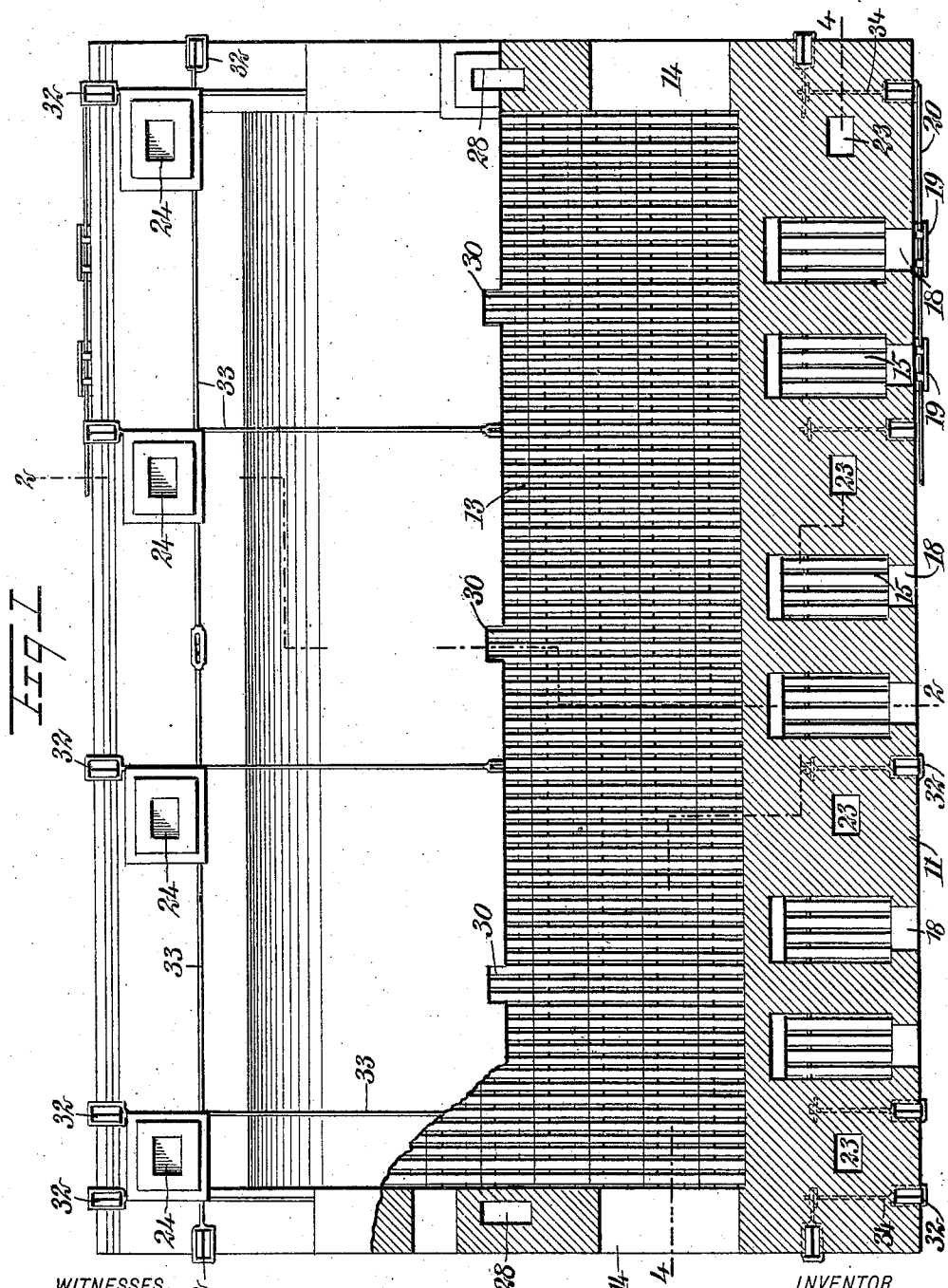
No. 850,066. PATENTED APR. 9, 1907.

J. A. SHUMAKER.

KILN.

APPLICATION FILED OCT. 10, 1906.

4 SHEETS—SHEET 1.




WITNESSES

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4 SHEETS—SHEET 2.

Fig 2

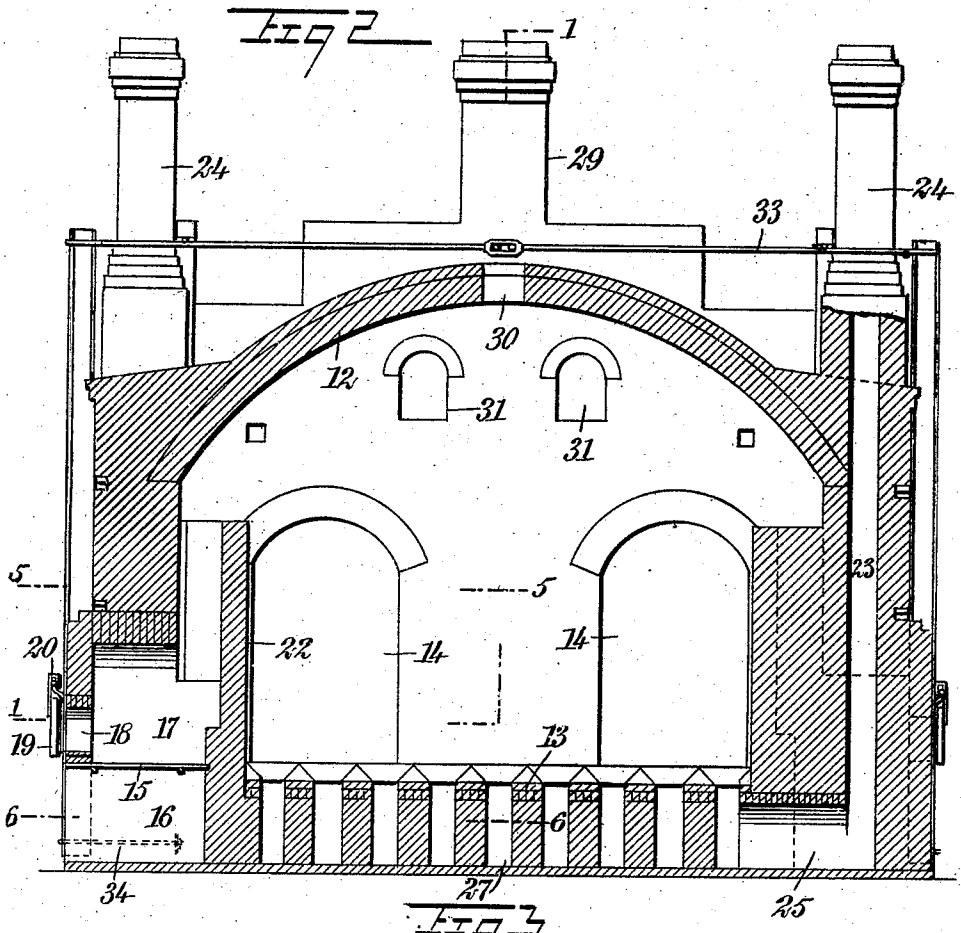
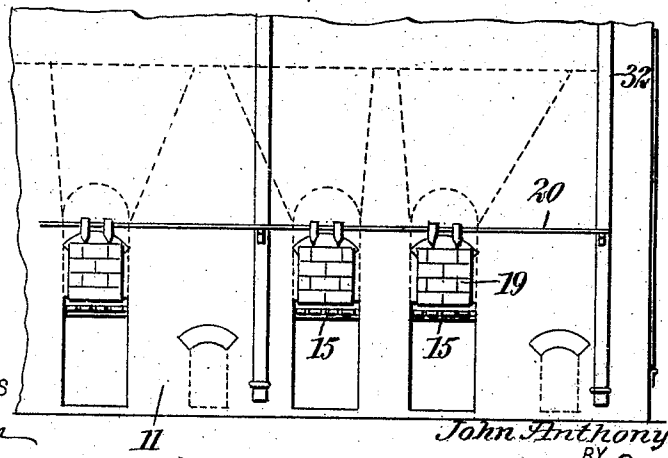



Fig 3

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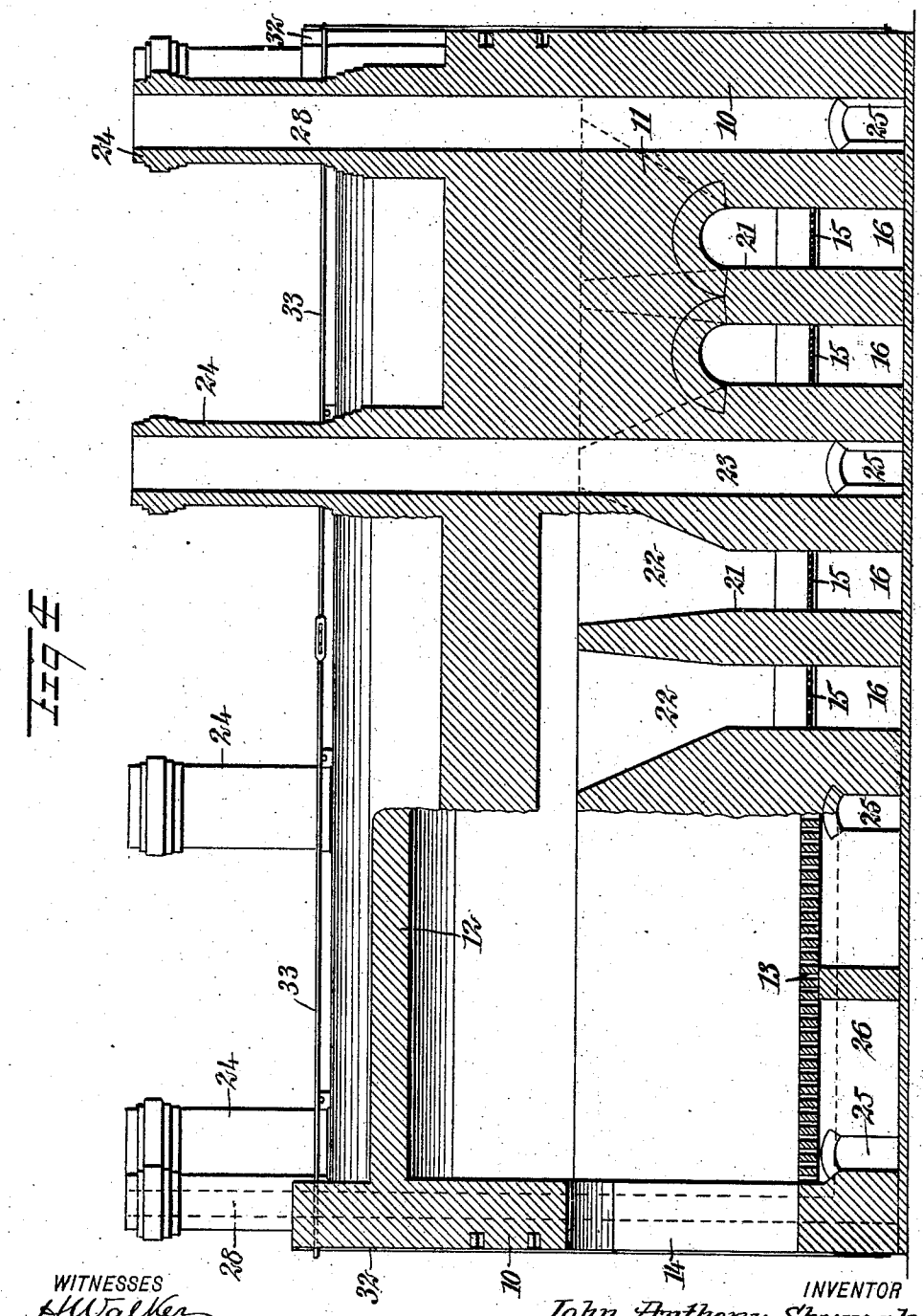


Fig. 3.

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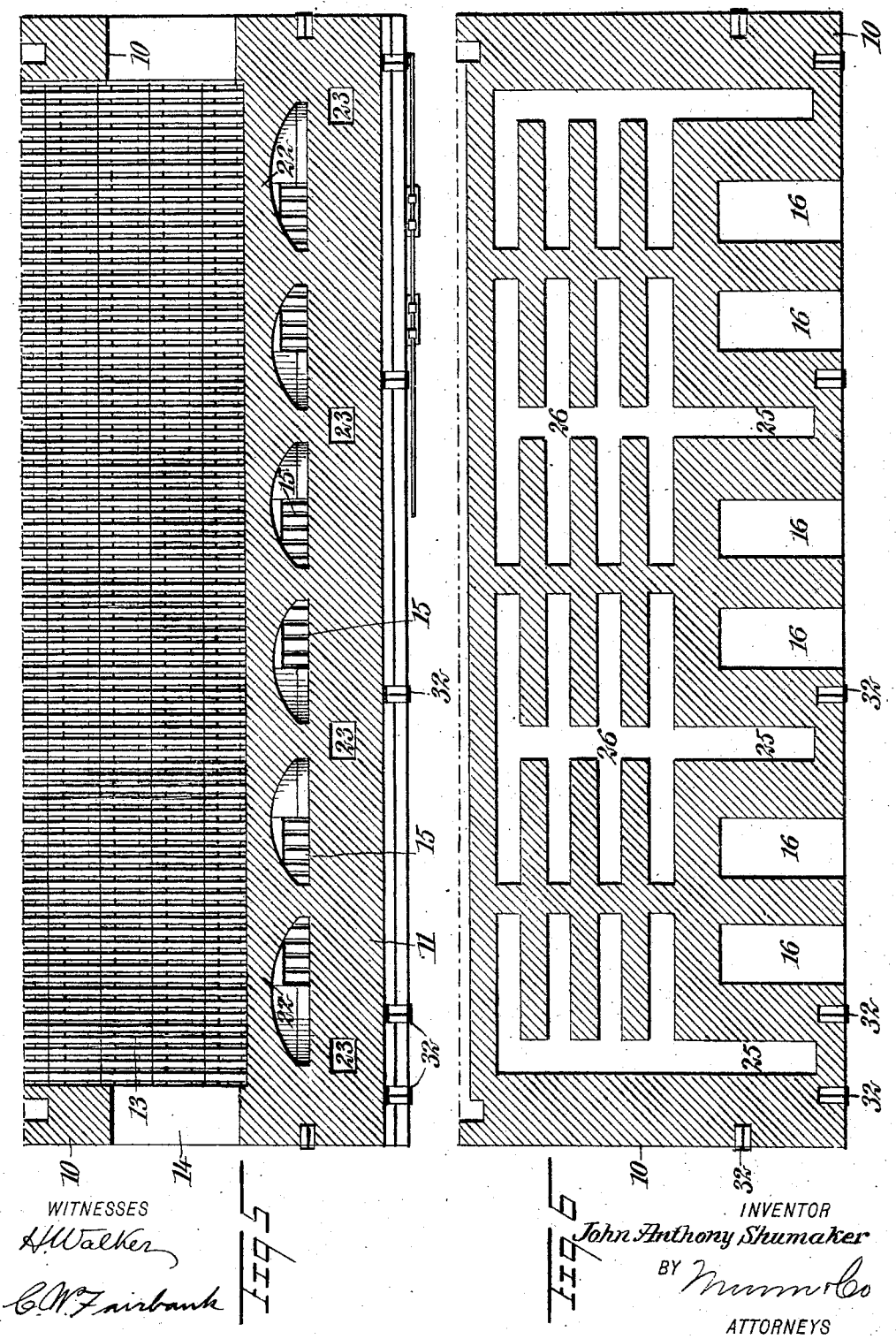


FIG 5

FIG 6

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# UNITED STATES PATENT OFFICE.

JOHN ANTHONY SHUMAKER, OF HYNDMAN, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO GEORGE WILLIAM BRINHAM AND ONE-THIRD TO NORMAN REUBEN SHUMAKER, BOTH OF HYNDMAN, PENNSYLVANIA.

## KILN.

No. 850,066. Specification of Letters Patent. Patented April 9, 1907.

Application filed October 10, 1906. Serial No. 338,264.

*To all whom it may concern:*

Be it known that I, JOHN ANTHONY SHUMAKER, a citizen of the United States, and a resident of Hyndman, in the county of Bedford and State of Pennsylvania, have invented a new and Improved Kiln, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in kilns, particularly kilns for burning brick; and the object of the invention is to provide certain improvements, specially in connection with the fire-box, whereby one part of the fire only may be maintained, while the other portion of the fire-box may be cleaned. By this construction a great saving in the volume of heat for the kiln is accomplished at all times, as well as the stopping of the volume of cold air entering the kiln, which latter is very detrimental to the hot brick.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, in which—

Figure 1 is a plan view of my improved kiln, a portion thereof being broken away on the line 1 1 of Fig. 2. Fig. 2 is a vertical cross-section taken on the line 2 2 of Fig. 1. Fig. 3 is a side elevation of a portion of the kiln, showing the doors for the fire-boxes. Fig. 4 is a vertical longitudinal section on the line 4 4 of Fig. 1. Fig. 5 is a cross-section of one-half of the kiln, said section being taken on the line 5 5 of Fig. 2; and Fig. 6 is a view similar to Fig. 5, but taken on the line 6 6 of Fig. 2.

My improved kiln comprises the customary end walls 10, side walls 11, arched dome 12, and brick-supporting grates 13. The end walls are provided with passages 14, through which the employees may enter to place the bricks within the kiln and to remove them therefrom, and the fire-boxes are arranged along the side walls. The fire-boxes are arranged in pairs, as clearly shown in the drawings, and each fire-box comprises a grate 15, supporting the combustible material and separating the chamber into the ash-pit 16 and the fire-space 17. The latter is provided with an opening 18, extending through the wall of the kiln, and suitable doors 19 are provided on the outside and slidable on a suitable track 20 to close the entrance-openings 18 to the fire-boxes. The two adjacent fire-boxes are completely separated by a vertical partition 21, which also serves to separate the flues leading from said fire-boxes, and each of the fire-boxes has a separate and independent arched top, which is of a length equal to the thickness of the side wall. Back of the fire-boxes is the vertical bag-wall 22, extending upward to a point adjacent the base of the arched dome 12 and provided with flues, one for each furnace, arched away from the furnaces, as shown in Fig. 5. The flues have flaring sides, so that from the fire-boxes they increase in cross-sectional area toward their upper ends, and the said flues have one side flared more than the other, as clearly shown in Figs. 3 and 4.

The furnaces project only a short distance beyond the outer faces of the side walls, and the grates thereof extend to the wall 22. By this construction the passage of the heat into the kiln is greatly increased, permitting the kiln to be burned in much less time. This construction also relieves the arch of the furnace of excessive heat.

Intermediate each pair of fire-boxes is arranged a vertical passage 23 within the side wall 11, and each of these passages terminate at its upper end in a suitable chimney 24, which serves to facilitate the draft. The lower end of each passage 23 communicates with a lateral passage 25, leading into the body of the kiln below the brick-supporting floor 13 and permitting the escape of the air which passes downward through the bricks into the network of passages 26. A central longitudinal flue 27 beneath the floor of the brick-chamber communicates with flues 28 in the end walls of the chamber, and each of these flues terminates in a chimney 29. The arched dome 12 of the brick-chamber is provided with a plurality of vents 30 along the medial line, and each end may, if desired, be provided with vents 31 adjacent the upper edge thereof. The entire structure is braced and held rigid by a plurality of bars 32, preferably I-beams, which are embedded in the outer surface of the walls and extend upward to a point a short distance above the top of the arched dome, at which point the opposite pairs of beams are connected by tie-rods 33.

The vertical bracing-beams may be held in place at their lower ends in any suitable manner, but preferably by anchoring-bars 34, the inner ends of which are embedded in the base of the wall of the kiln.

As it is often necessary in the burning of a kiln of brick to rebuild the fires in the various fire-boxes, and as cold air rushes into the kiln during this operation, it is advantageous to only rebuild a small portion of the total fire at any one time. In my improved kiln each fire-box is subdivided by a partition 21 into two parts, whereby a fire may be maintained in one of the parts even though it is extinguished in the other part. The fires may be rebuilt in two parts separately and independently and a constant delivery of hot gas maintained at all times. By providing the fire-boxes with subdividing-partitions and also subdividing the flues leading from said fire-boxes and by diverging the upper end of these flues an even and continuous heating effect may be maintained until the bricks are thoroughly fired. The partition in each fire-box also serves to brace the bag-wall 22 from the outer side wall, and the spacing-partition also serves to greatly strengthen the main wall and permits of the building of a thinner wall than is possible when a single arch is employed to span the fire-boxes.

By arching the flues of the bag-wall away from the furnaces warping of the flues and preventing them from being drawn toward the furnaces by the heat thereof is effectually prevented and without the use of stays commonly employed for this purpose and which obstruct the passage of the hot gases to the kiln. The flaring of the flues facilitate the escape of the hot gases from the furnaces to the kiln and also insures the delivery of the gases evenly to the kiln. By flaring the flues on one side more than the other provision is made for spacing the flues having enlarged upper ends equally apart throughout the length of the bag-wall.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination with a kiln, and furnaces in the side walls of the kiln, of a bag-wall at the inner face of the side wall and having vertical flues arched away from the furnaces.

2. The combination with a kiln and furnaces in the side walls of the kiln, of a bag-wall at the inner face of the side wall and having vertical flues, said flues being arched from the furnaces and of gradually-increasing cross-sectional area.

3. The combination with a kiln, and furnaces in the side walls of the kiln, of a bag-wall at the inner face of the side walls and having a vertical flue for each furnace, said flues being arched from the furnaces and flared outwardly at the sides, one side being flared more than the other.

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

JOHN ANTHONY SHUMAKER.

Witnesses:
A. J. HILLEGASS,
GEORGE E. FISKE.