

UNITED STATES PATENT OFFICE.

JOSEPH L. FERRELL, OF PHILADELPHIA, PENNSYLVANIA.

FIREPROOF WOOD, &c., AND THE ART OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 728,452, dated May 19, 1903.

Application filed August 27, 1901. Renewed April 20, 1903. Serial No. 153,573. (No specimens.)

To all whom it may concern:

Be it known that I, JOSEPH L. FERRELL, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Fireproof Wood, &c., and Art of Making the Same, whereof the following is a specification.

The present invention is related to the subject-matter of my application, Serial No. 78,118, filed October 9, 1901.

The product of the following process consists of a cellular substance impregnated with sodium chlorid, having the characteristics hereinafter more definitely specified; and inasmuch as wood is a typical substance to which my improvements are applicable I will simplify the following description by adverting only to that substance, it being understood, however, that I do not, therefore, intend to limit my claims accordingly. It is characteristic of my process that the wood is impregnated with the desired fireproofing material while the latter is in aqueous solution, the final step of said process being the evaporation of the moisture of solution from the impregnated wood.

Although wood is rendered fireproof if impregnated with commercial sodium chlorid, it is well known that the latter is hygroscopic. As any manifestation of hygroscopicity would be a commercially fatal defect in wood to be used for architectural and other similar purposes, it is one object of my present improvements to produce a flame-resisting wood which is impregnated with sodium chlorid, but does not manifest the hygroscopicity characteristic of that commercial salt. I have ascertained that such result may be secured by mixing sodium carbonate, sodium bicarbonate, or aluminium sulfate with the sodium chlorid. Moreover, I have found that if aluminium sulfate is added to the solution of sodium chlorid there is no manifestation of hygroscopicity in the product, the usual discoloring effect of the use of sodium chlorid *per se* is obviated, and the fire-resisting capacity of the product is augmented.

Although aluminium sulfate of any kind may be advantageously employed, as aforesaid, I have found that what is termed by the trade "porous" aluminium sulfate, which is produced from cryolite, is particularly de-

sirable in view of its freedom from the iron impurities which are found in aluminium sulfate produced from bauxite. The effect of such iron impurities is at once manifested in the treatment of woods, such as oak, the tannic acid of which combines with the iron and produces dark greenish stains in the product.

I have made satisfactory flame-resisting products which do not manifest any hygroscopic tendency under severe conditions of test by using each of the combinations aforesaid and various modifications thereof. For instance, I have treated oak wood with a compound consisting of equal parts of an aqueous solution of sodium chlorid and an aqueous solution of porous aluminium sulfate, both of said solutions being of a specific gravity indicated by 15° Baumé, and found that the product resisted flame, retained the natural color of the wood, and did not manifest any hygroscopicity. However, in view of the variable nature of the chemicals employed I do not desire to limit myself either as to the density of my liquid compound or to the specified proportions of its ingredients. I find that in forming such product of wood the desired degree of impregnation may be most quickly secured by applying the fireproofing compound thereto under pressure in the direction of the grain of the wood. The wood having been impregnated with the fireproofing compound, as aforesaid, the last step in the process is the evaporation of the moisture of solution from the wood, and this may be accomplished either by exposure to the atmosphere or preferably by exposure to a higher temperature than that of the atmosphere in a drying-kiln such as is ordinarily employed in the seasoning of timber.

I claim—

1. The hereinbefore-described product, characterized by capacity to resist flame, and consisting of wood impregnated with sodium chlorid, mixed with another chemical capable of obviating the hygroscopic tendency of commercial sodium chlorid, substantially as set forth.

2. The hereinbefore-described product, characterized by capacity to resist flame, and consisting of wood impregnated with sodium chlorid, mixed with aluminium sulfate, substantially as set forth.

3. The process of making the hereinbefore-
described product, characterized by capacity
to resist flame, which consists in impregnat-
ing wood with an aqueous solution of sodium
5 chlorid, mixed with another salt, capable of
obviating the hygroscopic tendency of com-
mercial sodium chlorid, substantially as set
forth.

In testimony whereof I have hereunto
signed my name, at Philadelphia, Pennsyl- 10
vania, this 23d day of August, 1901.

JOSEPH L. FERRELL.

Witnesses:

ARTHUR E. PAIGE,
CLIFTON C. HALLOWELL.