the source of heat.

6. A retort constructed to be heated externally by combustion gases, a furnace separated from the retort thereby, a radiating wall extending lengthwise of the retort for a portion only of the length thereof preventing direct impingement of the products of combustion against the retort, avoiding overheating in spots, and means embodying a heat accumulator interposed between the furnace and the retort for heating the whole underside of the retort uniformly.

7. A retort, constructed to be heated externally by combustion gases, with a separated fire box, and a heat accumulator in the furnace between the same and the flues leading

to the retort, to take up and absorb excess heat, to give off surplus heat, when desired, and a radiating wall interposed between the source of heat and the retort and extending for a major portion of the length of the latter for receiving the direct impact of the products of combustion, thereby insuring a regular even degree of heat inside the retort.

8. A retort constructed to be heated by combustion gases after having passed a heat accumulator, a wall surrounding the retort for a major portion of its length and terminating at a distance from the end of the retort farthest from the point of introduction of the products of combustion combined with means for preventing direct impingement of the gases against the retort, by reason of a separated fire box and deflecting walls, whereby the under side of the retort is heated uniformly.

9. In a device for the dry distillation of wood heated by combustion gases, a retort, a furnace, a radiating wall outside of the retort and separated therefrom with an air space therebetween, said wall extending for a major portion of the length of the retort and terminating at a distance from the end of the retort farthest from the point of introduction of the products of combustion, and inclined flues leading from the furnace to the adjacent end of the retort upon opposite sides thereof.

10. In a device for the dry distillation of wood heated by combustion gases, a retort, a furnace removed therefrom, a radiating wall outside of said retort and separated therefrom with an air space therebetween, said wall extending for a major portion of the length of the retort and terminating at a distance from the end of the retort farthest from the furnace, means for conducting the products of combustion from said furnace to and about said radiating wall to uniformly heat the contents of the retort, and means for maintaining the temperature of the retort not exceeding substantially 430° F.

Signed by me at Waycross Ga. this 19 day of Jan'y 1909.

THOMAS B. GAUTIER.

Witnesses:

W. L. FISHER,  
H. H. HIRSCH.