4 Sheets—Sheet 1.

M. P. SMITH.

Brick-Drying Oven.

No. 208,766. **Patented Oct. 8, 1878.**

Fig. 1.

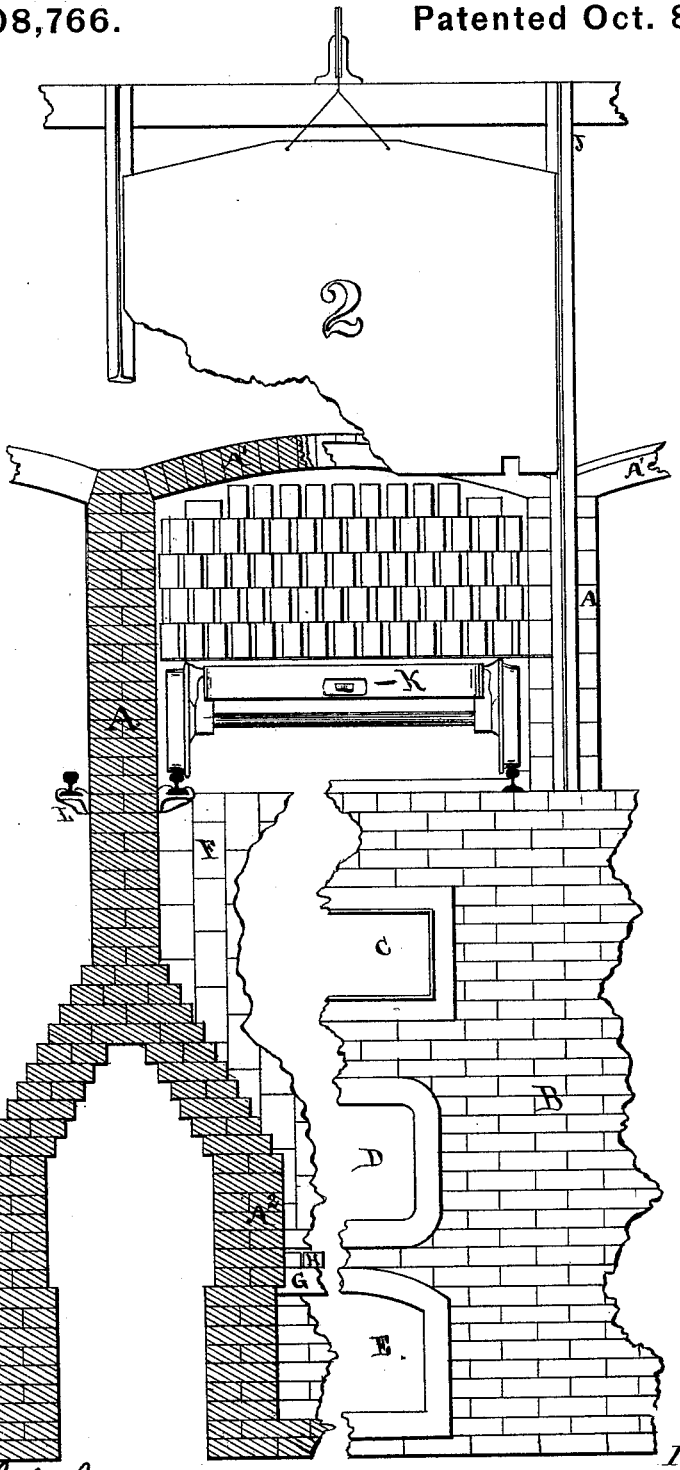

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Fig. 2.

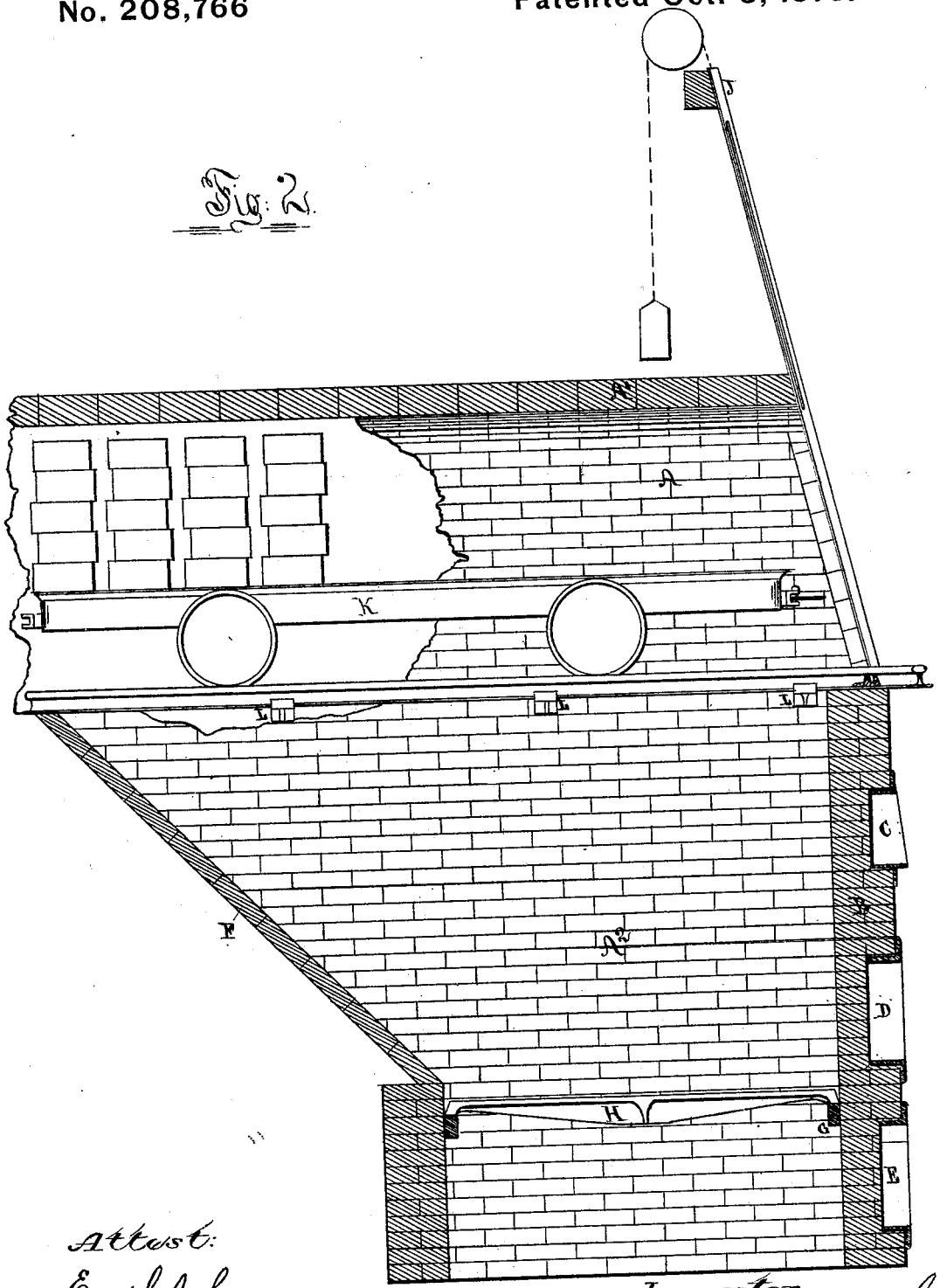

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Fig. 3

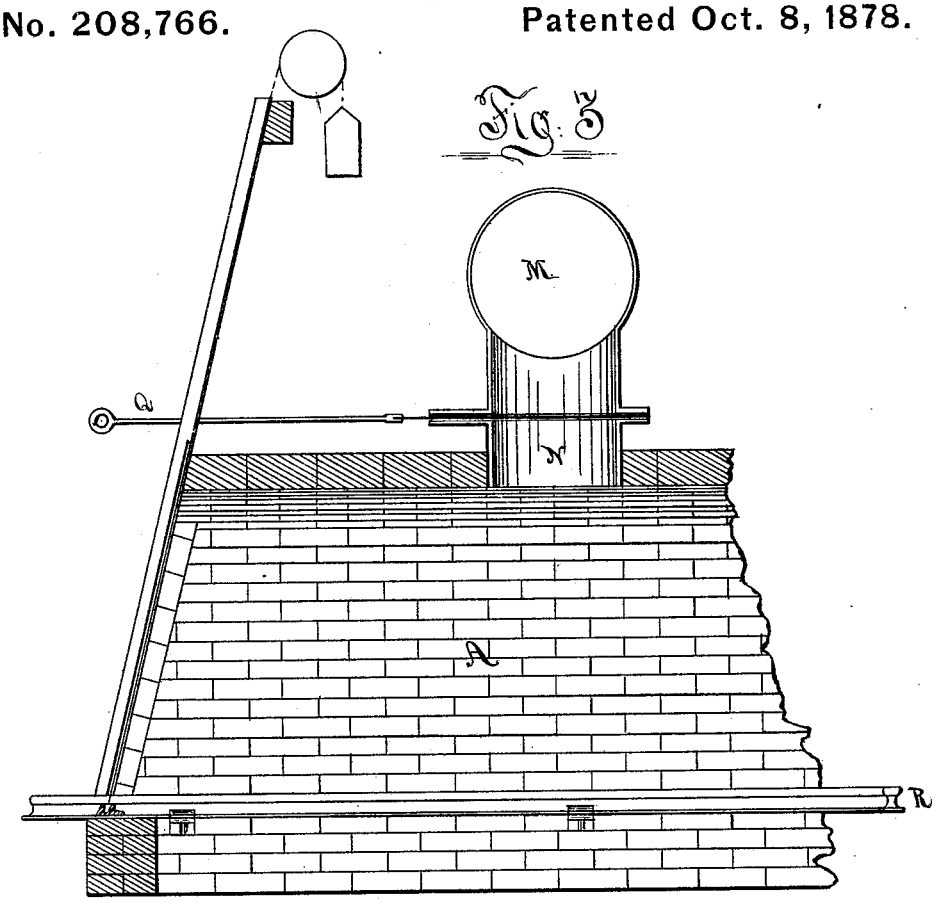
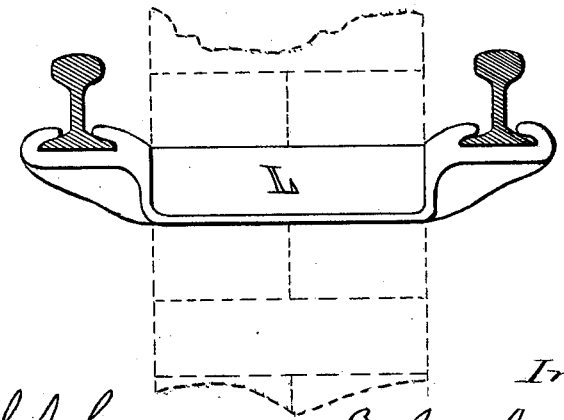


Fig. 4.



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No. 208,766. Patented Oct. 8, 1878.

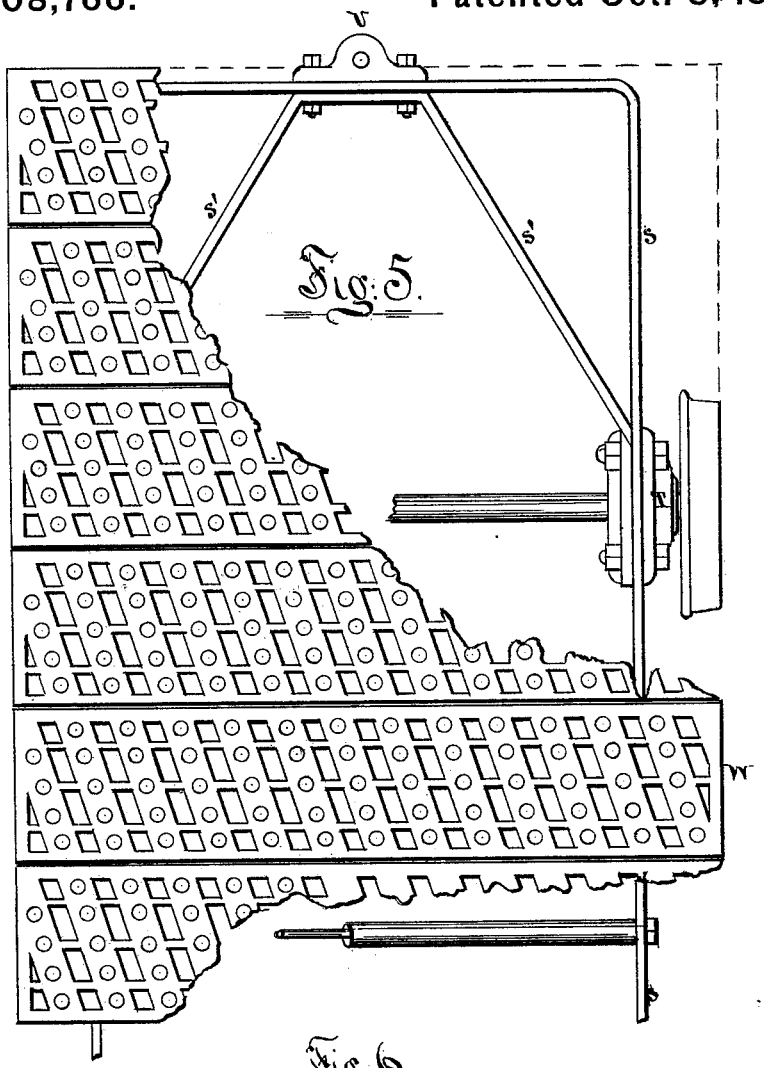
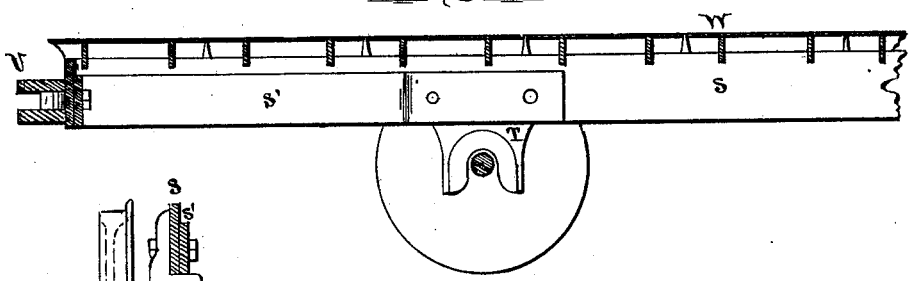


Fig. 5.

Fig. 6.



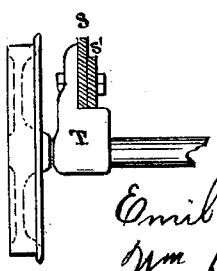


Fig. 7.

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UNITED STATES PATENT OFFICE.

MARSHALL P. SMITH, OF WAVERLY, MARYLAND.

IMPROVEMENT IN BRICK-DRYING OVENS.

Specification forming part of Letters Patent No. **208,766**, dated October 8, 1878; application filed January 3, 1878.

To all whom it may concern:

Be it known that I, MARSHALL P. SMITH, of Waverly, county of Baltimore, State of Maryland, have invented an Improved Oven or Tunnel for Drying Brick, and the cars used therewith, of which the following is a specification:

This invention relates to that class of ovens for drying brick and other articles for which Letters Patent were granted to my father, Francis H. Smith, February 26, 1861. In the apparatus constructed by him under that patent the drying-chamber was much larger in area of cross-section than the loaded car which passed through it, thus leaving a considerable space on every side of the car. He laid his bricks upon trays, which stood in four stacks or piles upon the car, and his system was worked by the gentle current caused by an ordinary chimney. His ovens worked successfully on the soft-molded brick, which were made by hand or by machinery at that date, but were of limited capacity.

Subsequently machines were invented which produced green brick of sufficient firmness to bear immediate hacking to the height of several courses, thus avoiding the cost and annoyance of the trays or any equivalent; and in the course of my experiments with such brick I have found that there is a great and unnecessary waste of fuel and labor in that method of construction and operation, and to correct these evils is the object of my present invention.

To dry brick rapidly and economically the following requisites should be kept in view:

First. The heated air should move with enough rapidity to carry off the vapor as fast as it is eliminated; otherwise it will be condensed on the cooler brick beyond and soften them. To accomplish this end an exhaust-fan has been found to be more efficient than any chimney, while at the same time it gives the operator complete control over the process of drying.

Secondly. The brick should be piled upon the car so as to offer the least obstruction to the current of air. When hacked at right angles every alternate course presents the largest surface of the brick to the air. They should be laid in courses, inclined about twenty-five degrees from a straight line—the first turned to the left, for instance, the second to the right, and so on alternately. In this way also greater steadiness under the jars incident to transportation is secured. To assist the hands in so placing them, I perforate the floor-plates of my car with diagonal series of holes, as shown in the drawing, Fig. 5.

Thirdly. The heated air should be caused to flow between and among the brick, and all other channels should be stopped as far as possible. I therefore contract the size of my tunnel until the loaded car can barely pass through without scraping. The cars are built so as to leave but a limited space under them, and this can be reduced by placing brick on the floor at suitable intervals. The natural tendency of hot air to rise to the top will then prevent any waste.

My invention consists, first, in a new mode of constructing the drying-chamber and supplying of air thereto; second, in a new method of supporting the rails by means of brackets built into the side walls; and, third, in an improved construction of car.

The drawings clearly show the manner in which I construct my drying-ovens and their appurtenances.

Figure 1 is a front elevation of the oven or tunnel A, the front wall, B, being cut away on the left-hand side, so as to show the interior construction of the walls, &c., and also an end elevation of the loaded car K. Fig. 2 is a longitudinal section of the rear or hot end of the tunnel and fire-pit, but showing the car in side elevation and partly loaded. Fig. 3 is a similar longitudinal section of the front or cool end of the tunnel. Fig. 4 represents, on enlarged scale, the iron rail-supporting bracket L. Fig. 5 is a plan of the floor of the car, partly cut away to show construction of wrought-iron frame. Figs. 6 and 7 are detail sections of car-frame.

A A are the side walls of the tunnel or oven, which should be about one hundred feet long. A^1 is the roof, which may be arched (as in the drawing) or flat. In the latter case it should be preferably of stone slabs or iron plates. A^2 is the side wall of the furnace or ash-pit. B is the front wall. C is the ventilator, placed above the furnace, by which a sufficient quan-

tity of cold air can be admitted to regulate the temperature of the blast and the consumption of coal. F is the rear wall of the fire-chamber, which slopes to the rear, so that the whole length of the first car may be equally subjected to the heat. The front and rear end walls of the tunnel above the level of the rails are also inclined inwardly, as shown in the drawings. The weight of the doors 2 thus presses on the slide-bars J, closing the entrance tightly without the use of grooves, which are liable to be choked with dirt. In the roof, near the front end of the tunnel, where the green brick are introduced, is the exhaust-pipe M N, leading to the exhaust-fan, (not shown,) and the escape of the moist air is regulated by the damper Q.

L L are iron brackets built into the side walls, and supporting the rails.

The drawings show the pattern which I prefer; but the form is not essential so long as the rail is supported by the side walls, the two rails of the same tunnel not being connected together by cross-ties or in any other way.

As it is intended that these ovens shall be built in sets of several together, I prefer to make these rail-brackets double, thus supporting a rail on each end. The rails are not bolted to these brackets, but rest loosely in them, by which plan allowance is made for expansion. The track should be coupled by ordinary splice-joints.

The frame of my car is formed of the wrought-iron bars S, bent at the corners and welded, braced at each end by the angle-bars S′. The top or floor is formed of plates W, which are perforated with holes in diagonal series. These plates, which are cast in sections for greater convenience, rest upon the wrought frames, being kept in place by lugs on their under surfaces and by their own weight. Bolts or other fastenings are unnecessary.

In the drawings are shown alternate rows of square and round holes for this purpose. The space between any two series of square holes is the thickness of a brick. In hacking they are placed over the rows of round holes, allowing the hot air to reach the bottom of the brick, and to rise through the square holes (which are the largest) between the bricks. The difference in shape of holes, as well as the inclined position of the same, being the guide to the laborer who loads the car, any variation in the shape of the holes which will preserve the same distinction will answer as well as the one I have drawn.

I claim as my invention—

1. The drying-tunnel A B, in combination with the inclined doors 2, the ventilator C, the inclined furnace-wall F, and the rail-brackets L, constructed in the manner and for the purposes set forth.

2. The rail-brackets L, constructed and operating as set forth.

3. The car K, constructed with floor-plates perforated diagonally with continuous series of holes of differing form, as described and set forth.

MARSHALL P. SMITH.

Witnesses:
EMIL JOHN,
WM. D. BIGGS.