

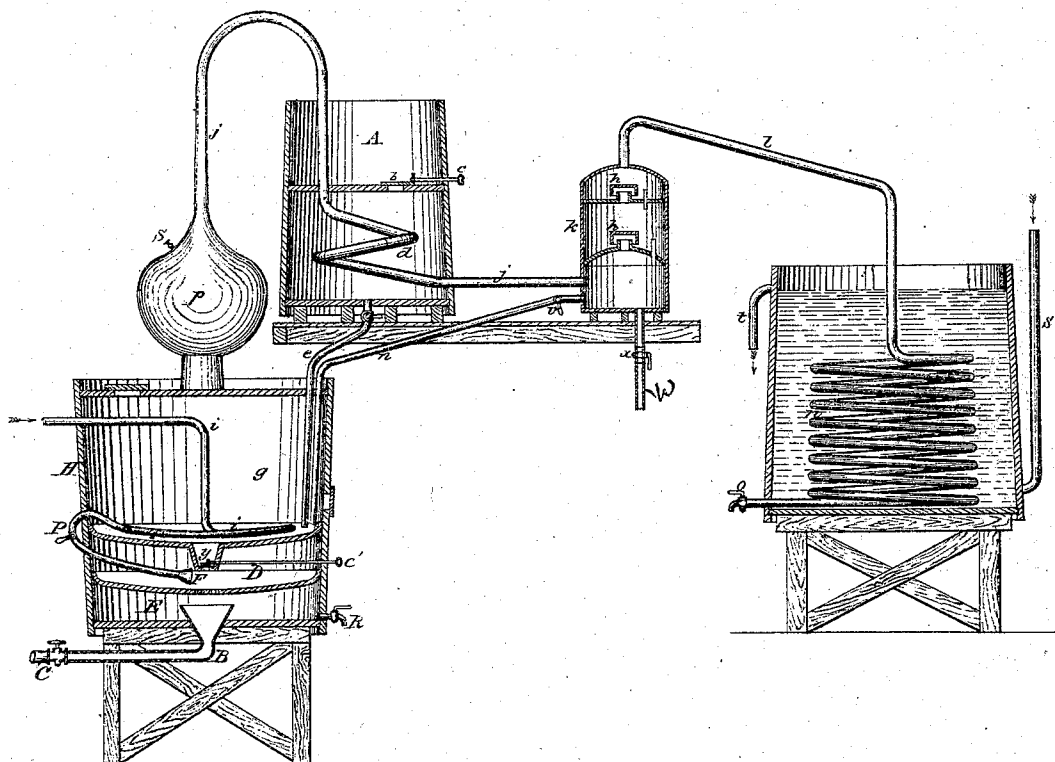
A. K. Lee's.

Improved Apparatus for Distilling Turpentine

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& Bleaching Rosin.

PATENTED AUG 1 1871



Witnesses:

J. C. Brecht.

Edwin James.

Inventor:

Archibald K. Lee

per J. E. J. Holmsted,
Associate Attorney
of Jenkins & Olmstead.

UNITED STATES PATENT OFFICE.

ARCHIBALD K. LEE, OF GALVESTON, TEXAS.

IMPROVEMENT IN APPARATUS FOR DISTILLING TURPENTINE.

Specification forming part of Letters Patent No. 117,549, dated August 1, 1871.

To all whom it may concern:

Be it known that I, ARCHIBALD K. LEE, of the city of Galveston and State of Texas, have invented a new and improved Apparatus for Distilling Turpentine and for Bleaching the Resin or residuum thereof, of which the following is a correct, clear, and full description and specification, reference being had to the drawing annexed which constitutes a part of said specification and description.

My invention has for its primary object the production, in as cheap, simple, and as effectual manner as possible, from the chips or pieces of pine wood or sawdust of the same material, or from the crude turpentine obtained in the usual manner from pine trees, a perfectly pure, limpid, and as perfect an article of the spirits of turpentine as can be produced by any known means; and secondly, the bleaching, purification, and defecation of the resin or residuum thereof, so as to produce, in the highest degree, the most desirable, marketable, and profitable article for the requirements of commerce, and, therefore, of the greatest benefit to the manufacturer.

My device is of simple construction, and does not materially differ in its general principles, arrangement, and operation, from an ordinary distilling apparatus, such as is now almost universally used in practice; but it possesses features, and peculiarities, and advantages which, in the result of its operations, place it in the most eminent degree far above anything of the same character of mechanism hitherto devised and brought into practical use, not the least important of which is, the production, as above stated, of an article of turpentine perfectly pure and free from the pyroligneous acids and other impurities which usually pertain to the spirits of turpentine produced in the usual and ordinary manner. That the resin or residuum which remains after the process of distillation should likewise be perfectly and entirely free from all feculent or foreign matters or impurities which diminish or depreciate its value for the purposes of the arts or manufactures is furthermore a consideration of the highest pecuniary importance to the producer.

The production of a good and valuable article in commerce, manufactures, or the arts, especially of the character to which we allude, begets economy in the cost of the vessels into

which it is to be retained or stored, as well as economy in the cost of handling and transportation to a market. Besides, the manufacturer or producer has the extreme satisfaction of having made available to the utmost extent for the production of a profitable result all the means at his command. A good article likewise meets with ready sale and quick returns, while an inferior article may remain, especially in a dull market, upon the hands of the producer to his great injury, detriment, and possible loss.

My device accomplishes all the good and desirable results sought to be attained, and therefore avoids all the evil ones to which allusion herein has been made, and will be more readily understood and appreciated when its mode of construction, arrangement, and operation has been made familiar by the drawing annexed, wherein the letters refer to the different parts thereof, and in which—

A represents the receiver or charger, divided into two compartments, the upper one of which is for the reception of the crude or raw turpentine, and in which it is to some extent partially or completely liquidized by means of the heat of the vapor-pipe *j*, which passes through it. The opening of the slide-valve *b* by the means of the valve-rod *c* admits the liquid and warmed raw material into the lower or charging-chamber *d*, where it is further heated by a continuation of the vapor-pipe *j*, above mentioned, preparatory to its reception through the pipe *e*, which is provided with a stop-cock, *f*, into the boiling or vaporizing-chamber *g* of the still H. The boiling and vaporizing process is effected by means of the pipe *i*, into which steam is introduced from the boiler or generator, which it is not necessary for our purpose to describe or to show on the drawing. The vapor which is generated by the boiling process aforesaid is immediately passed to the condenser through and by means of the pipe *j*, vessel *k*, and pipe *l*, a continuation of the latter forming the condensing-coil or worm *n*, provided at its outlet with a stop-cock, *o*. At this outlet the spirits of turpentine, in a perfectly pure state, is discharged into barrels or other vessels prepared for its reception.

It will now be perceived that as the vapors are generated from the raw or crude material in the boiling-chamber *g* by means of the steam-pipe *i*, to which allusion has already been made,

and ascend to the globe *p*, and pipe or goose-neck *j*, they will, by means of their contact or impingement against the surfaces of this said globe and pipe, which, being in the outer air and exposed relatively to a lower or cooler degree of temperature, to some extent be condensed, and therefore divested of a considerable portion of their heavier or liquid particles, which, by their own superior gravity, will naturally fall back to the boiling-chamber, leaving only the uncondensed or lighter vapors to pass on through the goose-neck or pipe *j* to the vessel *k*. This latter vessel *k* is provided with condensing-plates, so contrived and arranged as to receive the vapors against their lower surfaces, and, in their passage, are also forced through an accumulated stratum of liquid upon their upper surfaces by means of the inverted cups *h* placed over their outlets or perforations, as shown on the drawing. The contact of the vapors with the pipe *j* and the lower surfaces of the plates above mentioned, and their passage through the liquid upon their upper surfaces, as above described, will completely divest them of all the woody, vinegar, or pyroligneous acids or other impurities which they may contain at this stage or condition of the distilling operation, and the vapors which remain will pass on to be liquidized by the condensing-worm *n*, which is immersed in cold water for the accomplishment of this purpose, and finally be discharged at the terminus of the worm-pipe by means of the stop-cock *o*. The vessel in which the condensing-worm *n* is placed is supplied with a constant stream of cold water by means of an inlet or feed-pipe, *s*, which admits the water at the bottom of this vessel, and as it becomes warm, by reason of its contact with the worm *n*, ascends to the outlet-pipe *t*, where it is wasted or perhaps used for the supply of the steam-boiler or boilers, which it is necessary to use in connection with my apparatus.

The condensed and impure liquid which may be accumulated in the bottom of the vessel *k* may be returned to the boiling-chamber *g* through the pipe *n*, which is provided with a stop-cock, *v*, or it may be drawn off or wasted by means of the pipe *w* communicating with the bottom of said vessel, and which pipe is also provided with a stop-cock, shown at *x*.

It will furthermore be perceived, by reference to the drawing, that the still *H* is divided into three chambers, the objects of the upper or boiling-chamber of which having been herein partially described, it remains for me only to mention that it is further provided with an opening or man-hole at the top, and with one or more at the sides, if necessary, both or all of which are provided with covers tightly fitted and secured in the usual manner. Through these man-holes are inserted, when required, chips, knots, wood, or sawdust of pine, and the turpentine which they contain is extracted from them in precisely the same manner as herein described for the distillation of the crude or raw turpentine. The bottom of the chamber *g* is likewise provided with a slide-valve, *y*,

operated by the valve-rod *e'*, which serves the purpose of discharging the residuum or resin through the middle chamber *D* to the lower or discharging-chamber *E*. The bottom of the middle chamber is perforated for this purpose. From this chamber the resin is discharged through the pipe *B*, which is provided with a stop-cock, *C*. The pipe *B* aforesaid is provided with a bell-shaped mouth-piece, as shown, so as to receive all the liquid resin as it descends from the chamber above it.

It may here be stated that the steam which has been admitted through the coil-pipe *i* for the purpose of boiling the raw or crude turpentine is discharged at the terminus *F* of this pipe, where it will be forced in direct contact with the resin as it descends from the boiling-chamber *g*. This pipe is provided with a valve, *P*, to regulate the discharge of steam into the chamber *D*. It is this contact with a steam-jet which effects the bleaching and purification of the resin, for which object I claim my apparatus to be applicable. Sulphurous-acid gas or the fumes of burning sulphur may also be introduced into contact therewith for a like purpose.

The chamber *E* is provided with a stop-cock, *R*, at or near its bottom, which is intended to serve the purpose of discharging the condensed water which will accumulate therein.

A vacuum-valve, *S*, is provided on the globe above the still, for the purpose of providing against accident.

An indicator or eye-glass may be placed on the still in the usual manner, so as to indicate the quantity of liquid therein.

It is clearly evident that the different parts of my apparatus may be constructed in almost any desired form and dimensions without, in any manner, changing its general principles or without defeating or injuring the objects for which it is intended, as herein set forth. It will, I believe, be necessary, however, to construct all the pipes to which allusion herein has been made, of copper, as likewise the vessel *k*. The shell of the still, the charger, and condensing-vessel may be made of wood.

Having described my apparatus, what I wish to secure by Letters Patent is the following:

1. The still *H*, divided into the compartments, as stated, and the pipe *i*, so combined and arranged that the latter shall act both in the vaporizing-chamber *g* and the bleaching and purifying-chamber *D*, substantially as described.

2. The receiver and charger *A* and still *H*, each constructed as stated, and the pipes *i* and *j*, the same combined and arranged so as to operate substantially as described.

3. The receiver *A*, still *H*, and vessel *k*, each constructed as stated, and so connected with each other and the condenser by pipes *j* *i* as to operate substantially as described.

ARCHIBALD K. LEE.

Witnesses:

L. J. OLMSTEAD,
H. N. JENKINS.