Mar. 20, 1923. 1,448,985

J. M. YEWELL

AIR HEATING APPARATUS

Filed Apr. 12, 1922

Fig. 1.

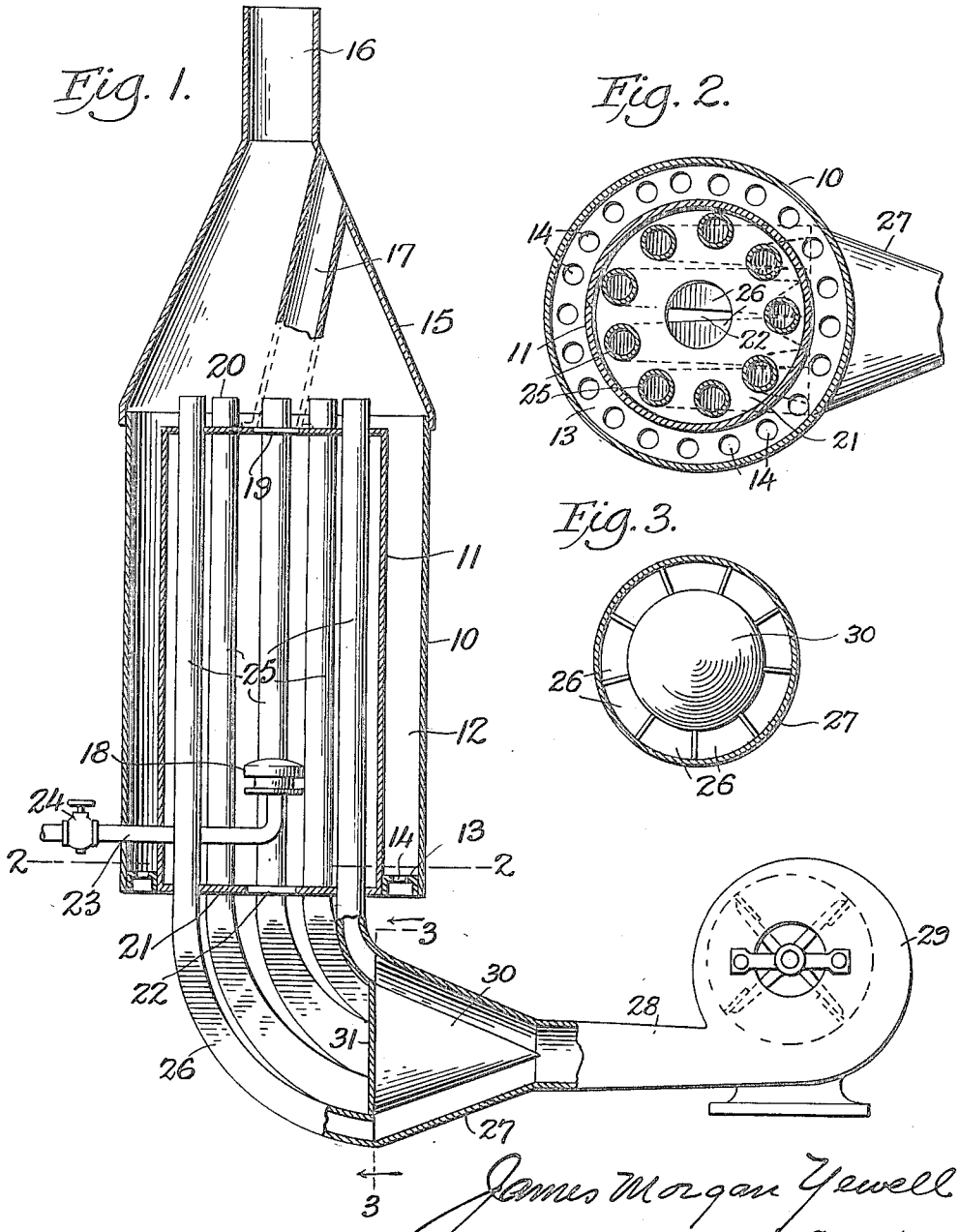


Fig. 2.

Fig. 3.

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AIR-HEATING APPARATUS.

Application filed April 12, 1922. Serial No. 551,788.

To all whom it may concern:

Be it known that I, JAMES MORGAN YEWELL, a citizen of the United States of America, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Air-Heating Apparatus, of which the following is a specification.

My present invention relates generally to air heaters, and more particularly to an air heating apparatus which may be utilized for the heating of dwellings and the like either with a single heat outlet pipe or with tubes or flues leading therefrom to various portions of the building, my object being the provision of an apparatus by means of which a considerable volume of air may be developed, set in motion, heated and delivered with maximum effect and efficiency and with minimum cost.

In my improved apparatus I propose the use of a blower for forcing air through a heater the construction of which is such as to subject air from the blower to the action of a burner employing either gas or liquid fuel into a heat absorbing surface which is such that the air will be effectively heated and at the same time held apart from the products of combustion of the burner.

In the accompanying drawing which illustrates my present invention and forms a part of this application,

Figure 1 is a vertical sectional view through my improved air heater,

Figure 2 is a horizontal section taken substantially on line 2—2 of Figure 1, and

Figure 3 is a vertical section taken on line 3—3 of Figure 1.

Referring now to these figures, my improved heater which is preferably vertically cylindrical in form includes an outer casing 10, spaced within which is a drum 11, the space 12 between this casing and drum being closed at the lower end of the casing by an air intake ring 13 having an annular series of apertures 14 through which air may be drawn upwardly into the space 12.

At its upper end, the casing 10 opens into an upwardly tapering header 15, with which the space 12 between the casing 10 and the drum 11 thus freely communicates. With the upper portion of this header 15 one or more heated air outlet pipes 16 may communicate, and through the header an outlet pipe 17 extends with its upper outer end opening through the wall of the header externally thereof.

The outlet pipe 17 which is for the discharge of products of combustion of a burner 18 located within the lower central portion of the hollow drum 11, is attached at its lower end around a central opening 19 in the top plate 20 which otherwise closes the upper end of the drum, the latter having a bottom plate 21 provided with a central opening 22 through which air is drawn in practice for the use of the burner 18 the latter of which may be supplied with oil or gas through a supply pipe 23 extending laterally through the casing and the drum and provided with a controlling valve 24.

Vertically through the drum 11 are extended a plurality of air heating tubes 25, arranged in an annular series concentrically within the same, these tubes being spaced from the wall of the drum and also from one another so that heat and flame from the burner 18 can circulate freely around each and every tube. The upper ends of the tubes 25 extend through the top plate 20 of the drum 11 and open into the header 15 while the lower ends of the tubes extend through the bottom plate 21 of the drum and are connected to curved rectangular conduits 26 extending in an annular series from and around the enlarged end of the flaring portion 27 of a blower pipe 28, the latter extending from a blower generally indicated at 29, which may be driven by any suitable means as for instance a conventional electric motor which I have not attempted to show in view of the fact that it forms no part of the present invention.

In the flared portion 27 of the blower pipe 28 is an air deflecting cone 30 the base of which is disposed against the end plate 31 at the enlarged end of the flared portion 27 around which the adjacent ends of the rectangular flues 26 are disposed so as to communicate with the annular space formed within the flared portion around the cone and thus permit of the flow of air from the blower pipe 28 and into the air heating tubes 25 with little if any friction or obstruction so that minimum power will be required for the proper operation of the blower 29.

In operation, with the burner 18 lighted, air from the blower 29 is forced upwardly through the tubes 25 and is heated in its passage through these tubes from which it

proceeds into the header 15 and into one or more hot air supply pipes leading from this header. The products of combustion pass out through the discharge pipe 17 and are maintained separate from this heated air supply, the latter of which is augmented by the supply of air drawn upwardly through the space between the drum 11 and the casing 10, through the air intake ring 13. It is thus obvious that my construction provides for a maximum heating surface within the heater and for the supply of air in considerable volume as well as for the utilization of the heat from burner 18 to a maximum extent owing to the disposition and relation of the several parts.

I claim:

1. An air heater including a vertically cylindrical casing, a drum within and spaced from the casing, having top and bottom plates each provided with an opening, a header at the upper end of the casing and into which the latter opens, a burner within the drum, an outlet pipe for products of combustion extending from the top plate opening of the drum upwardly through the header and opening exteriorly of the latter, a perforate air supply ring between the lower portions of the casing and the drum, and an annular series of air heating tubes extending through the drum and concentrically with the latter in spaced relation thereto and to one another, the opposite ends of which tubes extend through the top and bottom plates of the drum with their upper ends opening into the header, and means for forcing air through tubes having a plurality of independent conduits leading separately to the lower ends of the tubes.

2. An air heater including a vertically cylindrical casing, a drum within and spaced from the casing, having top and bottom plates each provided with an opening, a header at the upper end of the casing and into which the latter opens, a burner within the drum, an outlet pipe for products of combustion extending from the top plate opening of the drum upwardly through the header and opening exteriorly of the latter, a perforate air supply ring between the lower portions of the casing and the drum, and an annular series of air heating tubes extending through the drum and concentrically with the latter in spaced relation thereto and to one another, the opposite ends of which tubes extend through the top and bottom plates of the drum with their upper ends opening into the header, and means for forcing air into the lower ends of the tubes, said last named means including a blower having its discharge pipe provided with a flared portion, an air deflecting cone within said flared portion, and an annular series of rectangular flues in connection at their outer ends with the lower ends of the air heating tubes and having their inner ends opening into the flared portion of the blower pipe around the said air deflecting cone.

In testimony whereof I have affixed my signature.

JAMES MORGAN YEWELL.