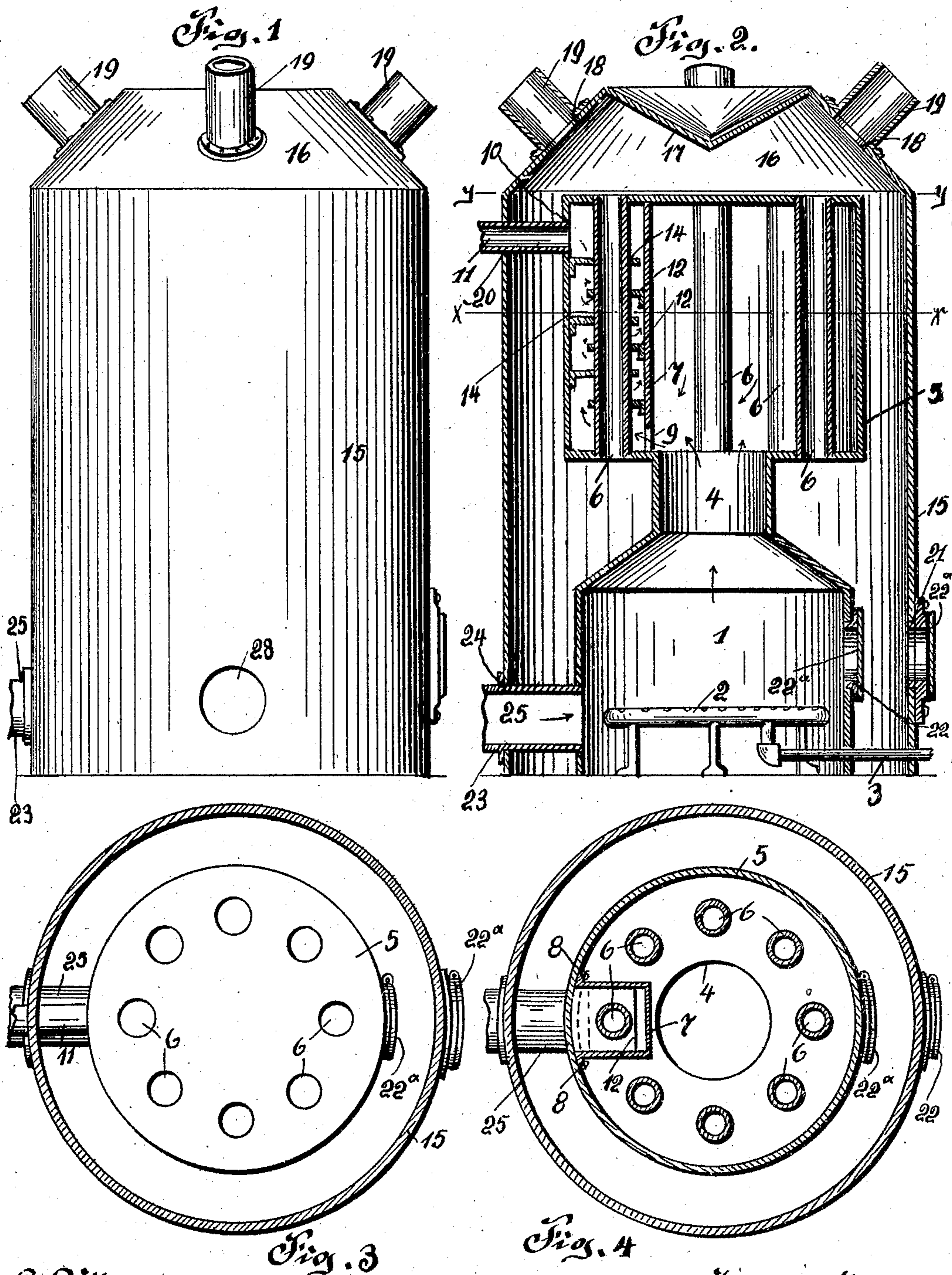


No. 806,029.

PATENTED NOV. 28, 1905.

J. S. WALKER.  
FURNACE.

APPLICATION FILED MAY 11, 1905.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JOHN S. WALKER, OF PITTSBURG, PENNSYLVANIA.

## FURNACE.

No. 806,029.

Specification of Letters Patent.

Patented Nov. 28, 1905.

Application filed May 11, 1905. Serial No. 259,919.

*To all whom it may concern:*

Be it known that I, JOHN S. WALKER, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in furnaces; and the invention has for its object to provide a novel form of furnace or heater wherein novel means is employed for baffling and providing a circuitous path for the products of combustion derived from a suitable burner prior to their escape.

My invention relates more particularly to that type of furnace commonly known as a "cold-air" furnace, wherein a supply of cold air is passed through a plurality of heated flues prior to its escape to the compartments to be heated. To this end I have devised a novel form of heater having a plurality of flues arranged therein through which the cold air admitted to the furnace is adapted to pass, and within the heater I have provided a plurality of baffling-plates to form a staggered or circuitous path for the products of combustion prior to their escape from the furnace. In this manner I am enabled to derive the full benefit of the heat units of the products of combustion and heat a maximum amount of cold air with a minimum amount of fuel.

The above construction will be hereinafter more fully described and then specifically pointed out in the claims, and referring to the drawings accompanying this application like numerals of reference designate corresponding parts throughout the several views, in which—

Figure 1 is a side elevation view of my improved furnace. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a horizontal sectional view taken on the line *y y* of Fig. 2, and Fig. 4 is a similar view taken on the line *x x* of Fig. 2.

To put my invention into practice I construct my improved furnace or heater of a casing 1, comprising a combustion-chamber in which a suitable burner 2 is mounted. I may employ any desired conventional form of burner in connection with the heater or furnace, and in the present illustration I have shown the burner as provided with a suitable gas-supply

pipe 3, which may carry a conventional form of air-mixer and controlling-valve. (Not shown.) The top of the casing 1 is provided with a vertically-disposed flue 4, which supports and communicates with a drum 5. Circumferentially arranged within said drum are a plurality of vertically-disposed flues 6, which are open at both ends, forming passages through the drum. One of the flues 6 is inclosed by a substantially U-shaped housing 7, which is secured to the side wall of the drum 5, as indicated at 8 8. The substantially U-shaped housing 7 is provided with an opening near its lower end, as indicated at 9, and the wall of the drum 5 within the housing 7 is provided with an opening 10, in which is secured a suitable exhaust-flue 11. The innermost wall of the housing 7 and the wall of the drum lying within said housing are provided with a plurality of plates 12, which are alternately secured to the housing 7 and the wall of the drum 5, said plates being arranged one above the other in a staggered relation and provided with openings 14 14, through which the flue mounted within the U-shaped housing can pass.

This combustion-chamber and drum are mounted in a suitable casing or shell 15, which has a substantially frustrated cone-shaped top 16, carrying a depending inverted-cone-shaped deflector 17. The slanting or inclined walls of the top 16 are provided with a plurality of openings 18, which communicate with flues 19, carried by the top of said casing.

The casing 15 is also provided with an opening 20, through which the exhaust-flue 11 protrudes, and with an opening 21, whereby access may be had to the burner 2. The opening 21 is formed in alinement with an opening 22, and said openings may be provided with suitable doors 22<sup>a</sup> 22<sup>a</sup>. The casing or shell 15 is also provided with a suitable opening 28, whereby cold air may be admitted to said casing to be heated by the products of combustion derived from the burner 2. The casing is also provided with an opening 24, which communicates with the combustion-chamber by a jacket 25, whereby the burner can be supplied with fresh air.

In operation the products of combustion are adapted to collect and circulate within the drum 5 and then pass through the opening 9 into the housing 7, where they finally encounter one of the flues 6, mounted within said housing, and pass upwardly into the exhaust-flue 11. The passage of the products of

combustion within the housing 7 is baffled or delayed, thereby affording time for them to part with their heat before escaping through the exhaust-flue. The cold air entering the shell or casing 15 encounters the heated surface of the drum 5, and the combustion-chamber and a portion of the air entering the casing passes upwardly through the vertically-disposed flues 6 and encounters the heated surfaces of said flues before its final escape through the flues 19 to the compartments to be heated.

It is thought from the foregoing that the construction, operation, and advantages of my improved furnace or heater will be apparent without further description, and it will be understood that various changes in the form, proportions, and minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

What I claim, and desire to secure by Letters Patent, is—

1. In a furnace of the type described, the combination with an outer casing or shell having flues leading therefrom, of a combustion-chamber, a drum carried by said combustion-chamber, a plurality of vertically-disposed flues mounted within said drum, a housing surrounding one of said flues, an exhaust-pipe carried by said drum, said housing being provided with openings affording a communication through said housing between the interior of said drum and said exhaust-pipe and a plu-

rality of plates staggeredly arranged within said housing between said openings. 35

2. In a furnace of the type described, the combination with a suitable burner, of a combustion-chamber surrounding said burner, a drum carried by said combustion-chamber, a plurality of flues mounted within said drum, a housing surrounding one of said flues, a plurality of plates staggeredly arranged within said housing and providing a tortuous passage-way through the housing, said housing having openings formed therein, an exhaust-flue carried by said drum and opening into said housing, a casing surrounding said drum and combustion-chamber, said casing having openings formed therein, substantially as described. 40 45 50

3. In a furnace of the type described, the combination with a suitable burner, of a combustion-chamber, a drum carried by said combustion-chamber, a plurality of flues mounted within said drum, a housing surrounding one of said flues, said housing having inlet and exhaust openings formed therein, an exhaust-pipe leading from the exhaust-opening of the housing and means to baffle the products of combustion passing through said housing, substantially as described. 55 60

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

JOHN S. WALKER.

Witnesses:

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E. E. POTTER.