B. F. A. SAYLOR.

PROCESS OF EXTRACTING TURPENTINE AND ROSIN.

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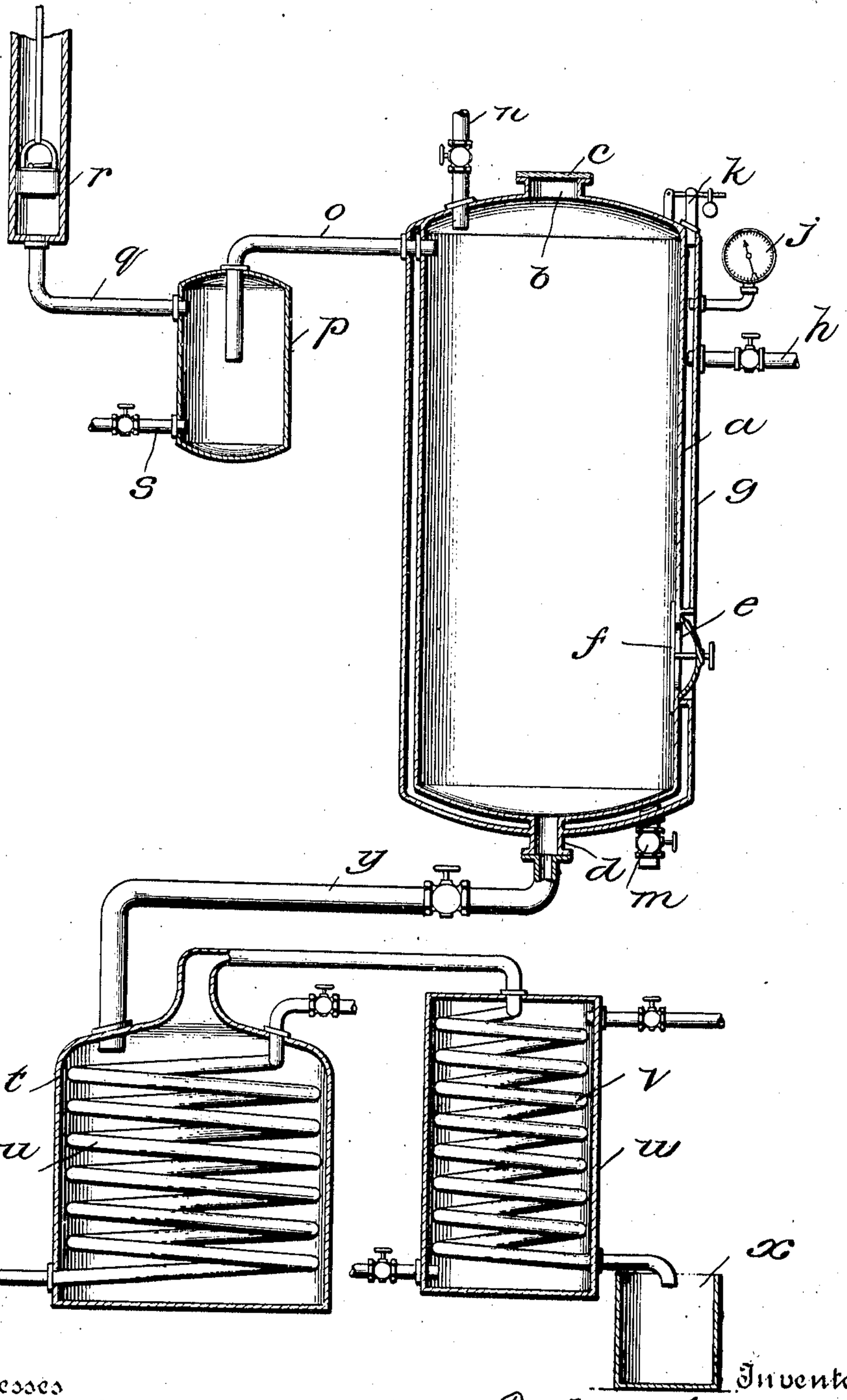

Witnesses

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UNITED STATES PATENT OFFICE.

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PROCESS OF EXTRACTING TURPENTINE AND ROSIN.

945,612. Specification of Letters Patent. Patented Jan. 4, 1910.

Application filed April 18, 1908. Serial No. 427,841.

To all whom it may concern:

Be it known that I, BENJAMIN F. A. SAYLOR, a citizen of the United States, residing at Rome, in the county of Floyd and State of Georgia, have invented certain new and useful Improvements in Processes of Extracting Turpentine and Rosin; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in processes for extracting turpentine and rosin from resinous woods containing the same.

The primary object of my invention is a process whereby turpentine and rosin may be extracted from wood in a more economical and expeditious manner than previously, and whereby resins and turpenes may be produced in a better and purer state than formerly.

In carrying out my invention, I use a strong steel cylinder with a capacity of three or more cords of wood. This cylinder is provided with an opening fourteen inches in diameter near the top thereof arranged in such a manner that the cylinder is steam and air-tight when closed. At the bottom of the cylinder there is a valve in a short discharge pipe about two inches in diameter through which pipe the resinous substances are withdrawn after they are extracted from the wood, as hereinafter described. In the bottom of the cylinder, near the discharge pipe, is a large opening about fourteen inches in diameter, ordinarily closed by a manhole valve through which the wood and chips contained in the cylinder are discharged at the close of the process. The entire cylinder is provided with a steam jacket made sufficiently strong to withstand a considerable pressure. A two-inch steam pipe connects with this jacket, which is also provided with a steam pressure gage and an automatic blow-off valve and an escape valve for removing the water of condensation. The cylinder is placed in an upright or slightly inclined position, supported by a steel frame fastened to or in a base of concrete, and is also provided with connections which lead to a vacuum pipe.

In carrying out my process, I charge the cylinder with chips, slivers, or blocks of pine or other resin producing woods. I then introduce into the cylinder a light hydrocarbon, such as gasolene or benzin, preferably gasolene, in sufficient quantities to thoroughly submerge the wood in the cylinder. The wood is soaked in the hydrocarbon for about an hour and then the excess of hydrocarbon is allowed to flow off. Small quantities of steam or hot water, at a temperature about 212° F., are then introduced into the jacket of the cylinder and the vacuum pump is started. This vacuum pump is kept in operation long enough to produce a vacuum corresponding to about 27 inches of mercury, (that is, leaving a pressure of about one-tenth of an atmosphere) which usually requires about 20 minutes, with the apparatus proportioned as in the drawing. During this time, the interior of the cylinder does not become heated to an extent sufficient to vaporize any appreciable amount of the gasolene, and even if considerable quantities of the gasolene were vaporized, it would not materially affect the ultimate result. The vacuum pump is then stopped and all openings into the cylinder closed, and steam or hot water, at a temperature about 212° F., is allowed to flow freely into the jacket of the cylinder, whereupon the pressure in the cylinder gradually rises until it reaches from 85 to 100 lbs. per square inch. The hydrocarbon in which the wood has been soaked has the effect of penetrating and opening the pores of the wood and attacking and dissolving out the resinous substances contained therein, and the heat has the effect of completing this action, whereby the resinous matter is thoroughly dissolved and freed from the wood. Complete solution and separation of the resinous substances from the wood take place within about two hours from the time the heat is applied to the closed cylinder, thus effecting the saving of several hours in the operation over any other process known to me. Hot air or hot water at a temperature of about 200° F. and at a pressure considerably greater than the pressure in the cylinder, is then forced into the cylinder through a valve in the top and this has the effect of driving down the resinous substances to the bottom and freeing the wood from any resinous matter adhering thereto. By thus treating the charge at a low heat and freed from

atmospheric influences, I obtain the result that the fiber of the wood is uninjured and is in good condition for the manufacture of wood pulp after the resinous substances have been removed. For the same reason the resinous matter is obtained in almost as pure a condition as that obtained by the "dip" method in vogue for many years by boxing trees. After having obtained the resinous substances, I then treat them by the ordinary and well-known methods of distillation. The hydrocarbons withdrawn in the first step of the process are also redistilled, and the resinous matter and turpentine contained in them separated, leaving the hydrocarbon in a condition to be used a second time.

In the accompanying drawing, which illustrates an apparatus for carrying out my invention, the figure represents said apparatus in cross section, partly in elevation, the supports being omitted.

a is the steel cylinder, provided with an opening *b* in its top, through which the material to be treated is fed into the cylinder, which opening is usually closed by the cover *c*, removably fastened thereto.

d represents the discharge pipe for the resinous material at the bottom of the cylinder. The cylinder is provided with a manhole opening *e*, through which the material after treatment is drawn out, which manhole is ordinarily closed by a cover *f*.

g represents the steam jacket, *h*, the valved steam pipe leading thereinto, *j*, the pressure gage, *k*, the escape valve, and *m*, the valved discharge pipe for the water of condensation.

n is the pipe for introducing air and hot water to the cylinder, *o*, a pipe leading into a closed vessel *p*, which is connected by a pipe *q* with the vacuum pump *r*. The vessel *p* is for the purpose of collecting any vapors that may be sucked out of the cylinder *a* by the pump, and this vessel is provided with a valved discharge pipe *s*.

t is an ordinary still provided with a steam coil *u* and having connected to its top an ordinary worm *v*, which runs through a condensing drum *w* and discharges into a receptacle *x*.

y is a valved pipe connecting the still *t* with the pipe *d*.

I claim:—

1. The process of extracting turpentine and rosin from resinous woods, which consists in subjecting the wood in a closed vessel, to the action of a light hydrocarbon until the wood is thoroughly saturated therewith, then withdrawing the excess of hydrocarbon, then establishing a partial vacuum in said vessel, then subjecting said vessel to a moderate heat, and, finally, separating from the wood the resinous matter adhering thereto by mechanical means, substantially as described.

2. The process of extracting turpentine and rosin from resinous woods, which consists in comminuting said woods, soaking the same with a light hydrocarbon in a closed vessel, removing the excess of the hydrocarbon, establishing a partial vacuum in said vessel, subjecting said vessel to a heat not exceeding 212° F., introducing a fluid into the top of said vessel to free the wood from resinous matter adhering thereto, collecting the resinous matters extracted from the wood, and separating the turpentine and rosin from the resinous matters, substantially as described.

3. The process of extracting turpentine and rosin from resinous woods, which consists in comminuting said woods, soaking the same in gasolene in a closed vessel, removing the excess of gasolene, establishing a partial vacuum in the vessel containing the substance under treatment, subjecting said vessel to a heat not exceeding 212° F., introducing hot water and air into the top of said vessel to separate from the wood the resinous matters adhering thereto, collecting the resinous matters extracted from the wood, and separating the turpentine and rosin therefrom, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

BENJAMIN F. A. SAYLOR.

Witnesses:

GEO. H. BYRNE,

R. M. PARKER.