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J. S. ANDREWS

WALL FURNACE

Filed Sept. 27, 1926

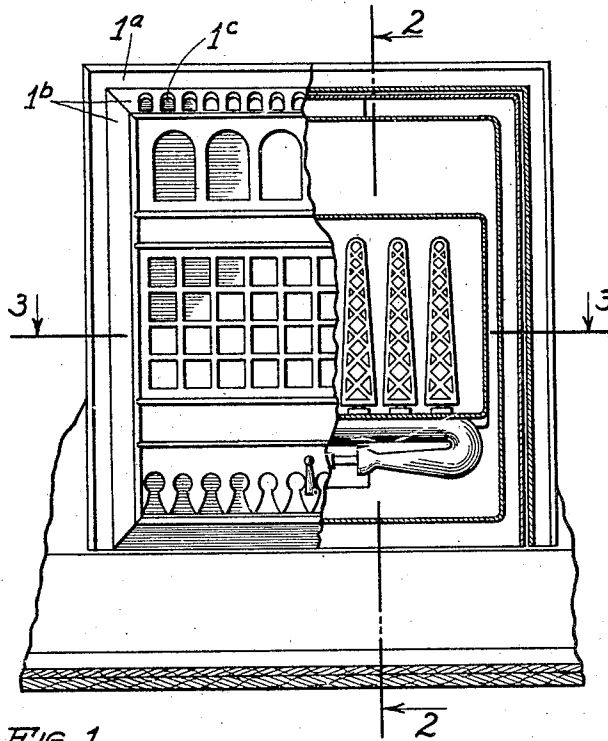


FIG. 1

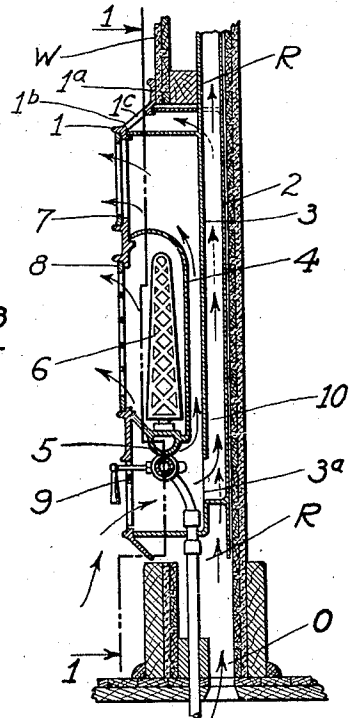


FIG. 2

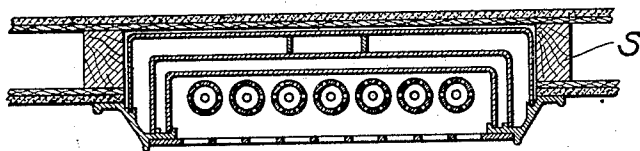


FIG. 3

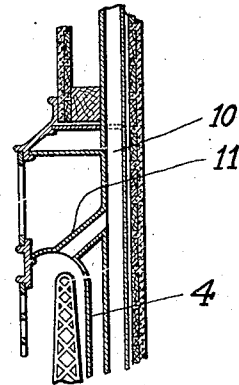


FIG. 4

INVENTOR.  
JOHN S. ANDREWS  
BY *A. B. Bowman*  
ATTORNEY

# UNITED STATES PATENT OFFICE.

JOHN S. ANDREWS, OF LOS ANGELES, CALIFORNIA.

WALL FURNACE.

Application filed September 27, 1926. Serial No. 137,889.

My invention relates to wall furnaces for heating the rooms of a dwelling, office building, or the like, and the principal object of this invention is to provide improvements  
5 over my wall furnace disclosed in Patent No. 1,582,657.

The objects of my improvements are; first, to provide a heater or furnace of this class whereby the room, in or in connection with  
10 which the heater or furnace is installed, is ventilated at all times when the heater or furnace is in operation; second, to provide a furnace of this class whereby only the foul or heavier air of the room is directed out-  
15 wardly when the furnace is in operation by reason of the positioning of the ventilating flue contiguous to the heating means, thereby causing the air or gases in the ventilating flue to be heated and to rise, and the heavier  
20 gases or air in the room to pass toward the furnace; third, to provide a furnace of this class whereby thorough circulation of the room may be had by fresh air passing upwardly at the back side of the heater and thence into the room at the top of the heat-  
25 er, by heated air passing around the heated housing enclosing the heating unit, by hot gases of combustion from the heating unit, and by return of gases and air to the burner  
30 or heating means and to the exhaust vent; fourth, to provide a furnace of this class whereby a portion of the gases of combustion are immediately discharged to the atmosphere; fifth, to provide as a whole a  
35 novelly constructed and arranged wall furnace of this class; and, sixth, to provide a furnace of this class which is simple and economical of construction, durable, efficient, safe and which will not readily deteriorate  
40 or get out of order.

With these and other objects in view, as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts  
45 and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part  
50 of this application in which:

Figure 1 is a partial front elevational and partial sectional view of my furnace in its preferred form of construction in connection with a building wall, the portion in section  
55 being taken on the line 1—1 of Fig. 2; Fig. 2 is a sectional elevational view thereof

taken through 2—2 of Fig. 1, showing certain parts and portions in elevation to facilitate the illustration; Fig. 3 is a sectional view thereof taken through 3—3 of Fig. 1; and, Fig. 4 is a fragmentary sectional elevational view similar to that shown in Fig. 2 of a slightly modified form of construction of my furnace.

Like characters of reference refer to similar parts and portions throughout the several views of the drawings.

My wall heater or furnace is preferably mounted in a recess R in one side of a building wall W, as shown in Figs. 2, 3 and 4. The recess is preferably made between a pair of vertical studs S, as shown in Fig. 3. The lower portion of the recess R communicates with an opening O at the bottom of the wall through the floor.

My heater or furnace is self contained so that the same may be readily installed in the recess in the wall and consists essentially of a face or front member 1, the outer housing 2, the inner housing 3, the heat reflecting housing 4, the burner 5 and the heating or burner elements 6.

The face or front member 1 is secured to the side of the wall provided with a recess by a flange 1<sup>a</sup> extending over the top and  
85 along the sides. The member 1 is provided with an outwardly extending inclined or beveled portion which extends outwardly from the flanges 1<sup>a</sup>. In the inclined or beveled portion 1<sup>b</sup> at the top portion of the  
90 member 1, are provided a plurality of openings 1<sup>c</sup> for admitting heated fresh air into the room.

To the back side of the member or plate 1, are secured the forward edges of the top and  
95 side portions of the outer housing 2 which substantially fills the space of the recess R in the wall. The lower end of the housing 2 is open and communicates at all times with the opening O at the lower portion of  
100 the wall.

Within the housing 2 and similarly secured to the member or plate 1, is the inner housing 3 which is spaced at its back side, as well as lateral and top sides, from the  
105 corresponding sides of the housing 2, as shown in Figs. 2 and 3. The bottom of the inner housing 3 is closed to the opening O, but the fresh air from the opening O passes between the opposed walls of the housings 2 and 3  
110 and out of the openings 1<sup>c</sup> at the upper portion of the front face member. On the back

side of the member or plate 1 is also supported the housing 4 which may be secured to the gaseous fuel burner 5 and extended upwardly therefrom. On the burner 5 and within the housing 4 are mounted a plurality of radiant burner or heating elements 6 which substantially fill the space of the housing 4. Said housing 4 is adapted to reflect the heat from the heating elements 6 into the room. The housing 4 is preferably spaced at its back, top, bottom and lateral sides from the inner housing 3, as shown in Figs. 1, 2 and 3.

In the front face of the member or plate 1, are provided large openings over which are placed gratings or foraminous plates 7, 8 and 9, the first between the upper ends of the housings 3 and 4, the second over the front side of the housing 4 and the latter between the lower ends of the housings 3 and 4, as shown best in Fig. 2.

Near the lower portion and in the back side wall of the housing 3, is provided an opening 3<sup>a</sup> which is connected, by means of a vent duct 10 with the atmosphere, which duct may extend up through the wall and the roof of the building. Said vent duct preferably fills the space between the housings 2 and 3 at their median lines, thus dividing the space between the two casings or housings into two parts, or more if desired.

The gases of combustion from the burner and radiant burner elements are forced into the room through the grating 8. The air from the room is drawn through the openings of the grating 9 and directed into the space between the housings 3 and 4 and also into the vent duct 10, the fouler and heavier air entering the duct. As the air passes between the housings 3 and 4, the same is heated and discharged as hot air through the grating 7 into the room. The air from the room is also heated as same passes up the vent, thereby causing a draft and causing further circulation in the room. The air passing upwardly from the opening O between the housings 2 and 3 is also heated slightly, thus discharging heated fresh air into the room through the openings 1<sup>c</sup>. Thus the foul and heavier air is continuously driven out of the room and replaced by heated pure air.

In the modified form of construction shown in Fig. 4, the upper end of the heat reflecting casing or housing 4, is directly connected with the vent duct 10 by means of a duct or vent 11 whereby a certain amount of the fuel gases are driven off into the atmosphere directly and whereby the gases in the vent 10 are also heated to a higher temperature so as to more readily discharge the same.

Though I have shown and described a particular construction, combination and arrangement of parts and portions and a certain modification thereof, I do not wish to

be limited to this particular construction, combination and arrangement, nor to the modification, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

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

1. In a furnace of the class described, a housing communicating at its lower portion with a source of fresh air and at its upper end with a compartment to be heated, an inner housing positioned within the first mentioned housing and communicating at its upper and lower portions with said compartment, a heating unit positioned within the inner housing, and a vent connected to the lower portion of the inner housing.

2. In a furnace of the class described, a housing communicating at its lower portion with a source of fresh air and at its upper end with a compartment to be heated, an inner housing positioned within the first mentioned housing and communicating at its upper and lower portions with said compartment, a heating unit positioned within the inner housing, and a vent communicating with the lower portion of the inner housing and extending upwardly between the first mentioned housing and the inner housing to the atmosphere, said vent being positioned adjacent and in heat conducting relation to the outer wall of said inner housing.

3. In a furnace of the class described, a housing communicating at its lower portion with a source of fresh air and at its upper end with a compartment to be heated, an inner housing, positioned within the first mentioned housing and communicating at its upper and lower portions with said compartment, a heating unit positioned within the inner housing, and a vent connecting with the lower portion of the inner housing and extending upwardly between the first mentioned and the inner housing to the atmosphere.

4. In a furnace of the class described, a housing communicating at its lower portion with a source of fresh air and at its upper end with the compartment to be heated, an inner housing positioned within the first mentioned housing and communicating at its upper and lower portions with said compartment, a heat reflecting housing positioned within the inner housing and spaced therefrom, a heating unit positioned within the heat reflecting housing, said housings being provided at their outer coincident sides with foraminous walls, and a vent connected to the lower portion of the inner housing and directed away from said compartment.

5. In a furnace of the class described, a housing communicating at its lower portion

with a source of fresh air and at its upper end with the compartment to be heated, an inner housing positioned within the first mentioned housing and communicating at its upper and lower portions with said compartment, a heat reflecting housing positioned within the inner housing and spaced therefrom, a heating unit positioned within the heat reflecting housing, and a vent connected to the lower portion of the inner housing and directed away from said compartment.

6. In a furnace of the class described, a housing communicating at its lower portion with a source of fresh air and at its upper end with the compartment to be heated, an inner housing positioned within the first mentioned housing and communicating at its upper and lower portions with said compartment, a heat reflecting housing positioned within the inner housing and spaced therefrom, a heating unit positioned within the heat reflecting housing, and a vent connected to the lower portion of the inner housing and directed upwardly between said first mentioned and inner housing with its one side adjacent and in heat conducting relation to the outer face of the wall of said inner housing.

7. In a furnace of the class described, a housing communicating at its lower portion with a source of fresh air and at its upper end with the compartment to be heated, an inner housing positioned within the first mentioned housing and communicating at its upper and lower portions with said compartment, a heat reflecting housing positioned within the inner housing and spaced therefrom, a heating unit positioned within the heat reflecting housing, said housings being provided at their outer coincident sides with foraminous walls, a vent connected to the lower portion of the inner housing and directed away from said compartment, and another vent communicating with the upper portion of said heat reflecting housing and directed away from said compartment.

8. In a furnace of the class described, a housing communicating at its lower portion with a source of fresh air and at its upper end with the compartment to be heated, an inner housing positioned within the first mentioned housing and communicating at its upper and lower portions with said compartment, a heat reflecting housing positioned within the inner housing and spaced therefrom, a heating unit positioned within the heat reflecting housing, said housings being provided at their outer coincident sides with foraminous walls, a vent connected to the lower portion of the inner housing and directed away from said compartment, and another vent communicating with the upper portion of said heat reflect-

ing housing and directed into said first mentioned vent.

9. In a wall furnace of the class described, the combination with a building wall having a recess in one side thereof, of a housing positioned in said recess, the lower and upper portions of the front side of said housing being provided with openings permitting circulation of air thereinto and therefrom, the space at the outer back side of said housing communicating with a source of fresh air from the lower portion of said recess, the space at the upper portion of the outer side of said housing communicating with the interior of the building, a heating unit positioned within said housing, and vent means communicating with the lower portion of the interior of said housing.

10. In a wall furnace of the class described, the combination with a building wall having a recess in one side thereof, of a housing positioned in said recess, the lower and upper portions of the front side of said housing being provided with openings permitting circulation of air thereinto and therefrom, the space at the outer back side of said housing communicating with a source of fresh air from the lower portion of said recess, the space at the upper portion of the outer side of said housing communicating with the interior of the building, a heating unit positioned within said housing, and a vent connected at its lower end to the lower portion of the interior of said housing and extending upwardly therefrom at the back side of said housing and communicating with the atmosphere.

11. In a wall furnace of the class described, the combination with a building wall having a recess in one side thereof, of a housing positioned in said recess, the lower and upper portions of the front side of said housing being provided with openings permitting circulation of air thereinto and therefrom, the space at the outer back side of said housing communicating with a source of fresh air from the lower portion of said recess, the space at the upper portion of the outer side of said housing communicating with the interior of the building, a heating unit positioned within said housing, and a vent connected at its lower end to the lower portion of the interior of said housing and extending upwardly therefrom at the back side of said housing and communicating with the atmosphere, said vent being positioned adjacent and in heat conducting relation to said housing.

12. In a wall furnace of the class described, the combination with a building wall having a recess in one side thereof, of a housing positioned in said recess, the lower and upper portions of the front side of said housing being provided with openings permitting circulation of air thereinto and

therefrom, the space at the outer back side of said housing communicating with a source of fresh air from the lower portion of said recess, the space at the upper portion of the outer side of said housing communicating with the interior of the building, a heating unit positioned within said housing, a vent connected at its lower end to the lower portion of said housing and extending upwardly therefrom at the back side of said housing and communicating with the atmosphere, and another vent communicating with the upper portion of the heating unit and connected with said first mentioned vent.

13. In a wall furnace of the class described, the combination with a building wall having a recess in one side thereof, of a housing positioned in said recess, the lower and upper portions of the front side of said housing being provided with openings permitting circulation of air thereinto and therefrom, the space at the outer back side of said housing communicating with a source of fresh air from the lower portion of said recess, the space at the upper portion of the outer side of said housing communicating with the interior of the building, a heat reflecting housing positioned within said first mentioned housing and spaced at its sides and back therefrom, a battery of gaseous fuel burners positioned within said heat reflecting housing, foraminous cover members positioned over the front sides of said housings and over the space between said first mentioned housing and the upper portion of the recess, and a vent communicat-

ing with the lower portion of said first mentioned housing and communicating at its opposite end with the atmosphere.

14. In a wall furnace of the class described, the combination with a building wall having a recess in one side thereof, of a housing positioned in said recess, the lower and upper portions of the front side of said housing being provided with openings permitting circulation of air thereinto and therefrom, the space at the outer back side of said housing communicating with a source of fresh air from the lower portion of said recess, the space at the upper portion of the outer side of said housing communicating with the interior of the building, a heat reflecting housing positioned within said first mentioned housing and spaced at its sides and back therefrom, a battery of gaseous fuel burners positioned within said heat reflecting housing, a vent communicating with the lower portions of said first mentioned housing below said heat reflecting housing and communicating at its opposite end with the atmosphere, and an outer housing positioned around the first mentioned housing and substantially filling the space of the recess, said vent extending from said first mentioned housing to said outer housing at substantially the median lines thereof and in heat conducting relation with said first mentioned housing.

In testimony whereof, I have hereunto set my hand at Los Angeles, Calif. this 8th day of September 1926.

JOHN S. ANDREWS.