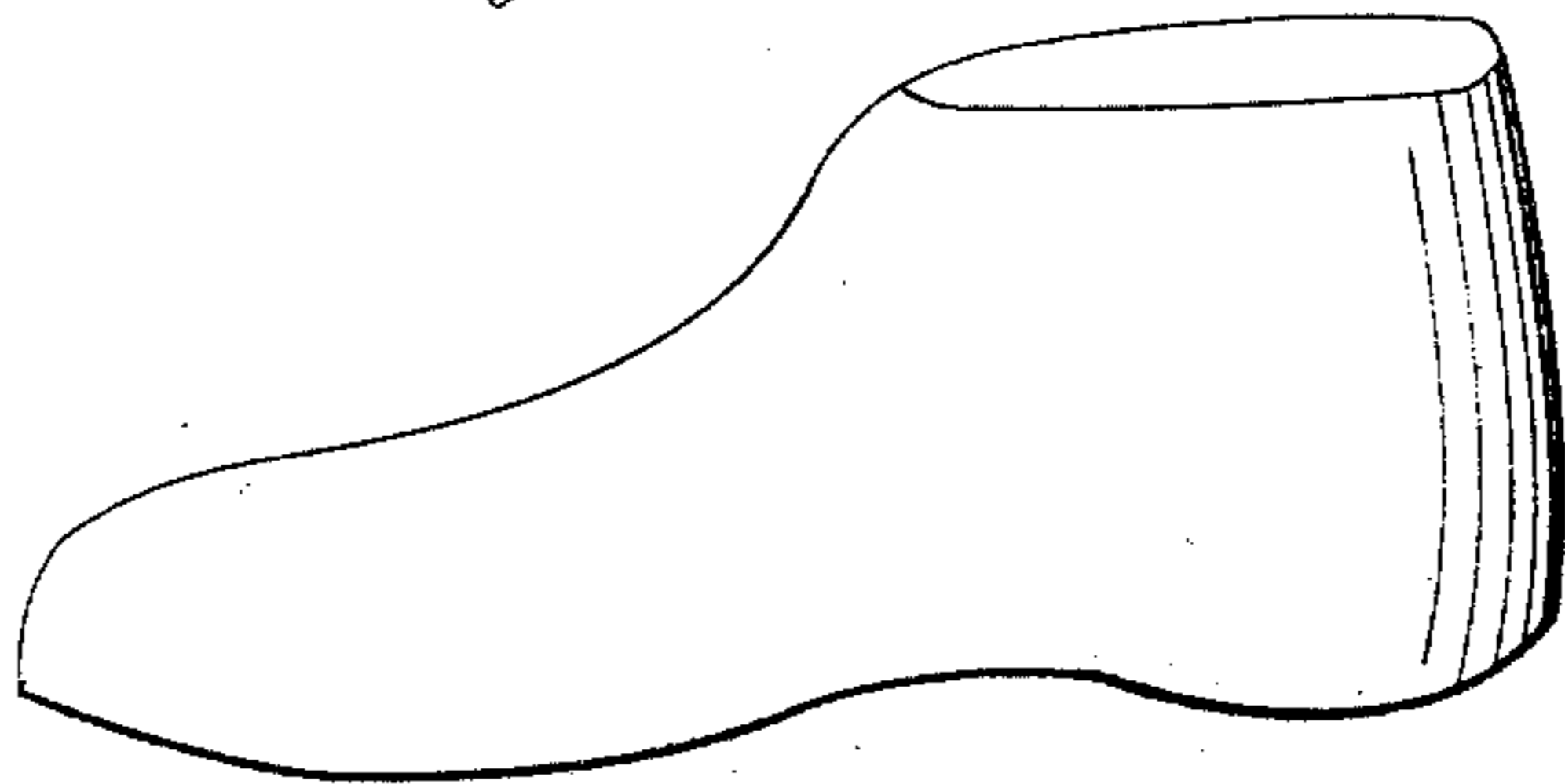
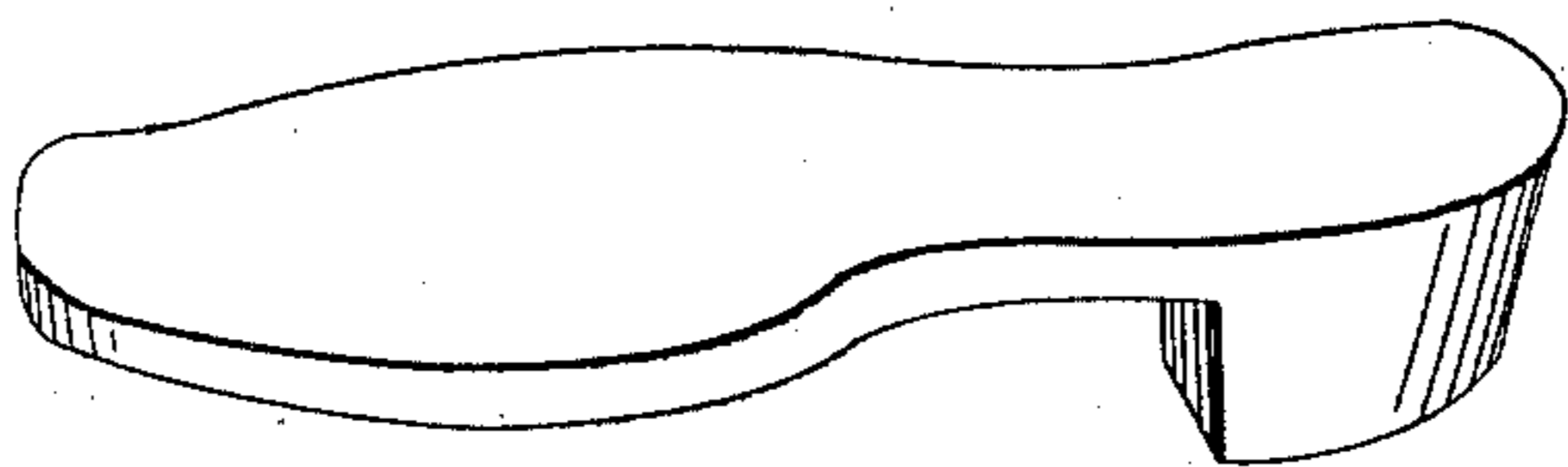


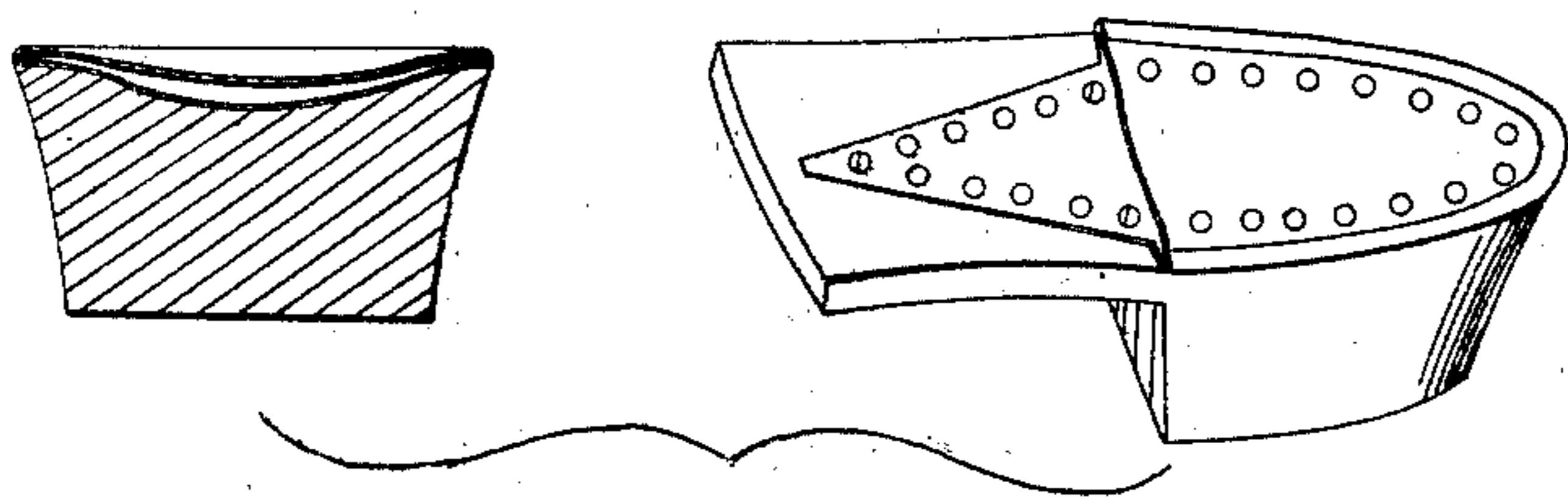
Fig; 3.



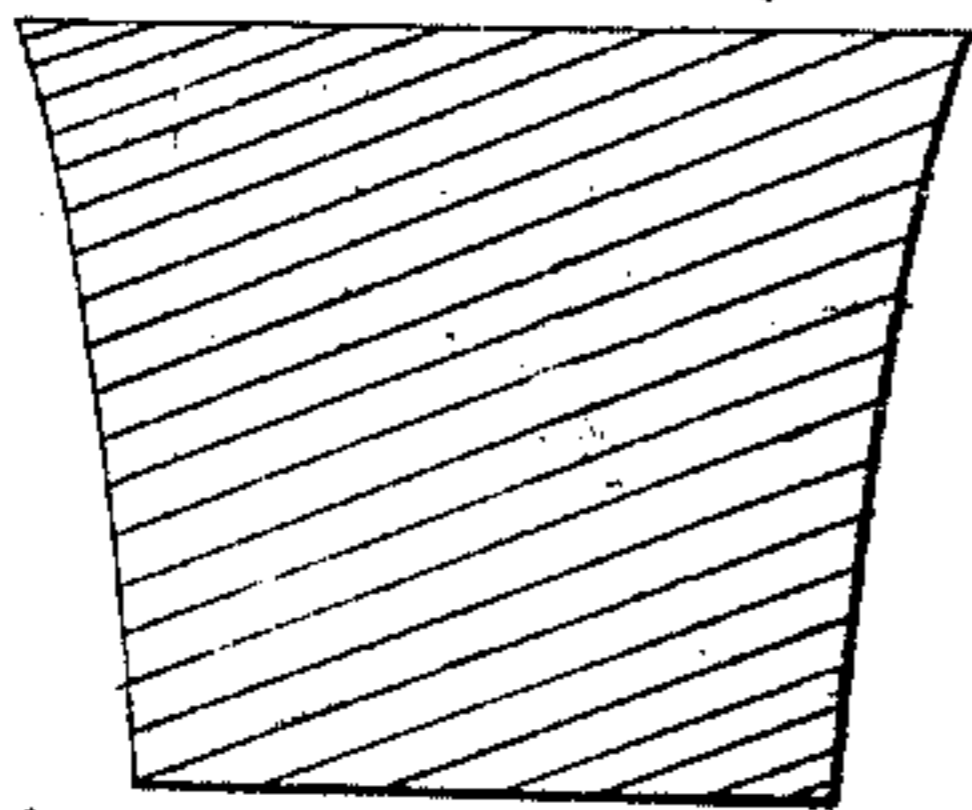
Fig; 5.



Fig; 4.

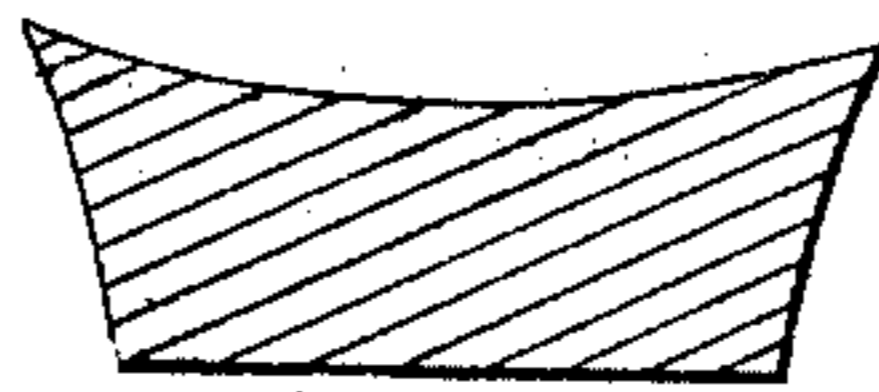


Fig; 2.



Witnesses;
J. B. Crosby
W. B. Gleason

Fig 1.



Inventor;
Phelander Shaw

UNITED STATES PATENT OFFICE.

PHILANDER SHAW, OF BOSTON, MASSACHUSETTS.

METHOD OF PREPARING AND MOLDING WOOD INTO DIFFERENT FORMS.

Specification of Letters Patent No. 28,309, dated May 15, 1860.

To all whom it may concern:

Be it known that I, PHILANDER SHAW, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful methods or processes of treating wood, consequent upon which it becomes so changed as to be well adapted to uses for which it is naturally unfit; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description thereof so full and exact as to enable those skilled in the art to practice my invention.

The object of this is to produce from wood, as a cheap material, by the means herein described, or their substantial equivalents, a substitute for more expensive materials now used in the arts, the article produced being very dense, and well adapted to resist to an extraordinary degree, wear and friction.

The nature of my invention consists in submitting wood to the action of heat while confined in a compressed state within a mold, and also in so treating the wood subsequent to filling it, either wholly or partially, with resinous or oily or other moisture repelling matter, or with metallic or mineral salts, or any preservative chemical, or dye.

The action of heat upon wood while confined in a compressed state in a mold is to materially increase its degree of hardness consequent upon such compression alone, decay of the wood also is in a measure arrested and prevented, and its natural elasticity either wholly or partially destroyed according to the extent to which my process is carried.

The practice of my invention will be found to produce a valuable and cheap substitute for horn, to be made into buttons, handles for cutlery, &c., for "babbitt" and other alloys and metals, in bearings for the moving parts in machinery, for leather, when made into heels and soles for boots or shoes; it may also be used for type, for pavement, and for various other uses too numerous to be herein mentioned.

If the articles to be made from the wood are finished, or nearly so, in the mold, then the wood previous to compression should be cut into shapes of such size and form as experience alone can show will be required to produce under pressure any given article.

But if the articles to be made are formed by cutting tools into shape subsequent to the compression of the wood then the shapes of wood may be made of any suitable and convenient size and form.

In the practice of my invention I submit the shapes or blanks of wood to the action of high pressure steam within a strong closed vessel, as by this I can perfectly season the wood if it contains sap or moisture, and by the condensation of the steam within the vessel I can obtain a vacuum in the pores of the wood. After a vacuum has been produced I admit into the vessel in a fluid state, oily or resinous or other water-proof material, or any metallic or mineral salts or other preservative chemical, or any desired dye, or other matter, in accordance with the requirements of the article to be made from the wood now subjected to the action of the injected matter. In some cases, where I desire to have the injected matter thoroughly forced into the wood, I apply any required amount of pressure to the contents of the vessel.

When the blanks are removed from the vessel they are submitted to the action of heat to evaporate from the wood any moisture which may be therein and any solvent of the injected matter, which may be condensed and preserved if this is desirable as a matter of economy. The blanks of wood are now compressed into molds by a screw or any other suitable press. I prefer to have the blanks and molds in a warm or heated state, but this is not essential. Before the action of the press upon the wood is removed the molds, or the movable parts thereof, are locked or bolted so that the wood cannot recover any of its original bulk by virtue of its elasticity. The molds with their contents are next removed from the press, and submitted to the action of heat, which I prefer to apply in ovens. I have used from 200° to 300° F. for the purpose of heating and hardening the wood confined within the molds with good results, but would observe that this temperature may be varied for the different varieties of wood and for the different uses to which the product of my process is to be applied.

My invention hardly admits representation by drawings, and the mechanical means used in my invention are all too well known to need description here. Some of the ar-

articles made under my process are represented in the drawings which form part of this specification.

Figure 1 represents a heel which was reduced from the blank, Fig. 2, both figures being full size. Fig. 3 represents a "last." Fig. 4 a heel which also shows means for its connection with a sole and vamp of leather. Fig. 5 shows a sole and heel made in one piece.

I do not claim "molding" or "bending" wood under the influence of steam, as this is common and well known to ship carpenters, carriage and furniture makers and others. I have mentioned the use of steam only in a well known way for the purpose of expelling sap and other moisture from the wood, and as affording a convenient medium through which a vacuum in the pores of the wood can be obtained for a desired object, which is the impregnation of the wood, but not the molding or bending of it, and it is obvious that the wood may be seasoned by other well known means, and that a vacuum may be obtained by means of an air pump. The wood in my process is not molded under the influence of steam but under, and by, pressure alone, and if by choice the wood is left warm or hot, when taken from the oven, this and the warming of the mold before mentioned

is merely intended to soften or render plastic, in a measure, the matter with which the wood is injected. Neither do I claim herein the compression or condensation of wood impregnated with water proof matter, preservative chemicals, or dye, inasmuch as I have described this method in the United States Letters Patent No. 26,712, nor do I claim the impregnation of wood with preservative substances generally, or the method herein described for effecting such impregnation, as these are well known as burnettizing, kyanizing, &c, but

What I do claim as new herein, and desire to secure by Letters Patent of the United States is—

1. The method or process of treating wood consisting in compressing it within molds and afterward heating it while thus confined under pressure.

2. Also the process of treating wood by impregnating it with steam, and resinous, oily or other water proof matter, and mineral or metallic salts, and preservative chemicals, and dyes, or any of these, or their substantial equivalents, prior to and in combination with the process above claimed.

PHILANDER SHAW.

Witnesses:

J. B. CROTTY,
W. B. GLEASON.