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UNITED STATES PATENT OFFICE.

JAMES D. STANLEY, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN DISTILLING AND PURIFYING TURPENTINE FROM WOOD.

Specification forming part of Letters Patent No. 130,598, dated August 20, 1872.

To all whom it may concern:

Be it known that I, JAMES D. STANLEY, of the city of Baltimore and State of Maryland, have invented certain improvements in the process and apparatus whereby spirits of turpentine, oil, and crude varnish are distilled and produced from pine wood; and I do hereby declare that in the following specification of my said invention is contained a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

My invention relates, first, to the introduction of a vapor—caused to issue from pine wood by the action of heat applied thereto—into receivers containing steam or vapor generated or evaporated from water or other liquid, impregnated or saturated with lime or other salt or substance having similar properties, by which a union is effected between the two vapors; secondly, to the particular application and use of the receivers themselves; and, thirdly, to the transmission of the two vapors thus combined and united through pipes submerged in cold water, the intent of such action being the condensation of the united vapors into the fluid substance thereby produced. In the further description of my invention which follows due reference must be had to the accompanying drawing, which is a representation in a longitudinal vertical section of the apparatus by which the above-mentioned process is effected.

A A are retorts or cylinders, of any suitable form or construction, provided with large door-openings, bars, or grates *a'* and free discharge apertures or pipes *b*. The retorts are inclosed by masonry B, into which are built furnaces *a''*. C C are copper stills, also set in masonry, which at separate times, as will hereinafter more fully be explained, are heated from the furnaces beneath *d d*. To the neck *e* of each still is attached that of a copper receiver, F, from each of which receivers a pipe, *f*, rises and falls, merging into a coil or worm, *f'*, of required size and length. G G are cylinders, which are to be filled with cold water surrounding and submerging the coils *f'*. The retorts A are connected to the stills C C by the pipes *g g* having the valves *g' g'*. H H are reservoirs for the liquid which is to be vaporized within

the stills C, and which may be conveyed to the reservoirs at pleasure through pipes *h* and cocks *h'*.

The manner in which the process is conducted is as follows: The retorts A are first charged with a fair quantity of wood piled upon the bars or grate-surfaces *a'*. The retort-doors are then closed. The stills C are supplied with the prepared or saturated liquid before described from the reservoirs H. The cylinders G are filled with cold water that the coils of pipe *f* may be submerged therein. The valve *g'* at the right of the figure is opened, the other remaining closed. Moderate fires are now to be kindled under the retorts A A and the still C situated at the right of the figure, and so regulated that the substances to be affected by the heat may, as nearly as possible, commence their evaporation at the same time. The substances thus converted into vapor, uniting within the receiver C, pass through the condensing-pipe *f* placed at the right of the figure and depart from the same as a liquid substance at F'. This liquor, during the continuance of the process just described, will be found to be white spirits of turpentine. When discoloration has been noticed at F' the valve *g'*, heretofore open, is closed, and that situated at the left of the figure opened when fire is applied under the left-hand still C, and the entire process as described repeated until the resinous resources of the wood placed within the retorts shall have been exhausted. The liquid thus produced at the latter stage of the process will be found to be yellow spirits of turpentine. The inspissated juice or exudation distilled from the wood, which may be considered as the residuum of the process, and which leaves the apparatus at F'', may be denominated as oil and crude varnish. A gas-chamber is represented at F'', having a pipe, *i*, leading therefrom to the furnaces *a''*, where the gas ignites.

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

1. A process which consists in the introduction of a resinous ingredient found in pine wood and in wood of trees of the fir species, converted into vapor, into a receiver containing another vapor generated from water or

