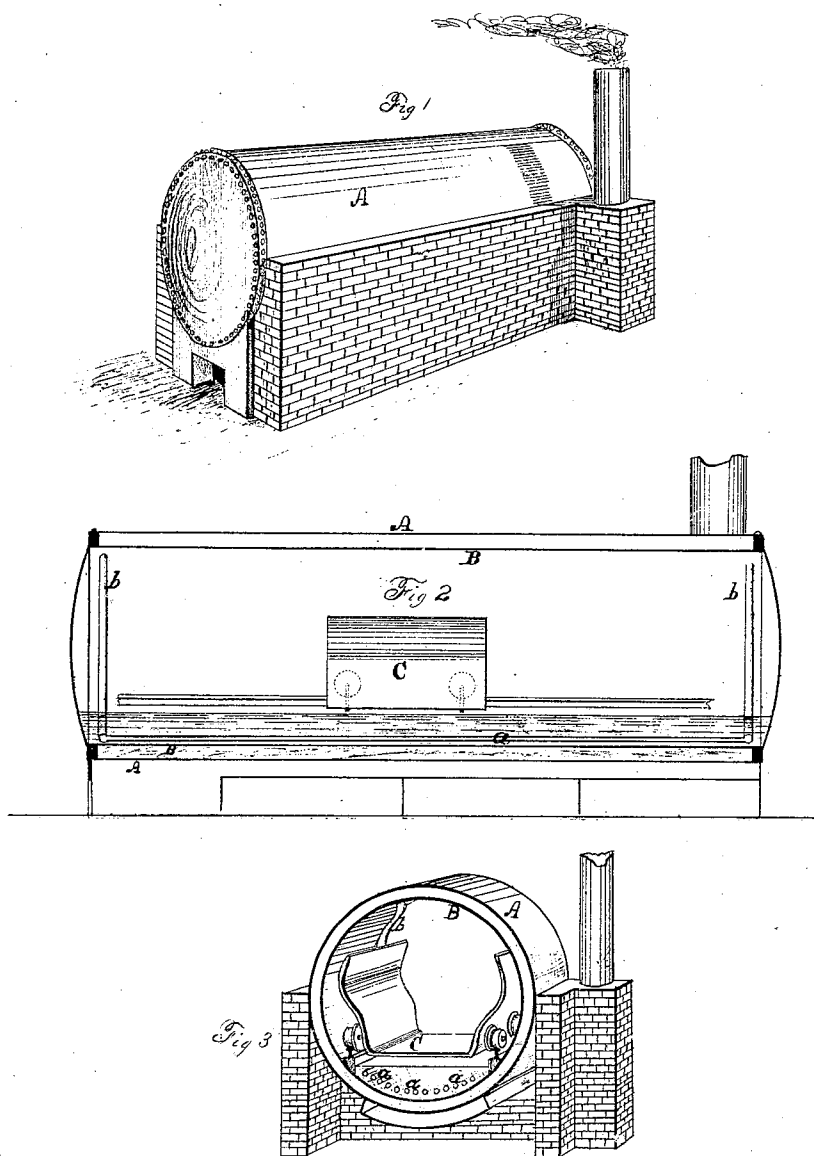


*F. A. Stevens,*

*Preserving Wood.*

*No. 102,725,*

*Patented May 3, 1870.*



Witnesses

*C. A. West*  
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# United States Patent Office.

FRANCIS A. STEVENS, OF CHICAGO, ILLINOIS.

Letters Patent No. 102,725, dated May 3, 1870.

## IMPROVEMENT IN APPARATUS FOR PRESERVING WOOD.

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

I, FRANCIS A. STEVENS, of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Preserving Wood, of which the following is a full description, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 shows my boilers set in brick-work ready for use.

Figure 2 is a vertical section, longitudinal.

Figure 3 is a transverse vertical section in perspective.

Attempts have been heretofore made to preserve wood by treating the same with the vapor of coal-tar oil. This has been done by placing the wood in a boiler or tank, and above the oil to be vaporized, the fire coming directly in contact with the boiler or tank holding both the oil and the wood. This process has been found so unsafe from the liability to explosion from overheating the oil, that it has been abandoned.

The object of my invention is to provide a method of heating the oil for the purpose above mentioned, which shall be entirely safe, and I accomplish this by heating the oil by means of steam, either common steam or superheated steam, as may be desired.

In the drawings—

A represents a boiler, of any suitable size; within this outer boiler is a cylinder, a little less in diameter than the outer boiler, which cylinder is permanently secured to the heads, thus forming, in effect, a double boiler. Along the bottom or near the bottom of this inner cylinder or boiler B are a number of pipes or tubes, *a*, connected with each other, and, by means of the tubes *b b*, opening into the space between the two boilers.

The rear end of the boiler is so constructed that that part covering the cylinder B can be opened and closed at pleasure, to put in and take out the wood to be subjected to the preserving process.

A safety-valve is also applied to A.

One or more cars or platforms, C, are prepared and placed within the cylinder B, to receive the wood, and these may run on a track placed near the bottom.

The outer boiler is intended to receive water for the formation of steam; the inner boiler is intended for the oil and wood.

The boilers may be so constructed that steam formed in A can be admitted into the cylinder B, so that the wood can be first subjected to the action of steam, if desired.

The two boilers should be thoroughly stay-bolted, and are not necessarily cylindrical.

In operation the outer boiler A is partially filled with water, and steam formed therein in the ordinary manner, the hot water and steam filling the space be-

tween the inner and outer boilers. At the same time a sufficient quantity of oil is pumped into the inner boiler B through a pipe connecting with the boiler and pump, the latter being located as convenience requires.

The steam formed in A is permitted to pass through the pipes *b b* into the longitudinal tubes *a* along the bottom of B, which last-mentioned tubes are surrounded by oil, and by this means, together with the heat from the water and steam between the two boilers, the oil is vaporized, and the wood on the platforms within B becomes treated with the vapor of the oil. As the fire does not come in contact with the boiler containing the oil, it cannot become overheated, and explosion cannot take place.

If it becomes necessary or desirable to raise the oil to a higher temperature than can be done by the use of common steam, it can be easily effected in the following manner:

After the oil has been heated, as above described, the water in the boiler A must be blown off, and, as soon as this has been done, the cock must be closed, thus leaving the space between the two boilers filled with common steam, which, by the use of a quick fire, becomes superheated in a short time, thus rapidly raising the temperature of the oil, and increasing its vaporization, without dangerously increasing the pressure, and without any danger from ignition of the oil or vapor, as there is still a steam-space between the oil and fire, and the temperature of the superheated steam can be regulated at pleasure.

The temperature in the boiler B is, of course, increased, and thereby the wood is more completely treated with the oil vapor.

Before the wood is submitted to the action of the vaporized oil, as above described, it may, if desired, be first submitted to the action of steam, by using my apparatus and devices, as follows:

Place the wood in the cylinder B without any oil, raise steam in A as before, and admit the same into B, by the use of suitable cocks. When a sufficient time has elapsed, close the cocks opening from the space between the boilers into B, allow the steam to escape from B, and then introduce oil into B, and complete the process as first described.

I have not shown the various cocks and indicators to be used with my apparatus, as they differ in no respect from those in common use, and will be located as convenience requires.

I am aware that efforts have been made to preserve wood by treating the same with vaporized oil, by heating or vaporizing the oil in a separate retort, and conveying the same into a chamber or cylinder containing the wood. But this method has not been successful, because the vapor, upon entering the wood chamber,

condenses rapidly, no means having been devised to maintain its high temperature, and in attempting to do this by increasing the heat around the retorts, the same frequently leak, setting the works on fire, even if there should be no explosion.

With my improvements the oil may be vaporized in a retort outside of the boilers A B, the vapor being conveyed into B, and there raised to any desired temperature by the use of superheated steam, as before.

The steam could also be generated and superheated outside of A B, and conveyed into the space between the two and into the pipes *a*, as before, in which case A B would not need to be set in brick-work.

A small scape-cock may be attached to the tubes *a*, or to one of them, for drawing off any condensation, and facilitating the circulation of the steam through the pipes *a*.

In addition to the advantages attending the use of my apparatus, the following essential feature may be mentioned:

The oil to be distilled or vaporized contains several elements, which are vaporized at different temperatures, all of which should enter the wood; first, the naphtha is vaporized, then, at a higher degree of heat, carbolic acid, and after that the heavier portions.

When heat is applied directly to the tank or boiler containing the oil, the heavier parts cannot be safely

vaporized, as it is necessary to maintain a certain quantity of oil in the tank, to prevent burning, and the lighter parts only can be vaporized, the heavier portions remaining in the tank. By using my apparatus the heat can be safely increased as may be necessary, and a certain quantity of oil having been placed in B, it can all be vaporized without burning any portion of it.

Having thus fully described my apparatus for preserving wood,

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

1. The cylinders or shells A and B, when so arranged as to leave a water, steam, or air-space between them, substantially as and for the purposes specified.

2. The pipes *a b*, in combination with the cylinder B and a steam-generator, substantially as described.

3. The application of water, steam, or hot air to the apparatus for vaporizing oil or other substances for preserving wood, when interposed between the heat and the oil or other substance to be vaporized, substantially as set forth.

FRANCIS A. STEVENS.

Witnesses:

E. A. WEST,

O. W. BOND.