E. L. COWLING.

Preserving Wood.

No. 84,733. Patented Dec. 8, 1868.

Fig. 1.

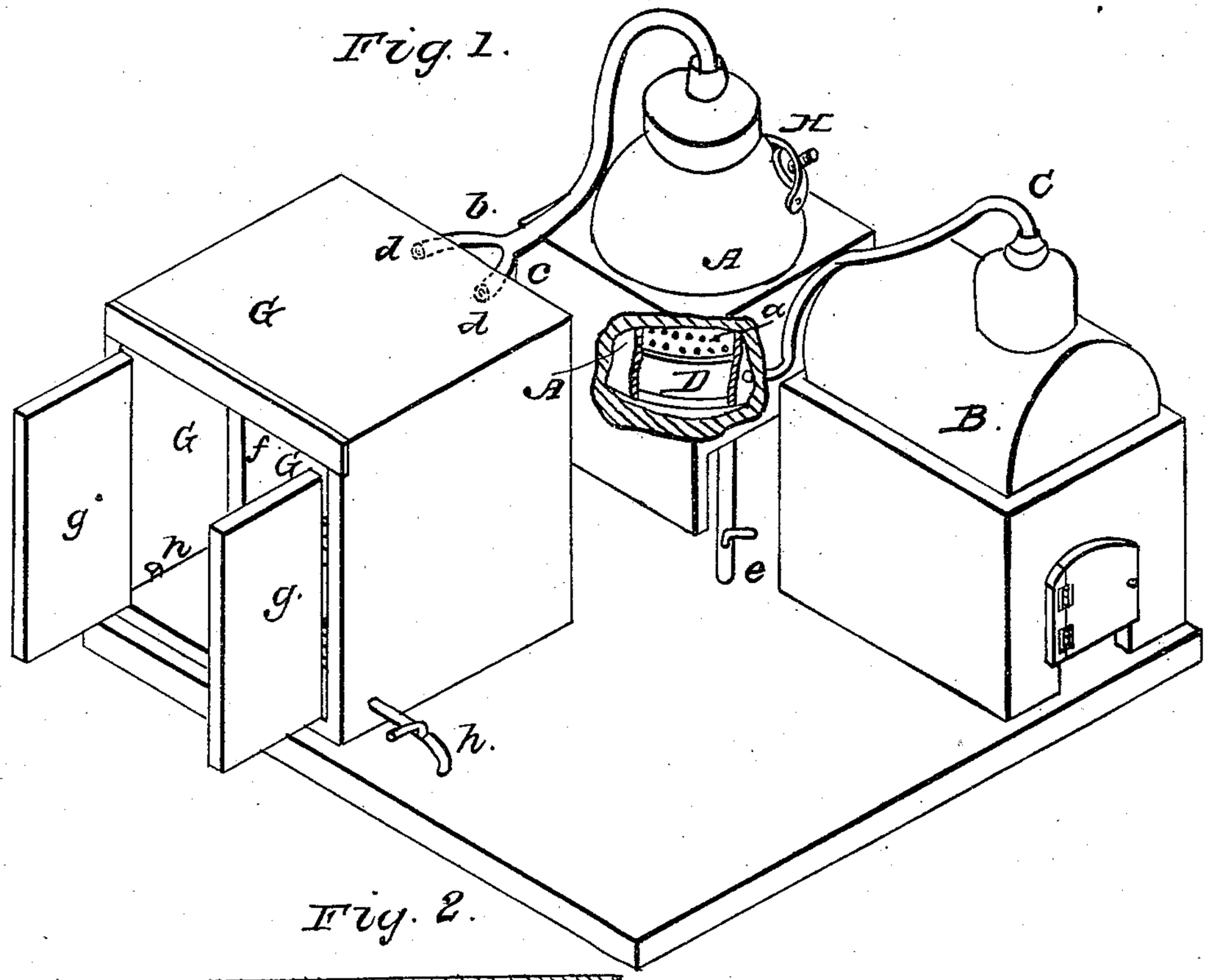
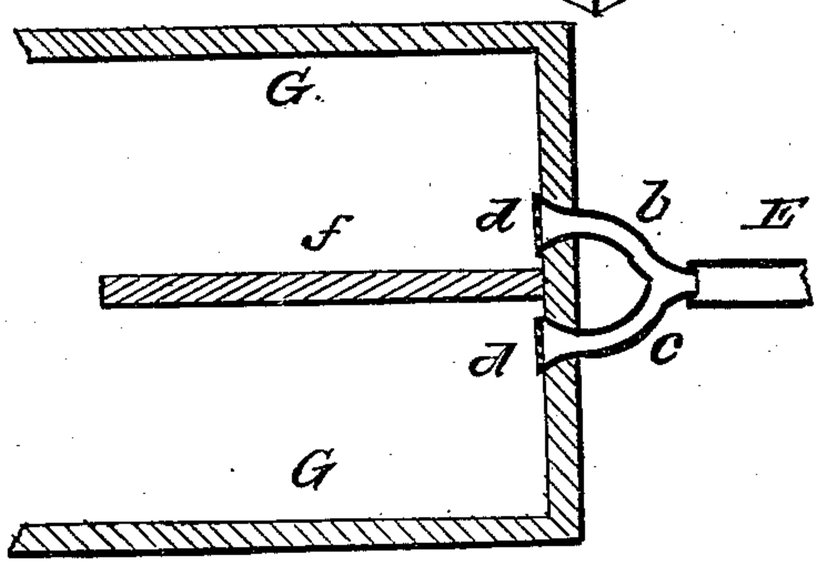


Fig. 2.



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Letters Patent No. 84,733, *dated December* 8, 1868.

IMPROVEMENT IN PRESERVING WOOD.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, EBEN L. COWLING, of Boston, in the county of Suffolk, and State of Massachusetts, have invented certain Improvements in the Art of Treating Wood for its Preservation, said improvements consisting in the employment of superheated steam in combination with various chemicals; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of the apparatus which I employ.

Figure 2 is a sectional detail to be referred to.

In the said drawings, A represents a still, made of boiler-plate iron, or of other suitable material, of any convenient size, (commensurate with the scale on which the operations are to be carried on,) circular or rectangular in form, and made use of for the purpose of holding the chemicals to be used in combination with the superheated steam.

The chemicals, consisting of coal-tar, resin, or resin-oil, petroleum, or linseed-oil, salt, creosote, and tannin, or other analogous compounds, are placed in such position in the still as to admit of the superheated steam being brought from the boiler B, through the steam-pipe C, and discharged into a chamber, D, underneath the chemicals.

From this chamber, the superheated steam passes up through the chemicals, either by a perforated floor, *a*, or other suitable arrangement, and, in coming in contact with the said chemicals, vaporizes a certain proportion, and conveys the same, through the pipe E, into the chamber G, which is divided into two compartments.

This pipe E is divided into two branches, *b c*, provided with suitable stop-cocks, to regulate the flow of the vaporized chemicals.

At the junction of these branch-pipes *b c* with the compartments in the timber-chamber G are arranged rose-nozzles, *d*, for the purpose of more uniformly diffusing the superheated vaporized steam in the said compartments, as seen in fig. 2.

The boiler B may be of any ordinary description for generating superheated steam, either vertical or horizontal.

H is the man-hole in the still, for the introduction of the chemicals before mentioned, which are introduced in about the following proportion: Ten barrels of either coal-tar, resin, or oil, two bushels of salt, one hundred and fifty pounds of tannin, and twenty-five pounds of creosote. These proportions I have found, by experience, to answer well, but they may be varied, according to the state of the wood to be treated, without departing from the spirit of my invention.

e is the "pitch-cock," for the discharge of the refuse matter from the still A.

The chamber G, into which the wood or timber to be operated on is introduced, is made steam-tight, of boiler-plate iron, and should be sufficiently strong to resist an internal pressure of at least twenty-five pounds to the square inch, to be indicated by an ordinary steam-gauge.

This chamber, as before mentioned, is divided into two compartments by a suitable steam-tight partition, *f*, each being provided with a door, *g*, for the introduction of the timber to be treated.

In this manner, the operation of treating the timber may be made continuous, by using the compartments alternately.

h h are discharge-pipes, for the escape of the condensed steam and moisture from the compartments of the chamber, G, containing the wood, and are placed at the lowest point in each compartment.

In chambers for treating timber of a large size, suitable tram-ways may be placed in each compartment, for permitting cars loaded with timber to enter.

I am aware that timber has been treated with oleaginous substances, with a view to its preservation, but in a manner not suited to accomplish perfectly the object in view. Thus, various oils have been placed in a retort, and subjected immediately to the influence of heat, for the purpose of vaporizing the same. The vapor so created has been brought in immediate contact with the timber under treatment, the effect of which has been to withdraw but a small proportion of the moisture from the external pores of the surface of the wood, and to saturate and close up the same with the oleaginous substances held in suspension by the vapor from the retort. The result of this is to actually hasten the decay of green timber, by preventing the escape of the internal moisture at any future period. This causes fermentation to set in, and decay of the timber immediately ensues. By my improvements, however, the vapor enters the timber-chamber or compartments in the condition of highly-superheated vaporized steam. This superheated vaporized steam, having a very strong affinity for moisture or air, absorbs the same immediately it comes in contact with the green timber, and deposits the chemicals which it holds in suspension in the pores of the wood, the chemicals thus taking the place of the moisture and air.

The temperature and pressure of the superheated vaporized steam, and also the length of the operation, will be in proportion to the size of the timber operated on.

In certain cases, when the timber is large, or highly charged with moisture, it may be found more economical, for drying-purposes, to introduce highly-superheated steam into the timber-chamber direct from the superheater in the boiler, by a steam-pipe for the special purpose, until the said timber is dried, and afterwards introduce the superheated vaporized steam, charged with oleaginous matter, from the still, as specified, for preserving-purposes.

My process may now be briefly specified as follows:

Superheated steam is generated in any suitable boiler provided with a superheater. This steam is then carried through suitable chemicals, placed in a still, as before described, and so becomes charged with the same by a portion of the chemicals becoming vaporized. This new steam compound, still in a superheated condition, passes immediately into the timber-chamber, and sucks out the moisture from the pores of the wood, and expels the air, leaving in place of the same the chemical residuum. The superheated steam, after absorbing the moisture, becomes saturated, and, gradually condensing, is withdrawn from the compartments of the chamber by suitable discharge-pipes, arranged with proper stop-cocks.

Having now described my improvements, and the mode of carrying the same into effect, I wish to state that I do not confine myself to the precise description of chemicals above described, as any suitable equivalents thereof may be employed instead; nor yet to any precise temperature or pressure of superheated steam, or size or form of apparatus, as it is evident the same may be varied with the description and size of timber, &c., to be treated.

The above-described process I propose to designate as "Cowling's Improvements in the Art of Treating Wood, for its Preservation, by Superheated Steam, in Combination with Various Chemicals."

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

The employment of dry superheated steam, in combination with vaporized chemicals, for the preservation of wood, as set forth, the natural moisture of the wood being first absorbed by the use of the dry superheated steam without the chemicals, and the air expelled, substantially as described.

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Witnesses:

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