

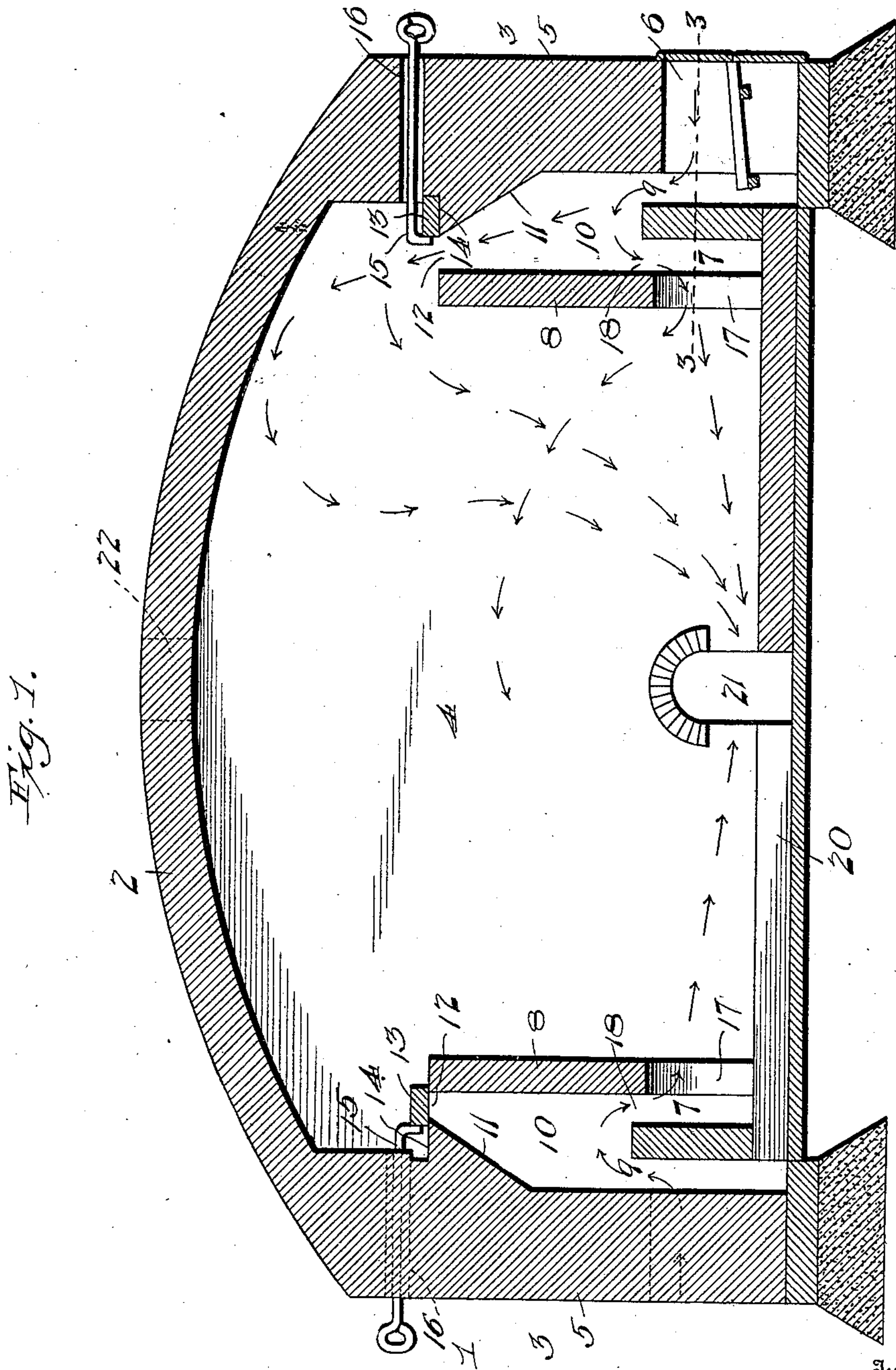
No. 885,954.

S. T. RAWLES.
BRICK KILN.

PATENTED APR. 28, 1908.

APPLICATION FILED APR. 27, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

SHERMAN T. RAWLES, OF GALESBURG, ILLINOIS.

BRICK-KILN.

No. 885,954.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SHERMAN T. RAWLES, a citizen of the United States, residing at Galesburg, in the county of Knox and State of Illinois, have invented certain new and useful Improvements in Brick-Kilns, of which the following is a specification.

This invention relates to that type of kiln for burning brick and other clay products embodying a structure which provides for what is termed in the art a combined and reversible up and down draft.

To this end, the invention primarily contemplates an improved construction of kiln, which in its usual operation, provides for a divided draft, the fire passing simultaneously through upper and lower flues, while at the same time, the smoke, sulfur and other impurities of the fuel are drawn off to a lower flue, and the lighter gases rise through an upper flue into the burning chamber and are diffused through the stock resulting in the radiation of the heat in all directions through the burning chamber and the production of a clean product, with a saving of labor, time, fuel and stock. In other words the result of the improved arrangement of walls, dampers, floor and flues, as contemplated by the present invention, produce a down draft, an up draft, a mixed draft and a divided draft, at the same time effecting a radiation of the heat in all directions throughout the burning chamber.

In many types of kilns as heretofore constructed, the same are provided with a solid flash wall only a few feet in height. Over this flash wall the fire passes upward to the crown of the kiln, and is then drawn downward through a perforated floor and escapes unchecked to the outlet flue. The result of such an arrangement is the wasting of a vast amount of heat, with a consequent greater fuel consumption, a greater length of time required for burning and a waste of stock. All of these objections are obviated by the improvements claimed herein.

With these and other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts herein-after more fully described, illustrated and claimed.

The essential features of the invention involved in carrying out the objects above indicated are necessarily susceptible to struc-

tural change without departing from the scope of the invention, a preferred embodiment of which is shown in the accompanying drawings, in which

Figure 1 is a vertical cross-sectional view of a kiln embodying the present invention. Fig. 2 is a sectional elevation of the kiln. Fig. 3 is a floor plan view of the kiln, the line of section being indicated by the line 3—3 of Fig. 1.

Like references designate corresponding parts in the several figures of the drawings.

In adapting the improvements claimed herein to kilns of the type for burning brick and other clay products, the usual form of the kiln is preserved, so for illustrative purposes, there is shown in the drawings a kiln body 1 of the down draft type having the usual crown 2, the outer front walls 3, and the interior burning chamber 4 within which are stacked the brick or other clay products to be burned.

One of the distinctive features of the present invention resides in equipping the kiln body along opposite sides thereof with a plurality of suitably spaced furnaces each of which includes in its general organization an outer wall section 5, a fire box 6 within said outer wall section, an upright baffle wall 7 and an interior upright flash wall 8. These several instrumentalities (5, 6, 7 and 8) are preferably integrated with the side wall structure of the kiln body, as plainly shown in Fig. 3 of the drawings, but referring particularly to said elements, it is to be observed that the fire box of each furnace embodies the conventional features of a fire chamber, a grate and an ash-pit, but the baffle wall 7 is interposed between the fire box grate and the flash wall, and is arranged in spaced relation from the grate and the front wall section 5. Also the said baffle wall is of a height slightly exceeding the height of the fire box so as to leave a fire passage 9 between the front wall section and the baffle wall, and through which passage the fire and other products of combustion pass into the main circulating flue 10 lying above the baffle wall and confined between the flash wall and the inner side of the front wall section. It will be noted that the said wall section is provided at its inner side with an inwardly deflected flue wall 11 which converges with the outer side of the flash wall to a point opposite the top of the latter, leaving at such point a top flue opening 12 adapted to be covered and un-

covered by a shiftable damper slab 13, normally resting on a shoulder supporting shelf 14 formed at the upper end of the flue wall portion 11 and adapted to be shifted over and from the top flue opening 12 by a hooked or equivalent operating rod 15 which is manipulated through a rod opening 16 provided in the kiln wall above each furnace.

The flash wall 8 of each furnace extends from the floor of the kiln body and is provided at and immediately above the floor and in the horizontal plane of the baffle wall 7 with an arch flue 17. The flash wall is extended upward several feet higher than the ordinary flash wall and in the interval between the same and the top of the baffle wall provides a bottom flue opening 18 for the main circulating flue 10. The floor of the kiln body is imperforate, but is provided with a main central longitudinal outlet flue 19 and with a plurality of open top, and open ended, lateral bed flues 20 providing communication between the arch flues in the flash walls and the said outlet flue 19.

In starting the kiln, the damper 13 should cover the top flue opening 12, thus causing the smoke, gas and current of fire to pass over baffle wall 7, through bottom flue opening 18, arch flue 17 of flash wall, lateral bed flues 20, and thence to outer air through main outlet flue 19. This secures a down draft, and if an up draft is desired, the outlet flue or escape opening 21, with which main outlet flue 19 communicates, may be closed, and the usual escape hole 22 in the crown of the kiln opened. In such case a direct up draft is provided, and at the proper time, the escape hole may be closed, the main outlet 21 opened, and the damper 13 removed from over the opening 12. Then the smoke, sulfur and other impurities will continue to pass over the baffle wall and through the flues 17, 20 and 19, while the lighter gases will arise to the top of the furnace, thus producing a divided draft. From both the upper and lower currents of fire, heat will be uniformly radiated throughout the stock, and the downwardly circulating current will meet

and intermingle with the upwardly circulating currents in the burning chamber, with the effect of equalizing the temperature throughout the entire kiln and produce a uniformly burned stock without waste.

What I claim is

1. In a combined up and down draft kiln, the kiln body having a plurality of furnaces each of which consists of an outer wall section having a fire box, an interior flash wall spaced from the outer wall section and forming with the same an intervening circulating flue having top and bottom flue openings respectively, means for covering and uncovering said top flue opening, and an upright baffle wall interposed between the flash wall and the fire box and projecting above the plane of the crown of the latter.

2. In a kiln of the class described, the kiln body having a floor provided with a central longitudinal outlet flue, and a plurality of open lateral bed flues communicating therewith, said flue body being further provided with a plurality of furnaces each comprising an outer wall section having a fire box and at its inner side formed with an inwardly deflected flue wall, an interior flash wall spaced from the outer wall section and forming with the same an intervening main circulating flue having top and bottom flue openings, said flash wall being provided at its lower end with an arch flue, an upright baffle wall interposed between and in spaced relation to the fire box and flash wall in the horizontal plane of the arch flue of the latter, said baffle wall projecting above the plane of the crown of the fire box, and a damper slab arranged for support by the flue wall portion of the outer wall section and adapted to be shifted over and from said top flue opening.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

SHERMAN T. RAWLES.

Witnesses:

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