UNITED STATES PATENT OFFICE.

CHARLES A. SEELY, OF NEW YORK, N. Y.

IMPROVED METHOD OF IMPREGNATING WOOD WITH OLEAGINOUS AND SALINE MATTERS.

Specification forming part of Letters Patent No. 69,260, *dated September* 24, 1867.

To all whom it may concern:

Be it known that I, CHARLES A. SEELY, of the city, county, and State of New York, have invented a new and Improved Mode of Impregnating Wood with Oleaginous and Saline Matters; and I do hereby declare that the following is a full and exact description thereof.

The nature of my invention consists in immersing the wood in a bath of suitable liquid, which bath is at a temperature above that of boiling water. In this bath the mass of the wood is heated above the temperature of boiling water, and the moisture and air contained in its pores are expanded and dissipated. When the moisture and air are thus eliminated the wood is removed and immersed in a bath of impregnating liquid, which is at a temperature below that of boiling water. The pores of the wood, as its mass becomes cool, are in a vacuous condition, and the impregnating liquid readily fills them, by reason of capillary action and the pressure of the atmosphere.

To enable others skilled in the art to use my invention, I will proceed to describe it in detail.

I have above alluded to two baths, one being above the boiling-point of water and the other below it. In many cases these baths may be composed of the same substances, and in general it will be found advisable that they be the same in those cases where the impregnating substance will bear a temperature above that of boiling water. Whenever the impregnating substance cannot be heated above the boiling-point of water, the first or heating bath must be of such nature that it will not be incompatible chemically with the impregnating substance.

My process is especially useful for impregnating wood with crude carbolic acid and with dead-oil. As these substances bear a temperature above that of boiling water, I prefer to make the two baths of the same material. On the one hand I put into a suitable tank of iron, wood, or other material sufficient crude carbolic acid to allow the immersion of the quantity of wood to be treated. I heat the liquid by means of an open fire applied beneath or by steam-pipes arranged in the tank, and when the temperature has reached 300° and upward it is in a fit condition for the immersion of the wood. The wood, if in small pieces or blocks, may be tied in bundles or held together by a crate, to facilitate the handling. The wood is immersed and the heat is maintained till the pores are freed from moisture and air. The length of time of immersion which would be required will depend much upon the bulk of the wood and especially upon its length, as the moisture and air find escape only at its ends. As the steam and air escape they bubble through the liquid, and the progress of the operation becomes evident to the senses. When it is judged that this part of the process has been long enough continued, the wood is lifted out and immersed in a bath of crude carbolic acid which is below the temperature of boiling water. The time of immersion in the cold bath depends upon the same circumstances as the time of immersion in the hot bath. I would say, however, that the time of immersion desirable in actual practice need be no occasion for uncertainty. The progress of the operation may be ascertained at any time by taking out a sample of the wood and inspecting it.

For another illustration of my process I will describe its operation in impregnating wood with light petroleum-oil. In this case the hot bath is a heavy petroleum which bears a temperature of 250° and upward. The bath is heated and the wood is immersed, as above described, and when the water and air are discharged from its pores the wood is removed to the cold bath of the impregnating light oil.

For another illustration I mention the case where wood is to be impregnated with a weak saline solution—as, for example, of chloride of calcium. In this case the hot bath is a strong saline solution and the weak or impregnating solution is the cold bath.

The essential feature of my invention is the successive immersion of wood in a bath of liquid heated above the boiling-point of water, and then in the impregnating liquid at a temperature below the boiling-point of water. Above I have described the process as making use of two separate and distinct tanks; but my invention may also be successfully practiced

by the use of only one immersion-tank. Thus, the tank being supplied with the hot liquid, the wood is immersed for a sufficient length of time, when the hot liquid is drawn off and its place is supplied by the cold liquid. In another method of procedure, the wood is immersed in the hot liquid, as last described, and when the heat has been maintained sufficiently long to expel water and air, the liquid may be allowed to cool down spontaneously, or it may be cooled by artificial means. Thus the process is carried out by the use of one liquid and one containing vessel.

With reference to the temperature of the hot bath, it is to be observed that it must not be too high, and must not be too long continued. The effect of too much heat is to injure the toughness of the wood or to make it liable to crack. A temperature of about 300° at the beginning of the immersion is not excessive; but as the process progresses the bath should be allowed to cool down gradually, till, at the time of the change of the liquid, the mass of the wood shall be at about the temperature of 215°. The precise limits of temperature will vary with different kinds of wood and different liquids; but the observant operator will be easily able to determine them in practice. The temperature of the cold bath should be as low as possible consistently with its fluidity. A liquid which becomes viscid by cooling cannot, of course, be used at a very low temperature.

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

1. The process of impregnating wood, substantially as described.

2. The use in conjunction of the hot and the cold bath, for the purpose described.

CHARLES A. SEELY.

Witnesses:
HENRY WURTZ,
C. ELTON BUCK.