(No Model.) 3 Sheets—Sheet 1.

J. H. COHRS.

DRIER.

No. 319,562. Patented June 9, 1885.

Fig. 1.

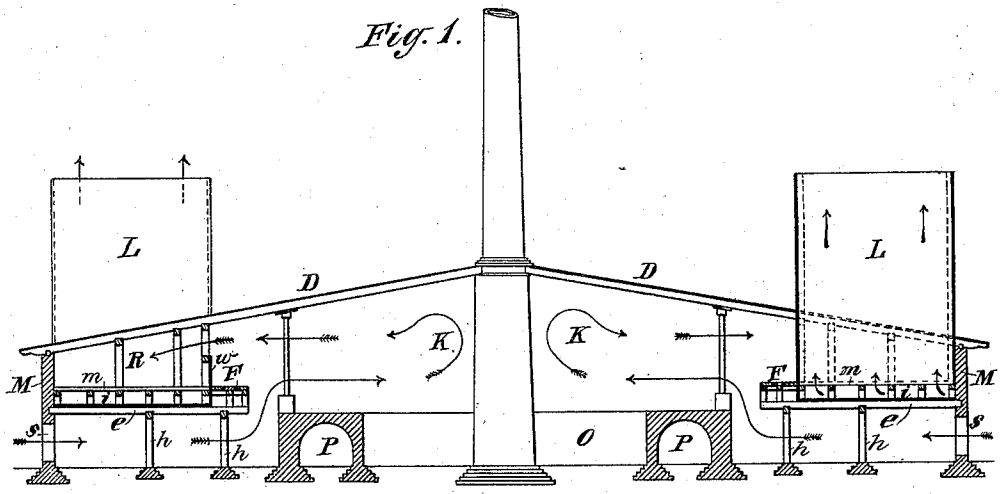
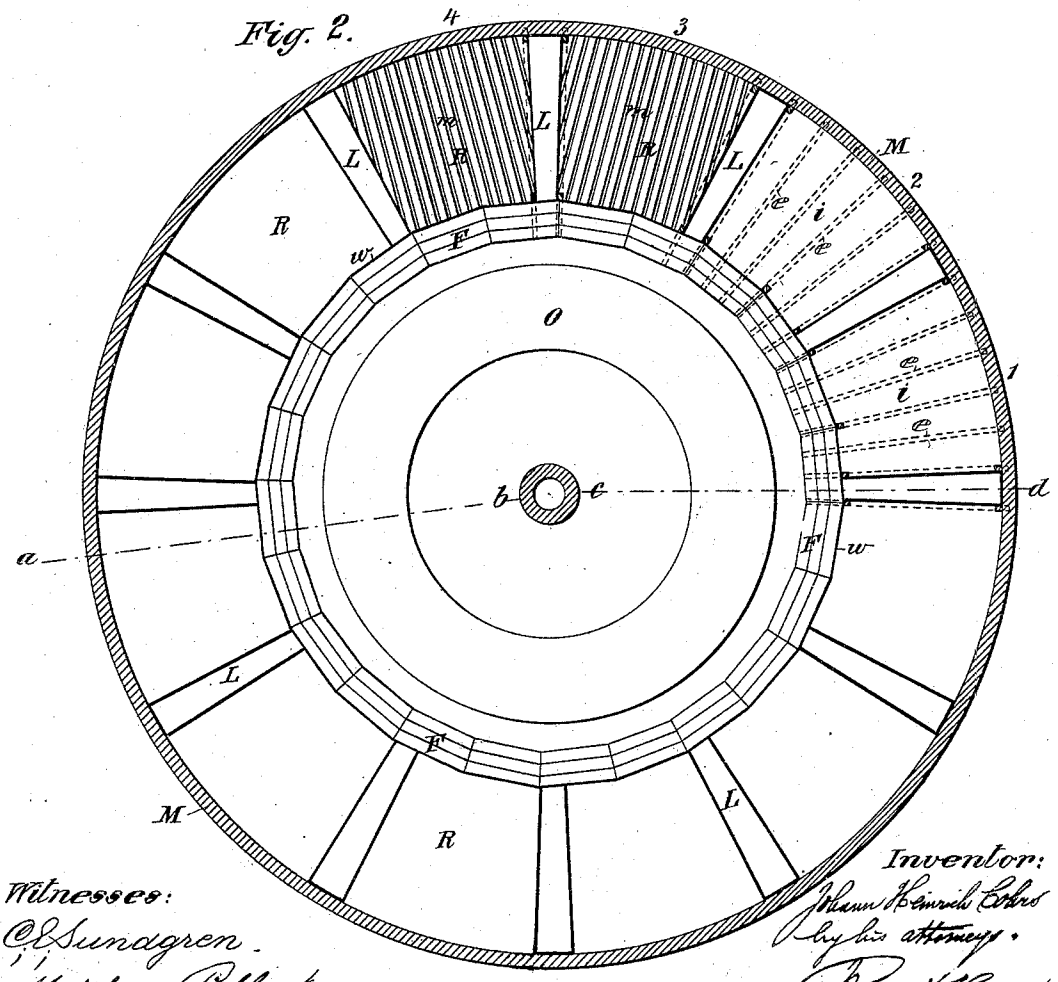


Fig. 2.



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Fig. 3.

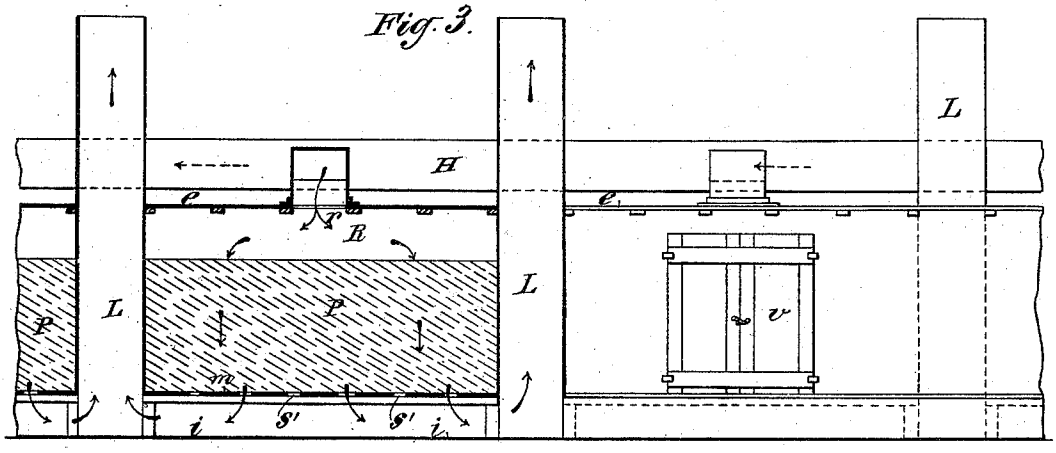
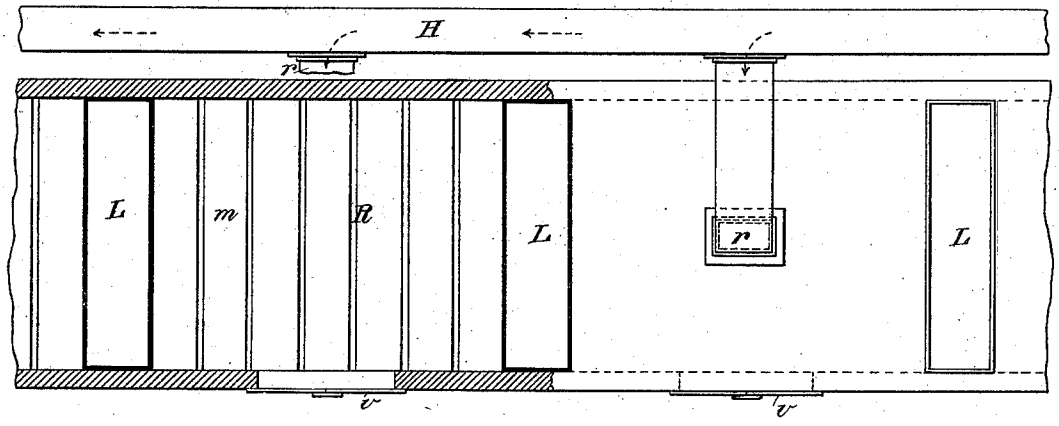


Fig. 4.



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Fig. 5.

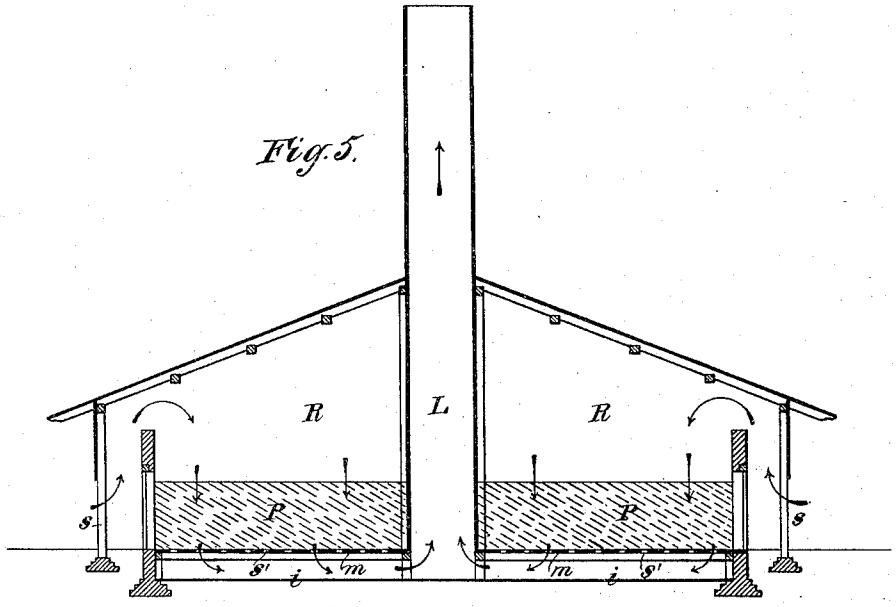
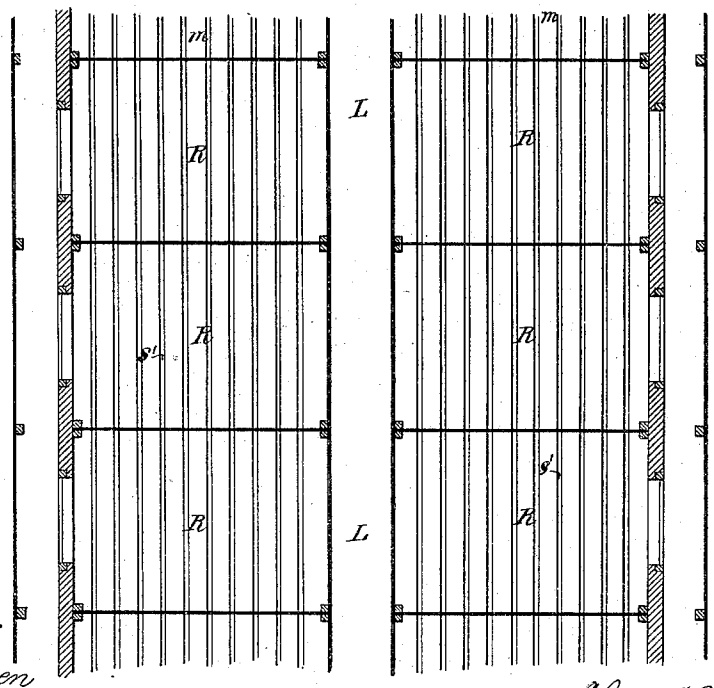


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHANN HEINRICH COHRS, OF HAMBURG, GERMANY.

DRIER.

SPECIFICATION forming part of Letters Patent No. 319,562, dated June 9, 1885.

Application filed March 21, 1885. (No model.) Patented in Germany March 3, 1883, No. 23,975, and in England August 12, 1884, No. 11,205.

To all whom it may concern:

Be it known that I, JOHANN HEINRICH COHRS, a subject of the Emperor of Germany, residing at the city of Hamburg, in said Empire, have invented certain new and useful Improvements in Drying Apparatus, (for which I have obtained Letters Patent of Great Britain, No. 11,205, dated August 12, 1884, and Letters Patent of the Empire of Germany, No. 23,975, March 3, 1883,) of which the following is a specification, reference being had to the accompanying drawings.

This invention has for one of its objects the utilization, in an effective and economical manner, of the waste heat of kilns and furnaces for drying purposes, especially to utilize the waste heat of kilns in the drying of raw material, green bricks, and earthenware before such goods are brought into the firing or burning chambers of the kiln. The invention is, however, applicable to drying by atmospheric air without heat.

Figures 1 and 2 of the drawings illustrate the application of my invention in connection with a circular kiln for burning bricks, lime, or other goods, in which the drying-chambers surround the kiln in a circular series. Fig. 1 is a vertical section in the line *a b c d*. Fig. 2 is a plan, partly in section. Figs. 3 and 4 illustrate the application of my invention to a series of drying-chambers arranged in a straight row for drying by the waste heat from a furnace. Fig. 3 is a longitudinal elevation, partly in section. Fig. 4 is a plan, partly in section. Figs. 5 and 6 illustrate the application of my invention to a series of drying-chambers arranged in two straight and parallel rows for drying by atmospheric air. Fig. 5 is a transverse vertical section. Fig. 6 is a horizontal section.

Similar letters of reference indicate corresponding parts in the several figures.

I will first describe the circular apparatus illustrated in Figs. 1 and 2.

The kiln is furnished with a roof that extends beyond the area of the kiln, and is supported by a wall constructed concentrically to the outer wall of the kiln. Within this surrounding space, also concentrically with the circumference of the kiln, the drying-chambers are arranged.

O designates the kiln, and D the roof extending above the kiln and supported by the surrounding wall M. The space between the kiln O and wall M is fitted with a framing of joists, *e*, supported by upright beams *h*, and divided into two compartments placed one above the other.

Above the framing *e* air-shafts L are arranged, preferably corresponding in number with the number of burning-chambers P of the kiln; but more or less may be provided, as convenient, or as required by the material to be treated. These air-shafts may be built of wood covered by any suitable water-proof roofing material. From the circumference of the wall to the sides of the air-shafts the framing *e* is covered by a flooring, *i*, as shown in the drawings at divisions 1 and 2, which are represented in horizontal section between *i* and another flooring, *m*, the object of which will be hereinafter explained.

F designates a staging for conveying the green bricks or unburned material to be operated on to the drying chambers or compartments. Such materials may be raised and lowered to the said staging by lifts, slopes, or in any other suitable and convenient manner. Each division R between two neighboring air-shafts, L, is, above the closed flooring *i*, furnished with a second floor, *m*, formed of boards that are not put close together, but placed so as to leave a free space between each two, as shown in Fig. 2 of the drawings at chambers 3 and 4. These chambers 3 and 4 are represented in section above floor *m*. The free space between the boards of floor *m* of one chamber or division must in size be equal to the section of one of the corresponding air-shafts L, or nearly so. The different compartments R between shafts L and above floors *m* are the drying-chambers.

On the floor *m* of the chambers R the green bricks or other goods to be treated have to be placed in such manner that air can pass between the different layers. Each shaft L is in communication with both neighboring chambers by an opening or free space left in the upright walls between the floors *m* and *i*.

The atmospheric air entering in the direction of the arrows through openings *s* of wall M passes underneath flooring *i*, and between

drying-room and kiln into the space K above the burning-chambers of the kiln, where it is heated by the waste heat of the kiln, kept confined by roof D. The heated air, as will be seen, (left-hand side of Fig. 1,) enters the chambers R (which are at their inner sides partly closed by a wall, *w*) from above, passes through the free space left between the material that has to be dried, and finds exit through the openings of floor *m* into the space between *i* and *m*, and from there passes sidewise into the neighboring air-shafts L, and through these escapes into the open air. In its passage through the green bricks or other raw material the heated and comparatively dry air takes up part of the moisture of the material and reaches the open air in a damp state, thus drying the goods in a very effective manner. In the modification illustrated by Figs. 3 and 4 the drying-chambers R receive the goods P to be dried through doors *v*, and receive warm dry air through a channel, H, from any place where waste heat is produced.

In the modification illustrated by Figs. 5 and 6 the atmospheric air enters the drying-chambers R through openings *s* at the sides, passes down through the material P to be dried into the space within the double flooring *m i*, of which *m* is provided with openings to allow the air to pass into the said space, whence it passes through lateral openings into the air-shaft L, as indicated by arrows.

What I claim as my invention is—

The combination of the drying-chambers R, having openings in the upper part for the air, the double floors *m i*, having openings in the upper part for the passage of the air, and the air-shafts L, having lateral communication with the space within the double floors, all substantially as described, and with reference to the accompanying drawings.

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Witnesses:
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