J. K. CALDWELL.

Oven or Tunnel for Drying Brick, &c.

No. 198,347. Patented Dec. 18, 1877.

Fig. 1

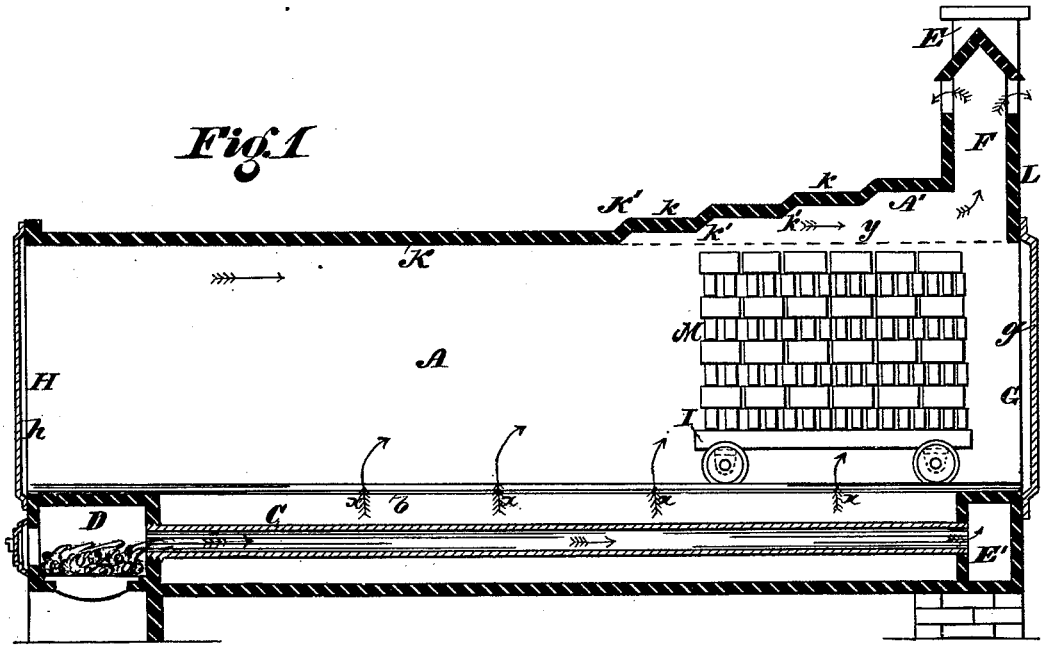
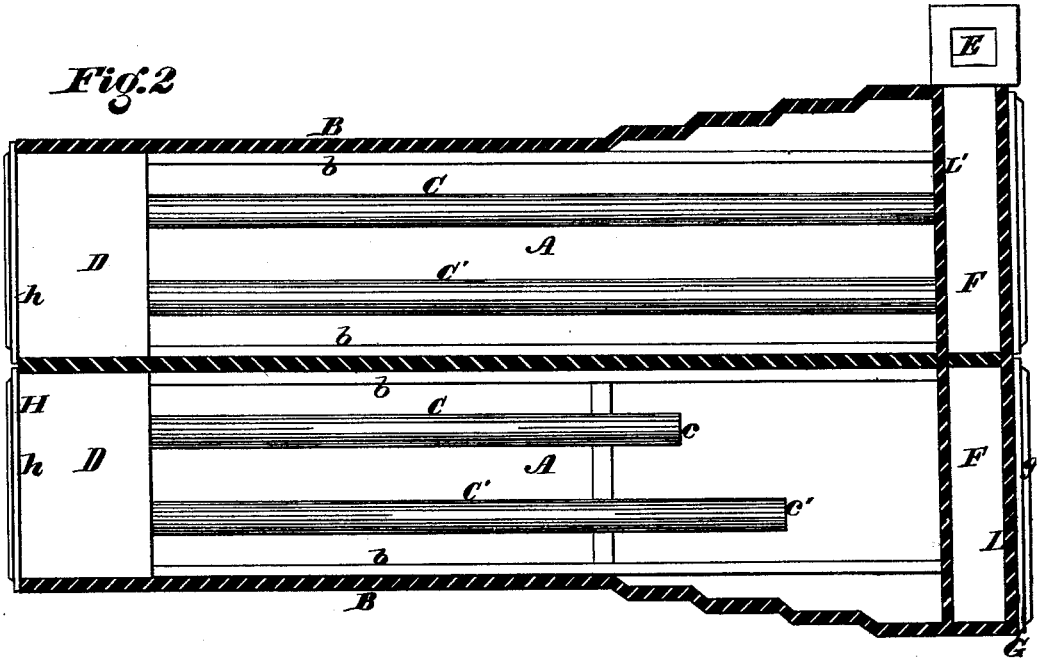


Fig. 2



WITNESSES:

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JOHN K. CALDWELL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN OVENS OR TUNNELS FOR DRYING BRICK, &c.

Specification forming part of Letters Patent No. **198,347**, dated December 18, 1877; application filed November 1, 1877.

To all whom it may concern:

Be it known that I, JOHN K. CALDWELL, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Ovens or Tunnels for Drying Bricks and other Articles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a vertical longitudinal section, and Fig. 2 is a horizontal section, of my improved oven or tunnel.

My invention has for its primary object the utilization, to a more complete extent than has been heretofore attained, of the heat employed for drying bricks and other articles in tunnels or ovens.

My improvements consist, primarily, in introducing the products of combustion from the radiating-pipes into the drying-chamber at or toward the rear part of said chamber, and, in combination therewith, the enlargement of said rear part, so as to avoid the collection of moisture in condensed form in injurious proximity to the bricks or other articles being dried.

Referring to the accompanying drawing, A represents a tunnel or oven for drying bricks and other articles, and B B the side walls thereof, having ledges or tracks *b b* for the cars. C C′ are pipes, which carry off the products of combustion from a furnace, D. Heretofore said pipes have been arranged simply for radiating purposes, carrying their contents to a smoke-stack, E, or cross-flue E′. This entails a considerable waste, as it is found that all the heat of said products of combustion will not be given off by radiation. To avoid such waste I cause the radiating-pipes C C′ to terminate in open ends *c c′*, respectively, before reaching the end wall L of the oven, or the cross-flue E′, which allows their contents to escape and ascend into the drying-chamber. The heat of said contents is thus completely utilized, carrying off the moisture from the rear end of the tunnel, or end where the cars enter, through the draft-flue, and assisting the draft or air-current in said tunnel.

K is the roof or ceiling of the tunnel, which is horizontal and parallel with the tracks or ledges *b b* for a considerable distance from the front or furnace end. At a point, K′, said ceiling begins to ascend in steps having horizontal treads *k* and inclined faces *k′*, said steps continuing until the draft-flue F is reached. This elevation of the ceiling gives an increased area at that end of the tunnel where the cars enter for the distribution of the moisture arising from the articles being dried, and also affords space for the passage of the air-currents above said articles without interruption of the draft when the rear door (indicated at *g*) is opened for the admission of the cars, or for other purposes. This enlarged area of the tunnel may be also obtained by flaring the walls B B, as shown in Fig. 2; and instead of causing the pipes C C′ to terminate in open ends, they may have apertures in their walls or other orifices for the escape of their contents, said escape-openings being graduated so as to increase the volume emitted as the rear end of the tunnel is approached. Where two pipes having open ends, as shown in the drawing, are used, they should be of unequal length, so as to avoid the discharge of the contents of both at the same point.

The operation is substantially as follows: The cars (one of which is indicated in the drawing by the letter I, its load being represented at M) enter the tunnel at the rear end G through a door, *g*, and proceed gradually toward the furnace end H, where they make their exit through a door, *h*. The products of combustion pass from the furnace D rearwardly through the pipes C C′, the latter radiating heat upon the articles on the cars above. Before the end of the tunnel is reached the products of combustion are allowed to escape from the smoke-pipes and ascend into the drying-chamber above. An air-current, induced by a blower or other means from the front to the rear of the tunnel, assists in the drying, and carries off the moisture eliminated from the bricks, as well as the products of combustion, to the draft-flue. By this means the articles to be dried will be first brought into con-

tact with the products of combustion, which take up and carry off, in conjunction with the air-current which they assist, the moisture eliminated, said articles being then brought within the influence of the radiated heat given off from the pipes C C′ in the more forward part of the tunnel.

Where pressed bricks or other articles likely to be injuriously affected by direct contact with the products of combustion are to be dried, the smoke-pipes C C′ should be continued unopened to the chimney E or cross-flue E′, leading to the latter.

What I claim as my invention is—

1. A drying tunnel or oven for brick, having a smoke pipe or pipes terminating therein, and arranged to discharge the products of combustion into the drying-chamber near its mouth or entrance, substantially as shown and described.

2. A tunnel or oven for drying bricks or other articles, having smoke-pipes arranged to carry their contents a certain distance, and then discharge said contents to permit their admission to the drying-chamber, so that the articles being dried will first come in contact with the products of combustion from the furnace, and then be subjected to radiated heat, substantially as set forth.

3. The method herein described of drying bricks and other articles by direct contact with the products of combustion first, and by radiated heat afterward, substantially as set forth.

4. The smoke-pipes C and C′, of unequal length, arranged within the tunnel or oven A, to radiate heat and discharge their contents therein, substantially as shown and described.

5. The combination, with the tunnel A, having its rear end enlarged, as set forth, of the smoke-pipes C C′, arranged to discharge their contents into said tunnel, as shown.

In testimony that I claim the foregoing I have hereunto set my hand this 31st day of October, 1877.

JOHN K. CALDWELL.

Witnesses:
M. D. CONNOLLY,
CHAS. F. VAN HORN.