

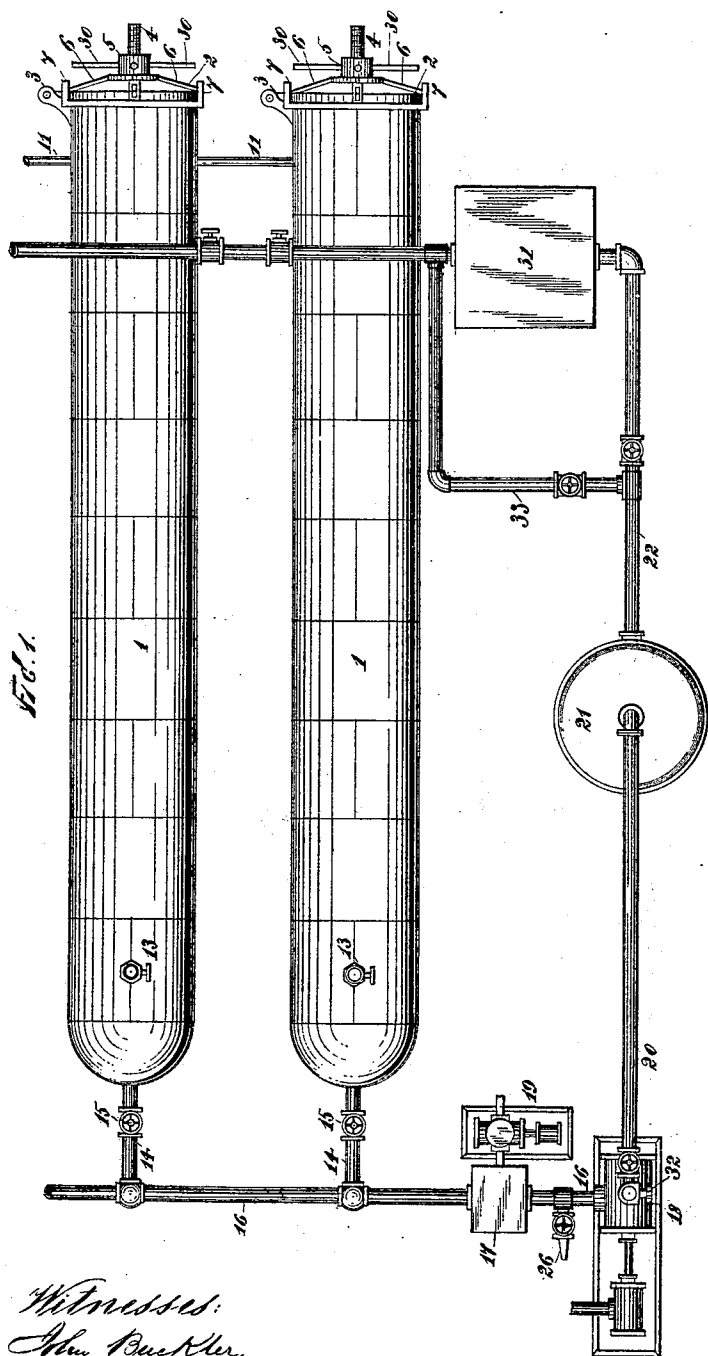
(No Model.)

C. HOWARD.

METHOD OF VULCANIZING AND DRYING WOOD.

No. 520,565.

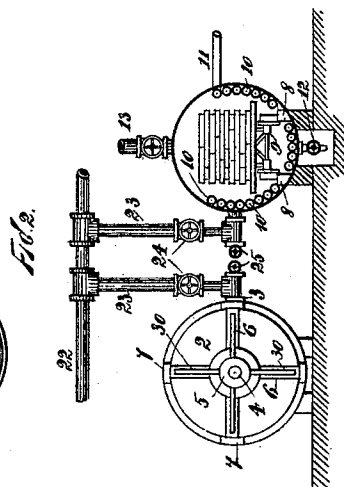
Patented May 29, 1894.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES HOWARD, OF NEW YORK, N. Y.

METHOD OF VULCANIZING AND DRYING WOOD.

SPECIFICATION forming part of Letters Patent No. 520,565, dated May 29, 1894.

Application filed June 14, 1893. Serial No. 477,514. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES HOWARD, a citizen of the United States, residing in the city, county, and State of New York, have invented a new and useful Improvement in Vulcanizing and Drying Wood, of which the following is a specification.

My invention relates especially to an improved method of treating wood, and has for its object the provision of a method, and means for carrying said method into effect, whereby lumber, timber and woods of all kinds and descriptions may be quickly and thoroughly vulcanized and dried, and at the same time so treated as to preserve the fiber of the wood intact, preventing rupture thereof, and splitting during the carrying out of the process.

To attain the desired end, my invention consists essentially in inclosing the lumber, timber or wood to be treated, while in a cold condition, in an air tight cylinder, exhausting the air from the cylinder and forming a vacuum therein; then applying heat to the cylinder, thus causing the moisture contained in the wood to escape therefrom, vaporizing, and breaking the vacuum; after the vacuum is broken, applying air pressure and heat, which is maintained a sufficient time to cook the wood being treated, and finally circulating the air, and taking out the moisture, thereby gradually reducing the temperature and pressure, all of which will be hereinafter first fully described, and then pointed out in the claims.

Heretofore attempts have been made to vulcanize and dry wood, &c., but the methods employed have been more or less defective; as if the wood to be treated is inclosed in an air tight chamber, and pressure and heat applied at the same time, the surface of the wood is dried, and the high heat employed causes the wood to crack and split, and the rapid generation of steam from the moisture contained in the pores of the wood, causes a rupture of the fiber, and the product of such a process is of a very inferior quality. By my improved method of treatment, these difficulties are overcome, and the quality of the product under my treatment is greatly enhanced in value. My first step is to inclose

the wood to be treated in an air-tight cylinder, and then exhaust the air; this causes a portion of the moisture within the wood to be drawn to the surface, while leaving the albuminous constituents of the sap of the wood therein. After maintaining the vacuum for a time, heat is applied by means of suitable circulating pipes within the cylinder, and such heat vaporizes the moisture of the wood until the vacuum is broken, and all such action is of so gentle a nature as to leave the fibers of the wood in a perfect and unruptured condition. The heat coagulates the albumen, &c., contained in the sap, leaving the same within the wood to act as a preservative. By now applying air pressure and heat, which are maintained for some time, the wood becomes thoroughly cooked. In order to gradually and gently reduce the pressure, and at the same time cool off the wood, I cause a circulation of the air to take place, through the cylinder, and condenser, around the heating furnace, and when the pressure has been brought down to the atmosphere, the wood is properly vulcanized, dried and cooled, and is in a perfect condition.

Various kinds of apparatus may be employed for carrying my method into effect, that shown in the accompanying drawings illustrating substantially what is required.

In said drawings, Figure 1 is a plan view of a plant for vulcanizing and drying wood in accordance with my invention. Fig. 2 is a front elevation of the cylinders, one of which has the door removed.

Similar numerals of reference, wherever they occur, indicate corresponding parts in both the figures.

1, 1, are air-tight cylinders, made of any approved material and shape.

2 is a door, hinged at 3, and arranged to close the end of the cylinder.

4 is a screw, projecting from the door.

5 is a screwthreaded hub mounted on the screw 4, and provided with arms 6 arranged to engage with the perforated ears, 7 upon the cylinders.

30 are manipulating arms upon the hub. This arrangement provides effective means for closing the cylinder.

8 are rails within the cylinder, designed to

support a car, 9, upon which the lumber to be treated is placed, as particularly illustrated in Fig. 2 of the drawings.

10 are pipes, placed within cylinder 1, and communicating with any source of steam supply through the medium of a pipe 11.

12 is a valve arranged for drawing any precipitated moisture, &c., from the bottom of the tank 1.

13 are blow-off, or relief valves, located in the top of the cylinders 1. From the rear of the cylinders 1 lead pipes 14, provided with valves 15, and communicating with a pipe 16, which passes through a condenser 17. From the air pump, 18, a pipe 20 leads to an air receiving and moisture precipitating tank, 21, arranged in the well known manner, and a pipe, 22, leads from this tank 21 through a heater 31, and to branch pipes 23, communicating with cylinders 1.

24 are valves located in the branch pipes 23, and 25 are blow-off valves.

26 is a valve in pipe 20 arranged to open into the atmosphere.

33 is a pipe which passes from pipe 22 around the heater 31, whereby air may be circulated through the tanks, 1, and the heater cut out.

In carrying my method into effect, the air pump, 18, is employed to exhaust the air from the cylinders 1, through a relief valve 32, in order to create a vacuum within said cylinder, and after the heat has been applied to the cylinders, in carrying out the treatment, as hereinabove described, this pump is employed for creating an air pressure within the cylinders 1, and in maintaining the circulation through the cylinders and condenser after the wood has been sufficiently cooked, thus gradually cooling the wood and at the same time the pressure is gently reduced to atmospheric.

In obtaining the vacuum, which of course is not complete the valves 24 in the branch pipes 23 are closed, and the valve 32 at the pump 18 is opened. After the vacuum has been maintained the requisite length of time, the valve 32 is closed, and also the valves 15, pre-

venting the escape of air from the cylinders. The heat is now applied, breaking the vacuum, by reason of the expansion of the cold air still remaining in the cylinder and wood, and also by reason of the expansion and vaporization of the moisture therein, and then the pump 18 is started, creating a pressure in the cylinder 1. After the wood has been subjected to this heat and pressure as long as is necessary, the heater is cut out, valves 15 opened, and the pump 18 causes a circulation of the air through the cylinders and condenser, removing the moisture, cooling the air and wood, and gradually reducing the pressure to the normal.

Having now fully described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The herein described method of vulcanizing and drying wood, that is to say; first inclosing the wood in a cold condition in an air-tight cylinder, exhausting the air from said cylinder; applying heat to the cylinder until the vacuum is broken; then creating an air pressure within the cylinder, maintaining the same until the wood is sufficiently vulcanized, and then circulating the air and reducing the temperature, substantially as set forth.

2. The herein described method of vulcanizing and drying wood, which consists in inclosing the wood to be treated, while in a cold condition in an air-tight cylinder; exhausting the air from the cylinder and forming a vacuum therein; applying heat to the cylinder, causing the moisture contained in the wood to vaporize and break the vacuum; then creating air pressure within the cylinder while the heat is maintained, and finally circulating the air through the cylinder and through a condenser whereby the moisture is removed from the circulating air and the pressure and temperature are gradually reduced, substantially as set forth and described.

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