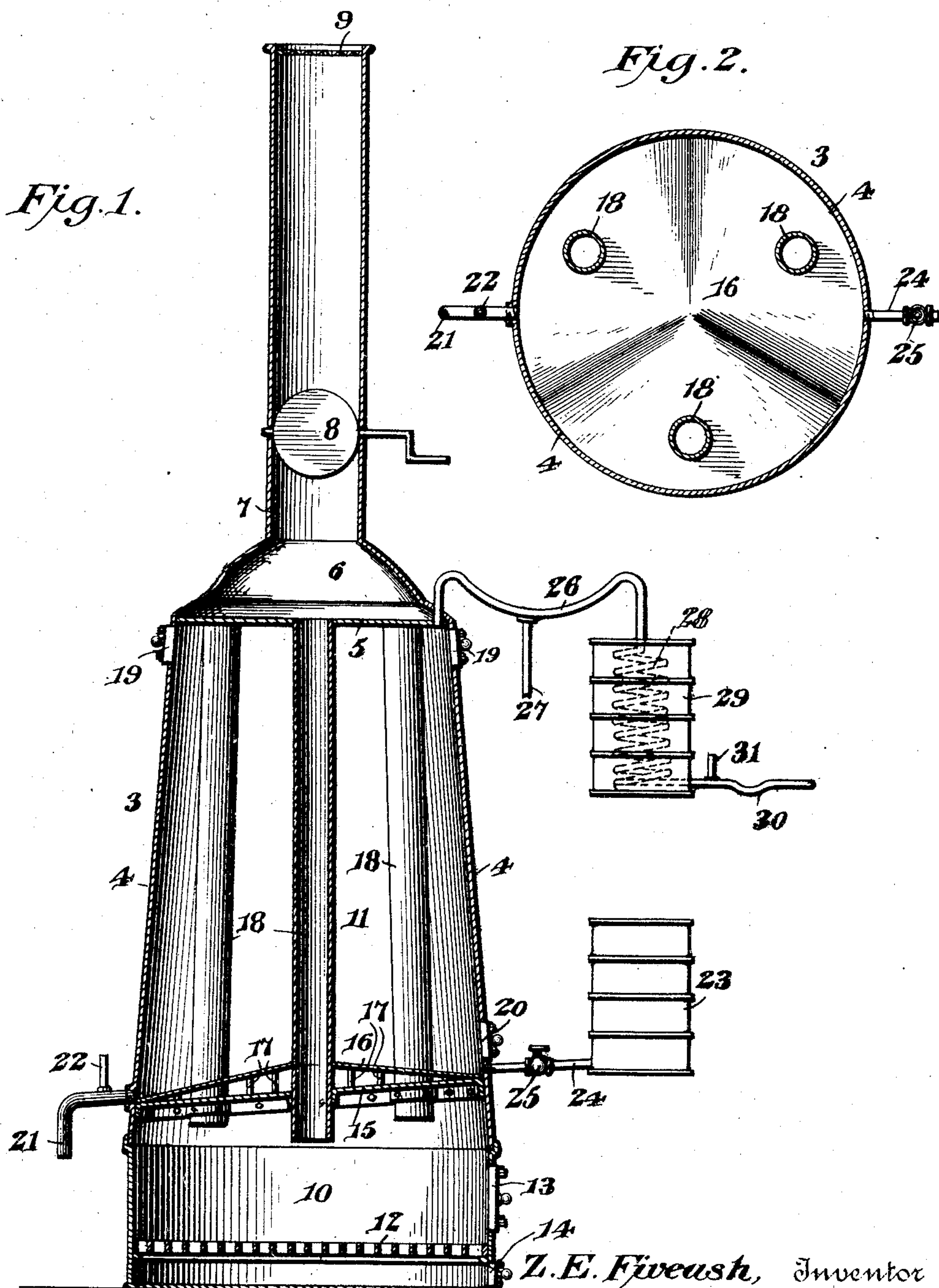


No. 789,271.

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Z. E. FIVEASH.  
WOOD DISTILLING APPARATUS.  
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# UNITED STATES PATENT OFFICE.

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## WOOD-DISTILLING APPARATUS.

**SPECIFICATION** forming part of Letters Patent No. 789,271, dated May 9, 1905.

Application filed June 24, 1904. Serial No. 214,012.

*To all whom it may concern:*

Be it known that I, ZION ELMORE FIVEASH, a citizen of the United States, residing at Heckla, in the county of Perry and State of Mississippi, have invented a new and useful Wood-Distilling Apparatus, of which the following is a specification.

This invention relates to improvements in that class of apparatus employed in obtaining various products from wood by distillation.

The object is to provide a novel structure wherein the heat is properly and thoroughly applied to the wood, while the products are protected from becoming scorched or burned, said structure being simple and capable of being readily manufactured.

An embodiment of the invention that is considered at present to be the preferable one is illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical sectional view through the apparatus. Fig. 2 is a horizontal sectional view through the apparatus shown in Fig. 1.

Similar reference-numerals indicate corresponding parts in both figures of the drawings.

In the embodiment illustrated a body 3 is employed having cylindrical side walls 4 and tapering toward its upper end. A transversely-disposed crown-sheet 5 constitutes the upper end wall of the body and is surmounted by a smoke-box 6, from which projects a stack 7. In this stack is located a suitable damper 8, while the upper end is provided with a spark-arresting screen 9. The lower portion of the body constitutes a furnace 10, and above the same is located a retort-chamber 11. The furnace 10 is provided with a suitable grate 12 and has a fuel-door 13 and an ash-door 14, located, respectively, above and below said grate.

The furnace and retort-chamber are separated by a transverse partition consisting of spaced sheets 15 and 16, the lower sheet 15 being flat and the upper sheet 16 being substantially conical in form, whereby said sheets converge toward their margins, said margins being suitably secured to the body-walls 4. Tie-bolts 17 connect the sheets and serve to stiffen the partition. Upright flues 18 extend through the partition and through the crown-

sheet 5, said flues being preferably secured to the lower sheet 15 of said partition and depending within the furnace. They preferably converge toward their upper ends, as shown in Fig. 1. Charging-doors 19 are located in the upper portion of the body and constitute the means of access to the retort-chamber, while a charcoal-removing door 20 is located in one of the body-walls just above the bottom of said chamber.

It will be noted by reference to Fig. 1 that the partition is located at an inclination, and a tar-outflow spout 21 is connected to the lower portion of the chamber above the lower portion of said partition. The spout has a suitable gas-vent 22. A water-reservoir 23 has communication with the lower portion of the retort-chamber just above the uppermost part of the partition by means of a pipe 24, containing a valve 25. The volatilized oil and vapors escape through a crooked tube 26, communicating with the upper portion of the retort-chamber and having a depending creosote-spout 27 connected to the lower bend of said tube. The tube, furthermore, communicates with a condenser-coil 28, arranged within a suitable reservoir 29, and from said condenser-coil leads an oil-spout 30, said spout having a gas-vent 31.

The wood to be distilled is charged into the retort-chamber in the usual manner and will be heated from the fire in the furnace and the products of combustion passing through the flues, so that the various products will be given off and discharged through the different spouts in a manner readily understood. The tapering construction of the body and the convergent relation of the flues are important, as the heat is properly maintained throughout the length of the retort-chamber by being gradually concentrated in the upper contracted portion of the retort-chamber. The double-sheet construction, constituting the bottom of the chamber and the top of the furnace, is a very important feature, for the tar is thus protected against scorching and at the same time will readily find its way to the spout 21. Moreover, as the water is introduced into the body at the opposite side from said spout the water has as long a course as possible be-



fore it can come into contact with the tar during the outflow of the latter and is consequently evaporated before such contact. In this connection it may be stated that the water is necessarily supplied in very small quantities either from time to time or a little may be allowed to enter the retort-chamber continuously, as may be found desirable, the amount being easily regulable by the valve 25. The use of water has been found advantageous, as the steam generated therefrom assists in preventing the flues from becoming burned out, prevents injury to the distillates from overheating, and appears to assist in opening the pores of the wood to permit the more ready escape of the products contained therein. The depending flues, located within the chamber, deflect the flame from the bottom sheet to a certain extent, and thus prevent overheating of the same. While three flues are shown in the present structure, any number desired may be employed.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In wood-distilling apparatus, a body having a retort-chamber, a furnace, a partition-wall separating the furnace and chamber and comprising spaced sheets, and flues extending from the furnace through the spaced sheets and through the retort-chamber.

2. In wood-distilling apparatus, an upright body having a furnace in its lower portion, a smoke-box in its upper portion, and a retort-chamber arranged between the furnace and smoke-box, a partition-wall separating the furnace and the chamber and comprising spaced sheets, and flues extending from the furnace through the spaced sheets and retort-chamber to the smoke-box.

3. In wood-distilling apparatus, an upright body having a retort-chamber and a furnace,

a conical partition-wall located within the body and tilted as a whole at an inclination to the horizontal, a valved outlet communicating with the retort-chamber at the lower portion of the partition, and a flue extending from the furnace through the partition and retort-chamber.

4. In wood-distilling apparatus, a body, comprising cylindrical side walls, having a lower furnace and an upper retort-chamber, a partition separating the chamber and furnace and comprising spaced sheets secured to both walls and converging toward their margins, said partition and the sheets thereof being located at an inclination, an outlet from the chamber communicating with the same at the lower portion of the partition, and a flue extending from the furnace through the sheets, said flue being secured to the sheet on the furnace side of the partition.

5. In wood-distilling apparatus, the combination with a body that tapers toward its upper end, of a furnace located in the lower portion of the body, an upwardly-tapering retort-chamber formed in the upper portion of the body and having a top wall, a partition separating the furnace and the chamber, and a plurality of independent flues extending longitudinally through the retort-chamber, and having their upper ends spaced apart and located in the top wall, said flues converging toward their upper ends and communicating at their lower ends with the furnace.

6. In wood-distilling apparatus, a cylindrical body tapering toward its upper end, a smoke-box located on the body, a stack projecting from the smoke-box, a furnace located in the lower portion of the body, a retort-chamber formed in the body above the furnace, a partition separating the furnace and chamber and comprising spaced sheets located at an inclination, and upright flues extending through the partition and communicating with the smoke-box, said flues converging toward their upper ends.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ZION ELMORE FIVEASH.

Witnesses:

JAMES EDGAR DAVIS,  
JOHN DOSSETT.