

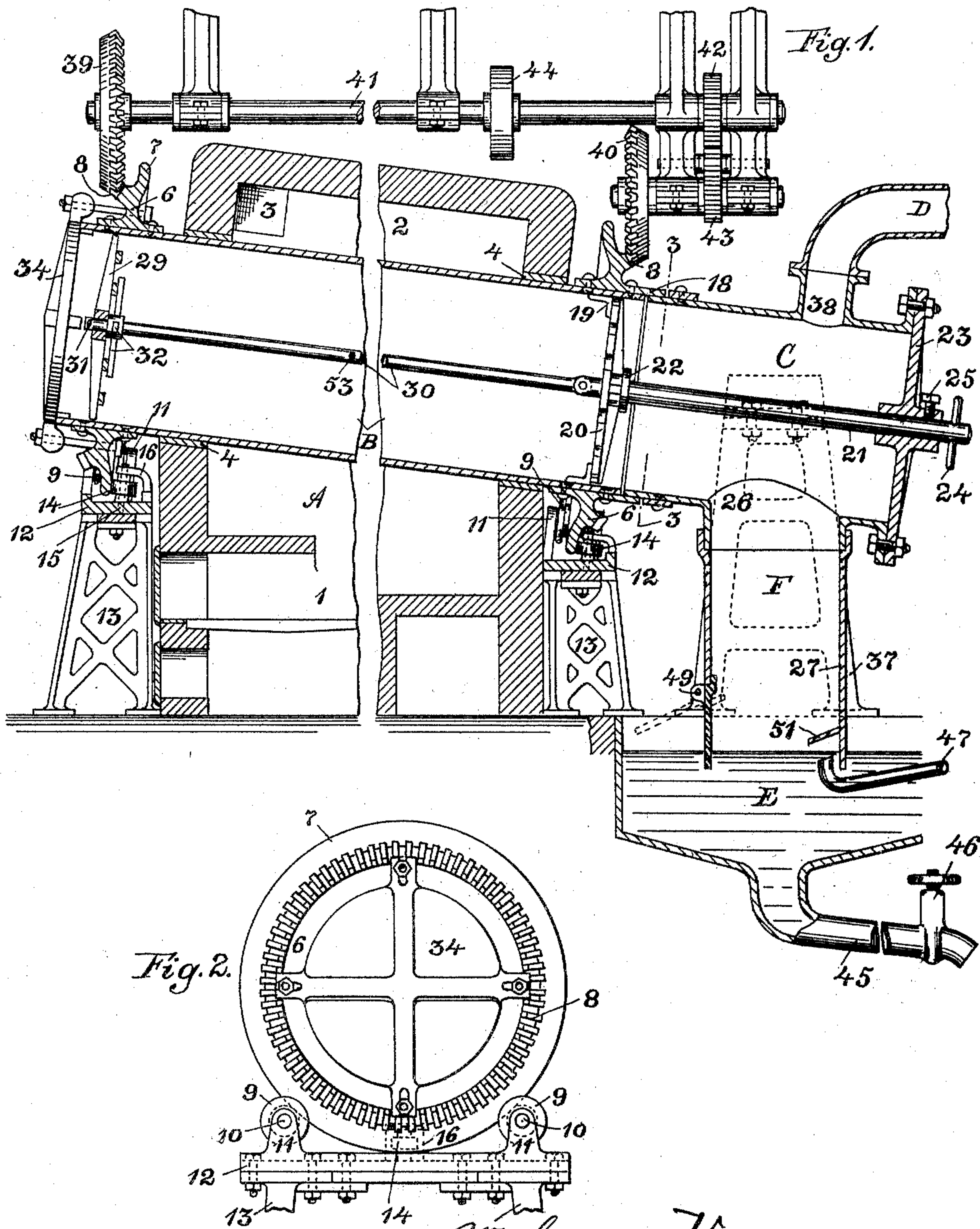
No. 767,091.

PATENTED AUG. 9, 1904.

B. VIOLA.
WOOD DISTILLING APPARATUS.
APPLICATION FILED JAN. 28, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

John A. Paulson by
Mastelink

Bartholomew Viola, Inventor
Schreiter & Mathews
his Att'ys

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2 SHEETS—SHEET 2.

Fig. 3.

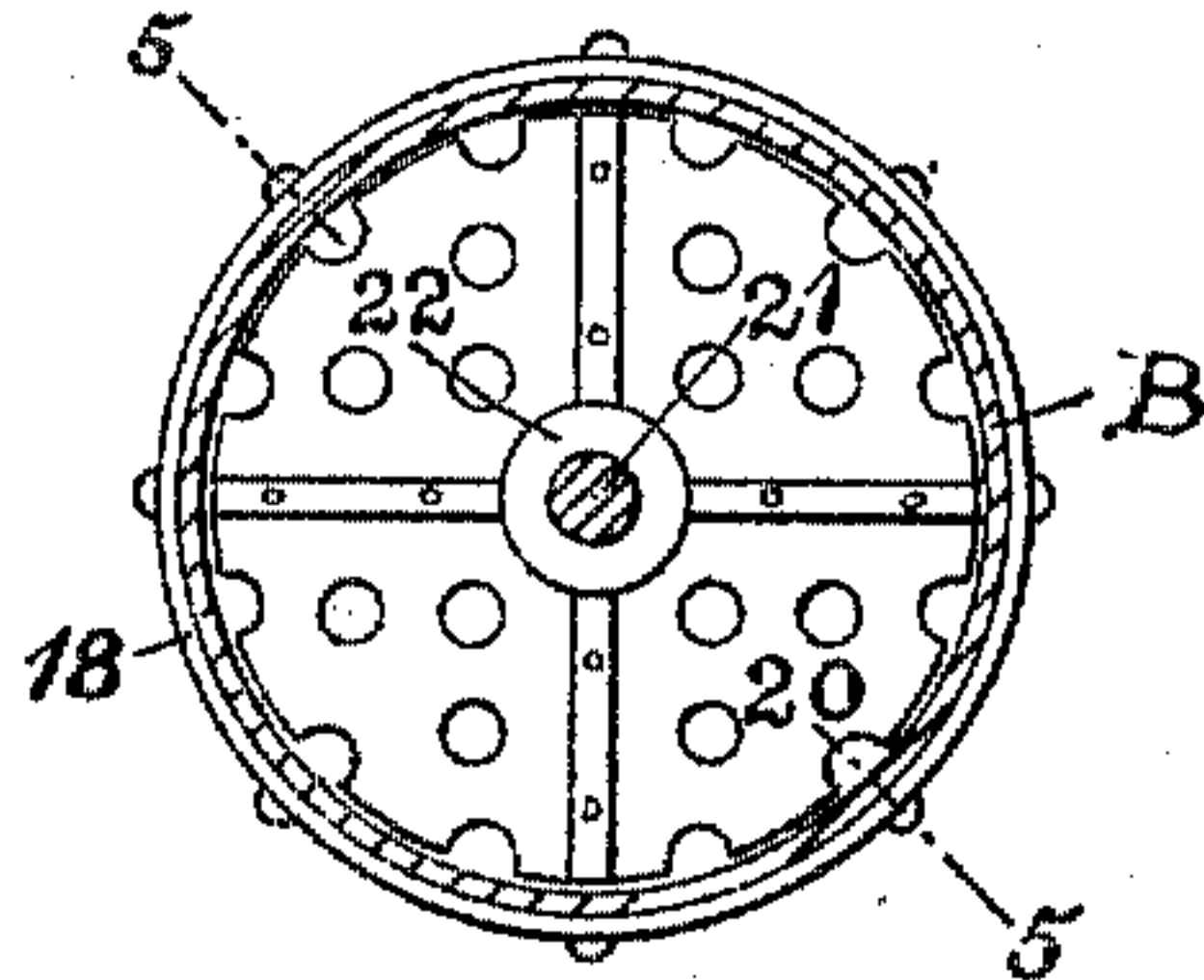


Fig. 4.

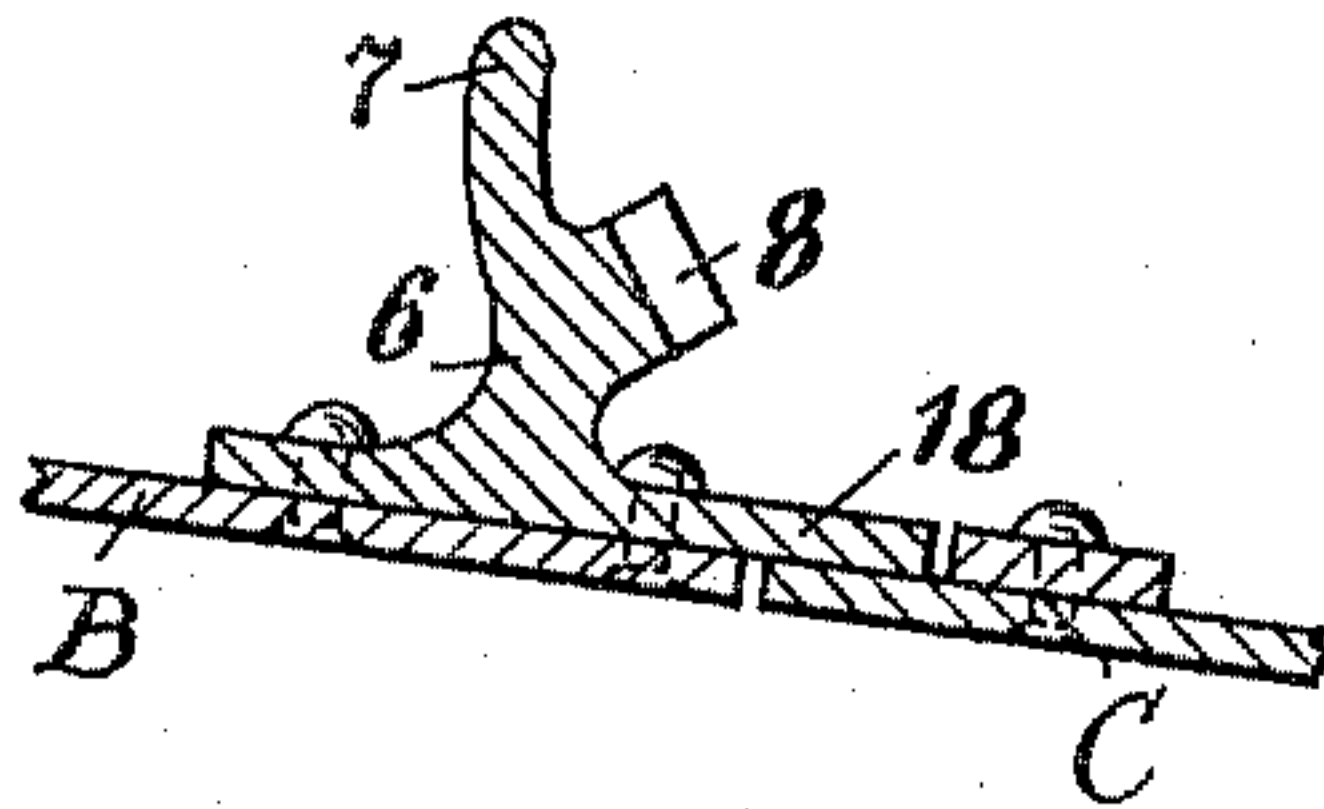


Fig. 5.

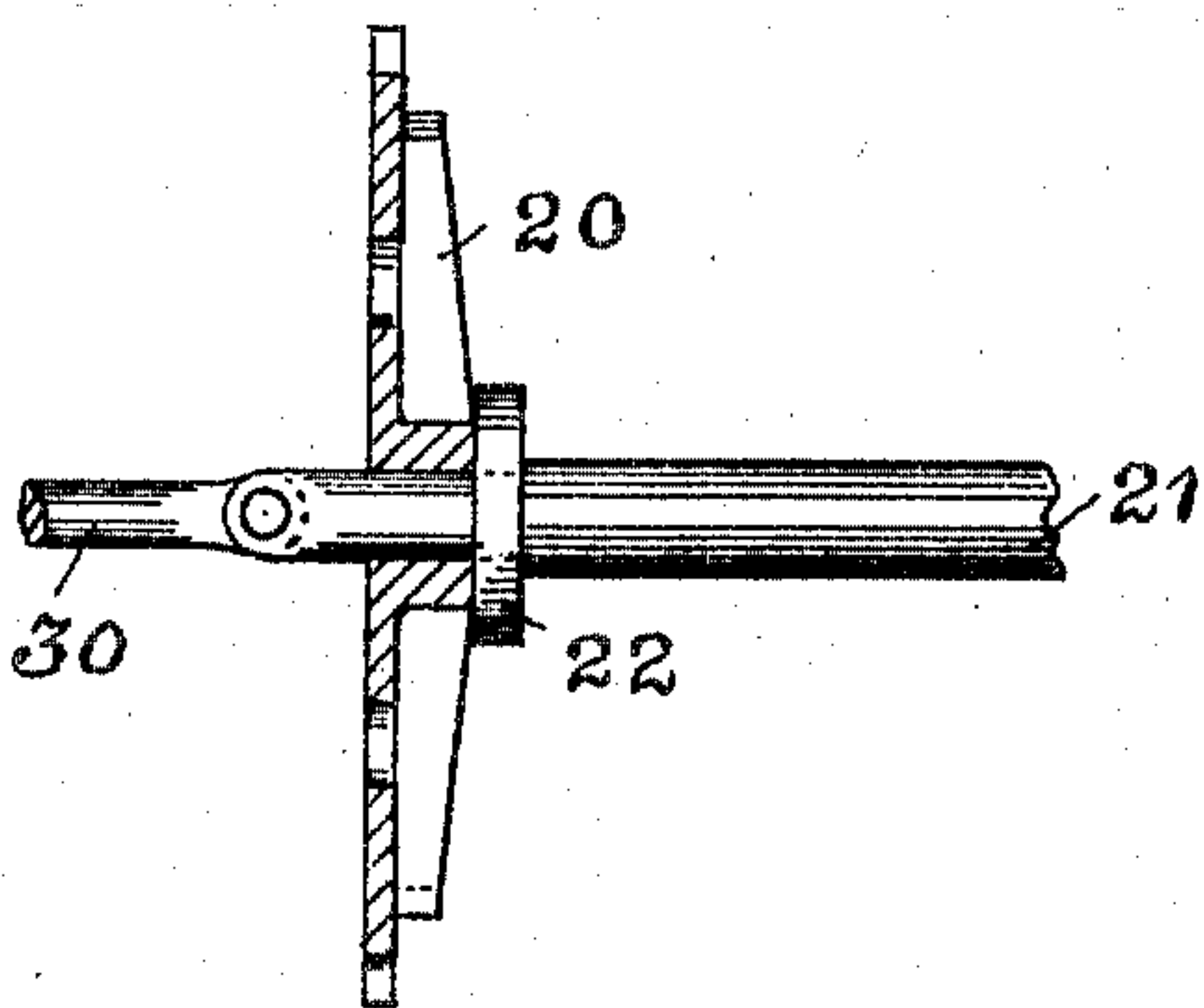
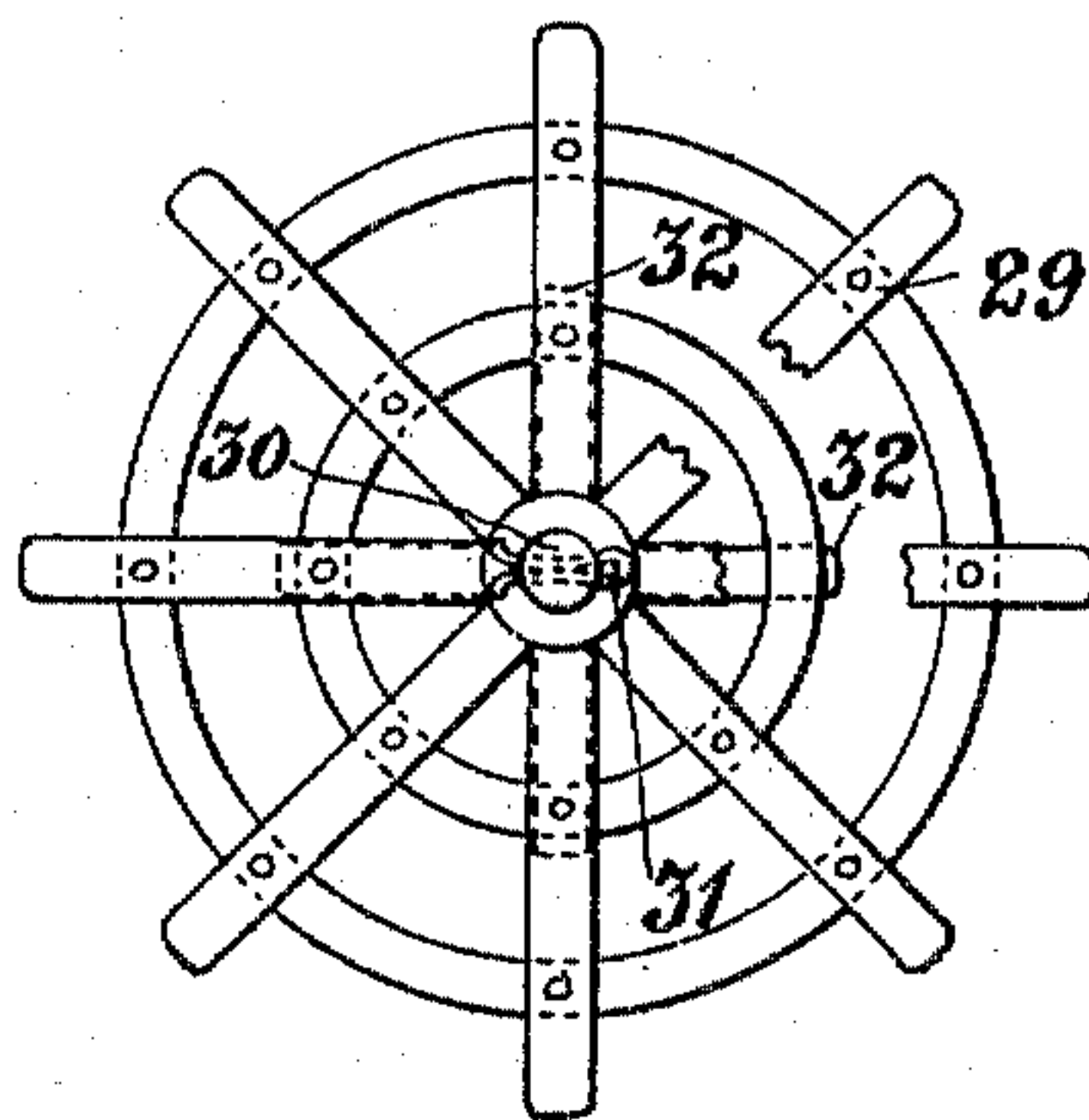


Fig. 6.



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UNITED STATES PATENT OFFICE.

BARTHOLOMEW VIOLA, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO
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WOOD-DISTILLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 767,091, dated August 9, 1904.

Application filed January 28, 1903. Serial No. 140,907. (No model.)

To all whom it may concern:

Be it known that I, BARTHOLOMEW VIOLA, a citizen of the United States, and a resident of the borough of Brooklyn, in the city, county,
5 and State of New York, have invented certain new and useful Improvements in Wood-Distilling Apparatus, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings,
10 wherein—

Figure 1 is a sectional view, partly elevation, of my improved distilling apparatus. Fig. 2 is a front elevation thereof; Fig. 3, a sectional view on lines 3-3, indicated in Fig.
15 1; and Figs. 4, 5, and 6 are enlarged detail views.

My invention relates to apparatuses for the distilling of wood and other carbonaceous materials, more particularly of pine and other
20 woods suitable for extracting therefrom of pine-oil and other allied products; and it consists of an apparatus designed for rapidly and completely extracting the products of distillation and for roughly separating them, so
25 that they may be used in further processes and for manufacture of such products as may be desired.

The apparatus illustrated in the drawings consists of an oven A, a retort B, chamber C,
30 conduit D, tank E, chute F, connecting-tank E with chamber C, and of the several mechanisms and appliances connected therewith, as shown in the drawings and set forth herein.

Oven A is a brick structure consisting of a
35 furnace 1 of the usual construction, a combustion-chamber 2, and flue 3, leading to the chimney. In the side walls of this oven A are provided two concentrically-located circular openings lined by metallic rings 4. In these
40 rings retort B is rotatably mounted, but is not supported therein. On each end of retort B is secured thereto a ring 6, which is extended into a flange 7 and gear 8. By means of these rings the retort is supported on rollers 9.
45 (See Fig. 2.) These rollers are set to loosely revolve on pins 10, mounted in standards 11, which are integral with bed-plates 12, supported on standards 13. These standards are

set upon the foundation and support the retort in its position. Flanges 7 of rings 6 also
50 engage with rollers 14, revolving on pins 15, which are also secured in bed-plates 12 and brackets 16. These rollers are provided to support retort B in its position relatively to chamber C and to prevent friction in the joint
55 of the retort with the chamber. This joint of retort B with chamber C is made by the base of ring 6, as shown in the enlarged detail view, Fig. 4. Ring 6 is riveted to the retort and the part of its base projecting beyond the edge
60 of the retort, including edge 18, turned on a lathe and snugly fitted upon the adjoining part of chamber C, which is also circular in shape. The width of the part of the base of ring 6 projecting over the adjoining part
65 of chamber C must be made sufficient to provide for variations resulting from extension and contraction of the retort, and for the same reason an adequate clearance must be provided between the ends of the adjoining
70 edges. The retort is not to rest with any part of its weight upon the chamber C. For this purpose flanges 7 of rings 6 and their bearings on rollers 9 and 14 are provided, as described above. Gear-wheels 39 and 40, the
75 former secured to shaft 41 and the latter driven from the shaft through gear-wheels 42 and 43, engage with gears 8 of rings 6. Shaft 41 is driven by a belt stretched over pulley 44, keyed thereto, or in any other convenient
80 manner. By this mechanism retort B is rotated while the distilling process is going on, and thereby the overheating of the retort in one part is prevented and the distilling of the material within the retort equalized in all
85 parts thereof.

Chamber C is stationary, being supported in fixed position on standards 37. In the top of chamber C an aperture 38 is provided, connecting with conduit D. Through this aper-
90 ture 38 and conduit D the volatile products of distillation are withdrawn during the period of distillation and conducted to other apparatuses, where these volatile products are condensed, separated, or fixed. In the bottom of
95 chamber C an aperture 26 is provided, con-

necting by chute 27 with the separating-tank E. Through this aperture the non-volatile products of distillation and the residue are discharged into tank E, where the former are separated according to their specific weights. Chute 27 projects some distance below the level of the water in tank E, and thus an airtight closing of chamber C is effected.

Inside of chamber C, adjoining the edge connecting it with retort B, brackets 19 are affixed thereto, (see Fig. 1,) and against these brackets a perforated disk 20 is secured by rod 21, as shown in Fig. 5, being an enlarged detail thereof. Disk 20 is provided to hold the material charged in the retort and to prevent it from dropping into chamber C during the period of distilling. Rod 21 is recessed on its end, and on this recessed portion collar 22 is set. Disk 20 is provided with a central bore only wide enough to admit the recessed portion of rod 21. Collar 22 is provided to enlarge the area supporting the disk against displacement. The other end of rod 21 passes through a bore provided in the enlarged central portion of front wall 23 of chamber C and is manipulated by handle 24. When disk 20 is in its position against brackets 19, the end of rod 21 is secured against displacement by set-screw 25. When the distilling of the charge in the retort is completed and the solid residue is to be discharged from the retort, disk 20 is withdrawn by releasing set-screw 25 and pulling rod 21 outwardly.

For better and more convenient withdrawing of the residue from retort B and dumping it through aperture 26 in chamber C and chute 27 into the separating-tank E a spider-disk 29 is provided, which is flexibly connected by rod 30 to rod 21. Spider-disk 29 is hung onto rod 30 by pin 31 and held in position by cross-arms 32. Rod 30 is of smaller diameter than the recessed part of rod 21, thus permitting this rod 30 to be drawn through the aperture in disk 20 and collar 22 until one or more cross-pins 53 on the rod 21 strike the disk 20, when the disk 20 will be moved through the chamber C past the opening in the chamber; but if the retort is full of charcoal the spider 29 will force the same against the disk 20 and move the latter to the end of the chamber C. By thus drawing spider-disk 29 through the retort the solid residue (charcoal) is drawn into chamber C and from there discharged through aperture 26 and chute 27 into tank E. When this is accomplished, spider-disk 29 and disk 20 are pushed back again into their original position, rod 21 secured by set-screw 25, and then lid 34 is removed, spider-disk 29 disconnected from rod 30, and a new charge of material filled in the retort. Then spider-disk 29 is again attached to rod 30, lid 34 replaced and secured in position, and the distillation of the new charge started. This arrangement facili-

tates a rapid discharge of the residue from the retort and saves a great deal of labor and inconvenience.

During the process of distillation the liquid products, such as tar and heavy oils, are not retained in the retort. The retort is mounted on an inclined plane inclined toward chamber C. These liquid products flow into chamber C and through aperture 26 and chute 27 into separating-tank E. This tank is filled with water. Some of these liquid products are specifically lighter while others are specifically heavier than water; but none of those which are desired to be saved assimilate with water. The heavier ones accumulate on the bottom of the tank and are withdrawn from time to time through culvert 45 and outlet-cock 46. The lighter ones remain on the surface of the water remaining within chute 27 and are withdrawn from time to time through siphon-conduit 47. For protection of the inlet of this conduit when the charcoal is being discharged shield 51 is provided. When the distilling process of each charge is completed, the gas-conduit D is closed and the rear wall of chute 27 (hinged to the other portion of the chute at 49) opened, as indicated in dotted lines in Fig. 1. After all liquid products floating on the water in tank E are withdrawn the charcoal is discharged from the retort by drawing spider-disk 29 through the retort toward the chamber C. This charcoal being dumped through aperture 26 and chute 27 into tank E is almost instantly cooled and may be conveniently removed.

I claim as my invention—

1. In a device of the character described, the combination of a fixed chamber having an opening in its lower part, a rotatable retort adjacent to the chamber and forming a substantially continuous vessel, a rod passing through the end of the fixed vessel, and extending into both vessels, a disk loose on the rod, lugs on the inside of the retort against which the said disk normally rests, and means on the rod for engaging said disk and moving it through the fixed chamber past said opening.

2. In a device of the character described, the combination of a fixed chamber having an opening in the lower part, a rotatable retort adjacent to the chamber and forming a substantially continuous vessel, a rod passing through one end of the fixed vessel and extending into both vessels, a disk loose on the rod, lugs on the inside of the retort against which the said disk normally rests, a spider on the inner end of the rod and normally located adjacent to the other end of the retort, and a stop-pin on the rod arranged to engage the said disk upon the rod being drawn through the vessels and move the disk through the fixed chamber past said opening, and at the same time move the said spider to the other end of the retort.

3. An apparatus for distilling wood comprising an oven, a fixed chamber set up alongside the oven, and having separated apertures for discharging the products of distillation, a
5 cylindrical rotary retort, rotatably joined to the chamber and communicating therewith, set in the oven in a position slanting toward the chamber and approximately concentrically therewith; a perforated partition, set in the
10 chamber adjoining the end of the retort, and means for movably securing the partition in position; a lid removably secured to the other end of the retort, mechanism for rotatably
15 tating it; a spider-disk loosely fitted in the retort, and means for drawing the spider-disk through the retort; a conduit connecting with the chamber at the aperture for discharging the gaseous products therefrom, a tank underneath the chamber and water filled in the
20 tank; a chute connected to the chamber at the aperture for discharging the non-volatile residue therefrom, and extended into the tank below the level of the water filled therein, and means for withdrawing the separated products
25 from the tank.

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Witnesses:

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