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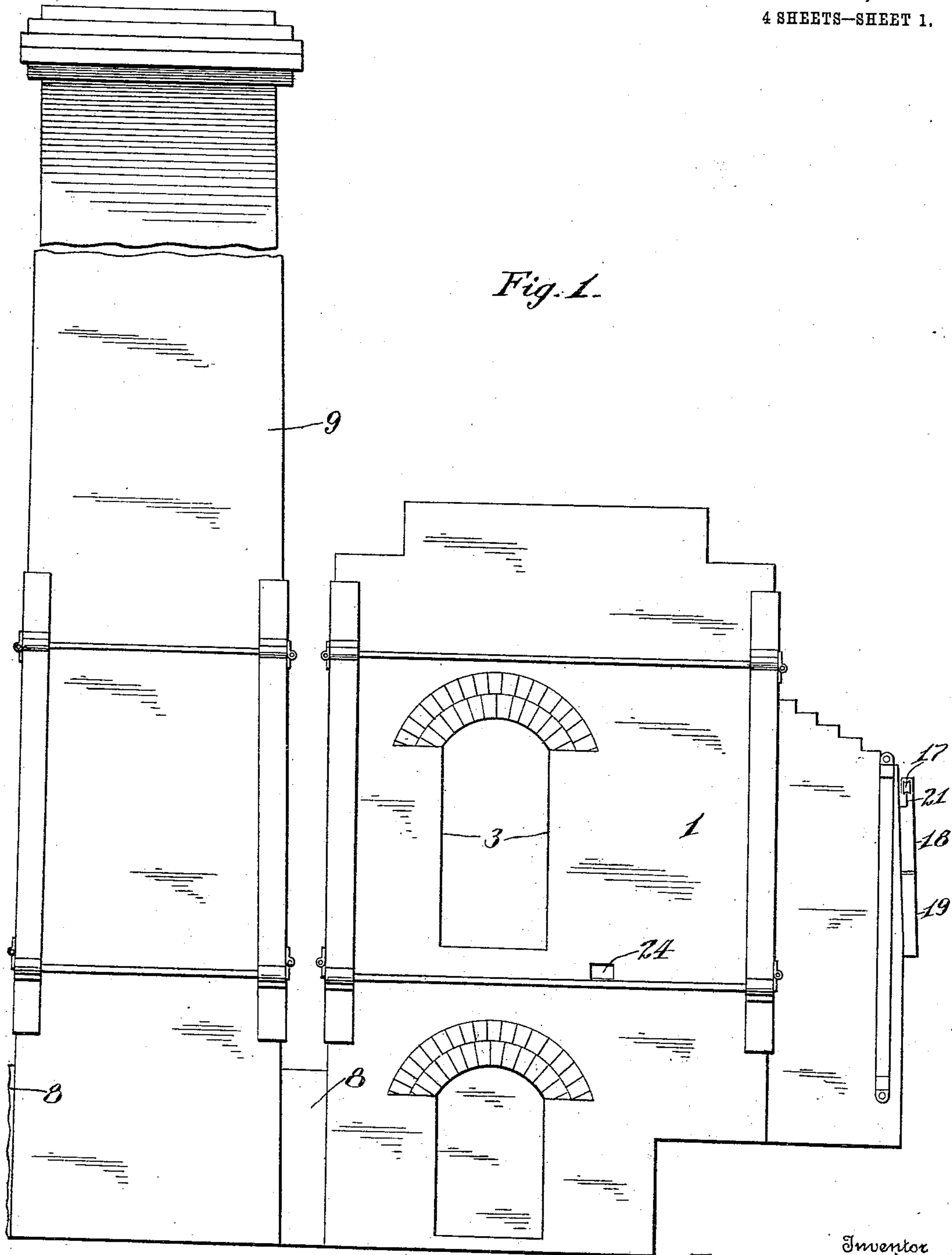
KILN.

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946,089.

Patented Jan. 11, 1910.

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

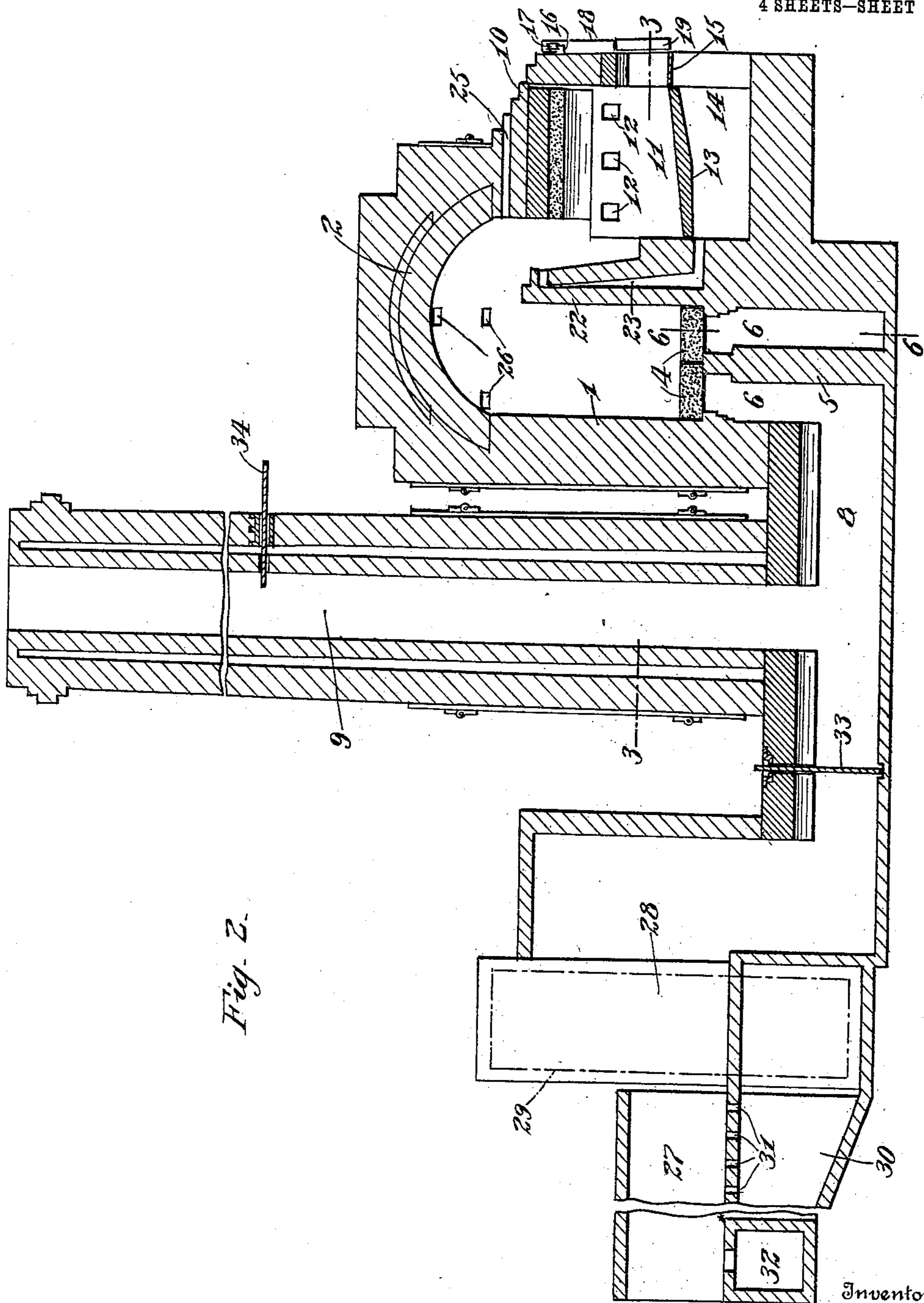


Fig. 2.

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4 SHEETS—SHEET 3.

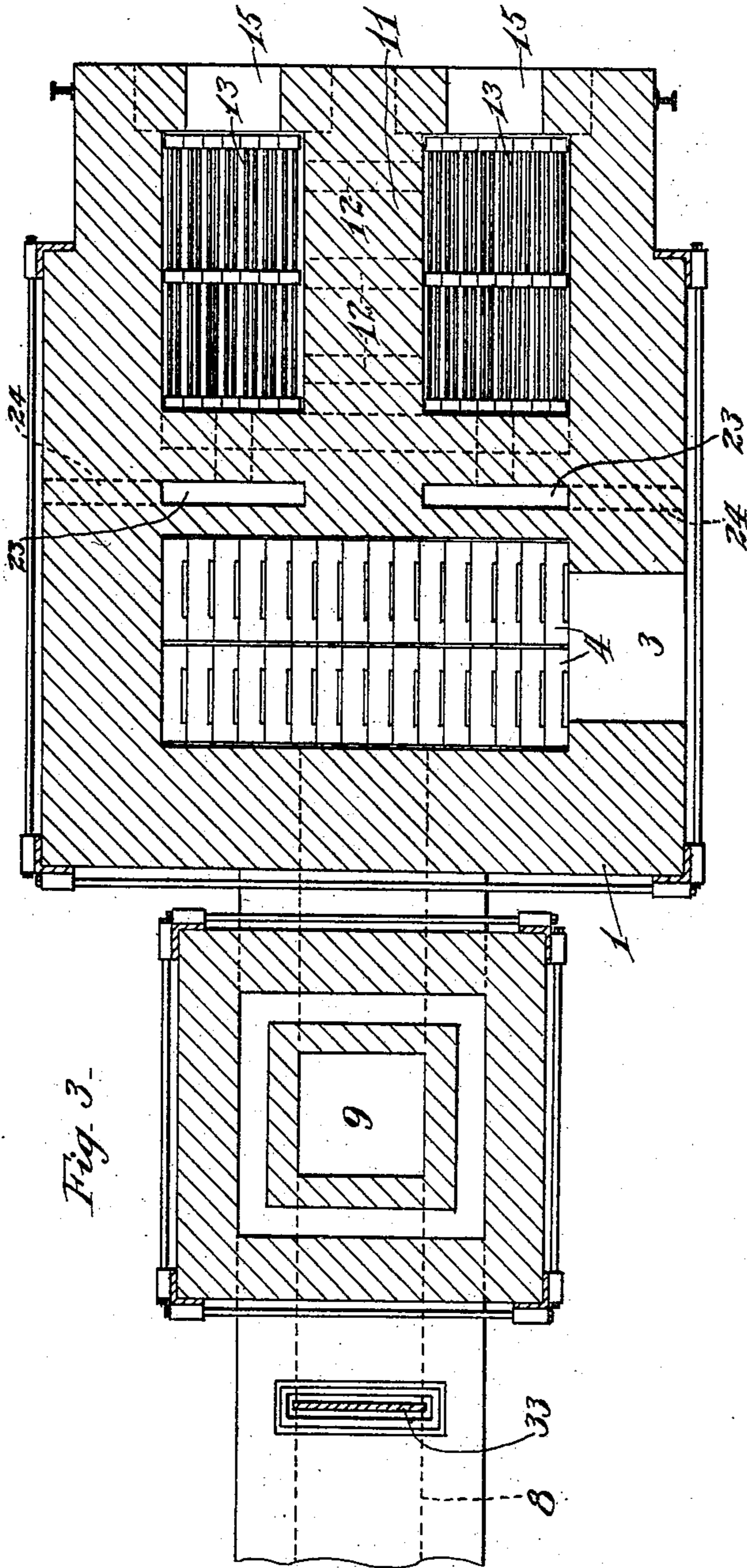


Fig. 3.

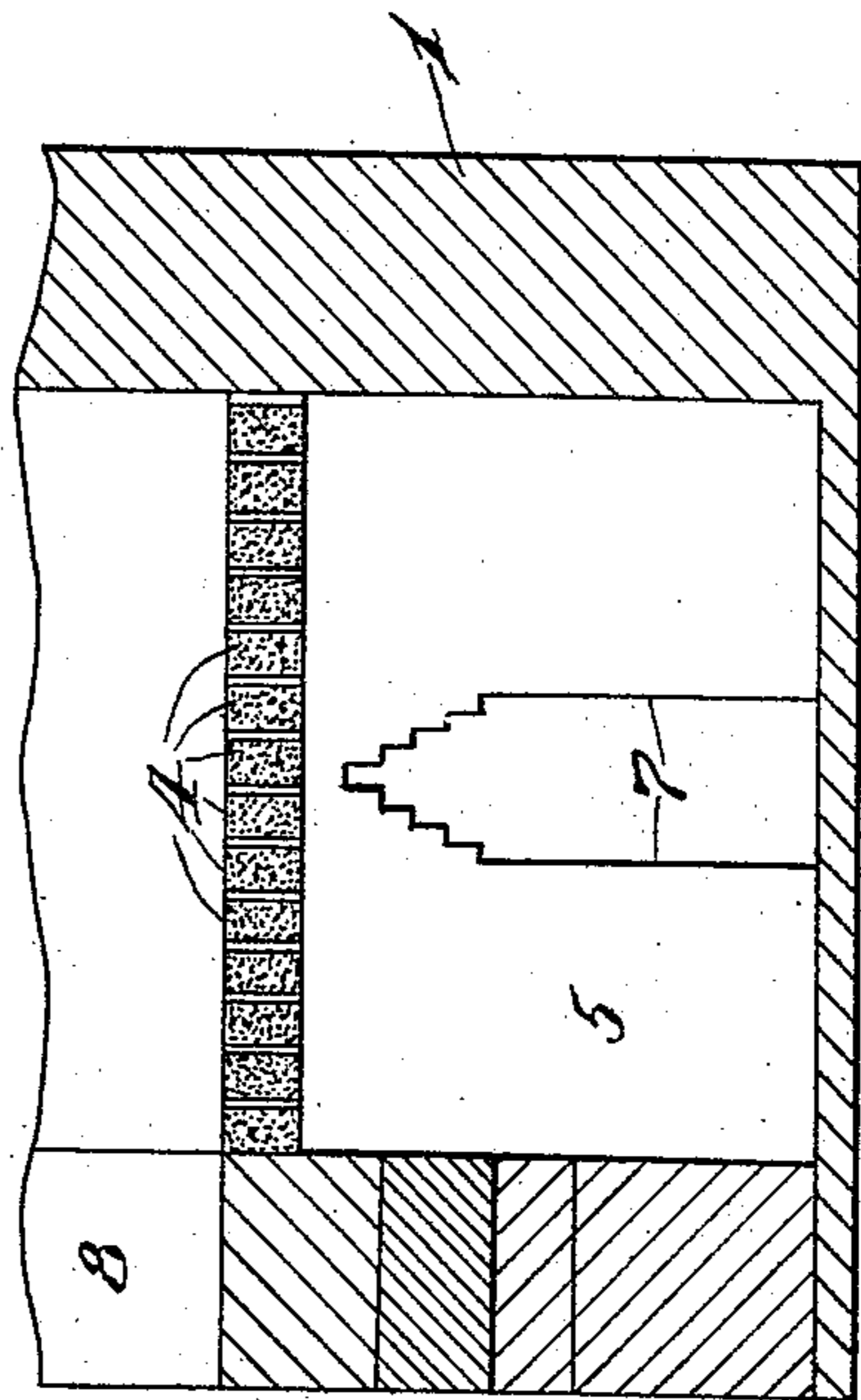


Fig. 6.

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4 SHEETS—SHEET 4.

Fig. 5.

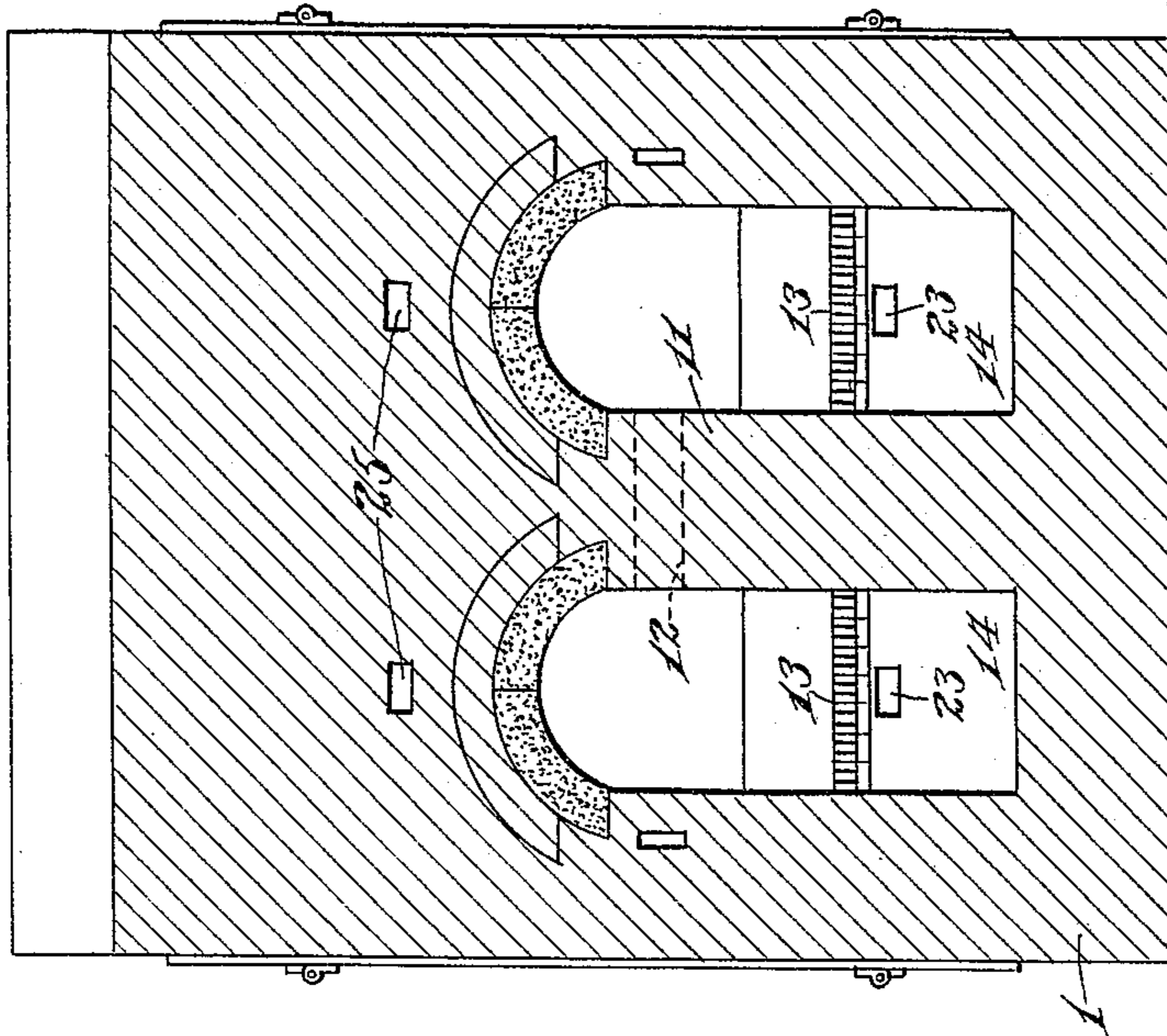
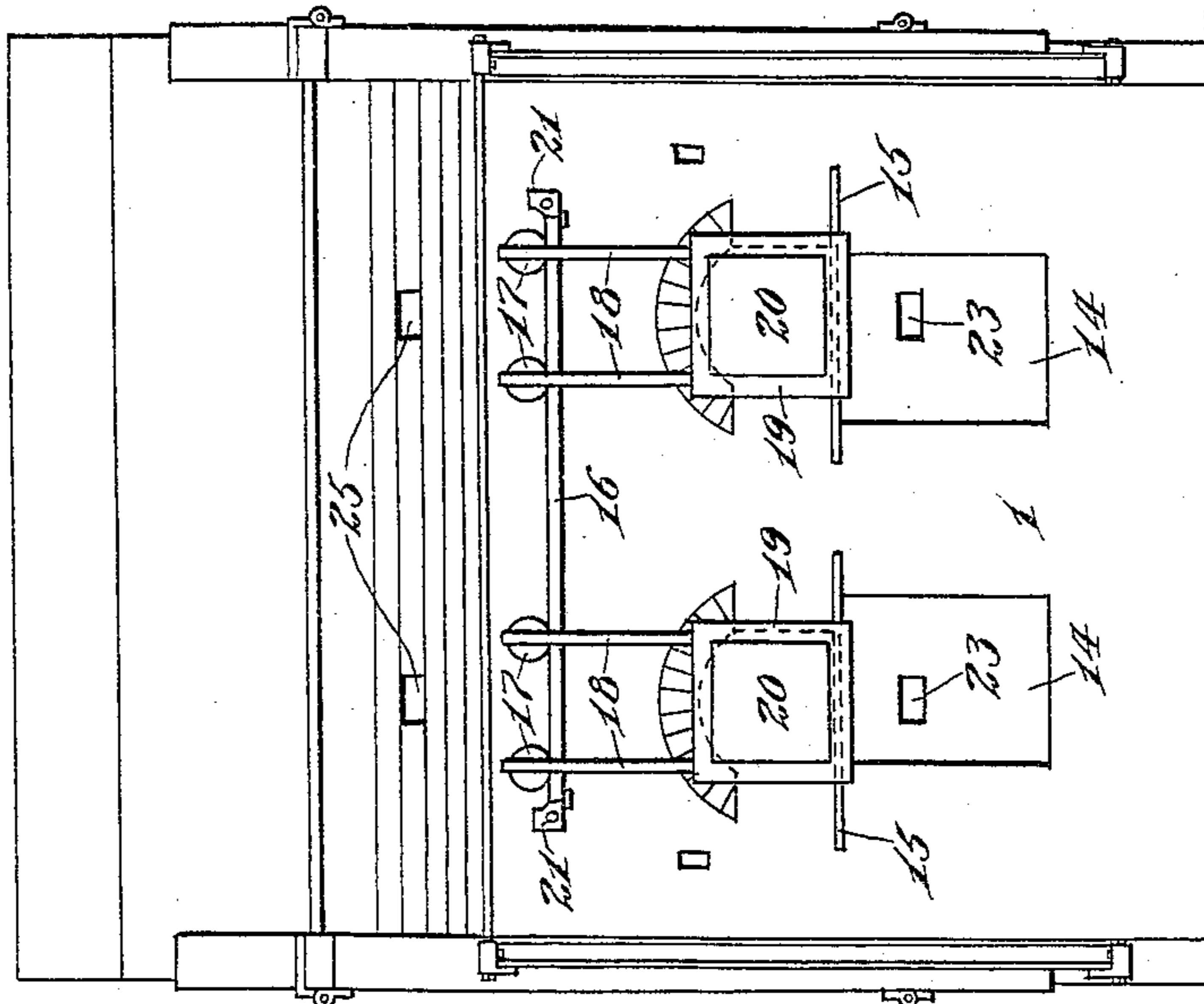


Fig. 4.



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UNITED STATES PATENT OFFICE.

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KILN.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, THOMAS M. WILSON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Kilns, of which the following is a specification.

My invention relates to improvements in kilns, and more particularly to a combined test kiln and auxiliary drier heating furnace, which is especially adapted for use in baking a small quantity of brick or other articles, to determine results before baking large quantities in larger kilns, and also provide improvements of this character which may be utilized as a heater or furnace for a drier, the heat from said kiln either being the waste heat, while the articles are cooled, or may be the smoke and gases direct from the kiln furnace.

A further object is to provide improvements of this character with an arrangement of dampers, by means of which the direction of flow of the smoke and gases may be directed either to a drier, or up through a stack.

A further object is to provide an improved construction of furnace, in which twin fire-boxes are employed, having communication with each other through openings in the dividing wall between them.

A further object is to provide an improved construction of furnace, employing twin fire-boxes, discharging their smoke and gases together over the bridge or flash wall, and doors for said fire-boxes, so mounted that but one door can be opened at a time, hence permitting but a single fire-box to be charged, and the smoke and gases resulting will be consumed by both of the fire-boxes, as they are in communication with each other through openings in the dividing wall between them.

A further object is to provide an improved construction of bridge wall, or flash wall, through which air is conveyed from the ashpits of the fire-boxes to a point near the top of the wall to aid in the combustion of the smoke and gases.

A further object is to provide an improved construction of bridge wall in which the outside air is admitted from the sides of the furnace to an interior duct in said wall, to also aid in the combustion of the smoke and gases.

With these and other objects in view, the invention consists in certain novel features of construction, and combinations, and arrangements of parts as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1, is a view in side elevation illustrating my improvements. Fig. 2, is a view in vertical section showing the connection of the kiln with a drier channel. Fig. 3, is a view in horizontal section on the line 3—3 of Fig. 2. Fig. 4, is a view in elevation of the end of the kiln. Fig. 5, is a view in vertical section through the fire-boxes, and Fig. 6, is a fragmentary view in section on the line 6—6 of Fig. 2.

1 represents the vertical walls of the kiln, which latter is preferably of rectangular form, and closed by an arch 2 sprung across the top thereof, and one end wall of the kiln is made with an opening 3 to afford an entrance and exit to the kiln chamber, which opening is, of course, to be sealed during the baking operation.

The kiln chamber is provided with a floor 4, of brick, having spaces between them for the passage of smoke and gases, and said bricks are supported upon a chord 5, separating parallel longitudinal flues 6 below the floor 4. The chord 5 is made with a central opening 7 connecting flues 6, said opening being in line with an arched flue 8, the latter communicating with the stack 9.

That portion of the furnace which I term the front, is built out as shown at 10 to accommodate my improved furnace, which latter comprises two fire-boxes, the upper portion of which being arched as shown, and having a division wall 11 between them, in which latter a series of openings or passages 12 are provided, so that the smoke and gases from one fire-box can pass through the partition into the other, as will more fully hereinafter appear. Both of these fire-boxes are provided with grates 13 separating the fire-boxes from ashpits 14 below. The partition wall 11, it will be observed, as shown most clearly in Fig. 2, projects inwardly beyond the upper walls of the fire-boxes, so as to more effectually separate the fires in the boxes, except at the openings or passages 12, thus compelling the gases from a freshly charged fire-box to pass directly over the fire in the other box, and not escape directly into the baking chamber.

In constructing the fuel openings for the fire-boxes, it is desirable that these openings shall be of a size smaller than are the ashpit openings, and to support the wall, metal plates 15 are embedded in the wall at the juncture of said openings as clearly shown in Fig. 4.

A track bar 16 is secured to the front wall of the kiln, and rollers 17 are adapted to run on this track bar 16, and support hangers 18, to which latter metal frames 19 are secured and support fire brick doors 20. The track bar 16 is provided at its ends with stops 21, which limit the movement of the doors and prevent them being opened except when moved to a point between the fire-boxes, and as this space between the fire-boxes is only sufficient to accommodate a single door, it is apparent that but one door can be opened at a time, and hence but one box can be charged at a time, which is an object which I desire to attain.

22, represents a bridge wall which extends throughout the length of the kiln in front of the fire-boxes, and is provided with ducts 23, extending from a point below the grates 13, up to a point near the upper edge of the wall, where they communicate with the space between the wall and the fire-boxes, compelling the air admitted through said ducts to commingle with the smoke and gases and aid combustion. Ports 24 in the sides of the kiln also communicate with the said ducts 23, and are located in the same horizontal plane as is the entrance to said ducts from the ashpits, to bring the outside air in the duct and create a greater draft therein.

Peep holes 25, are provided in the front wall in line with a point just above the bridge wall, so as to view the smoke and gases passing over the wall, and similar peep holes 26 are provided in the side walls of the kiln to permit an operator to observe the contents of the kiln.

27 represents a drier tunnel, such as ordinarily in use, adapted to contain a train of cars supporting the moist brick or articles for drying before passing into the kiln.

The flue 8 extends past the stack 9, and communicates with a suction chamber 28, in which a fan or blower 29 is mounted, and is adapted to direct the heat into a feeder duct 30. This duct 30 communicates with the floor of the tunnel 27, by means of a series of perforations 31, a suitable duct 32 being provided at the other end of the tunnel to carry off the heat.

A damper 33 is provided in the flue 8, and a damper 34 is provided in the stack 9, which dampers may be moved to regulate the passage of the smoke and gases as will now be explained.

In operation, the bricks or other articles to be baked are piled upon the floor 4, and

the entrance 3 thoroughly sealed. Fire is started in one of the fire-boxes, and when well under way, fire is started in the other fire-box, the smoke from the last started fire-box passing through the passages 12, into the other fire-box, and being consumed by the more highly heated combustion in the latter. This is especially true when charging with soft coal, for as each shovel of coal is thrown into a fire-box, there is an explosion of the gases, and the passages 12 will permit this exploding gas to pass into the more highly heated fire-box, and be consumed, whereas, it would most probably have been wasted if not so consumed. It will also be observed that by mounting the doors over the fire-boxes as above explained, it is quite impossible to charge but a single furnace at a time, as but one door can be opened at a time, which obviates the careless methods of workmen. The smoke and gases escaping from the fire-box pass over the bridge wall 22, where it commingles with the air entering through the ducts 23, to aid the combustion, and provide the maximum of heat for the articles in the kiln. The smoke and gases then pass down between the articles through the floor 4 into the flues 5, and from thence into the flue 8. If the kiln is not being employed as a heater for the drier, the damper 33 will be closed, while the damper 34 will be opened, so that the smoke and gases will escape up through the stack 9. If the drier is being heated by the kiln, the damper 34 will be closed and the damper 33 will be opened. The smoke and gases cannot then escape through the stack, and must pass through the flue 8 into the suction chamber 28, where the fan 29 blows the smoke and gases through the drier tunnels 27, and out the duct 32, thoroughly utilizing the heat in the drier.

When the furnace is to be cooled, the damper 33 will be opened, and the fan will be utilized to draw the heat from the kiln through the drier.

A great many slight changes might be made in the general form and arrangement of parts described without departing from my invention, and hence I do not restrict myself to the precise details set forth, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a kiln, the combination with a baking chamber, of an open work floor in said chamber, parallel flues below the floor, a chord extending from end to end of the kiln, separating said flues, supporting the floor, and having an opening midway its ends connecting said flues, a drier, a flue at right angles to the first mentioned flues, and con-

necting the drier with said first mentioned flues, and located in line with the opening in the chord, and a stack on said flue connecting the drier and kiln.

5 2. In a kiln, the combination with a baking chamber, of twin fire-boxes located in the wall of said chamber, a bridge wall inside the baking chamber and across the fire-boxes, and spaced therefrom, a partition
10 wall between said fire-boxes projecting inwardly beyond the upper portions of the fire-boxes, but terminating short of the bridge wall, and having an opening or passage connecting the fire-boxes.

15 3. In a kiln, the combination with a pair of twin fire-boxes, of a partition wall dividing said fire-boxes, said partition wall extending inwardly beyond the upper wall of the fire-boxes, and said division wall having a series of openings connecting the fire-boxes, and a bridge wall in front of said
20 fire-boxes spaced from the inner end of said division wall, and forming a space at the end of the fire-boxes into which the said division wall extends.

4. In a kiln, the combination with a baking chamber, of a pair of twin fire-boxes in the wall of said chamber, a partition wall dividing said fire-boxes and having a series
30 of perforations or passages connecting the fire-boxes, and said partition wall projecting inwardly beyond the upper wall of the fire-boxes, grates below the fire-boxes separating them from ashpits below, a bridge
35 wall within the baking chamber spaced from the inner end of the division wall and in front of the fire-boxes, and said bridge wall having a duct communicating at one end with an ashpit, and at its other end with the

baking chamber on the side of the bridge 40 wall adjacent to the fire-boxes.

5. In a kiln, the combination with a baking chamber, of a pair of twin fire-boxes in the wall of said chamber, a partition wall dividing said fire-boxes, and having a series 45 of perforations or passages connecting the fire-boxes, and said partition wall projecting inwardly beyond the upper wall of the fire-boxes, grates below the fire-boxes separating them from ashpits below, a bridge 50 wall within the baking chamber spaced from the inner end of the division wall and in front of the fire-boxes, and said bridge wall having a duct communicating at one end with an ashpit, and at its other end with the 55 baking chamber on the side of the bridge wall adjacent the fire-boxes, and ports in the side walls of the furnace communicating with said duct.

6. In combination with a drier, a kiln, a 60 flue connecting the kiln and drier, a stack communicating with said flue, a damper in said stack, a damper in said flue between the stack and drier, twin fire-boxes in the wall of the kiln farthest removed from the said 65 flue, a bridge wall in front of the fire-boxes, a perforated floor in said kiln, and a longitudinal chord below said floor forming longitudinal flues, said chord having an opening in line with said first mentioned flue. 70

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS M. WILSON.

Witnesses:

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