

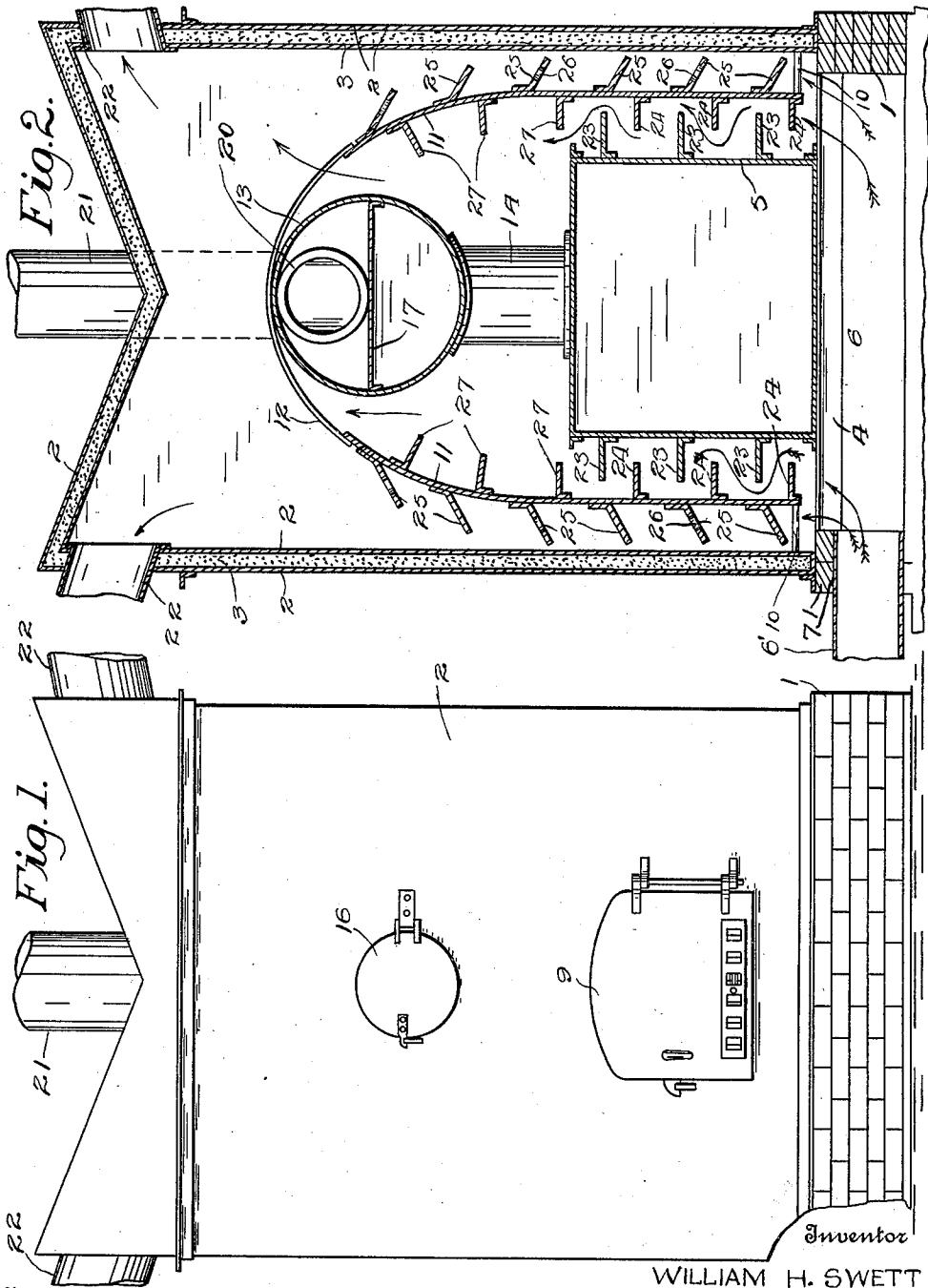
W. H. SWETT.
HOT AIR FURNACE.

APPLICATION FILED MAR. 23, 1911.

1,026,777.

Patented May 21, 1912.

2 SHEETS—SHEET 1.



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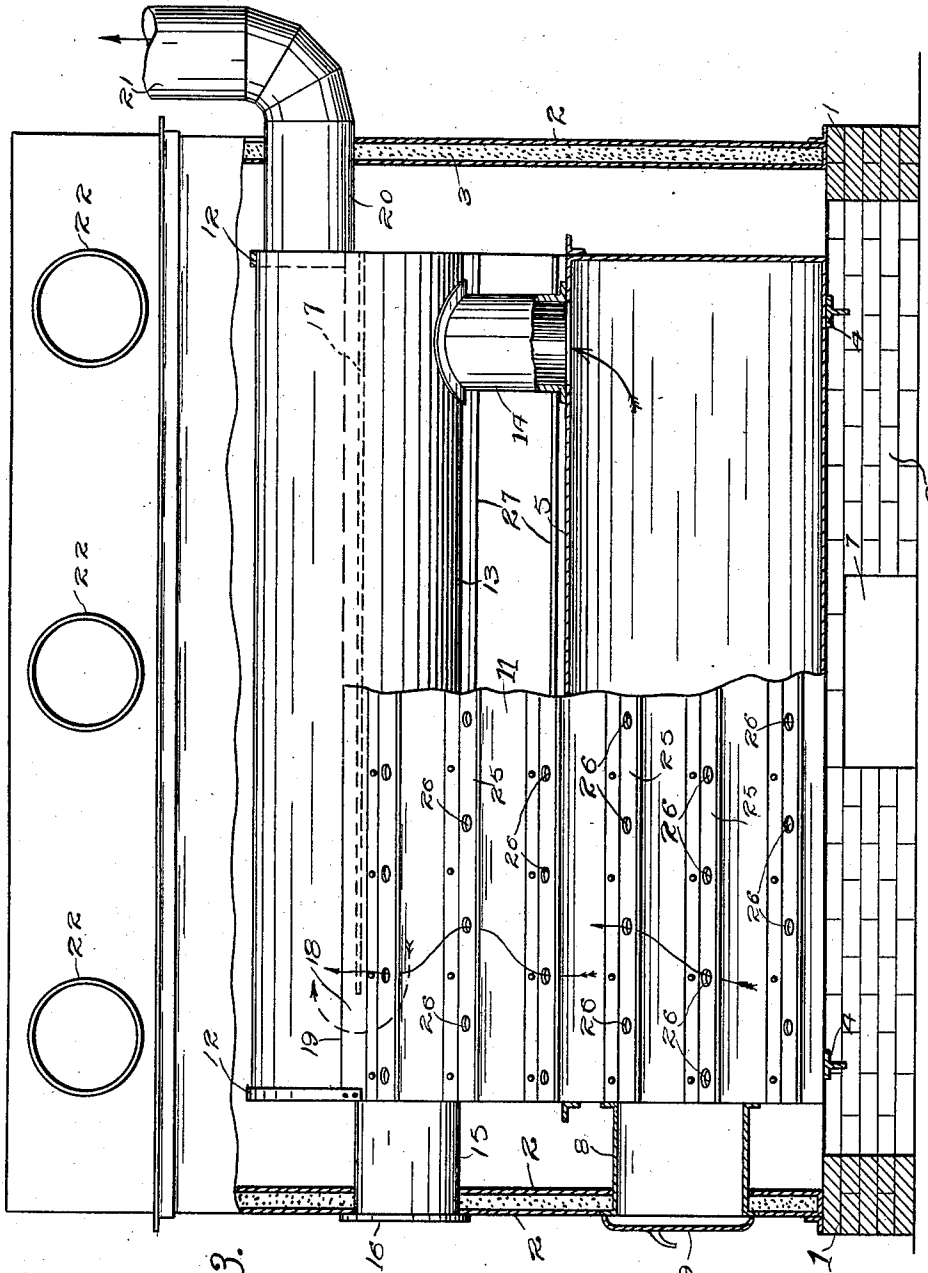


Fig. 3.

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HOT-AIR FURNACE.

1,026,777.

Specification of Letters Patent.

Patented May 21, 1912.

Application filed March 23, 1911. Serial No. 616,422.

To all whom it may concern:

Be it known that I, WILLIAM HENRY SWETT, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented certain new and useful Improvements in Hot-Air Furnaces, of which the following is a specification.

This invention relates to hot air furnaces and has special reference to hot air furnaces which are so constructed that the circulation of hot air about the fire box and through the furnace is deflected and retarded so as to increase the heating capacity of the furnace.

The object of this invention is to provide an improved hot air furnace of this kind in which the increased heating surface about the fire box is located in a compact space and the circulation of hot air about the fire box is retarded so as to increase the heating capacity of the furnace.

Referring to the accompanying drawings: Figure 1 is a front view in elevation of a hot air furnace constructed in accordance with this invention. Fig. 2 is a front view in elevation and cross section of the heating furnace. Fig. 3 is a side view of the heating furnace partly broken away and in longitudinal section.

In carrying out the invention a suitable foundation 1 of brick or other material is provided on which is mounted the furnace having its walls, ends and top formed of pairs of sheet metal plates 2 spaced apart from each other and filled with a non-conducting material 3 such as asbestos or mineral wool. Mounted on transverse bars 4, which as here shown consist of T-bars having their ends resting on the side walls of the foundation 1 is a fire box 5 extending lengthwise through the casing and having its ends spaced from the front and rear walls of the casing. The fire box resting on the cross bars 4 is located above an air space 6 between the walls of the foundation and air is supplied to said air space through a pipe 6' opening into said air space through an opening 7 in one side of the foundation as shown in Fig. 3. The front end of the fire box 5 is provided with a pipe 8 which has its outer end located in the front wall of the casing and is closed by a door 9. Mounted on suitable brackets or supports 10 projecting from the side walls of the casing at the

bottom thereof are vertical sheet metal plates 11 which are spaced apart from the walls of the fire box and from the side walls of the casing so as to form two vertical passageways leading up from the air space 6 beneath the fire box. The upper ends of the plates 11 are curved and held in position by means of curved metallic strips 12. Spaced above the fire box 5 is a longitudinal drum 13 having its rear end supported on a pipe 14 which opens into the fire box and into the drum and permits the passage of hot air from the fire box to the drum. Projecting from the front end of the drum 13 is a pipe 15 having its front end resting in the front wall of the casing and closed by a door 16.

Mounted in and extending lengthwise of the drum 13 is a baffle plate 17 which extends to the rear end of the drum as shown in dotted lines in Fig. 3 and terminates at its forward end at a little distance from the front end of the drum so as to afford a passageway 18 for the hot air passing through the drum as shown by the arrow 19 in Fig. 3. At the rear end of the upper part of the drum 13 is a pipe 20 for the exit of air passing through the top of the drum, the pipe 20 projecting through the rear wall of the casing and having connected to it a discharge flue 21. The roof of the casing is preferably formed of a V-shape or with a pair of inclined portions meeting centrally, as shown in Fig. 2, so as to divert the hot air circulating through the top of the casing through openings in the upper part of the side walls of the casing in each of which is located a discharge pipe 22. In order to retard the circulation of air passing between the vertical plates 11 and the sides of the fire box baffle plates 23 are mounted on the sides of the fire box in zigzag relation to baffle plates 24 mounted on the inner sides of the plates 11, said plates 23 and 24 projecting at such a distance between each other as to cause the air passing up between them to move in a serpentine direction as indicated by the arrows.

Mounted on the outside of the plates 11 are baffle plates 25 preferably inclined downward and having a small space between their outer edges and the inner wall of the casing whereby only a small portion of air ascending between the plates 11 and the walls of the casing is permitted to pass. The baffle

plates 25 are formed with holes 26 located in zigzag relation to each other whereby the circulation of air carried in a serpentine direction is retarded. The plates 11 are further provided with baffle plates 27 above the fire box which serve to deflect the hot air ascending toward the drum.

By means of the foregoing construction cold air entering through the pipe 6' into the air space 6 beneath the fire box passes up as shown by the arrows in Fig. 2 in an irregular or serpentine direction between the baffle plates 23 and 24 thereby being retarded in its upward movement and subjected to the heat radiated from the sides of the fire box and from the plates 11. The heated air ascending between the baffle plates 23 and 24 being deflected by said baffle plates and retarded in its movement is completely heated by being subjected to the increased heat radiating surfaces afforded by the walls of the fire box or plates 11 and the baffle plates 23 and 24. At the same time air ascends from the air chamber 6 between the plates 11 and the side walls of the casing and is retarded in its upward movement by the inclined baffle plates 26 and owing to the narrow space between the outer edges of the baffle plates 26 and the side walls of the casing is retarded, a portion of the air passing up between the plates 26 and the side walls of the casing and the rest passing up in an irregular or serpentine direction through the holes 26 in the plates 25. It will thus be seen that the air passing up from the air chamber 6 will be divided and distributed, passing up between the fire box and the plates 11 and between the latter and the side walls of the casing, so that it will be thoroughly heated by the heat radiated from the fire box and the plates and metallic walls of the casing. The products of combustion passing from the fire box through the pipe 14 to the drum will be carried lengthwise in the lower part of the drum beneath the baffle plate 17, said drum being at the same time heated by the products of combustion in the same, the products of combustion passing lengthwise through the lower part of the drum, ascending through the opening 18 in the forward end of the drum and passing lengthwise through the top of the drum and through its rear end where it escapes through the pipe 20 and the flue 21.

It will be seen that by means of the construction hereinbefore set forth greater heating surface will be provided and owing to the air being divided and retarded in its circulating movement it will become thoroughly heated and thereby provide a large volume of heat for the furnace which is carried off through the pipes 22, the products of combustion passing off through the flue 21.

Having described the invention, I claim:—

1. In a hot air furnace of the kind de-

scribed, a foundation provided with an air chamber, means for the admission of air to said chamber, a fire box mounted above said chamber, a casing mounted on said foundation and having its sides, ends and top formed of metallic walls with a lining of heat non-conducting material, vertical plates located between the fire box and the side walls of the casing and spaced apart from the fire box and said side walls, horizontal baffle plates mounted on the sides of the fire box, horizontal baffle plates mounted on the inside of said vertical plates and in staggered relation to the plates on the fire box and baffle plates mounted on the outside of said plates, a drum mounted above said fire box and having a longitudinal baffle plate extending from the rear end of the drum and to a point adjacent to its front end, a pipe connecting the rear end of the drum with the rear end of the fire box, and a discharge pipe connected to the rear end of the drum above said baffle plate.

2. In a hot air furnace of the kind described, a foundation provided with an air chamber, means for supplying outside air to said air chamber, a metallic casing mounted on said foundation, a fire box mounted above said air chamber and having longitudinal horizontal baffle plates on its sides, vertical metallic plates extending lengthwise of the fire box and above the same, and curved at their upper edges and having horizontal baffle plates on the inner side in zigzag relation to the baffle plates on the fire box and inclined baffle plates on their outer sides between said plates and the side walls of the casing, said plates forming with the side walls of the casing and the fire box air passages from the air chamber beneath the fire box, a drum mounted above the fire box and having a longitudinal baffle plate extending to the inner end of the drum and provided with an opening at its outer end, a pipe connecting the inner end of the drum at its bottom with the inner end of the fire box, and a discharge pipe connected to the inner end of the drum.

3. In a hot air furnace of the kind described, a foundation provided with an air chamber, an air inlet pipe connected with said air chamber, a metallic casing mounted on said foundation, transverse bars mounted on said foundation and extending across said air chamber, a fire box mounted on said transverse bars and having longitudinal horizontal baffle plates on its sides, a vertical metallic wall on each side of the fire box and spaced therefrom and from the side walls of the casing and having on its inner side horizontal baffle plates located in zigzag relation to the plates on the fire box and on its outer side inclined baffle plates with apertures, a drum located above the fire box and having a longitudinal baffle plate ex-

tending to the rear end of the drum and having an opening at its forward end, a pipe connecting the rear end of the drum at its bottom with the rear end of the fire box, a discharge pipe connected to the rear end of the drum above the baffle plate and air discharge pipes located at the top of the side walls of the casing.

4. In a hot air furnace of the kind described, a foundation provided with an air chamber, having an open top, means for the admission of outside air to said air chamber, transverse bars mounted on the side walls of said foundation, a fire box mounted on said transverse bars and having longitudinal horizontal baffle plates on its sides, a metallic casing mounted on said foundation and consisting of sheet metal plates with a lining between them of heat non-conducting material, the top of said casing being of a V-shape, a vertical metallic wall on each side of the fire box and mounted above the air chamber in the foundation, and having horizontal baffle plates on its inner side in

a zigzag relation to the baffle plates on the fire box, the upper end of said metallic walls being curved and provided with baffle plates on the inner sides, inclined baffle plates on the outer side of said metallic walls each having perforations and located between the said metallic walls and the walls of the casing, a drum mounted above the fire box, a longitudinal baffle plate extending to the rear end of the drum and terminating at a short distance from the front end of the drum, a pipe connecting the rear end of the bottom of the drum with the rear end of the fire box, a discharge pipe connected to the rear end of the drum above the baffle plate, and a number of discharge pipes located in the upper end of each of the side walls of the casing.

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

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."