No. 891,900. PATENTED JUNE 30, 1908.

P. BELVIN.

HEATING AND VENTILATING SYSTEM.

APPLICATION FILED JAN. 15, 1908.

Fig. 1.

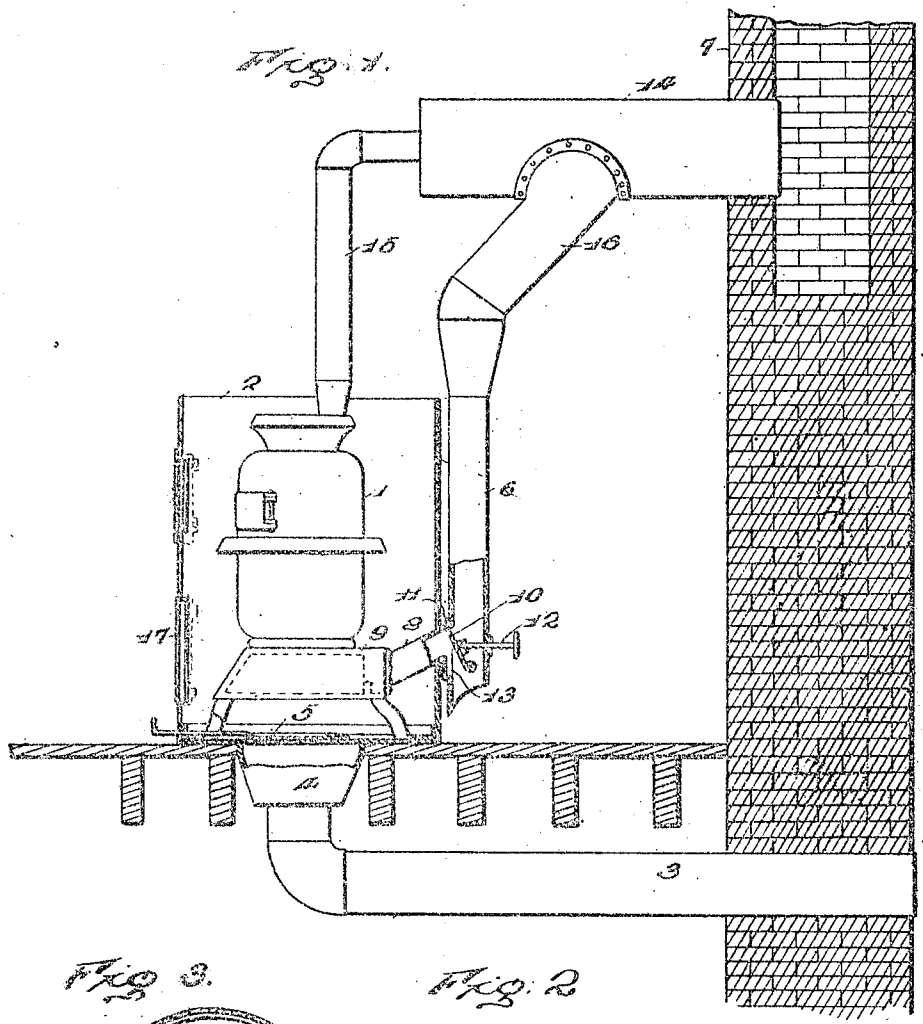


Fig. 3.

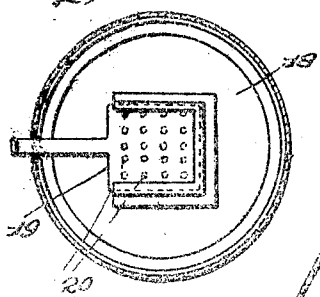
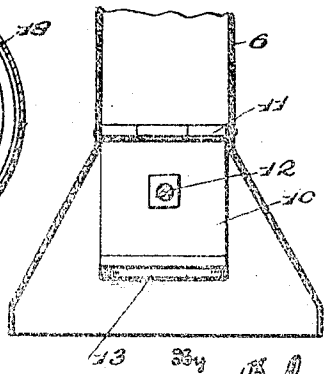


Fig. 2.



Witnesses

E. Irwin

W. F. Hoodam

Inventor

Preston Belvin

R. A. Brady. Attorneys

UNITED STATES PATENT OFFICE.

PRESTON BELVIN, OF RICHMOND, VIRGINIA.

HEATING AND VENTILATING SYSTEM.

No. 891,900. Specification of Letters Patent. Patented June 30, 1908.

Application filed January 15, 1908. Serial No. 411,004.

To all whom it may concern:

Be it known that I, PRESTON BELVIN, citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Heating and Ventilating Systems, of which the following is a specification.

The present invention appertains to means for heating and ventilating rooms, apartments, halls and like places, being of especial advantage for heating school rooms and removing vitiated air.

The invention consists of a drum encircling a stove or heater of any type and adapted to receive fresh air at the lower end and confine the same to insure its heating, the upper end of the drum being open to discharge the warm air into the room or other place to be heated and ventilated. A foul air pipe is provided and has connection at its upper end with the chimney or other outlet and is in communication with the lower portion of the room and with the ash pit of the stove or heater, a damper being arranged to control the current of air through the foul air pipe so that the vitiated air may have a direct passage to the chimney or outlet or be deflected and caused to enter the ash pit of the stove or heater to create a draft therethrough for supporting combustion.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a sectional view, showing the application of the invention. Fig. 2 is a detail view of the lower end of the foul air pipe. Fig. 3 is a horizontal section of the drum immediately above the mat.

The stove or heater 1 may be of any type, make or design. A drum 2 preferably of sheet metal, as steel, is arranged to encircle the stove or heater and is spaced therefrom to provide for ample circulation of air between the sides of the heater drum. Fresh air is supplied to the lower end of the drum and passes upward through the space formed between the drum and heater and is warmed in its ascent by the heat radiated from the stove, the heated air being discharged into the room through the upper end of the drum, which is open for this purpose. The drum in the preferable arrangement is placed upon the floor of the room, apartment or the like, a close fit being obtained to prevent any foul air entering the drum. Fresh air is supplied to the lower end of the drum through an opening formed in the floor, said opening being arranged directly below the stove or heater. A register is fitted to the opening so as to regulate the amount of fresh air to be admitted from the outside according to existing conditions. In the event of the air directly below the floor containing any impurities, a pipe 3 may be provided to extend beneath the floor and open out through a wall of the building or structure, so as to receive a supply of air from the outside. The inner end of the pipe 3 connects with a box 4, which is fitted in the opening of the floor, the upper end of the box being provided with the register embodying the damper 5.

The foul air pipe 6 is adapted to have connection with the chimney 7 or other outlet for carrying off the smoke from the stove or heater 1 and its lower end extends close to the floor of the room, apartment or the like in which the heater is placed, so as to receive the foul and vitiated air which accumulates in the lowermost strata of the room. The lower end of the foul air pipe 6 is flared, as shown most clearly in Fig. 2, to provide an extended mouth for gathering in the foul or heavy air. A branch pipe 8 connects with the lower portion of the foul air pipe 6 and inclines downwardly therefrom and connects with the ash pit 9 of the stove or heater. By having the branch pipe 8 inclined, as shown, ashes, cinders and the like are prevented from passing from the ash pit therethrough and into the pipe 6 and dropping upon the floor. A damper 10, pivoted or hinged at 11, is adapted to control the current of air either through the pipe 6 or the branch 8. A rod 12 connects with the damper and passes through an opening in a side of the pipe 6 and is notched or toothed to make engagement with said pipe to hold the damper in any adjusted position. The damper when, released, closes by gravitative action. A re-

cess 13 is formed near the juncture of th branch 8 with the pipe 6 to receive the lower portion of the damper 10 so as not to obstruct the entrance to the pipe 6.

A pipe section 14 fitted to the smoke pipe opening leading into the chimney 7, is of larger diameter than the smoke pipe 15 or the foul air pipe 6 so as not to impair or check draft therethrough. The upper section of the foul air pipe 6 is enlarged, as shown at 16, whereby provision is had for accommodating the air as the same is expanded as it approaches the pipe section 14, thereby preventing any checking or diminution in the draft therethrough.

It is well known that the lower strata of air in a room, apartment or the like, is laden with impurities, and the present invention provides for carrying off such vitiated air. When the parts are assembled, substantially as shown and herein indicated, a draft is created through the foul air pipe 6, and by reason of the latter opening into the room close to the floor thereof, the heavy or vitiated air is drawn therein and passes upward and out through the chimney or other discharge. The vitiated air thus disposed of is replaced by the fresh air entering the lower portion of the drum 2, said air being held within the heating zone of the stove 1 by the drum 2 and warmed prior to its discharge from the upper end of the drum into the room. For supporting combustion, the lower end of the damper 10 may be drawn outward, thereby causing the foul air to enter the lower portion of the pipe 6 and thence pass through the branch 8 into the ash pit and up through the body of coals in the stove and creating a draft therethrough in the manner well understood. The damper 10 may be set either to direct the entire current through the stove or through the foul air pipe, or partly through each, as may be found to give the best results. The fresh air entering the lower portion of the drum and rising is deflected outward by coming in contact with the bottom of the stove or heater, and after spreading horizontally, passes through the space surrounding the heater and is confined by the drum 2. The drum may be of any construction to admit of access being had to the stove door for feeding fuel thereto and to the ash pit for removing the ash pan or ashes. As shown, a door 17 is provided in the lower portion of the drum opposite the ash pit to admit of access being readily had to the latter. It is of the utmost importance that the ash pit be entirely closed, except for the opening in communication with the branch pipe 8, thereby preventing any of the fresh air being utilized for supporting combustion.

The register may be of any construction and arrangement. It may be fitted in the open end of the box 4, or it may be part of a mat. The mat 18 is of sheet metal reinforced at its outer edge and having its middle portion perforated and surrounded on three sides by a guide to properly position a slide 19 and direct it in its movements, said slide controlling the air admitted through the openings of the perforated portion 20 of the mat.

Having thus described the invention, what is claimed as new is:

1. In a heating and ventilating system, the combination of a heater provided with an ash pit and having connection with an outlet, a drum encircling the heater, means for supplying fresh air to the lower portion of the drum to be heated in its ascent through said drum and discharged from the upper end thereof, and a foul air pipe having its lower end in communication with the lower portion of the room or apartment in which the heater is placed and having its upper end connected with the aforesaid outlet, a branch pipe connecting the lower portion of the foul air pipe with the ash pit of the heater, and a damper arranged in the lower portion of the foul air pipe for controlling the circulation through the said pipe and the branch in communication therewith.

2. In a heating and ventilating system, the combination of a heater provided with an ash pit and having connection with an outlet, a drum encircling the heater, means for supplying fresh air to the lower portion of the drum, a foul air pipe having its lower end extended to within a short distance of the floor of the room or apartment in which the heater is placed and having its upper end in communication with the aforesaid outlet, a branch pipe connecting the lower portion of the foul air pipe with the ash pit of the heater and inclined upwardly from the latter, and a damper arranged at the juncture of the branch pipe with the foul air pipe for controlling the same.

3. In combination, a heater provided with an ash pit and having connection with an outlet, a drum encircling the heater, means for supplying fresh air to the lower portion of the drum, an enlarged pipe section having connection with the outlet and with the smoke pipe leading from the heater, a foul air pipe having its upper portion enlarged and connected with said enlarged pipe section and having its lower end in communication with the lower portion of the room to carry off the vitiated air therefrom, a branch pipe connecting the lower portion of the foul air pipe with the ash pit and the heater, and a damper located at the juncture of the branch pipe with the said foul air pipe.

4. In combination, a heater provided with an ash pit and having connection with an outlet, a drum encircling the heater, a fresh air pipe leading from the outside and open-

ing through the floor beneath the heater, a register for controlling the outlet of the fresh air pipe, a foul air pipe having connection at its upper end with the aforesaid outlet and having its lower end flared and in communication with the lower portion of the room, an inclined branch pipe connecting the lower portion of the foul air pipe with the ash pit of the heater, and a damper at the juncture of the branch pipe with the said foul air pipe.

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

PRESTON BELVIN. [L. S.]

Witnesses:
V. B. HILLYARD,
W. N. WOODSON.