

A. McNEILE.  
Lumber-Drier.

No. 201,033.

Patented March 5, 1878.

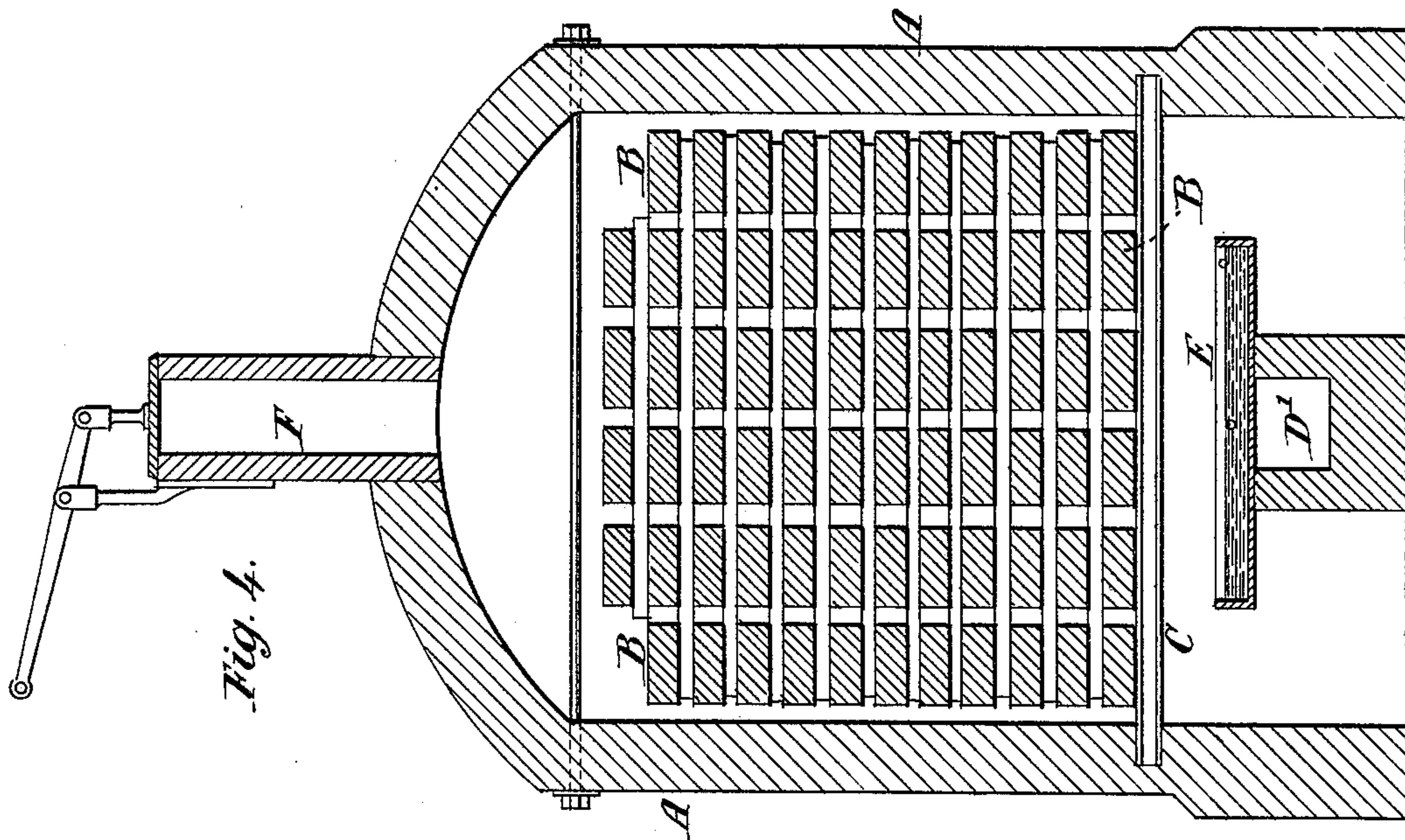


Fig. 4.

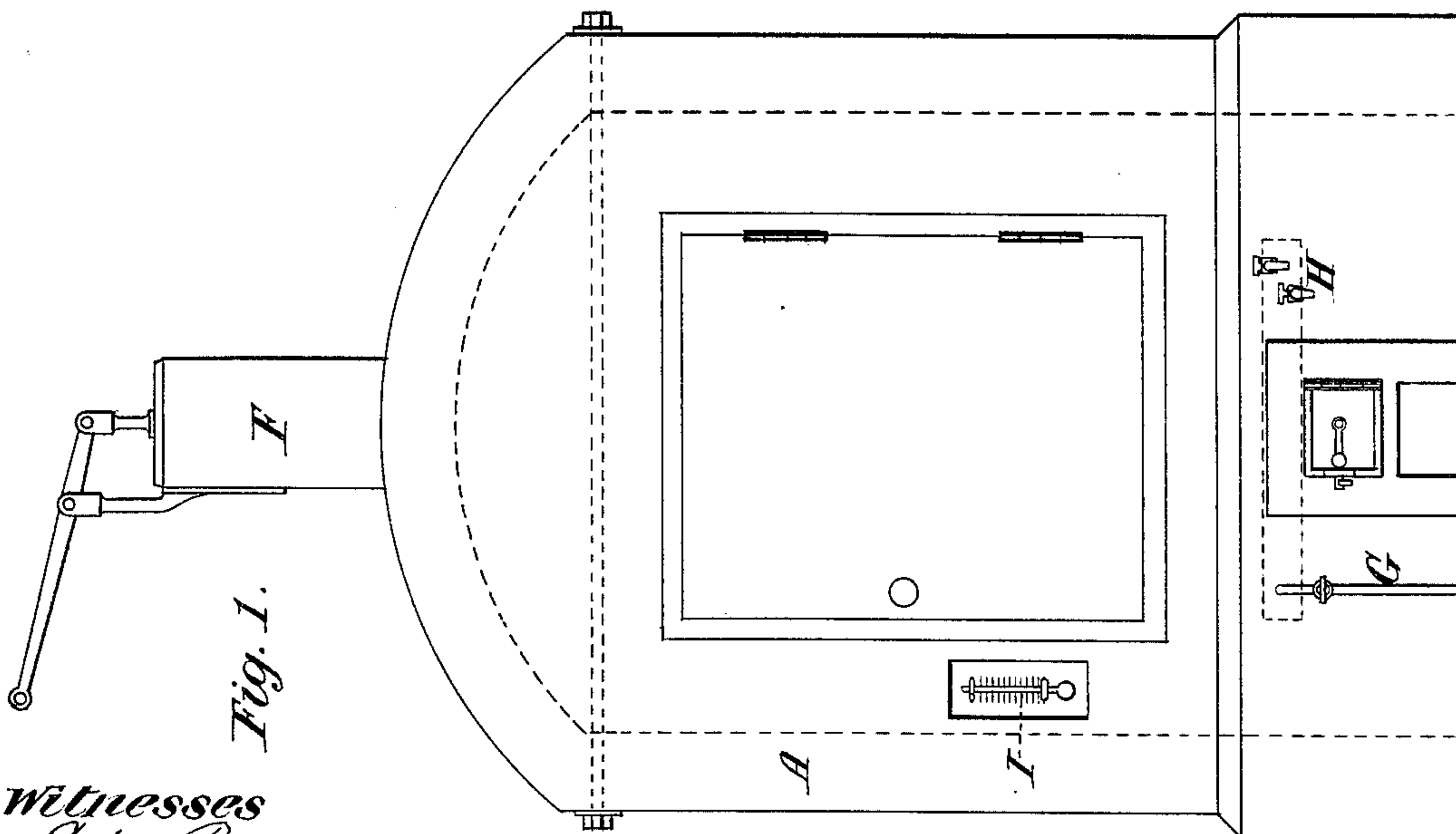


Fig. 1.

Witnesses

John Becker.  
Fred. Maynes

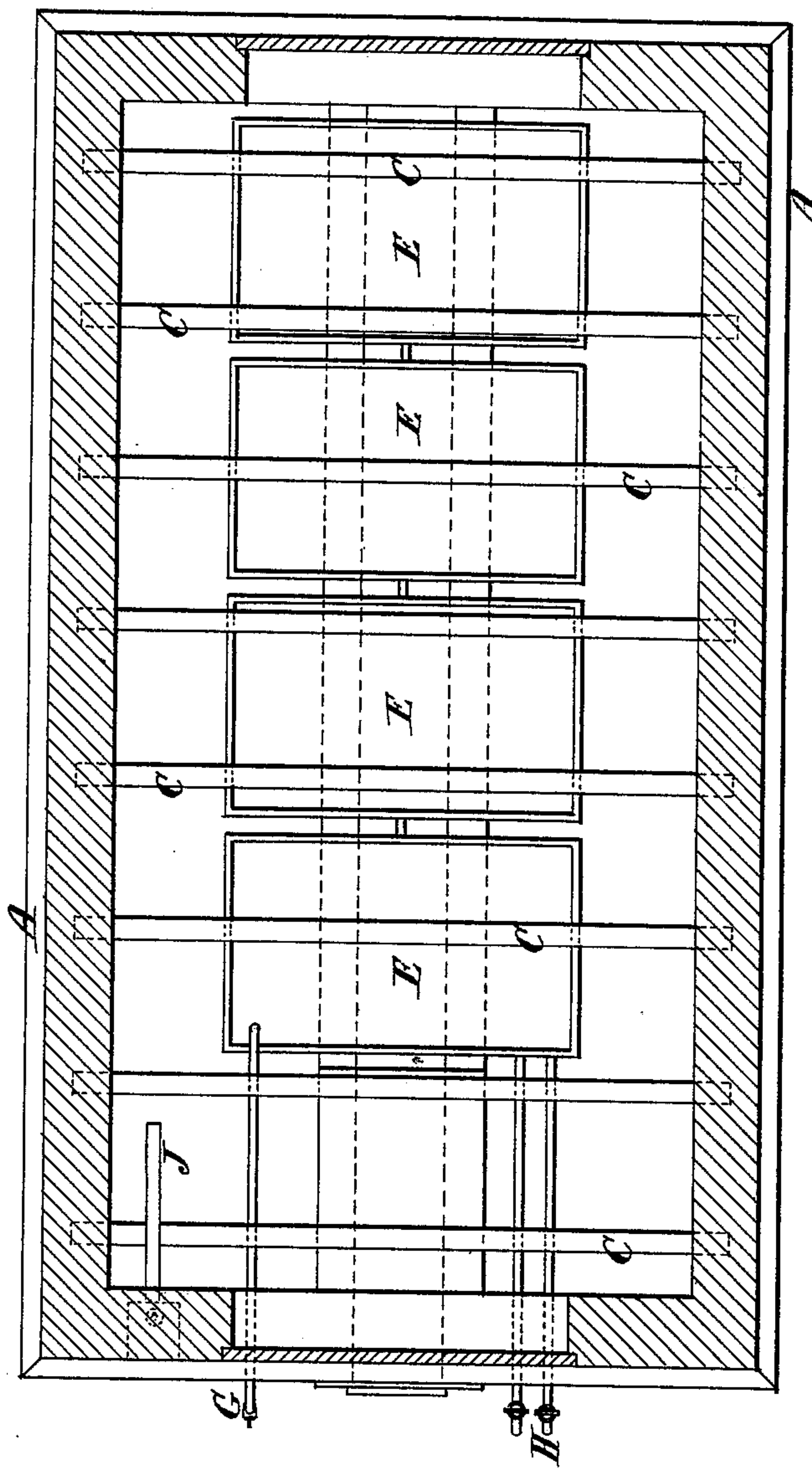
Alexander McNeile  
by his Attorneys  
Brown & Allen

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Fig. 2



Witnesses.  
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Fred Daynes

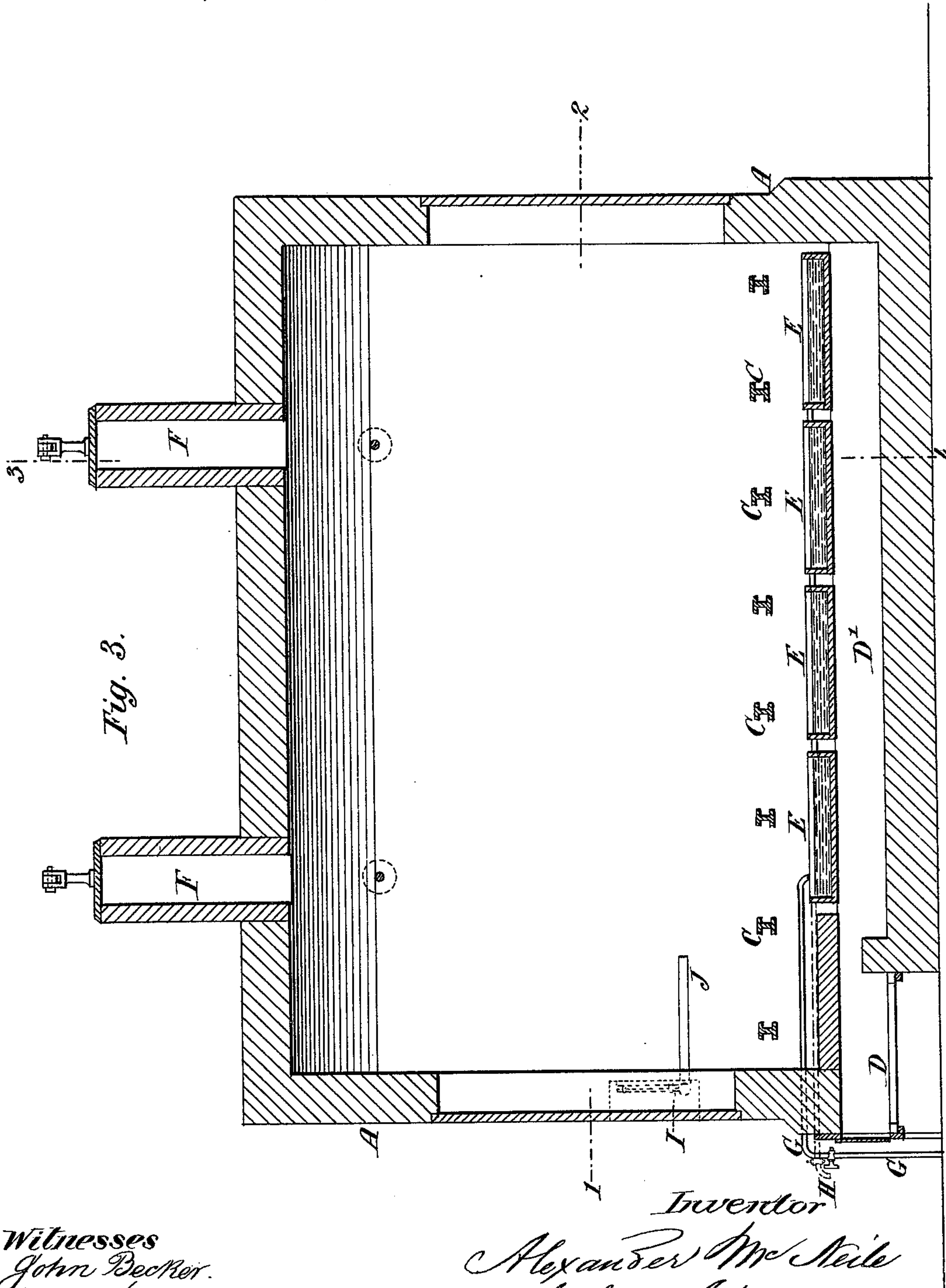
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# UNITED STATES PATENT OFFICE.

ALEXANDER McNEILE, OF PENTONVILLE, ENGLAND.

## IMPROVEMENT IN LUMBER-DRIERS.

Specification forming part of Letters Patent No. **201,033**, dated March 5, 1878; application filed October 31, 1877; patented in England, July 17, 1874.

### *To all whom it may concern:*

Be it known that I, ALEXANDER McNEILE, of John street, Pentonville, in the county of Middlesex, England, have invented certain Improvements in the Process of and Apparatus for Drying and Seasoning Timber, of which the following is a specification:

The object of the present invention is to dissolve out the sap from timber, and to dry or season it in a much more expeditious manner than by air-drying, and without deteriorating the quality of the timber. To this end I place the timber in a close chamber, and submit it to the action of a heated mixed atmosphere of carbonic-acid gas and aqueous vapor.

In carrying out my invention I prefer to obtain the carbonic-acid gas from the combustion (in the drying-chamber) of coke, coal, or other fuel, to which is added common chalk or limestone in moderate-sized lumps, for the purpose of increasing the yield of the carbonic-acid gas. I find, moreover, that the addition of chalk to the fuel enables me to maintain a slow-burning and lasting fire at a moderately low and uniform temperature without requiring very much attention. This is a great advantage, as, if the chalk or limestone be omitted and ordinary fuel be alone employed, there will either be great difficulty in keeping up the small fire that is required for the purposes of the invention, or the fire will be too fierce and hot, and therefore liable to char or discolor the timber. The carbonic-acid gas thus produced I cause to play, in a heated state, on and over a shallow vessel or vessels containing water, in order that it may vaporize the same and produce a warm, damp atmosphere, consisting of carbonic-acid gas and aqueous vapor, within the drying and seasoning chamber.

In the accompanying drawing I have shown an arrangement of drying-stove which I have found to answer the requirements of my drying and seasoning process, Figure 1 being a front or end elevation of the stove; Fig. 2, a horizontal section or sectional plan of the same, taken in the line 1 2 of Fig. 3, which is a longitudinal vertical section of the stove. Fig. 4 is a transverse vertical section of the same, taken in the line 3 4 of Fig. 3.

The stove or drying-chamber is made of brick-work A A, with an arched roof, and, if desired, two of these chambers may be placed side by side; but they are intended to be used independently of each other, and will be fitted in a precisely similar manner, to receive the planks or pieces of timber B B, which are supported upon iron girders C, having their bearings in the brick-work A.

In the lower part and at one end of the drying-chamber is a fire-place, D, the flue D' of which extends along the middle of the chamber, and is open at top, in order to allow the gases of combustion to play onto the bottoms of a series of shallow vessels, E, placed on the open flue and beneath the iron girders C. These vessels E are supported by the walls of the flue, and are placed a short distance apart, so as to allow the gases from the flue to escape into the chamber.

Water is supplied to the vessels E of the drying-chambers by any convenient arrangement of pipes, as, for example, that shown at G G, Figs. 1 and 3, such pipes being connected with an elevated tank or head, which will afford a constant supply of water to the vessels, and thus compensate for the evaporation that takes place therein.

The vessels E are connected together by short pipes, and are provided with an over-flow and draw-off pipe, H.

The drying or seasoning chamber is constructed with suitable doorways at each end, for facilitating access thereto for the purpose of stacking the timber thereon and removing it when dried.

The chamber is furnished at its upper part with chimneys F, provided with dampers, which will enable me to regulate the draft through the chamber and equalize the circulation of the moist carbonic-acid gas throughout the stack of timber.

It will now be understood that when a fire is lighted in the fire-place D the gases thereby generated will pass along the flue D', and the heat will cause the water in the shallow vessels E to vaporize slowly, and the dry carbonic-acid and other gases flowing from the fire-place will combine with the aqueous vapor, and, passing upward through the stack of timber, will permeate the wood, and act



upon and dissolve the sap contained therein. At the same time it will draw or drive out the natural moisture from the wood, and will thereby dry and season it, without the risk of cracking or splitting the wood, as would be the case if a dry heat were employed.

I would remark that in no case will the temperature required to dry and season timber be high, and care must be taken that the temperature of the atmosphere surrounding the stack of timber under treatment shall never approach to a charring heat. For this purpose I place a thermometer, I, at one end of the chamber. This thermometer is let into a recess in the brick-work, and a short pipe, J, Fig. 3, will conduct the heated air from the interior of the chamber to the bulb of the thermometer, so that the attendant can at once see what is the temperature within the chamber.

I may state, as an example, that, in treating hard wood, planks three inches in thickness may be dried by exposing them to a temperature not exceeding  $120^{\circ}$ , the same being maintained for from six to eight weeks. It will, however, be understood that the time required for drying the timber will vary according to the nature of the material under treatment.

The timber, when removed from the kiln, should be stored for a few days before being used.

It should also be remarked that when treating mahogany and other woods which are valued for their color the use of coal in the fire-place is objectionable, as the sulphurous acid generated from the combustion of the coal has a bleaching effect upon the wood. In such cases I prefer to use wood or peat for fuel.

Having now set forth the nature of my invention of improvements in the process of and apparatus for drying and seasoning timber,

and having explained the manner of carrying the same into effect, I would remark that attempts have been made to dry timber by subjecting it to an atmosphere of hot air in a close chamber.

I am also aware that it is not new to dry wood in an atmosphere of hot steam in an airtight vessel or chamber; neither is it new to submit wood to the action of the dry gaseous products of combustion.

I would further remark that I have found in practice that carbonic-acid gas has a marked beneficial effect on the wood when it is used in combination with aqueous vapor; but if used in a hot, dry state it will not produce the desired effect.

What I declare to be new in the above-described process, and therefore claim as my invention, is—

The construction, arrangement, and combination of parts herein shown and described, constituting an apparatus for drying and seasoning timber, and consisting of a close chamber with fire-place and open flue, and fitted with open shallow vessels containing water, arranged as shown, so that the heated gaseous products of combustion, by passing under the said shallow vessels, may evaporate the water contained therein, and then mingle with such aqueous vapor, thereby producing a mixture of gases, which will be carried forward by a gentle draft through the fire-place and flue, and caused to flow or pass through the stack of timber, as and for the purpose herein set forth.

Dated the 7th day of September, 1877.

ALEXR. McNEILE.

Witnesses:

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