S. CABOT, Jr.

PROCESS OF PRESERVING WOOD.

No. 184,141. Patented Nov. 7, 1876.

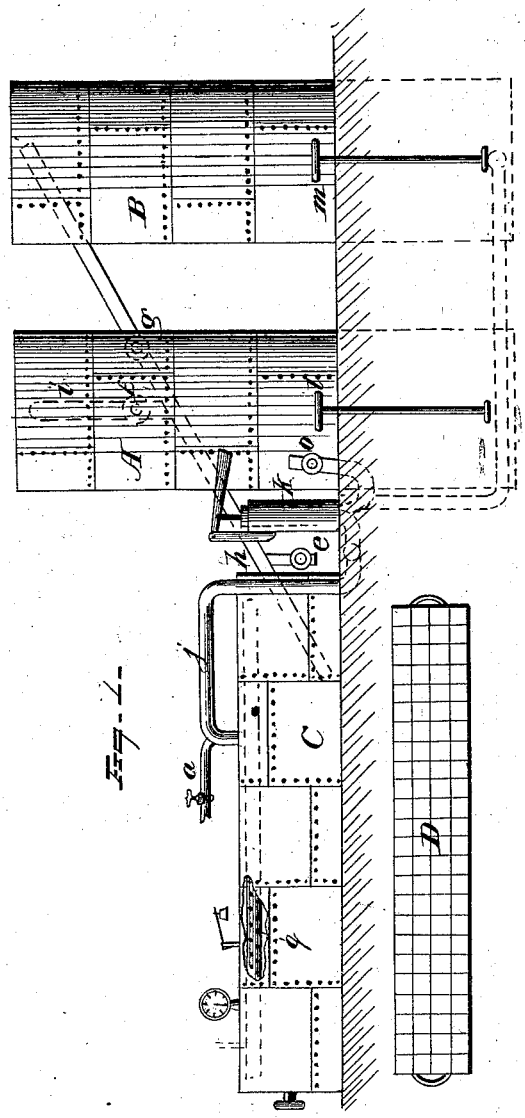

Fig. 1.

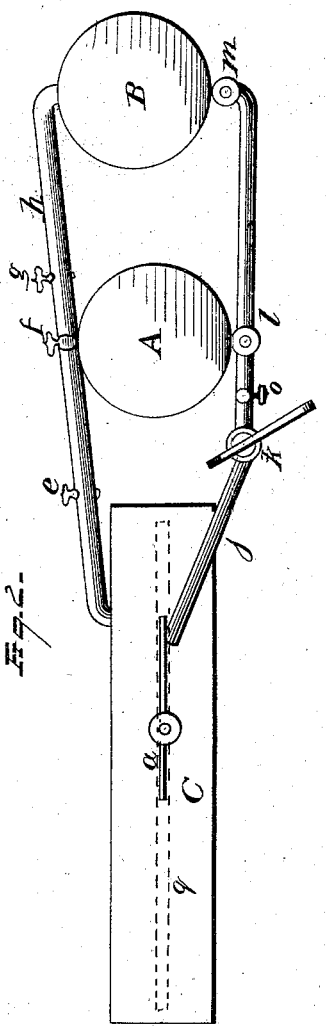

Fig. 2.

WITNESSES

Edw. Nottingham

A. W. Bright.

INVENTOR

Samuel Cabot Jr.

By Leggett and Leggett.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

SAMUEL CABOT, JR., OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN PROCESSES OF PRESERVING WOOD.

Specification forming part of Letters Patent No. **184,141**, dated November 7, 1876; application filed October 31, 1876.

To all whom it may concern:

Be it known that I, SAMUEL CABOT, Jr., of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Process for the Preservation of Wood; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

The upright boiler or tank lettered B in the accompanying drawings is made of some material adapted to resist the action of the contained solution. It is filled with a solution of sulphate of copper containing from five (5) to twenty (20) parts of the salt to one thousand (1,000) of water. The upright boiler or tank A is filled with a solution of phenate or cresate of lime, obtained by stirring the heavy oils distilled from the tar of coal or wood with a milk of lime, by which means the phenol of the coal-tar oil is united with the lime to form phenate, or the cresol of the wood-tar is united with the lime to form cresate of lime. The solution of phenate or cresate of lime may be drawn off after a short time from the bottom of the vessel in which the mixing is done. The boiler C is made of strong boiler-plate, and is furnished with a safety-valve, steam-gage, and thermometer connecting with the interior. It also has a pipe, *j*, entering it at the top, and connecting inside with a pipe, *q*, perforated with holes, for sprinkling or distributing the liquid or steam through the interior. It is furnished also with an exit-pipe, *h*, with the upper ends of the boilers A and B, and also the waste-pipe *e*.

The two cylindrical tanks A and B being filled, the cylinder D, made of coarse iron wire, and open at the ends, is packed with wood to be treated. The man-door *b* of the boiler C is then removed, and the cylinder D containing the wood is slid into it. The door is then adjusted and closed tightly. Steam, either at its normal temperature or superheated, is next applied through the steam-pipe *a*, passing thence through a part of the pipe *j* into the pipe *q*, and out through the fine holes in this pipe into the boiler C. The condensed steam is drawn off by opening the waste-pipe *e* from time to time. When the wood is sufficiently heated, which may be known by the diminution in the amount of water from *c*, the steam is shut off, the communication with B is established by means of the valve-rod *m*, and a little sulphate of copper is pumped into C by means of the force-pump *k*, which may be worked either by hand or by mechanical power. This cools the steam in C, and the vacuum thus produced draws the cold liquor from the tank B, and the boiler C fills up. Additional pressure may now be applied by opening the valve *o* and pumping air into the boiler C, or, indeed, by pumping more of the liquid in until the gage indicates a pressure as great as the boiler can safely be subjected to. After the liquid has been left under pressure upon the wood for a sufficient time, the valve *g* is opened, and steam is again applied through *a*. This forces all the liquid, except what is left in the wood, back into B again. The steam is kept on until the wood is again hot; then it is shut off, and some liquor from A is forced into the boiler C precisely as before, except that the valve *l* is turned instead of the valve *m*. Again the vacuum draws the liquid into C, and again, as before, the additional pressure is applied with the force-pump *k*. The pressure is again let on for a time to force the liquid into the fiber more thoroughly, although the heated pores full of steam absorb the liquid very perfectly at the first operation. The liquid is then forced back into the stock-tank A by letting on steam through *a*, and opening the valve *f*; or the force-pump *k* may be used for this purpose by opening the valve *o* and pumping in air.

The great advantage of the alternate use of sulphate-of-copper solution and phenate or cresate of lime is that by this means a double decomposition goes on in the fiber, giving sulphate of lime, phenate and cresate of copper, and some free cresol or phenol. The former of these substances—sulphate of lime—communicates a hardness and resistance to fire to the woody fiber, while the latter prevent decomposition and the attacks of worms.

The phenate or cresate of lime may be applied before the copper solution; but I believe the method described to be the best. The

process being finished, the wood may be dried in the boiler by blowing the hot air and gases from a stove into the boiler C, or it may be removed from the cylinder D to a suitable drying apparatus or kiln.

What I claim as my invention is—

1. The process of preserving wood, consisting essentially in subjecting wood to the alternate application of sulphate of copper and phenate or cresate of lime, substantially as set forth.

2. The process of preserving wood, consisting in subjecting wood *in vacuo*, or under steam or liquid pressure, to the alternate application of sulphate of copper and phenate or cresate of lime, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 30th day of October, 1876.

SAMUEL CABOT, JR.

Witnesses:
HENRY W. SEYMOUR,
THOMAS B. HALL.