

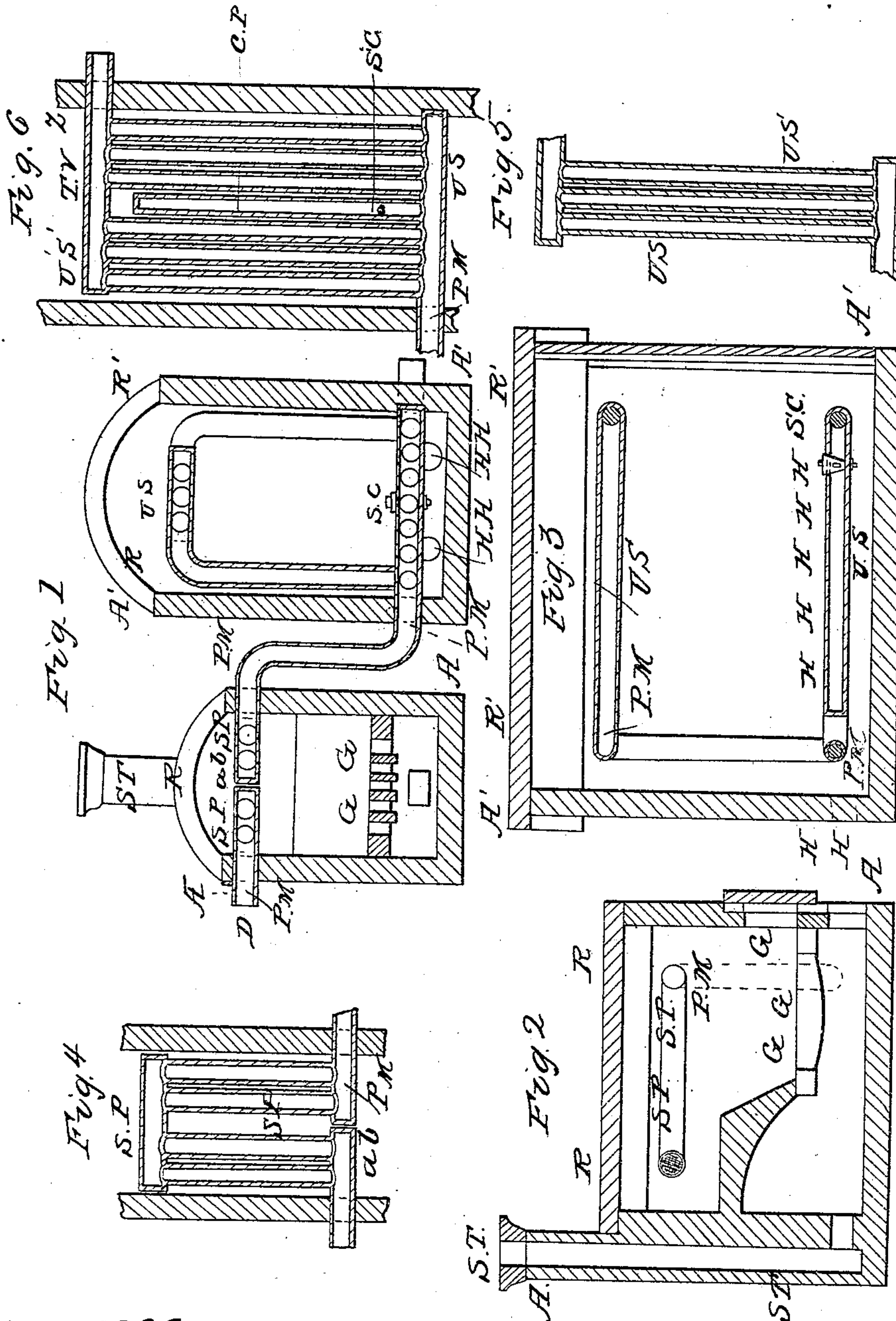
W. RYNER.

2 Sheets—Sheet 1.

Steam Drier.

No. 68,239.

Patented Aug. 27, 1867..



Witnesses
Samuel L. Lagler
William W. Roberts

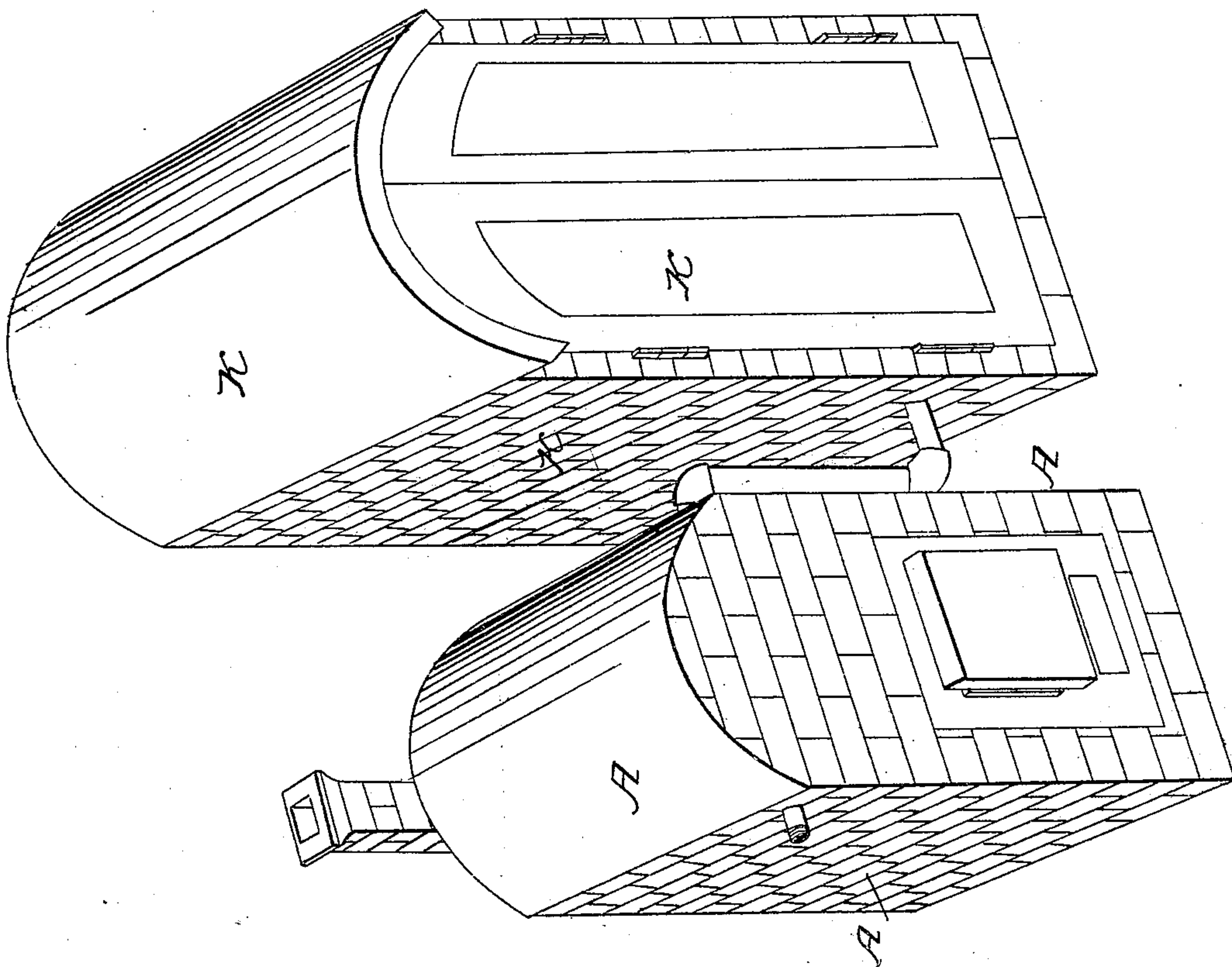
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Witnesses
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WILLIAM RYNER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND JOHN C. HOPEWELL, OF FLEMINGTON, NEW JERSEY.

Letters Patent No. 68,239, dated August 27, 1867.

IMPROVEMENT IN STEAM-DRYING APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM RYNER, of the city of Philadelphia, in the county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in "Kiln-Drying Apparatus;" and I hereby declare that the following is a full and exact description of my invention, reference being had to the accompanying drawings, making a part of this specification, and in which—

Figure 1, plate 1, is a perspective elevation of my apparatus

Figure 1, plate 2, a transverse sectional elevation, showing the general arrangement of the pipes inside the kiln and fire-house.

Figure 2, plate 2, a transverse sectional elevation, showing the furnace, smoke-stack, and set of pipes on the top of the fire-place.

Figure 3, plate 2, a longitudinal sectional elevation of the kiln and pipes.

Figure 4, plate 2, a sectional plan view of the steam pipes on the top of the fire-place.

Figure 5, plate 2, a sectional plan view of the steam pipes in the kiln near the roof.

Figure 6, plate 2, a sectional plan view of the steam pipes in the kiln near the floor.

The nature of my invention consists principally in the method of kiln-drying by means of superheated steam, which I obtain by a certain combination of pipes and fire-places, as hereinafter described, and which affords a more economical, safer, and surer mode of kiln-drying any kind of article it may be desired to season.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

My apparatus is composed of two boxes, or more properly houses, placed side by side, as shown in fig. 1, plate 1, and built of any material or metal to suit the purpose. Both are provided with convex roofs, R R', metallic or otherwise. The smaller of those houses, A, is a sort of furnace, with fire-place and grate, G, smoke-stack S T, and inside said house, near the roof, and on top of the fire-place, is placed a set of steam pipes, S P, as shown in plan, fig. 4, plate 2, and, in elevation, figs. 1, 2, plate 2. The kiln K, built up, as has been said, by the side of the furnace A, is provided within with two sets of steam pipes, the upper set U S, shown in plan fig. 5, plate 2, and in elevation figs. 1 and 3, plate 2, the lower set U' S' shown in plan fig. 6, and in elevation figs. 1 and 3, plate 2. Fig. 1, plate 2, shows how the steam pipes in the furnace communicate with those in the kiln by means of the pipe P M. The centre pipe C P, of the set U' S', is provided with holes H and a steam-cock, S C, as respectively shown in figs. 3 and 6, plate 2. Transverse pipe T V of set U' S' is made on one end to run out through the wall of kiln K, as shown in L, fig. 6, plate 2. Lastly, two holes, H H, are made through the wall of the kiln, opposite the doors of the same, as shown in H H, fig. 3, plate 2.

The operation of the above-described arrangement is obvious. The fire is lighted on grate G and pipe P M, being connected in the more suitable way with a steam-boiler, or generators of any kind, the steam is thus let in and soon invades and fills up all the steam pipes of my apparatus. The fire in G soon heats the pipes placed on the top of it red hot, thus superheating the steam in pipes, which reaches pipes in kiln in a very superheated dry state. By pushing on the fire on G, and increasing the heat of the superheating pipes, I increase the dryness of the steam inside them, and can thus obtain almost any amount of very dry heat inside my kiln. Opening cock S C the superheated steam will enter the kiln through holes H H, and any excess of steam will egress of itself throughout holes H H. Pipe P M in fire-house A is represented (figs. 1 and 4, plate 2) as sectional in *a b*, this being for the purpose of checking the steam inside the pipes on the top of fire G, and forcing said steam to remain longer in the pipes, where it gets better superheated.

In the drawings and descriptions of the horizontal and upright sets of pipes in both boxes or houses, I have not intended and do not intend to limit myself to any number of pipes, but have described an average arrangement to illustrate my *modus operandi*.

Again, I reserve to use, in the constructions of my kiln-drying apparatus, any material or metal that I may think best to answer my intended purpose.

Now, the advantages and superiority of my apparatus over those generally in use are many and obvious. The faculty of regulating the degree of heat used for dry-kilning is one of the best features of my invention,

as it allows to use the kiln with the degree of heat precisely appropriate to the article in it. My mode of obtaining superheated steam, and using it instead of the common or damp steam generally generated by means of a pan located inside the kiln itself, is another great advantage.

With the water-pan system the steam thus generated carries up a great deal of water not vaporized, which, if the steam is let out and the temperature in the kiln lowered, will fall on and cover the article to be dried with dampness, a serious objection to good result and success in the operation; whereas, with my system, the steam, highly and as much superheated as required, outside of the kiln, reaches there very hot and dry, and even if the temperature in the kiln is lowered, the superheated steam I use will remain the same, as it is a known fact that "superheated steam admits of losing a part of its heat without suffering, as common steam does, partial condensation." (See Appleton on Sciences.)

I do not claim in a broad manner having invented kiln-drying by means of steam, but I present my invention as a decided improvement on steam kiln-drying apparatus, using superheated steam, or, if one can say so, improved steam, steam better prepared for the purpose it is used for.

Having thus described my invention, what I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. The centre pipe C P, steam-cock S C, and openings H, the whole being constructed and operating in the manner and for the purpose above set forth and described.

2. The sets of steam pipes U S and U' S', with escape steam pipe T Y, and discharge holes H H H H, connected with fire-house A by pipe P M, the whole constructed and operating in the manner and for the purpose above set forth and described.

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Witnesses:

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