

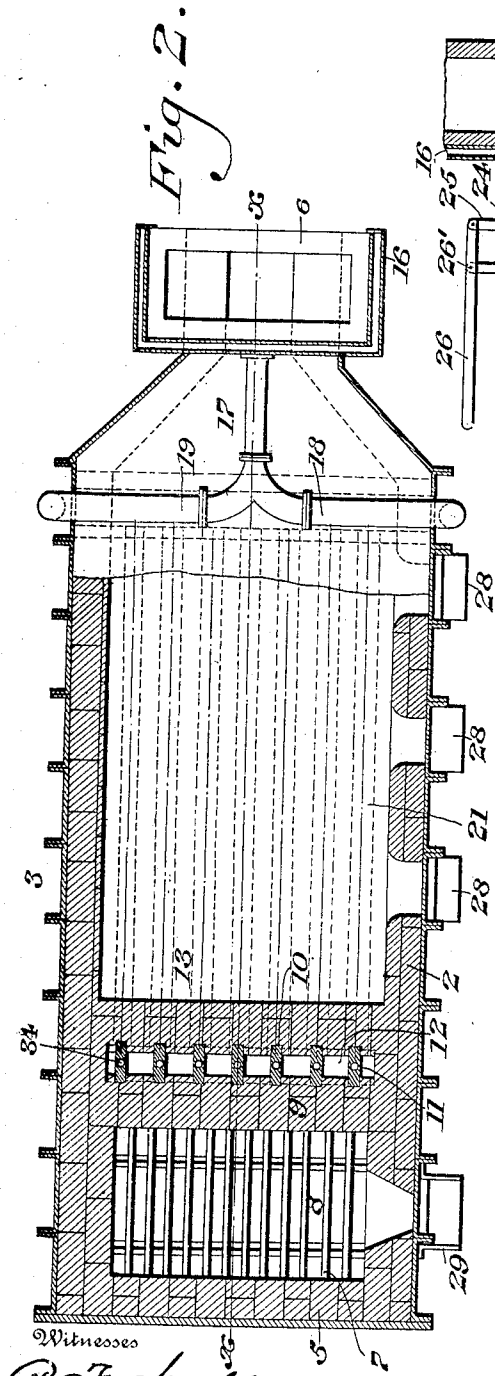
No. 869,698.

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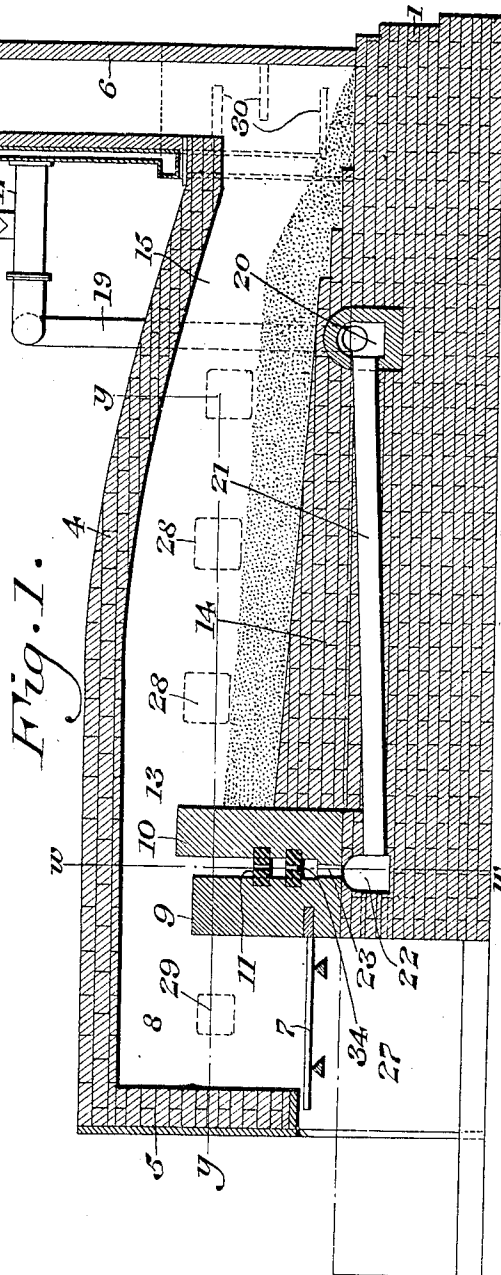
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FURNACE.

APPLICATION FILED FEB. 28, 1905.

4 SHEETS—SHEET 1.



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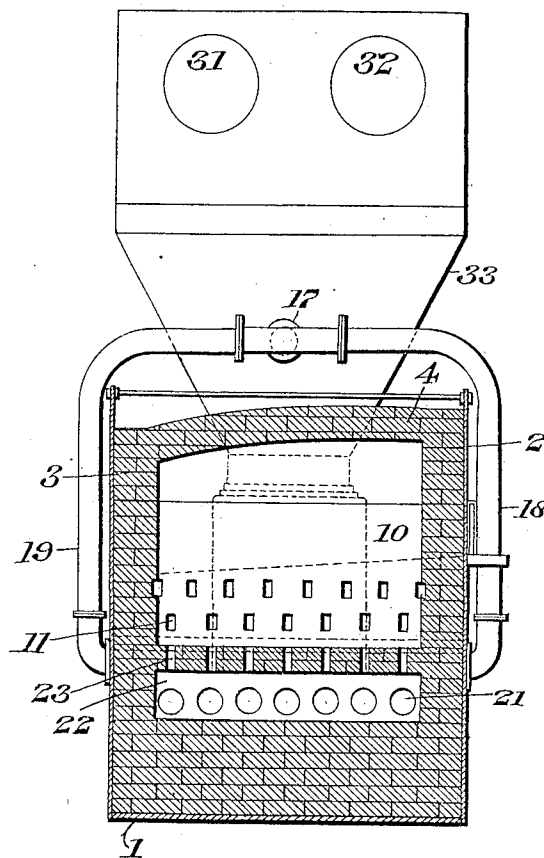
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4 SHEETS—SHEET 2.

Fig. 3.



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4 SHEETS—SHEET 3.

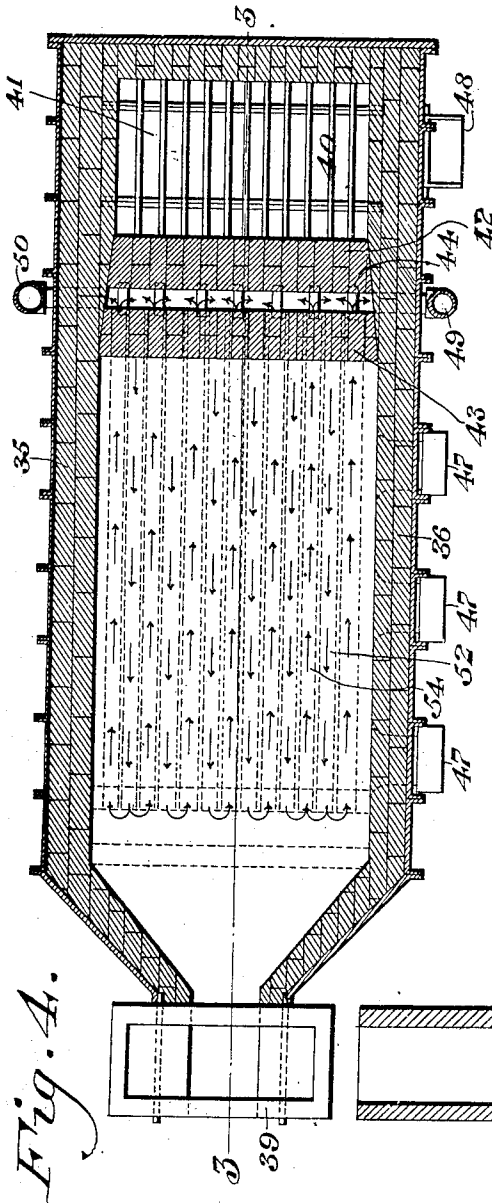


Fig. 4.

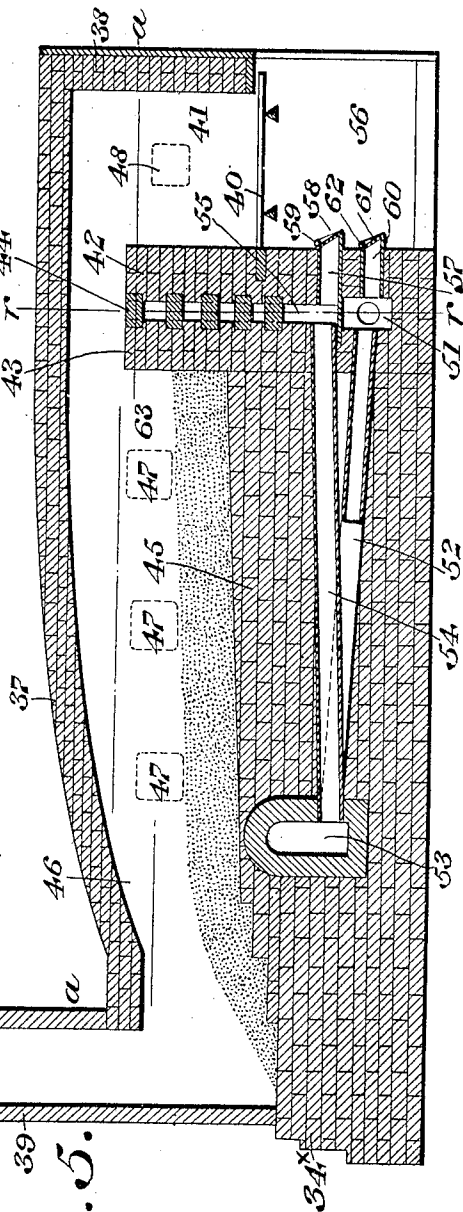


Fig. 5.

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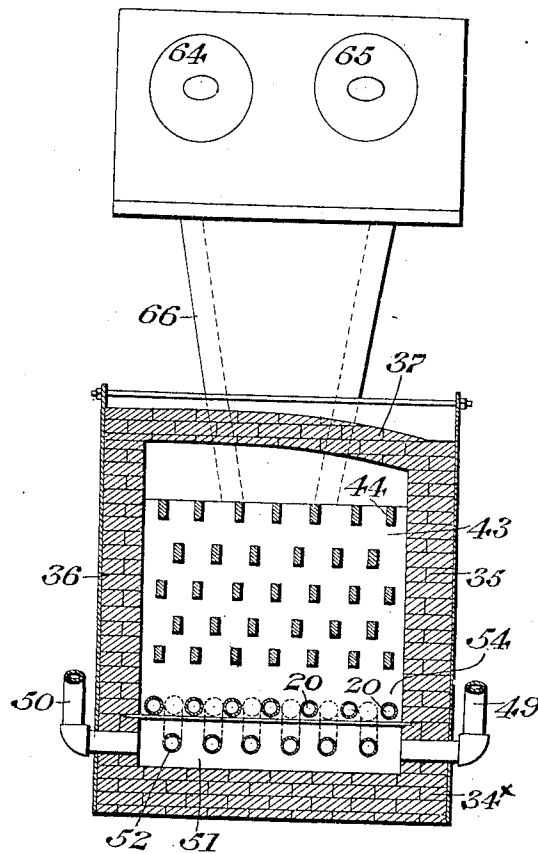
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4 SHEETS—SHEET 4.

Fig. 6.



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UNITED STATES PATENT OFFICE.

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FURNACE.

No. 869,698.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed February 28, 1905. Serial No. 247,768.

To all whom it may concern:

Be it known that we, JAMES EYNON and JOHN R. EYNON, citizens of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Furnace, of which the following is a specification.

Our invention consists of a novel construction of furnace in which a double bridge wall is employed, said walls having bricks or other suitable material interposed between them in order to form a greater heating surface for the air passing therethrough.

It also consists of other novel features of construction, all as will be hereinafter fully set forth.

Figure 1 represents a longitudinal vertical section of a furnace embodying our invention on line $x-x$ Fig. 2. Fig. 2 represents a plan view partly in section on line $y-y$ Fig. 1. Fig. 3 represents a transverse section on line $w-w$ Fig. 1. Figs. 4, 5 and 6 show modified forms of the invention shown in Figs. 1, 2 and 3. Fig. 4 represents a section on line $a-a$ Fig. 5. Fig. 5 represents a longitudinal vertical section of an embodiment of our invention on line $z-z$ Fig. 4. Fig. 6 represents a transverse section on line $r-r$ Fig. 5.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1, Figs. 1, 2 and 3, designates the base or foundation of a furnace embodying our invention having side walls 2 and 3, a roof 4 therefor, a front wall 5 and a stack 6.

7 designates the grate for the fire chamber 8.

9 and 10 designate two bridge walls which have bricks or other suitable material 11 built therein so as to form air passages 12, through which the air of the air blast passes before entering the combustion chamber 13.

14 designates the hearth which is covered with sand or other suitable material and 15 designates the throat of the furnace through which the unconsumed products of combustion pass into the stack 6.

16 designates a casing herein shown as surrounding the stack on three sides but this may evidently be otherwise arranged if so desired having a pipe 17 leading therefrom which latter preferably has two branches 18 and 19 which open into the chamber 20 from which a pipe or passage 21 extends beneath the hearth opening into the chamber 22. The air passes from the latter into passages 12 through the openings 23.

24 designates a valve having a link 25. Secured to the latter is an arm or handle 26 pivoted at 26' and by means of which said valve is actuated.

27 designates a fire box, 28 designates doors opening into the furnace above the hearth and 29 designates a door opening into the fire chamber.

30 designates baffle plates suitably secured in the smoke stack 6.

31 and 32 designate boilers suitably supported above the furnace by the walls 33

34 designates passages leading through the bricks 11, which it is evident may be thus apertured without departing from the spirit of our invention. The bricks of the several rows may be staggered if desired.

The operation is as follows:—The cold air coming from the casing 16 enters through pipe 17 and passes through pipes 18 and 19 into chamber 20 from which it is led through passage 21 into chamber 22 through passage 23 between the bridge walls and passing around the bricks 11 interposed between said walls into the combustion chamber and as these bricks or other suitable material are strongly heated owing to the location of the same between the bridge walls, the air passing around them will absorb heat therefrom so that when the blast enters the furnace it will be nearly at the point of ignition and coming in contact with the unconsumed smoke and gas coming from the fire chamber and commingling therewith the products of combustion are practically all consumed. The amount of air admitted through the blast may be regulated as desired, thus insuring a nearly perfect combustion. It is evident that the fuel will be greatly economized and a more uniform heat produced.

In the furnaces heretofore constructed there has been a large amount of waste owing to a large percentage of the gaseous products of combustion passing off unconsumed. In our present invention the incoming air absorbs so much heat from the bridge walls and the material interposed between them that when the same commingles with the gas and smoke coming from the fire chamber it is nearly at the point of ignition which will cause a more perfect combustion, eliminate a large portion of the smoke and economize the fuel. We have also found that the percentage of waste of the product to be treated is much less than that in furnaces of the construction heretofore employed.

In the embodiment shown in Figs. 4 to 6, 34^x designates the base or foundation having side walls 35 and 36, a roof 37 therefor, a front wall 38 and a stack 39. 40 designates the grate for the fire chamber 41.

42 and 43 designate two bridge walls having suitable material 44 interposed between the walls, said material being of such a character as will readily absorb heat so that the air passing around the same will readily absorb heat therefrom. While we preferably use fire brick for this purpose, we do not desire to be limited to such material or to material having a brick form as it is evident that other suitable material and of a different form from that shown herein may be employed without departing from the spirit of our invention.

45 designates the hearth which is covered with sand or other suitable material and 46 designates the throat opening into the stack 39.

47 designates doors opening above the hearth and 48 designates a door opening into the fire chamber 41. 49 and 50 designate pipes through which air may be led

to the chamber 51, from which extends a passage 52 beneath the hearth and opening into the chamber 53.

54 designates a passage leading from said chamber through the bridge wall 43 and opening into the space 5 or passage 55.

56 designates the fire box.

57 designates a connection opening into the space 55 between the walls and into the fire box 56.

58 designates a door suitably hinged at 59.

10 60 designates a connection which opens into the chamber 51 at one end and at the other end into the fire box 56.

61 designates a door for said connection 60 suitably hinged at 62.

63 designates the combustion chamber.

15 64 and 65 designate two boilers suitably supported above the furnace by the frame 66.

The operation will be as follows:—The air passes from the chamber 51 through the passage 52 into the chamber 53, from thence through passage 54 into the space or 20 passages 55 between the bridge walls. In passing around the bricks or heating material so much heat will be absorbed therefrom that the air on entering the com-

bustion chamber is super-heated nearly to the point of ignition. The advantages of this are apparent as herein- before described. 25

It will be evident that various changes may be made by those skilled in the art, which will come within the scope of our invention and we do not therefore desire to be limited in every instance to the exact construction herein shown and described. 30

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

In a furnace, a hearth, a double bridge wall, bricks between said walls arranged in a plurality of horizontal rows with vertical and horizontal passages, a chamber beneath 35 the said bricks and communicating with the spaces between them, an air passage under the hearth, communicating at one end with said chamber, a chamber at the other end of said passage, a stack, a casing embracing the same, means connecting said casing with the last named cham- 40 ber, and baffle plates in said stack.

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