T. M. WILSON.

KILN.

APPLICATION FILED SEPT. 2, 1909.

952,777.

Patented Mar. 22, 1910.

5 SHEETS—SHEET 1.

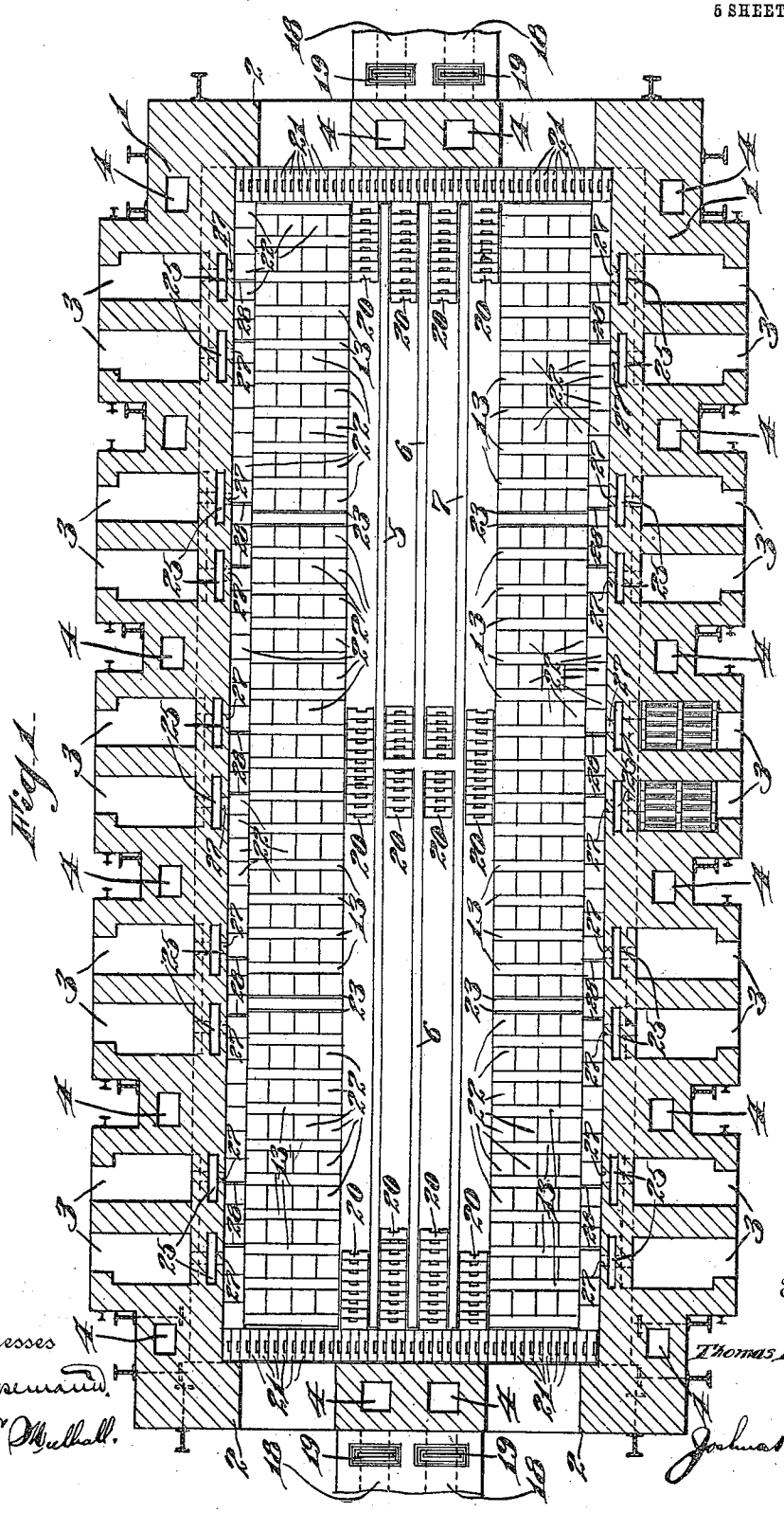

Fig. 1.

Witnesses

Thos. Rosemund.

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5 SHEETS—SHEET 2.

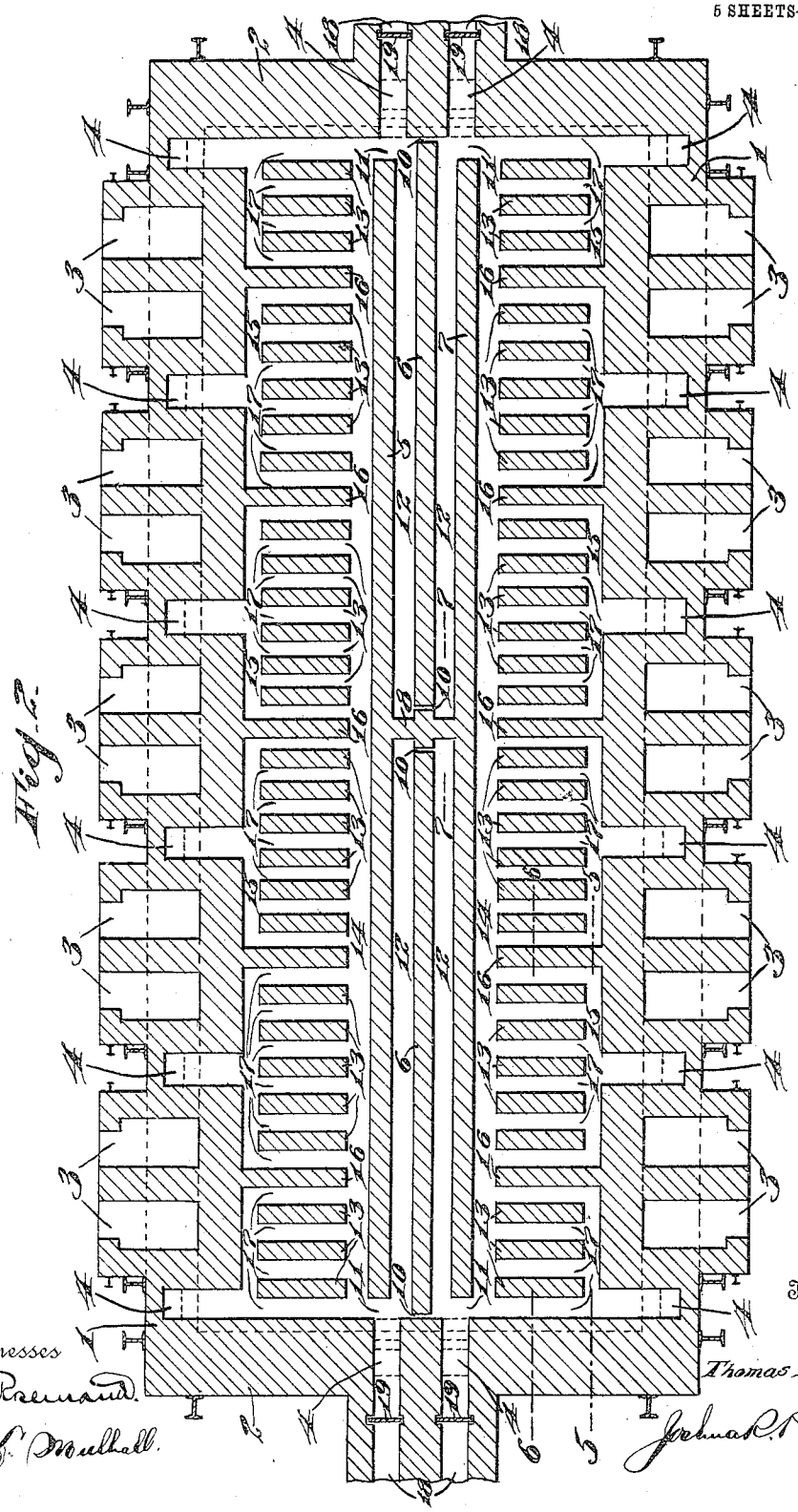

Fig. 2.

Witnesses

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5 SHEETS—SHEET 3.

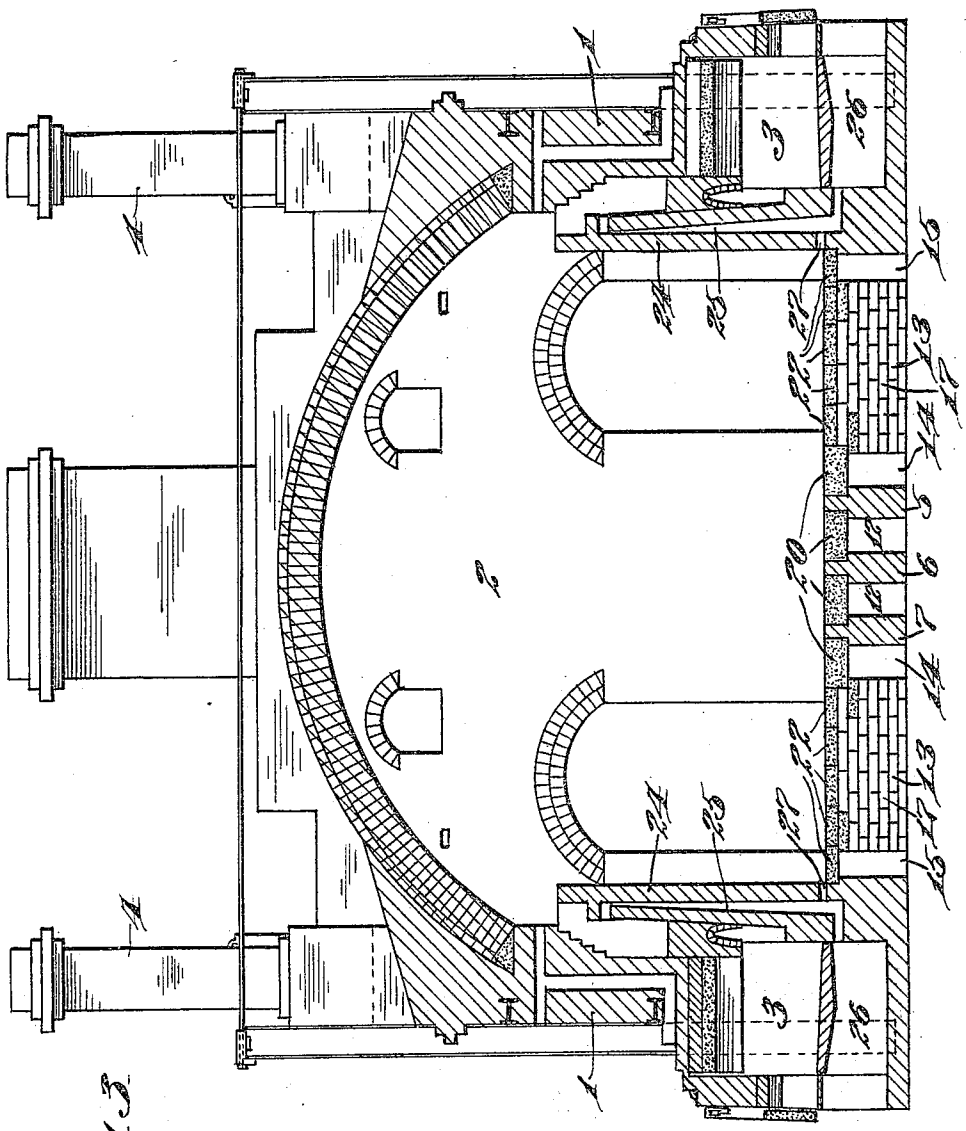

Fig. 3.

Witnesses
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5 SHEETS—SHEET 4.

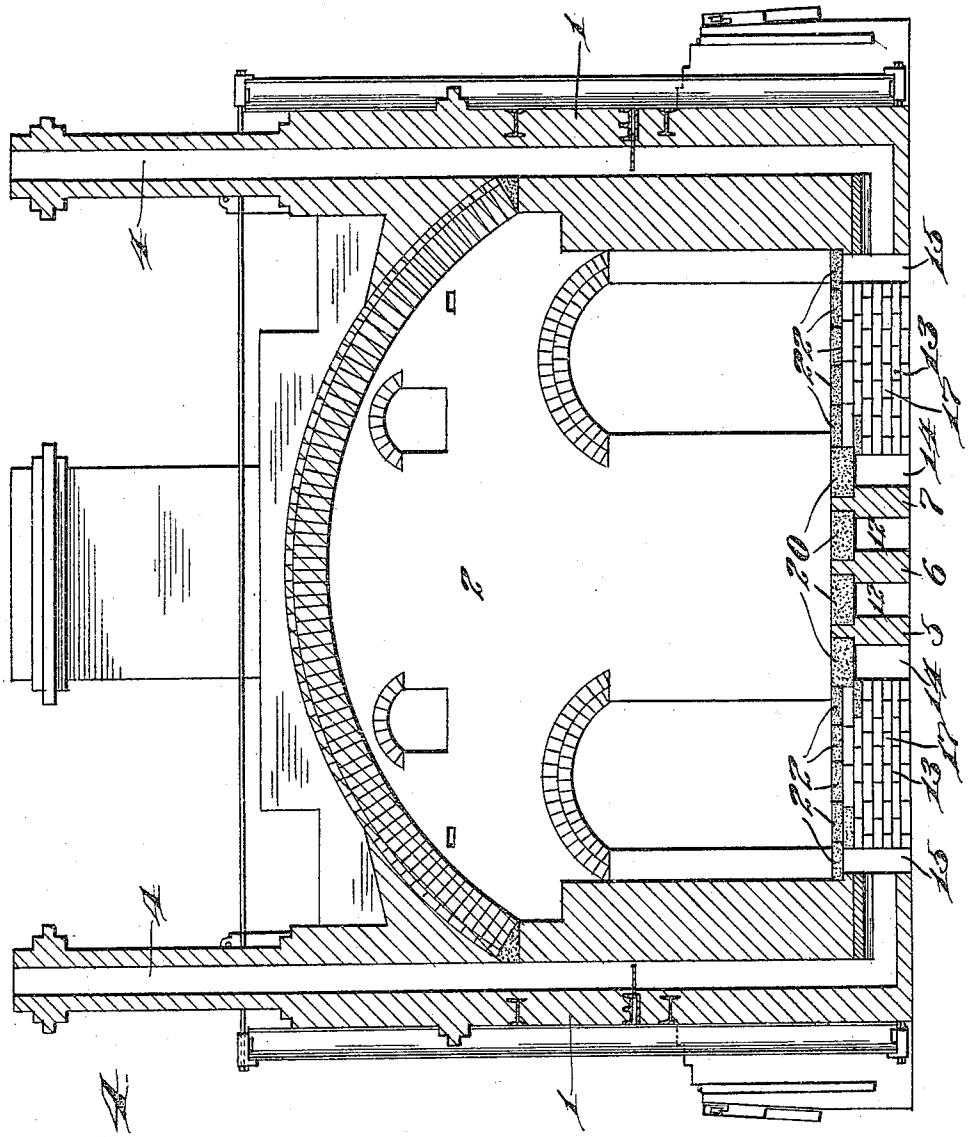

Fig. 4.

Witnesses

Thos. Rosemund.

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5 SHEETS—SHEET 5.

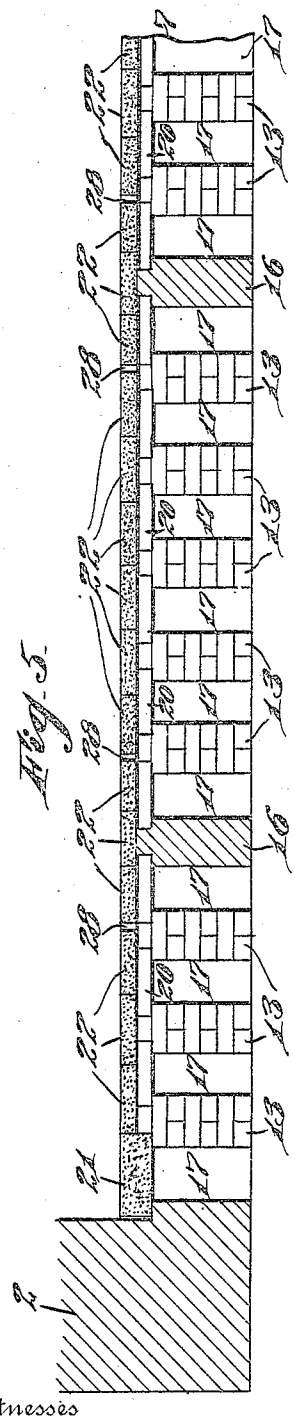

Fig. 5.

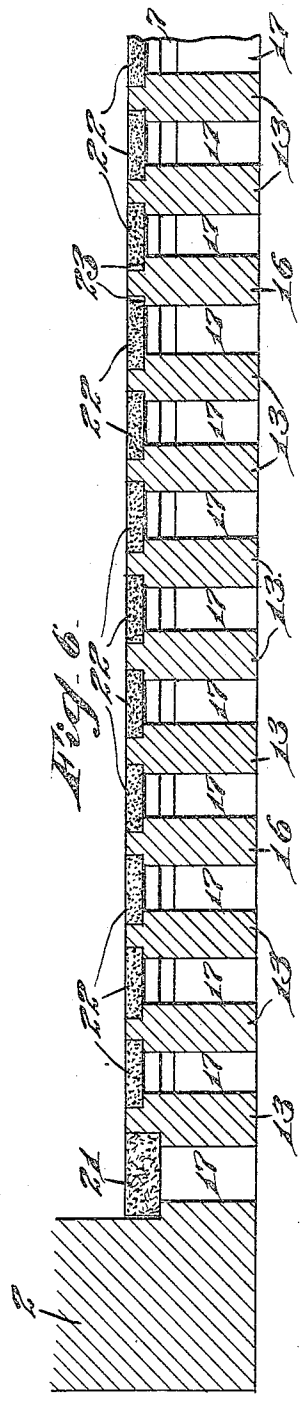

Fig. 6.

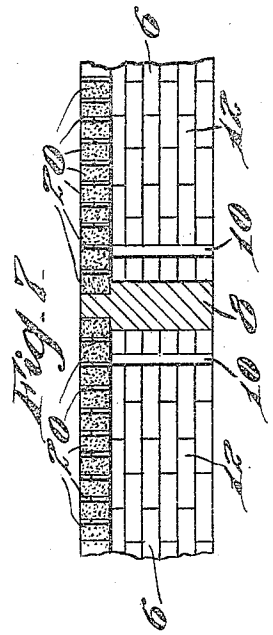

Fig. 7.

Witnesses

Theo. Rosenwald.

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Inventor

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# UNITED STATES PATENT OFFICE.

THOMAS M. WILSON, OF PHILADELPHIA, PENNSYLVANIA.

## KILN.

952,777. Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed September 2, 1909. Serial No. 515,775.

*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 an improved arrangement of flues, with an improved construction of floor above the flues, whereby a uniform distribution of heat is insured throughout the kiln, and the maximum of heat units utilized to burn the brick or other articles in the kiln.

A further object is to provide a kiln having a series of furnaces in its side walls, and chimneys between the furnaces in the side walls and in the end walls of the kiln, with an improved arrangement of chords below the kiln floor, forming an improved arrangement of longitudinal and lateral flues communicating with the respective chimneys, and providing an improved kiln having longitudinal riddles at the center communicating with longitudinal flues below, and provided with lateral riddles at the ends of the kiln communicating with lateral flues below.

A further object is to provide an improved kiln floor, which is closed or tight except throughout its longitudinal center, and at its ends, which prevents dirt and sand from the burning, clogging the flues below, and affords a maximum smooth surface for the accommodation of the bricks to be burned.

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 longitudinal horizontal section above the floor of my improved kiln. Fig. 2, is a longitudinal horizontal section through the kiln below the floor. Fig. 3, is a view in cross section through the kiln taken at a point between the chimneys in the walls of the kiln. Fig. 4, is a view in cross section taken through the chimneys in the side walls of the kiln. Fig. 5, is a fragmentary view in longitudinal section on the line 5—5 of Fig. 2. Fig. 6, is a fragmentary view in longitudinal section on the line 6—6 of Fig. 2, and Fig. 7, is a fragmentary view in longitudinal section on the line 7—7 of Fig. 2.

1, 1, represent the side walls of the kiln, and 2—2 the end walls, and 3 are the fire boxes or furnaces in the side walls of the kiln, and 4, the chimneys in the side walls of the kiln located at opposite sides of all of the furnaces, and also located in the end walls of the kiln.

Below the kiln floor and extending substantially throughout the length of the central portion of the kiln, are three chords 5, 6 and 7 respectively, said chords connected by a short cross chord 8 at the center of the kiln, and the central chord 6, which extends practically throughout the length of the kiln, is provided with expansion joints 10 at the ends of the kiln, and adjacent the cross chord 8, while the chords 5 and 7 terminate short of the ends of the kiln, leaving passages 11 connecting the central longitudinal flues 12 formed by chords 5, 6 and 7, with longitudinal and lateral flues at the sides of the chords, as will more fully hereinafter appear.

Between the chords 5 and 7, and the side walls of the kiln, are arranged a series of short lateral chords 13, which terminate short of the side walls, and also short of the chords 5 and 7, forming longitudinal flues 14, and adjacent the side walls 1, longitudinal flues 15. These longitudinal flues 15 are crossed by chords 16 in the same series as are the chords 13, but of slightly greater length, sufficient to form a juncture with the side walls, dividing the short lateral flues 17 formed between the several chords 13 and 16 into several series or sections, said chords 16 being located midway between the chimneys 4, so as to divide the kiln below the floor into so many sections, providing an equal section for each chimney to carry off the smoke and gases, except the end chimneys in the side walls, which are provided with smaller compartments to chimneys 4, as it is most difficult to secure the maximum of heat in the ends of the kiln.

In the end walls of the kiln, waste heat flues 18 are provided to carry off the waste heat from the kiln. These flues are normally closed by dampers 19. My improved floor is supported upon the chords 5, 6, 7, 13 and 16, and comprises solid or closed sections and riddles, as will now be explained.

Above the longitudinal flues 14 and 12, fire bricks are positioned, which construct longitudinal riddles 20, permitting free passage of the smoke and gases from the interior of the kiln into the longitudinal flues below, and at the ends of the kiln above the lateral flues 17, and extending across the longitudinal flues at the ends of the kiln, bricks are also provided to form riddles 21 to permit the free passage of the smoke and gases into the lateral flues below.

At all other points between the several chords and supported upon the chords, solid tile 22 are positioned, forming a closed tight floor. These tile are adapted to fit with reasonable snugness, and in order to prevent damage by expansion and contraction, at three points throughout the length of the kiln, at both sides, I space the tile apart as shown at 23, to allow for its expansion and contraction.

24 represents the bridge walls inside of the kiln, and over which the smoke and gases pass the furnaces 3 into the body of the kiln, and these bridge walls, at regular intervals, are provided with ducts 25, which not only communicate at their lower ends with the ash pit 26, but are also provided with inlets 27 connecting them with the interior of the kiln, and these ducts discharge the hot air into the space between the bridge walls and the side walls of the kiln, so as to aid combustion.

Above the short longitudinal flues 15, adjacent the side walls of the kiln, narrow spaces 28 are provided between the tile forming the floor, so as to permit a small quantity of the smoke and gases to pass through these openings into the flue below. These small openings are advantageous in order to secure the draft to the several chimneys, particularly in the initial burning of the furnace.

In operation, the smoke and gases from the several flues 3 pass upwardly over the bridge walls 24, and in such passage, the air entering the ducts 25, commingles with the smoke and gases to aid combustion. After contact with the brick and other articles in the body of the kiln, the smoke and gases pass downwardly through the riddles 20 and 21. That portion which passes through the riddles 21 enters the flues 14 and 12, and from the flues 12 pass longitudinally of the kiln and up the chimneys 4 in the end walls of the kiln, while that portion passing into the longitudinal flues 14 traverse the lateral flues 17 and escape at the chimneys 4 in the side walls of the kiln. The smoke and gases which pass downwardly through the end riddles 21, divide, and while a portion passes up the stacks in the ends of the kiln, the greater portion will pass up the stacks in the side walls of the kiln adjacent the ends of the kiln. In the passage of the smoke and gases laterally under the solid brick floor above the lateral flues 17, it will thoroughly heat the tile and transmit this heat to the brick or other articles to be burned.

A great many slight changes might be made in the general form and arrangements 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 the claims.

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 floor and stacks in the walls of the kiln, of longitudinal flues extending substantially throughout the length of the kiln below the floor and communicating with the stacks in the end walls of the kiln, parallel lateral chords forming lateral flues between the longitudinal flues and the side walls of the kiln, some of said chords extending to the side walls dividing said lateral flues into several series of flues, each series communicating with a stack in the side walls.

2. In a kiln, the combination with a floor, of longitudinal chords extending substantially throughout the length of the kiln, and forming parallel longitudinal flues, parallel lateral flues between the longitudinal chords and the side walls of the kiln, certain of said chords extending to the side walls, dividing said lateral flues into a plurality of series of flues, chimneys in the side and end walls with which said series of flues communicate.

3. In a kiln, the combination with a floor, of longitudinal chords extending substantially throughout the length of the kiln, and forming parallel longitudinal flues, parallel lateral flues between the longitudinal chords and the side walls of the kiln, certain of said chords extending to the side walls, chimneys in the side and end walls with which said flues communicate, and all of said lateral chords terminating short of the longitudinal chords, forming longitudinal flues connecting all the lateral flues.

4. In a kiln, the combination with a floor, and stacks in the walls of the kiln, of longitudinal flues extending substantially throughout the length of the kiln below the floor, and communicating with stacks in the end walls of the kiln, and parallel lateral flues connecting the outer longitudinal flues with the stacks in the side walls of the kiln, longitudinal riddles in the floor above the longitudinal flues at the center of the kiln, and lateral riddles in the floor above the lateral flues at the ends of the kiln.

5. In a kiln, the combination with a floor and stacks in the walls of the kiln, of lon-

gitudinal flues extending substantially throughout the length of the kiln below the floor, and communicating with stacks in the ends of the kiln, parallel lateral flues connecting the longitudinal flues with the stacks in the side walls of the kiln, and chords between some of the lateral flues extending to the side walls of the kiln, longitudinal riddles in the floor above the longitudinal flues at the center of the kiln, and lateral riddles in the floor above the lateral flues at the ends of the kiln.

6. In a kiln, the combination with a floor and stacks in the walls of the kiln, of longitudinal flues extending substantially throughout the length of the kiln below the floor and communicating with the stacks in the end walls of the kiln, parallel lateral chords forming lateral flues between the longitudinal flues and the side walls of the kiln, some of said chords extending to the side walls dividing said lateral flues into several series of flues, each series communicating with a stack in the side walls, longitudinal riddles in the floor above the longitudinal flues at the center of the kiln, and lateral riddles in the floor above the lateral flues at the ends of the kiln.

7. In a kiln, the combination with a floor, of longitudinal chords extending substantially throughout the length of the kiln, and forming parallel longitudinal flues, parallel lateral flues between the longitudinal chords and the side walls of the kiln, certain of said chords extending to the side walls, dividing said lateral flues into a plurality of series of flues, chimneys in the side and end walls with which said series of lateral flues communicate, longitudinal riddles in the floor above the longitudinal flues at the center of the kiln, and lateral riddles in the floor above the lateral flues at the ends of the kiln.

8. In a kiln, the combination with a floor, of longitudinal chords extending substantially throughout the length of the kiln, and forming parallel longitudinal flues, parallel lateral flues between the longitudinal chords and the side walls of the kiln, certain of said chords extending to the side walls, chimneys in the side and end walls with which said flues communicate, and all of said lateral chords terminating short of the longitudinal chords, forming longitudinal flues connecting all the lateral flues, longitudinal riddles in the floor above the longitudinal flues at the center of the kiln, and lateral riddles in the floor above the lateral flues at the ends of the kiln.

9. In a kiln, the combination with a floor, and stacks in the walls of the kiln, of longitudinal flues extending substantially throughout the length of the kiln below the floor, and communicating with stacks in the end walls of the kiln, and parallel lateral flues connecting the outer longitudinal flues with the stacks in the side walls of the kiln, longitudinal riddles in the floor above the longitudinal flues at the center of the kiln, and lateral riddles in the floor above the lateral flues at the ends of the kiln, tile closing all other space in the floor above the flues below, except where said tile are spaced apart at intervals above the space between the ends of the lateral flues, and the side walls of the kiln.

10. In a kiln, the combination with a floor and stacks in the walls of the kiln, of longitudinal flues extending substantially throughout the length of the kiln below the floor, and communicating with stacks in the ends of the kiln, parallel lateral flues connecting the longitudinal flues with the stacks in the side walls of the kiln, and chords between some of the lateral flues extending to the side walls of the kiln, longitudinal riddles in the floor above the longitudinal flues at the center of the kiln, and lateral riddles in the floor above the lateral flues at the ends of the kiln, tile closing all other space in the floor above the flues below, except where said tile are spaced apart at intervals above the space between the ends of the lateral flues and the side walls of the kiln.

11. In a kiln, the combination with a floor and stacks in the walls of the kiln, of longitudinal flues extending substantially throughout the length of the kiln below the floor and communicating with the stacks in the end walls of the kiln, parallel lateral chords forming lateral flues between the longitudinal flues and the side walls of the kiln, some of said chords extending to the side walls dividing said lateral flues into several series of flues, each series communicating with a stack in the side walls, longitudinal riddles in the floor above the longitudinal flues at the center of the kiln, and lateral riddles in the floor above the lateral flues at the ends of the kiln, tile closing all other space in the floor above the flues below, except where said tile are spaced apart at intervals above the space between the ends of the lateral flues and the side walls of the kiln.

12. In a kiln, the combination with a floor, of longitudinal chords extending substantially throughout the length of the kiln, and forming parallel longitudinal flues, parallel lateral flues between the longitudinal chords and the side walls of the kiln, certain of said chords extending to the side walls, chimneys in the side and end walls with which said flues communicate, longitudinal riddles in the floor above the longitudinal flues at the center of the kiln, and lateral riddles in the floor above the lateral flues at the ends of the kiln, tile closing all other space in the floor above the flues below, except where said tile are spaced apart at in-

tervals above the space between the ends of the lateral flues and the side walls of the kiln.

13. In a kiln, the combination with a floor, of longitudinal chords extending substantially throughout the length of the kiln, and forming parallel longitudinal flues, parallel lateral flues between the longitudinal chords and the side walls of the kiln, certain of said chords extending to the side walls, chimneys in the side and end walls with which said flues communicate, and all of said lateral chords terminating short of the longitudinal chords, forming longitudinal flues connecting all the lateral flues, longitudinal riddles in the floor above the longitudinal flues at the center of the kiln, and lateral riddles in the floor above the lateral flues at the ends of the kiln, tile closing all other space above the flues below, except where said tile are spaced apart at intervals above the space between the ends of the lateral flues and the side walls of the kiln.

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

THOMAS M. WILSON.

Witnesses:

WM. LOWENTHAL,

C. E. POTTS.