Jan. 3, 1961 H. E. THOMPSON ET AL 2,966,838

VENTING UNIT

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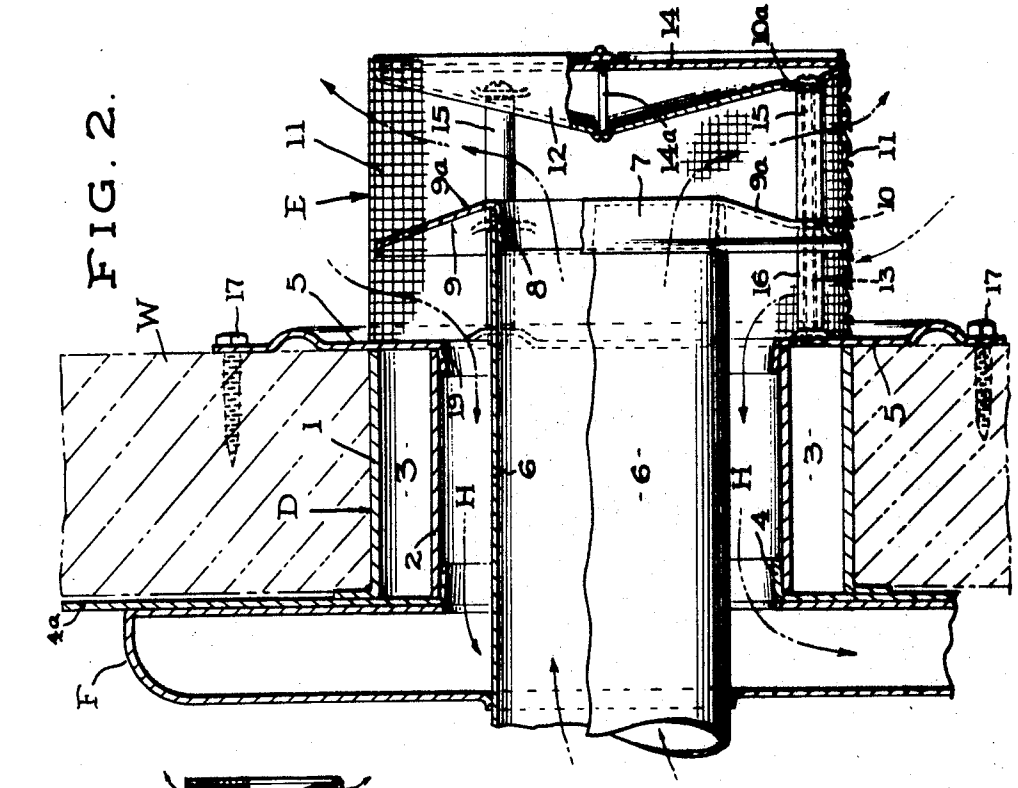


FIG. 2.

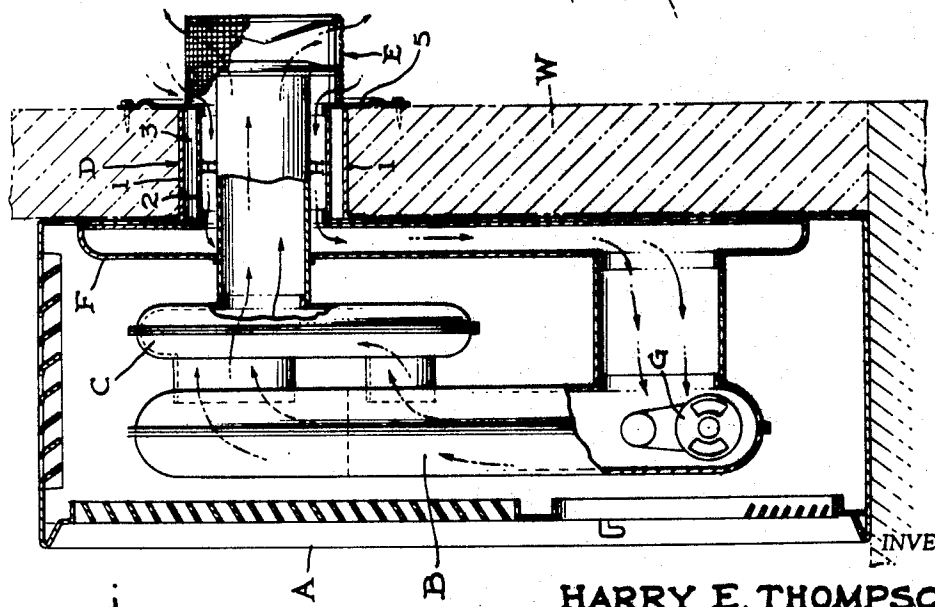


FIG. 1.

INVENTORS
HARRY E. THOMPSON
MERL J. KIMMEL
BY
ATTORNEY

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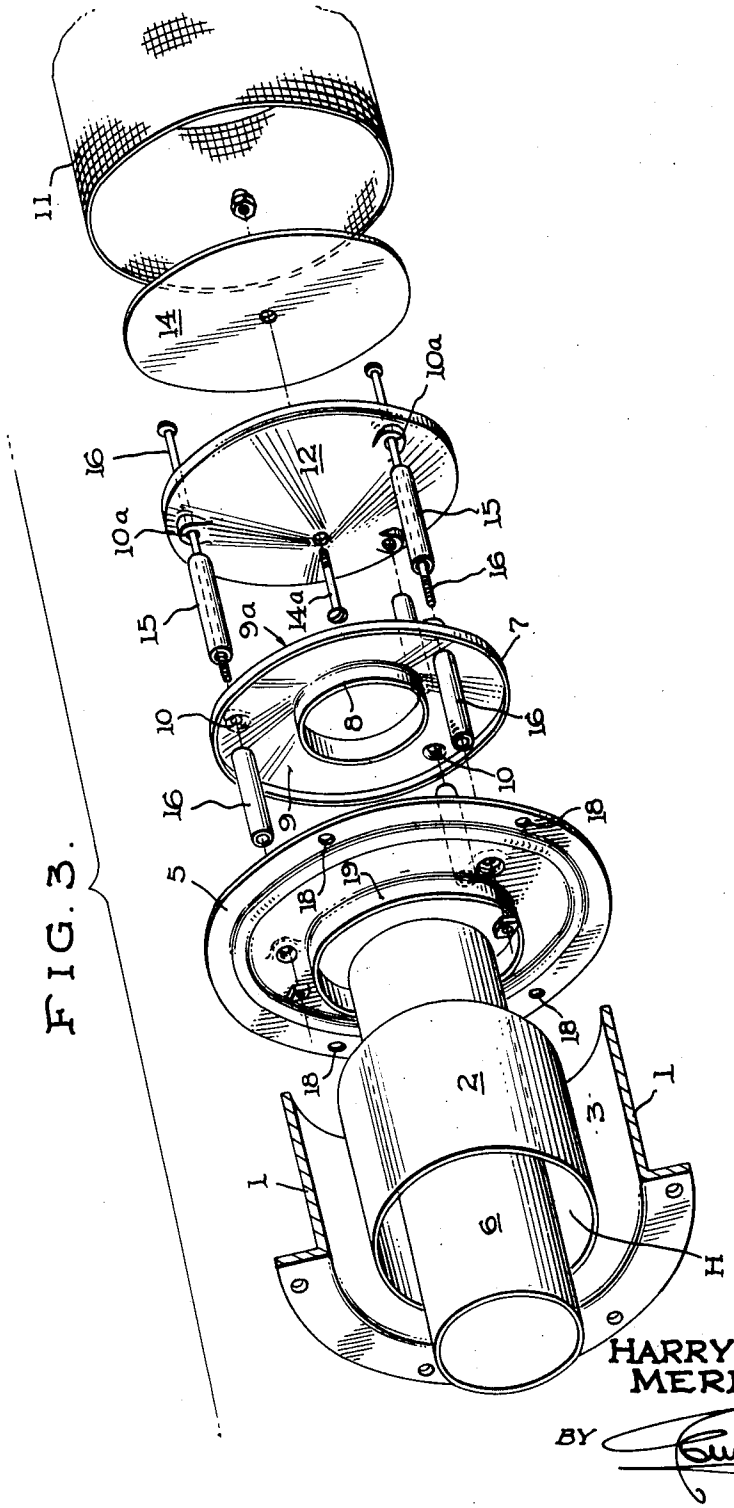


FIG. 3.

INVENTORS
HARRY E. THOMPSON
MERL J. KIMMEL
BY
ATTORNEY

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VENTING UNIT

Harry E. Thompson and Merl J. Kimmel, Steubenville, Ohio, assignors to The Ohio Foundry & Manufacturing Company, Steubenville, Ohio, a corporation of Ohio

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1 Claim. (Cl. 98—62)

This invention relates to a venting unit for establishing communication between an interior space and the outer atmosphere.

A primary object is to provide a unit having a special head construction disposed at its outer end which will not only assure free access to fresh air, but will also adequately dispose of smoke, fumes, dust-laden air, and the like, even though it may be subjected to air currents such as high velocity winds outside of the space being vented. In that connection, the outer end portion of the unit, whether installed in a roof or a wall, is provided with means functioning as a venturi opening, thereby to prevent back pressure caused, for example, by high winds, thus assuring adequate ventilation and safe removal and dispersal of the undesirable contaminated air of products of combustion.

Another object is to provide a compact venting unit providing intake and exhaust flues both of which are located within a single opening and are furthermore connected to a single exterior vent head.

A further and more specific object of the invention is to provide a unit which may be fitted into the wall of the room space to be heated to provide a cooled dead air space adjacent the building structure and a fresh air intake duct leading to the combustion chamber to supply the necessary atmospheric oxygen to support combustion. Atmospheric air in entering the unit and before reaching the combustion chamber serves to maintain the dead air space at a safe low temperature to prevent damage to the wall in which the unit is installed, particularly where the wall or roof is made of wood.

With the above and other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawings, in which:

Figure 1 is a vertical sectional view of a heater showing the combustion chamber and the present unit installed in the wall to establish communication between the heater and the outer air.

Figure 2 is an enlarged detail vertical sectional view of the venting assembly.

Figure 3 is an exploded perspective view showing several parts of the invention.

Similar reference character designate corresponding parts in the several figures of the drawings.

As will be seen from the drawings, the vent head E may be used and installed in various combinations.

For example, it may be used in connection with a heater having a combustion chamber B and a secondary chamber C in direct communication with venting means designated generally as D, and including the said outer head E. In this arrangement the air intake chamber F is connected to the venting unit through an opening in the back panel of the heater and communicates with a

burner G located within the sealed combustion chamber B.

As will be seen from the example given in Figure 1, the venting assembly may be installed in a wall W so that the inner ends of its intake and exhaust flues communicate directly with the secondary chamber C and intake chamber F, respectively, while the outer ends of the flues communicate with the atmosphere through the vent head E.

Thus it will be noted that when the present invention is employed in connection with heaters of the "sealed combustion chamber" type wherein all of the oxygen for combustion is received from outside the building and all of the resultant products of combustion are delivered to the outside air, the venting assembly which carries the head E includes an outer annular shell 1 which fits in and forms a liner for the wall opening, and an inner concentric shell 2 spaced from the outer shell to define the side walls of a dead air chamber 3. The shells 1 and 2 are held in approximately spaced relation by a collar 4 on the back panel 4*a* of the heater and a flange 19 on an outer circular plate or ring 5, which provides inner and outer closures for the ends of said dead air chamber.

Also, the venting assembly includes an exhaust pipe or flue 6 of smaller diameter than the shell 2 thereby providing intake flue space H (Figure 2) communicating with the vent head E for receiving and conducting cool outside air through the intake chamber F to the burner G. At the same time this cool outside air maintains the temperature of the dead air space 3 sufficiently low to avoid scorching or other damage to the wall W of the building.

The outer end of the exhaust flue 6 which extends beyond the wall and into the head E is fitted to the inturned collar 8 of frusto-conical plate 7, said collar telescoping into the outer end of the said flue. This plate 7 is provided with a bevelled or inclined flange 9 having an outer face 9*a* which provides part of a venturi. Spaced about the flange 9 are a series of fastener receiving openings formed with flat bearing surfaces 10, which, as will presently appear, receive bolts 13 and give support to sleeves 15 for holding parts of the head assembly together and in spaced relation.

The bevelled portion of the plate 7 is surrounded by an annular cage 11 which may be of screen mesh to provide a screen wall to keep out leaves, birds and the like, and whose inner end abuts the body of the ring 5 to cover the inlet to the intake flue F formed by the shell 2 and flue 6.

The mesh wall of the cage 11 also surrounds the substantially conical disc member 12 which, together with the bevelled outer face 9*a* of the nozzle, provides a special venturi type opening through which the gases of combustion escape. It should be noted that the opposing faces of the plate 7 and cone 12 produce a venturi opening that resists wind pressure that would otherwise cause back drafts.

A flat circular cover plate 14 fits within the curved perimeter of the cone 12 and is secured thereto by a suitable fastening member 14*a*.

The disc member or cone 12 is provided with openings 10*a* for receiving the bolts 13, which, together with sleeves 15, hold the plate 7 and cone 12 in proper spaced relation.

As will be most clearly noted in Figure 2, the bolts 13 pass from the cone 12 through sleeve 15, then through openings 10 in the nozzle 7 and next pass through another series of sleeves 16 which maintain the nozzle 7 spaced apart from ring 5 to define the intake portion of the head.

Inasmuch as the vent head E is a self-contained preas-

sembled unit, it is a relatively easy matter to install the present invention through the wall of a building and to make the necessary flue connections to the heater.

First a hole having the same diameter as the annular shell 1 is made through the wall. This shell 1 is then placed in the opening from inside the room. The heater is placed flush against the wall so that the flange opening 4 on the back panel 4a will be located concentrically within the wall opening. From the outside of the wall the inner shell 2 is slipped over the flange 4. The exhaust pipe 6 is then passed through the opening in the intake chamber F and press fitted around a collar on the secondary combustion chamber C. Next the preassembled vent head E is attached to the outside of the wall by means of suitable fasteners 17 passing through the holes 18 in ring 5. It will be seen that the flange 19 on the ring 5 will engage the outermost end of the inner shell 2 while the flange 8 fits within the exhaust pipe 6.

The pitch of the outer surface 9a of the flange 9 and the pitch of the inside face of the cone 12 together form an angle of 27° plus or minus one degree, this relationship having been determined by experimental procedures which have established that the venting assembly functions properly and efficiently in winds of a velocity up to and including fifty miles per hour to prevent back drafts.

We claim:

A venting unit adapted to be installed in a building opening to supply fresh air to and exhaust spent gases from the combustion chamber of a heater, said venting unit comprising, a pair of outer and inner spaced concentric shells adapted to be disposed in the building opening, an inner panel having an inturned collar to receive one end of the inner shell, an outer supporting ring also having an inturned collar for receiving the other end

of said inner shell, said collars supporting the inner shell in spaced relation to the outer shell to provide a dead air space in the zone of the building opening, an exhaust flue of less diameter than the inner shell and having its external face cooperating with the said inner shell to define an intake flue and said exhaust flue being adapted to communicate at its inner end with the said combustion chamber and having its outer end projecting beyond the face of said supporting ring, a frusto-conical plate including a flange inclined toward said ring, the outer diameter of said flange being substantially equal to the diameter of the outer shell and the inner periphery of said flange including a collar which fits into the outer end of the exhaust flue, a conical disc member facing the inclined flange of the frusto-conical plate and having its apical portion concentric with the axis of the exhaust flue to define an exhaust outlet permitting products of combustion to escape and also diminishing the effect of back pressure in the flue, means anchored to the supporting ring and cooperating with the plate and disc to maintain them in spaced relation, and a screen surrounding and supported by the peripheral edge portions of the frusto-conical plate and the conical disc.

References Cited in the file of this patent

UNITED STATES PATENTS

1,615,909	Nance	Feb. 1, 1927
2,755,794	Wendell	July 24, 1956
2,818,060	Field	Dec. 31, 1957

FOREIGN PATENTS

771,986	Great Britain	Apr. 10, 1957