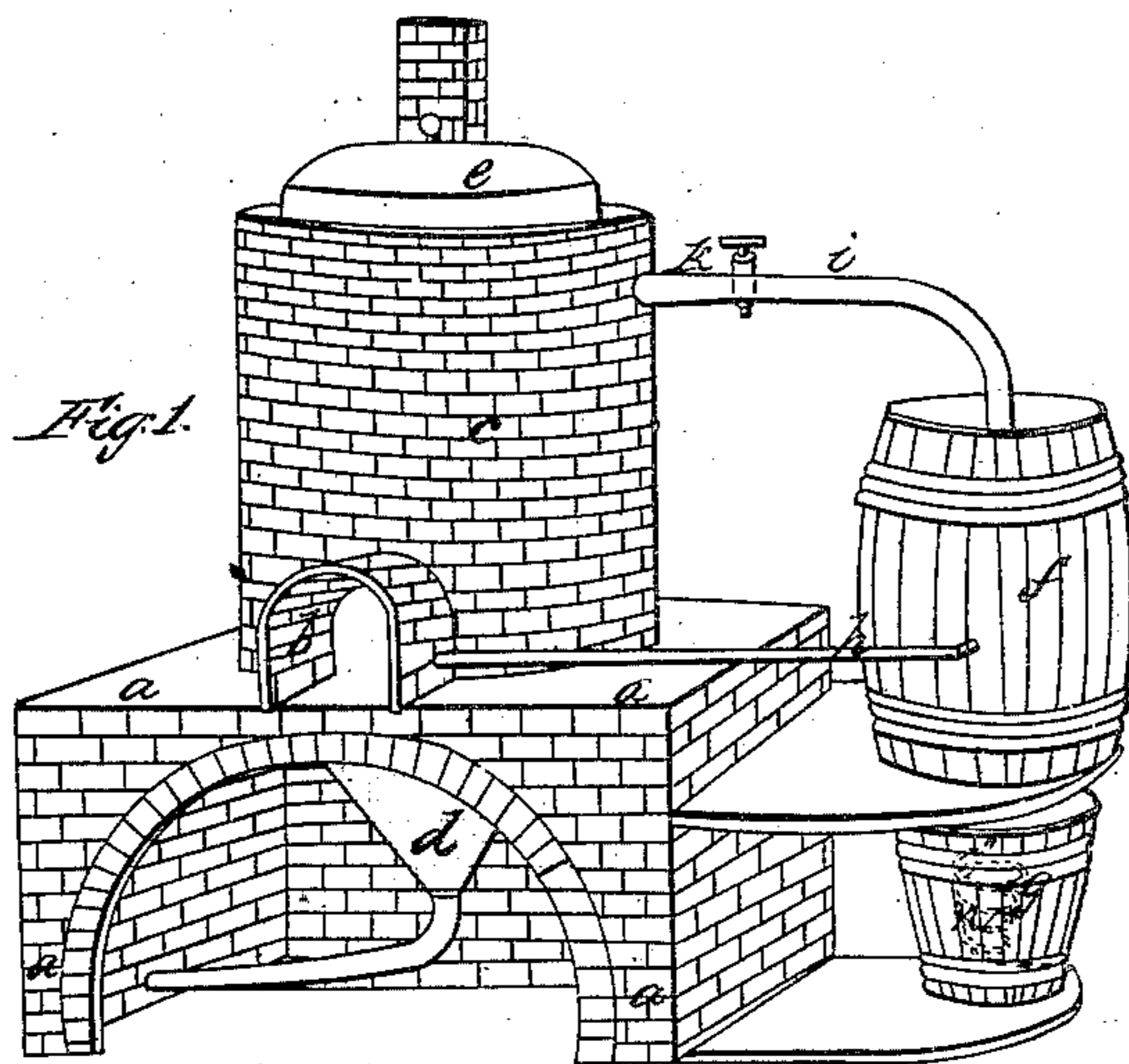


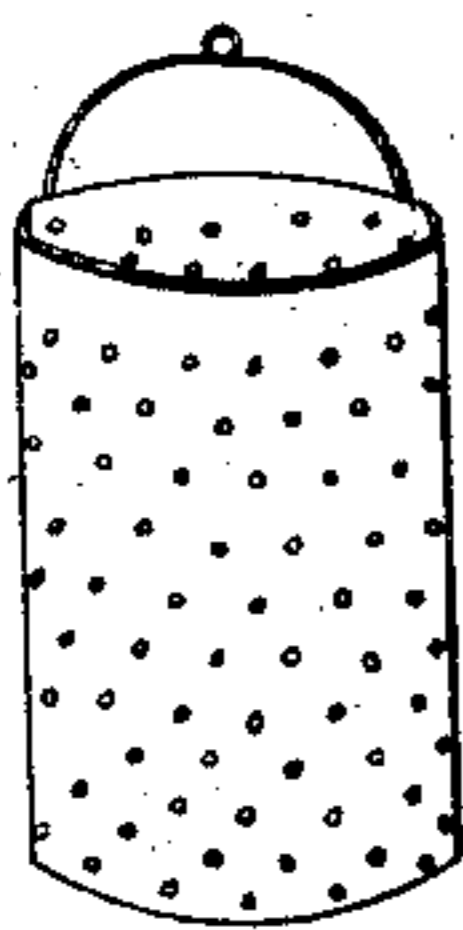
*S. L. Cole.*  
*Distilling Wood.*

*Nº 38,560.*

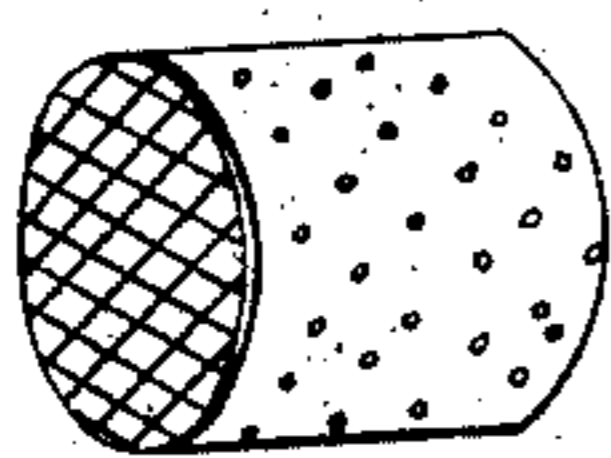
*Patented May 19, 1863.*



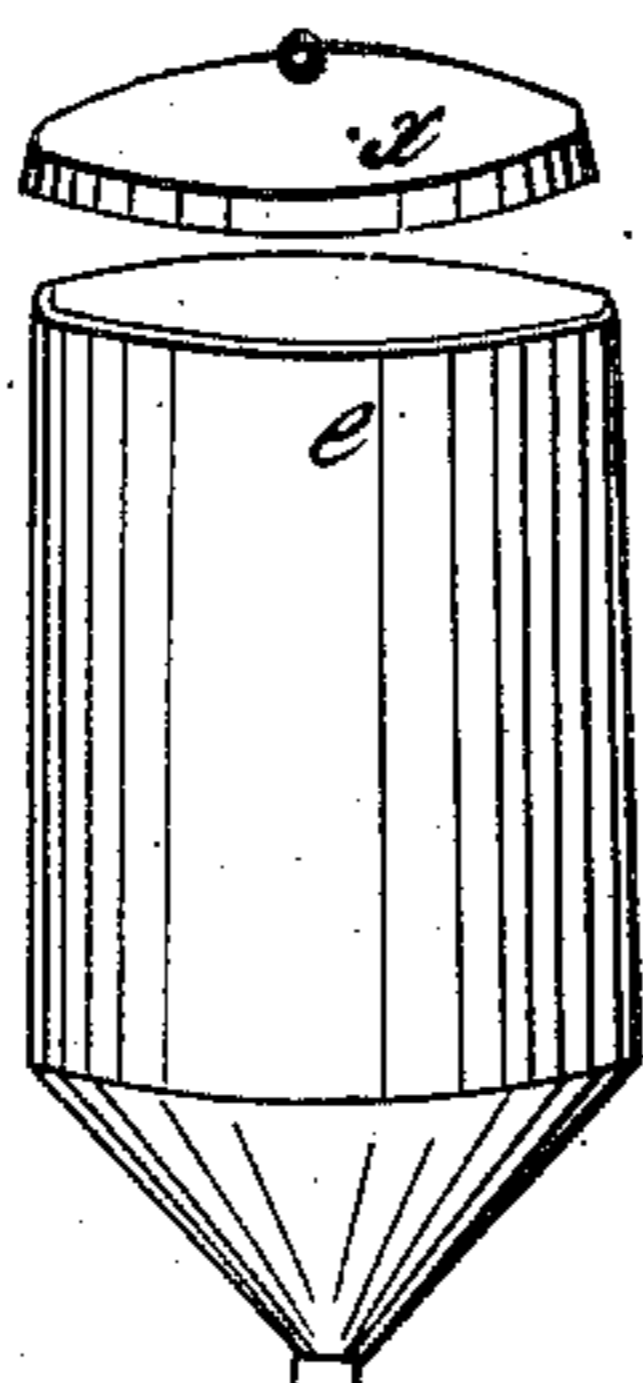
*Fig. 4.*



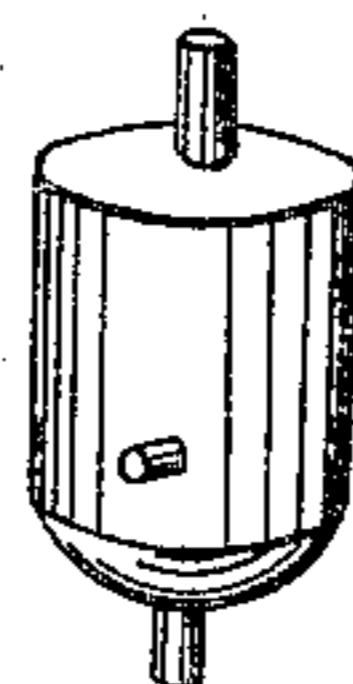
*Fig. 5.*



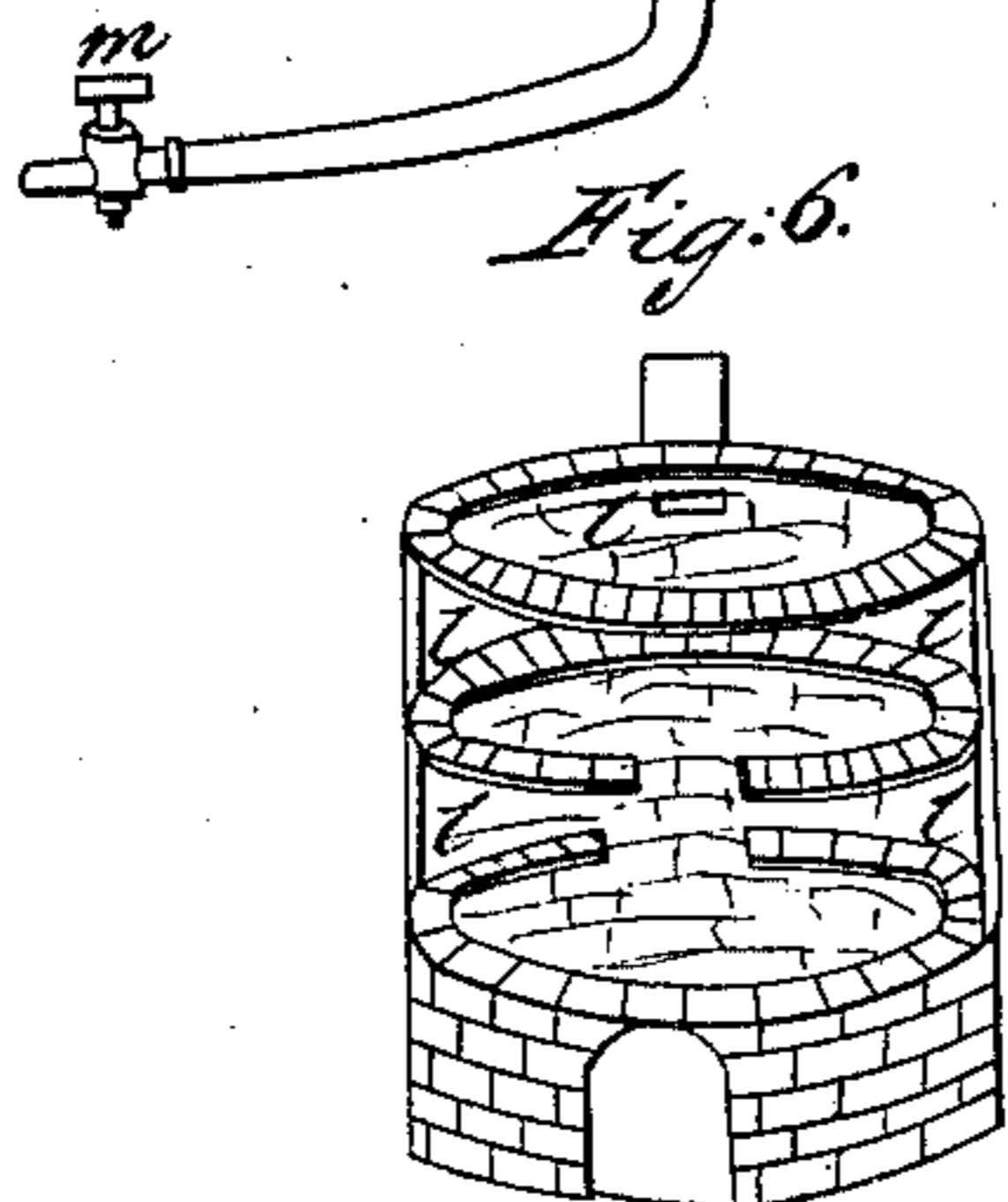
*Fig. 2.*



*Fig. 3.*



*Fig. 6.*



*Witnesses:*

*S. B. Bigelow*  
*Charles Miller*

*Inventor:*

*John L. Cole*

# UNITED STATES PATENT OFFICE.

SETH L. COLE, OF BURLINGTON, VERMONT.

## IMPROVED APPARATUS FOR DISTILLING PINE WOOD, &c.

Specification forming part of Letters Patent No. 38,560, dated May 19, 1863.

*To all whom it may concern:*

Be it known that I, SETH L. COLE, of Burlington, in the county of Chittenden and State of Vermont, have invented a new and useful apparatus for extracting the oil or spirits of turpentine directly from wood by means of a furnace arranged and combined with a retort, a gas-receiver, refrigerators, and condensers, a distilling apparatus, and a skeleton cylinder or iron basket in which the wood is placed for conveyance into the retort, as represented and described in the drawings and specification hereto annexed.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

I construct the several parts in proper proportion for combination with each other, of suitable material, as represented in the drawings, and as described in the following specification.

Figure 1 of these drawings represents a view of the entire apparatus or machine; Fig. 2, the retort with a pipe and stop-cock, *m*, attached to the lower end and a movable cover, *x*, at the top; Fig. 3, the gas-receiver, which is placed within the refrigerator and upper condenser, *f*; Figs. 4 and 5, the skeleton cylinder or iron basket in which the wood is conveyed to the retort; Fig. 6, part of the furnace or fire-flues *l l* around the retort.

In Fig. 1, *a a a* represent the base or foundation; *b*, the furnace in which the fire is placed; *c*, the cylindrical part of the furnace, in which the flues *l l* are constructed to conduct the flame and heat around the retort; *d*, the lower end of the retort (the tunnel part of which is fixed below the fire-place to prevent its being too highly heated and burning the tar or residuum which falls into it) and the pipe leading from it to the stop-cock *m*, where the tar is discharged; *e*, the top of the retort or movable cover *x*; *f*, the refrigerator and upper condenser inclosing the gas-receiver; *g*, the lower condenser and worm-pipe *n*; *h*, the pipe for conducting the incondensable gas from the upper condenser to the fire-furnace, where it is used as fuel; *i*, the main pipe conveying the vapor from the retort to the condensers, in which is fixed the stop-cock *k*.

The mode of operating the apparatus or machine I describe as follows: I prepare the wood in pieces of suitable size, equal, say, to one

and one-half to two inches square and from twelve to eighteen inches long. These pieces are placed in the skeleton receiver, Figs. 4 and 5, or iron basket, in a vertical position, or nearly so, and as close together as may be convenient. The basket and wood are then placed in the retort by a crane and chain or other suitable contrivance. The cover of the retort *x* is placed over it, and its joint around the edge of the retort is luted or packed with clay or other suitable material to prevent the escape of gases from the retort as they are thrown off from the wood. After closing the cover of the retort the stop-cock *m* in the pipe leading from the lower end of the retort is closed, and the stop-cock *k* in the main pipe *i*, leading from the retort to the refrigerator or condenser *f*, is opened. The fire is then applied in the furnace and a gradual heat maintained, say, from six to ten hours, or long enough to extract the volatile substance from the wood, which substance or gases from the wood is conveyed through the pipe *i* and stop-cock *k*, Fig. 1, to the refrigerator or condenser *f*, where, by condensation, the condensable portion of the vapor is separated and conveyed into the lower condenser, *g*, through the worm-pipe *n*, Fig. 1, to a proper discharge. The oil or spirit thus discharged is turpentine—the principal object of the apparatus. The incondensable portion of the vapor or gas contained in the condenser *f* is conveyed through the pipe *h* to the fire-furnace, where it is consumed as fuel. After the volatile matter has been extracted from the wood, which is indicated by a change of color of the oil or spirits of turpentine issuing from the still-pipe *n* in the lower condenser, (from a light to a brown or dark color,) the stop-cock *k* in the main pipe *i* is closed and the stop-cock *m* in the pipe leading from the lower end of the retort is opened. At this stage of the operation the fire in the furnace may be increased for the purpose of sufficiently charring the wood remaining in the retort to extract the tar from it, which passes off through the pipe and stop-cock *m*, which leads from the bottom or lower end of the retort. The second condenser is not absolutely necessary to the working of the machine, but is preferable to a single condenser or refrigerator, and is recommended as producing a purer extract, spirit, or oil of turpentine than would be produced by a single refrigerator or condenser.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The above-described apparatus, as described and set forth in the drawings and specification, for extracting the oil or spirits of turpentine directly from wood by means of a furnace arranged and combined with a retort, a gas-receiver, refrigerator, and condensers, a distilling or refining apparatus, and skeleton cylinder or iron basket, in which the wood is placed and conveyed into the retort; the several parts of said apparatus I claim and use in combination with each other for

the purpose of extracting oil or spirits of turpentine directly from wood and saving the residuum or tar from the same in the manner and as set forth and represented in the drawings hereto attached, and substantially as described in the above specification.

2. The retort with the open cone-shaped bottom, constructed and operating as herein set forth and described.

SETH L. COLE.

Witnesses:

EDWARD SMITH,  
JOHN B. HOLLENBECK.