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METHOD OF SEASONING WOOD.

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The present invention relates to methods of seasoning material such as wood in the form of posts, poles, piles, railroad ties, lumber, etc.

The general object of the invention is to provide a new and improved method particularly adapted for the rapid seasoning of wood or other material which is afterward to be impregnated with some preservative. By "seasoning" I mean removing part of the moisture present in the wood prior to the seasoning treatment or otherwise making the wood less resistant to the absorption of preservative. The method is particularly intended for use in the seasoning of "green" wood, that is, wood which has been recently cut, but it is not limited to that use. Fresh cut or "green" wood contains in its pores a large amount of moisture which renders difficult the impregnation of the wood with a preservative; and my method hereinafter described, permits the rapid removal of a large proportion of such moisture from the wood, and leaves the wood in a condition to be readily impregnated with a preservative in any suitable and well-known manner.

The method of seasoning wood which comprises my invention may be carried out with a retort, preferably of the horizontal cylindrical type, usually found in wood treating plants. In connection with the retort there should be provided means such as a steam boiler for supplying steam to the retort; means such as a condenser and a vacuum pump for exhausting the retort to a pressure approaching a vacuum, say 28.5 or 29 inches of mercury; and an air-compressor by which compressed air may be furnished to the retort to raise the pressure in the latter considerably above atmospheric pressure, say to 80 lbs. per square inch. The arrangement of piping connecting the boiler, the condenser and vacuum pump, and the air-compressor to the retort, and the arrangement of control valve in such piping will be obvious to one skilled in the art.

With such apparatus as that above mentioned, my improved method of seasoning wood may be successfully carried out in the following manner upon wood arranged in the usual way in a closed retort:

(*a*) The wood to be treated is first heated by subjecting it to a bath of steam at a pressure considerably above atmospheric pressure, which heats the wood and its water content to a temperature considerably higher than 212 degrees Fahrenheit, but not high enough to in any manner injure the wood. A steam pressure of 20 lbs. per square inch maintained in the retort for a period of one hour has been found to be satisfactory. During this steam treatment any water condensed from the steam is preferably drained from the retort so as not to permit its reaching the timbers.

(*b*) At the end of the steaming period, the supply of steam is cut off and the steam in the retort is allowed to blow off to atmospheric pressure, whereupon the retort is immediately subjected to a high vacuum, say 28.5 or 29 inches of mercury in a manometer, through the medium of a condenser and vacuum pump connected to the retort. Owing to the fact that the boiling point of water at this reduced pressure in the retort is far below the temperature to which the wood has been heated by the previous steam treatment, a considerable part of the water content of the wood comes out of the latter in the form of water vapor which is drawn out of the retort through the condenser and vacuum pump. This vacuum treatment is preferably continued until water vapor ceases to come from the retort, this condition being apparent from observations of the well of the condenser.

(*c*) The condenser and vacuum pump are then shut off from the retort and the air pressure in the latter is restored to atmospheric pressure, after which it is increased considerably above atmospheric pressure by forcing air into the retort by means of an air-compressor. The wood being treated in the retort is held under such air pressure for a length of time sufficient, in the opinion of the operator, to make sure that the compressed air in the retort has worked thoroughly into the cells of the wood being treated. In practice, with one kind of wood, it has been found that an air pressure of 80 lbs. per square inch maintained for one hour is satisfactory. The air-compressor is then cut off from the retort, and the pressure within the latter is allowed to quickly exhaust to atmospheric pressure, which results in the expulsion of water from the wood due to the action of the

air at high pressure in escaping from the pores of the latter.

(*d*) Steam is then again supplied to the retort, as in the first step of the method, and the wood being treated is again heated by the steam to a temperature considerably higher than the boiling point of water at atmospheric pressure. It has been found that this second steam treatment also may advantageously be carried on with steam at 20 lbs. pressure for a period of one hour.

(*e*) The retort is then cut off from connection with the source of steam supply and is allowed to exhaust to atmospheric pressure; and again the retort is subjected to a high vacuum by means of a condenser and vacuum pump, as in the second step of the method. The proper duration of this second vacuum treatment may be determined in the same manner as above mentioned, namely, by observing when water vapor ceases to come from the retort and be condensed in the condenser.

Ordinarily, at the conclusion of the five steps of the method above described, the wood has been seasoned sufficiently to permit its proper impregnation by any suitable impregnating fluid. But if further seasoning is considered necessary or desirable, the wood may again be subjected to high air pressure followed by a quick release to atmospheric pressure, another heating by steam, and another vacuum treatment, in the manner above described.

When my method of seasoning is to be followed by the so-called "full cell process" of impregnating wood with a preservative, it will be found convenient to admit the preservative to the retort at the end of one of the vacuum treatments above described, without breaking the vacuum. It is to be understood, however, that my method of seasoning may be followed by any well-known method of impregnating wood with a preservative; and that if desired the pressure within the retort may be restored to atmospheric pressure before the wood is treated with preservative.

It has been found in practice that green wood, after having been subjected to my method of seasoning above described, is actually capable of absorbing a preservative material to an extent by volume which compares favorably with the absorption which is obtained in the case of wood of a similar kind which has been air-seasoned in the usual manner. I attribute such result as being due in large part to the subjecting of the wood to high air pressure after the first steam and vacuum treatments and before the second steam and vacuum treatments. However, in some cases, it may be found satisfactory to discontinue the seasoning treatment above described at the end of the third step, that is, after the wood has been subjected merely to a steam bath, high vacuum and high air pressure followed by release to atmospheric pressure. To one skilled in the art other modifications of my method of seasoning wood may be obvious without departing from the scope of my invention.

I claim:—

1. A method of seasoning wood characterized by the facts that the wood is first subjected to steam and vacuum treatments, is then subjected to air pressure considerably higher than atmospheric pressure followed by quick release to atmospheric pressure, and is then again subjected to steam and vacuum treatments.

2. A method of seasoning wood characterized by the facts that the wood is first heated with steam, is then subjected to a vacuum treatment, is then subjected to air pressure considerably higher than atmospheric pressure followed by a quick release to atmospheric pressure, is then again heated with steam, and is then again subjected to a vacuum treatment.

3. A method of seasoning wood characterized by the facts that the wood is first heated with steam at a pressure considerably higher than atmospheric pressure, is then subjected to a vacuum treatment, is then subjected to air pressure considerably higher than atmospheric pressure followed by quick release to atmospheric pressure, is then again heated with steam at a pressure considerably higher than atmospheric pressure, and is then again subjected to a vacuum treatment.

4. A method of seasoning wood characterized by the facts that the wood is first maintained surrounded for a considerable period of time with steam at a pressure considerably higher than atmospheric pressure, is then subjected for a considerable period of time to a vacuum treatment, is then maintained surrounded for a considerable period of time with compressed air at a pressure considerably higher than atmospheric pressure, said pressure being then quickly reduced to atmospheric pressure, is then again maintained for a considerable period of time surrounded by steam at a pressure considerably higher than atmospheric pressure, and is then again for a considerable period of time subjected to a vacuum treatment.

5. A method of seasoning wood characterized by the facts that the wood is first heated for approximately one hour by direct treatment with steam at a pressure of approximately twenty pounds per square inch, is then subjected for approximately one hour to a vacuum treatment, is then subjected for approximately one hour to direct treatment with compressed air at a pressure of approximately eighty pounds per square inch, said pressure being then quickly reduced to atmospheric pressure, is then again for a period of approximately one hour heated by direct treatment with steam at approxi-

mately twenty pounds per square inch, and is then again for approximately one hour subjected to a vacuum treatment.

6. A method of seasoning wood characterized by the facts that the wood is first heated by treatment with steam at a pressure considerably higher than atmospheric pressure, is then immediately subjected to a vacuum treatment, and is then subjected to treatment with compressed air at a pressure considerably higher than atmospheric pressure followed by quick release to atmospheric pressure.

In testimony whereof, I have affixed my signature to this specification.

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