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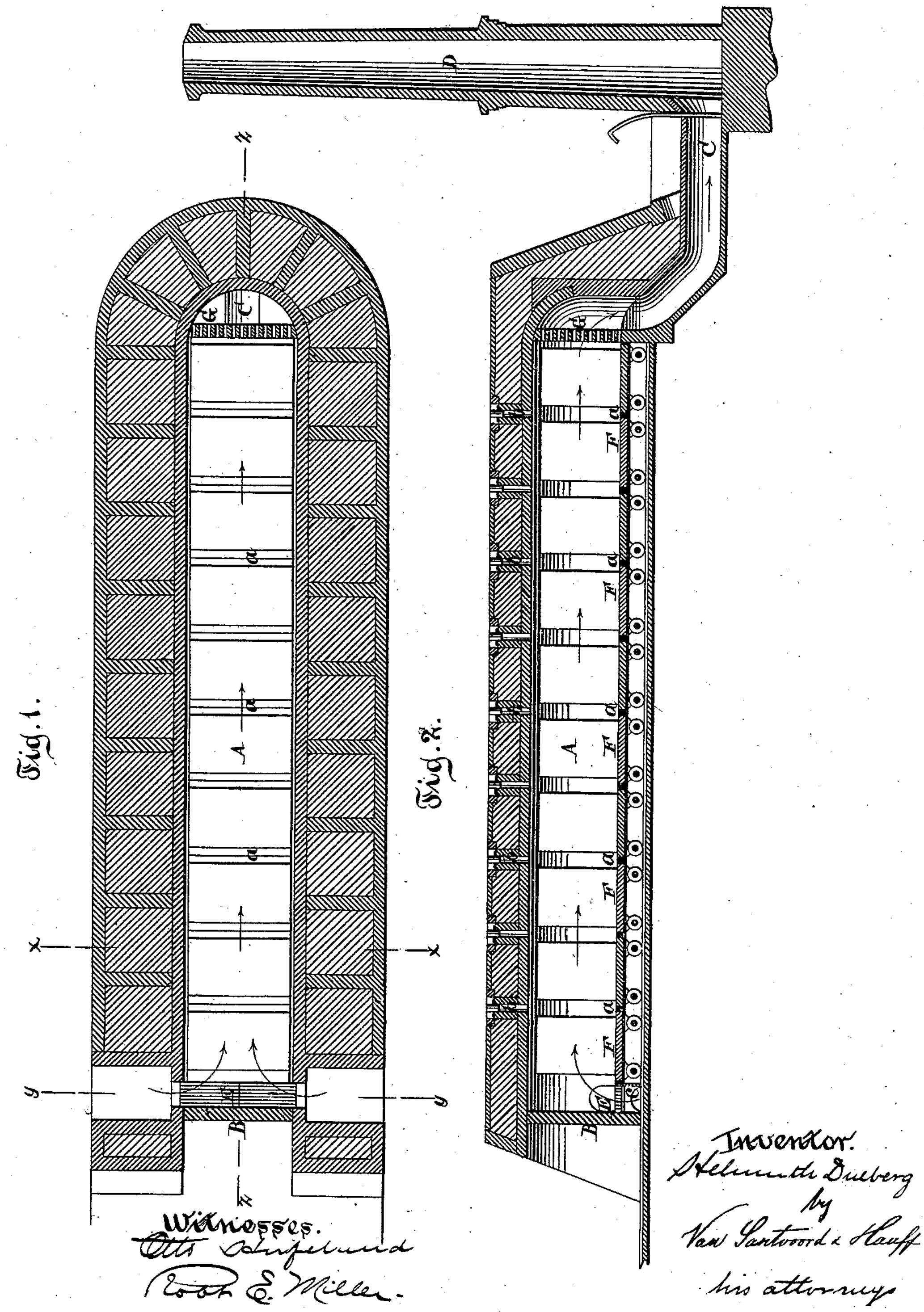
H. DUEBERG.

BRICK-KILN.

No. 187,109. Patented Feb. 6, 1877.



2 Sheets—Sheet 2.

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Fig. 3.

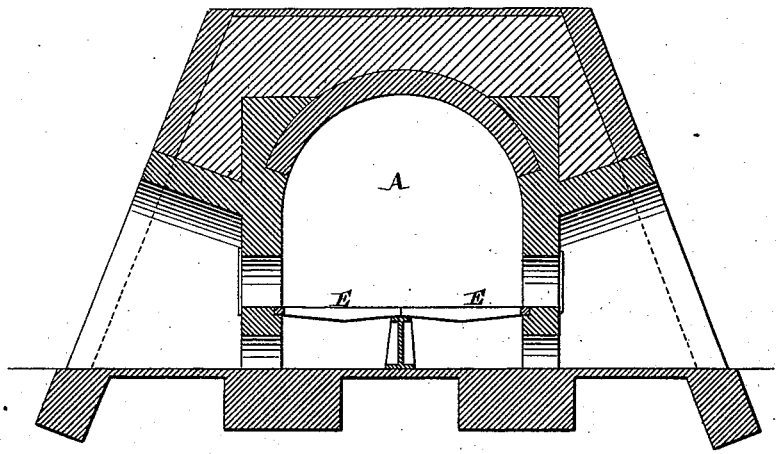


Fig. 5.

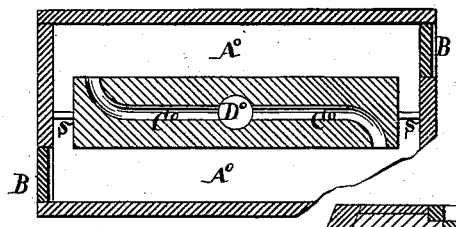
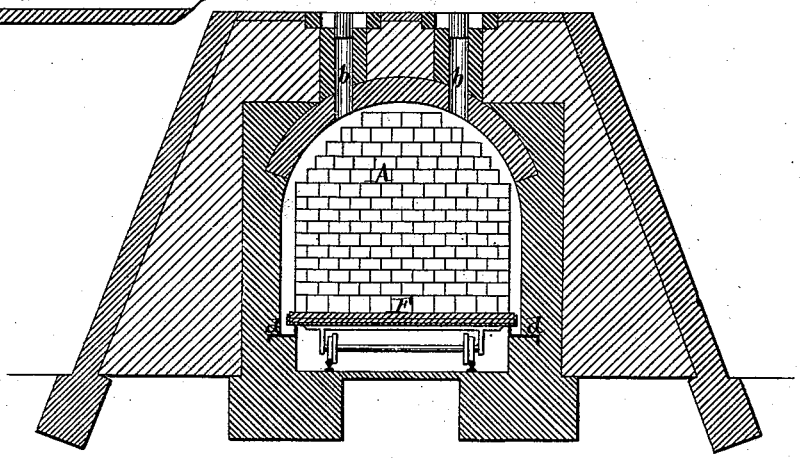


Fig. 4.



Witnesses.
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Robt. E. Miller.

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by
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UNITED STATES PATENT OFFICE.

HELMUTH DUEBERG, OF BERLIN, GERMANY.

IMPROVEMENT IN BRICK-KILNS.

Specification forming part of Letters Patent No. **187,109**, dated February 6, 1877; application filed December 26, 1876.

To all whom it may concern:

Be it known that I, HELMUTH DUEBERG, of Berlin, in the Empire of Germany, have invented a new and Improved Kiln for Burning Bricks and other Articles, which invention is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a sectional plan. Fig. 2 is a longitudinal vertical section in the plane *z z*, Fig. 1. Fig. 3 is a transverse vertical section in the plane *y y*, Fig. 1. Fig. 4 is a similar section in the plane *x x*, Fig. 1.

Similar letters indicate corresponding parts.

This invention relates to a kiln for burning bricks, pottery-ware, and other articles of a similar nature, the floor of which is made in sections, each section being supported by wheels, while the arch of said kiln is provided with fire-holes throughout its length, one end of the kiln being provided with a grate and with a temporary wall or shutter, so that by means of the movable floor-sections the operation of introducing the material to be burned and of removing the burned material is materially facilitated, and at the same time the process of burning can be effected with great economy in fuel.

Two systems of continuously-working kilns for burning bricks, pottery-ware, and other articles of a similar nature have heretofore been in use, one being that of E. Borrie, of Paris, France, which became known at the first Paris Exposition, in the year 1855, the other being that of Fred. E. Hoffmann, of Berlin, Prussia, known as "circular" or "progressive" kiln. Both systems have been modified since their first introduction in various ways, and have accordingly been designated by different names, with respect to their forms, as well as with respect to the manner of introducing the fuel into or applying the same to the kiln.

The principle of the Borrie kiln consists in placing the goods which are to be burned on cars and moving the latter through a stationary fire, while in the Hoffmann kiln the goods are stationary, the fire being made to progress through said goods, which are piled up in a continuous gallery. This latter system of kilns has been more successful in practice than the former, difficulties having arisen from the fact that the cars on which the goods are placed, while in motion, cannot be sufficiently protected against the fire, and that accidents preventing the movement of the cars are almost unavoidable during the process of burning; and, furthermore, the quality of the bricks burned in the Borrie kiln has not been satisfactory. It cannot be denied, however, that the Borrie system possesses one great advantage over all other kilns, which advantage consists in saving of labor in setting the goods to be burned, as well as in removing them from the kiln after burning, the goods being piled up directly on the cars, which go into the kiln, instead of being put on wheelbarrows, from which they must be taken off again in order to be set in the kiln, and in removing the goods from the kiln the same saving of labor is obtained in the Borrie system.

My kiln combines the advantages of the Hoffmann system—viz., great economy in fuel, good quality of burned goods, and safety in its operation—with the saving of labor effected by the Borrie system, and it can be constructed for continuous or for periodical operation.

In the drawing, the letter A designates the burning-chamber, which is closed at the top by an arch or any other suitable top. The floor of this burning-chamber is made in sections and movable, so that the goods to be burned can be piled thereon outside of the oven, and after the operation of burning has been completed, which is done while the floor-sections are at rest, said floor-sections can be drawn out of the kiln for the purpose of removing the burned goods. During the burning process, therefore, the floor-sections of the burning-chamber and the goods resting thereon are at rest, while the fire progresses in said chamber the same as in the system of Hoffmann. In order to make the floor of the burning-chamber movable, said floor is divided transversely in a series of sections or platforms, F, each from three to six feet in length, and supported by wheels resting on a railroad-track, which extends throughout the entire length of the burning-chamber, and continues on the outside of said chamber to the drying floor or sheds. Each of the floor-sections F, therefore, forms a platform-car, which can be moved along on the railroad-track, the same as in the kiln of Borrie.

The platform cars are loaded with the goods to be burned outside of the kiln, and they are, one after the other, pushed into the burning-chamber A. For this purpose said burning-chamber is left open at one end, and it is only closed during the burning process by a temporary wall, B. On the opposite end the burning-chamber is closed by a perforated wall, G, and it communicates through the perforations of this wall with the flue C and smoke-stack D. The goods to be burned are piled on the platform-cars F F, so that they nearly fill up the transverse section of the burning-chamber, without, however, touching the inside walls of said chamber. In pushing the cars into the burning-chamber, the joints between the sides of the platforms and the walls of the chamber are rendered tight by lutings *d d* of sand, or by other suitable means, and the joints *a a*, where the ends of the cars meet, are also rendered tight, which can be effected by coating the rear end of each platform with clay and pushing the next car close up against it. If the burning-chamber has thus been charged and closed air-tight at its bottom, a grate, E, is introduced next to the last car, and then the burning-chamber is closed by the temporary wall B.

On the grate E a fire is lighted, and after the goods on the first two or three platform-cars have been brought to a red heat, the fuel is introduced through the holes *b b* in the top of the burning-chamber. The distance between these holes in the direction of the length of the burning-chamber is equal to the length of the platforms F F, and between the goods piled upon two adjoining platforms a space from four to eight inches in width is left, in which the fuel introduced through the holes *b b* is consumed. The introduction of fuel must take place only through those holes *b b* where the goods below have already attained a red heat; consequently such introduction commences through the holes next to the grate E, and it advances as the heat in the burning-chamber progresses in the direction toward the smoke-stack. When the goods next the grate E have been completely burned, the fire on the grate is left to go down, and as the fire is advanced in the direction toward the smoke-stack it is stopped behind whenever the goods have been perfectly burned. The introduction of fuel from above is carried on simultaneously between two or more of the platforms. If the end of the burning-chamber has been reached, the introduction of fuel into the burning-chamber can be commenced. For this purpose the temporary wall B is removed, also the grate E, and the platform-cars with the burned goods are successively drawn out of the kiln, as the same have been sufficiently cooled to permit this operation. The platform of the car next the grate E is provided with an apron, *c*, best made of sheet metal, protected by fire-clay. In place of the temporary wall B, a simple shutter or slide may be used.

The grate E may be placed lower down than shown in the drawing—for instance, on a level with the railroad-track. In this case the necessity of removing the grate whenever the kiln is to be emptied will be avoided. Of course the ash-chamber must then be beneath the level of the railroad-track.

In order to extend this system on a continuous kiln, two burning-chambers, A° A°, will be placed side by side, Fig. 5, in opposite directions. The smoke-stack D° is common to both burning-chambers, and the heated air which passes off from the burning-chamber which is in operation, instead of being conducted through the flue C° to the smoke-stack, is passed through a gate, S, into the second burning-chamber, so that the grate E can be omitted.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the longitudinal burning-chamber A, having openings *b b* in its top for the introduction of fuel, the grate E and temporary removable partition B at one end of the burning-chamber, and a series of platform-cars, F, arranged for operation substantially as described.

2. The combination, with the burning-chamber A, the fuel-supply openings *b*, the grate E, and temporary partition B at one end of the burning-chamber, of the platform-cars F, forming a continuous brick-carrying floor to the burning-chamber, substantially as described.

This specification signed by me this 3d day of November, 1876.

HELMUTH DUEBERG. [L. S.]

Witnesses:
AUGUST ECKHART,
FRANZ LEHMANN.