

(No Model.)

J. & E. B. BARTLETT.
WARM AIR APPARATUS.

No. 538,813.

Patented May 7, 1895.

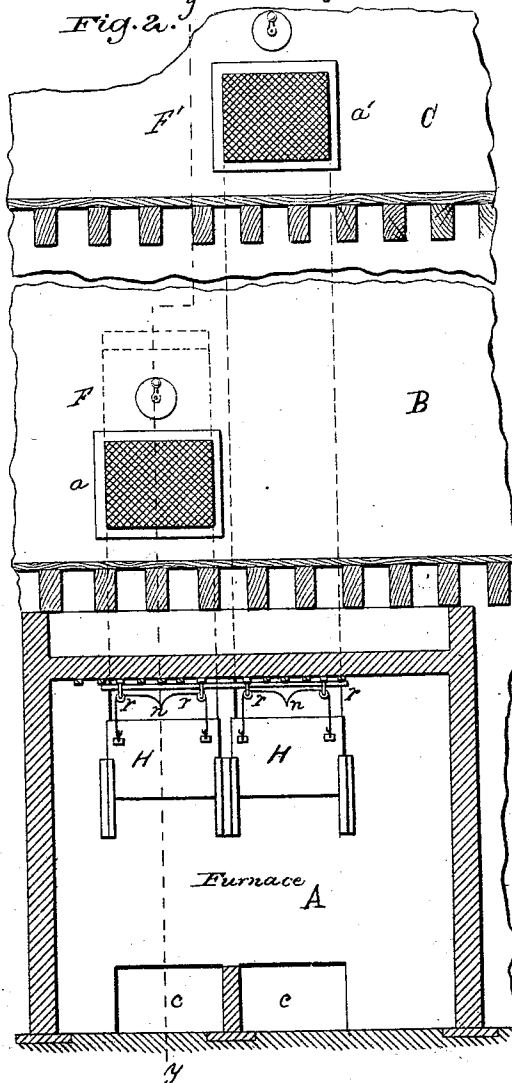
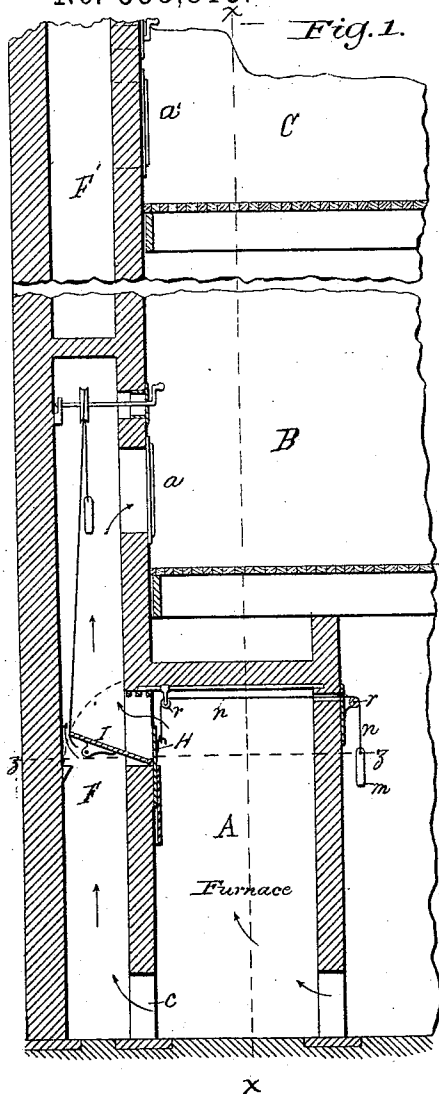
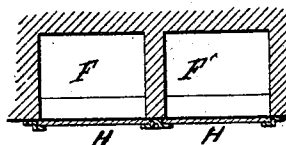


Fig. 3.



Witnesses
Arthur Ashby
Ellet Burdine

Inventors,
James Bartlett
Eugene B. Bartlett
by *Dodger & Sons*
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES BARTLETT, OF TOLEDO, AND EUGENE B. BARTLETT, OF CLEVELAND, OHIO.

WARM-AIR APPARATUS.

SPECIFICATION forming part of Letters Patent No. 538,813, dated May 7, 1895.

Application filed December 17, 1894. Serial No. 532,098. (No model.)

To all whom it may concern:

Be it known that we, JAMES BARTLETT, residing at Toledo, in the county of Lucas, and EUGENE B. BARTLETT, residing at Cleveland, in the county of Cuyahoga, State of Ohio, citizens of the United States, have invented certain new and useful Improvements in Warm-Air Apparatus, of which the following is a specification.

10 This invention relates to the warming and ventilating of buildings, and the invention consists in means for regulating the flow of the air in or to the several rooms for the purpose of regulating and equalizing not only the heat but also the volume of air entering the various rooms of the building, as hereinafter more fully described.

15 Figure 1 is a vertical section of a portion of a building on the line *yy* of Fig. 2. Fig. 2 is a similar view on the line *xx* of Fig. 1, and Fig. 3 is a transverse horizontal section on the line *zz* of Fig. 1.

20 This invention is designed for use in connection with what is known as the Smead system of warming and ventilating buildings, in which system both the warm and the cold air are brought into the room through a single flue, in which is arranged what is termed a "mixing valve," by the adjustment of which the relative proportions of cold and warm air can be varied at will.

25 In the drawings, A indicates the chamber in which the heating apparatus is located, and which may be either a furnace or a steam or hot water apparatus, and B and C indicate rooms to be heated in the stories above.

30 It is customary in the Smead system to build the flues F and F' for the warm air alongside of one another, one for each room, there being often four or more of these flues opening out from one heat chamber, two only being shown in this case, as they suffice to illustrate the invention. As shown in Figs. 1 and 2, these flues are usually of different heights, the flues F for the first story stopping at that story, while the flue F' extends to the second story, as indicated by the dotted lines in Fig. 2, the air entering the room B through the guard *a*, and the room C through the guard *a'*, and so on for any number of stories, there being no

registers or valves at these guards. In the Smead system as illustrated in this case, the cold air enters not only the heat-chamber but also the flues through the opening *c* at the bottom of the flues, while the warm air enters the flues through the opening above, the volume of both cold and warm air being regulated by the hinged valve I which is so arranged as to let on the warm air in proportion as it shuts off the cold air, and vice versa; and thus by mingling the warm and cold air as desired, secure the proper temperature in the room.

35 Experience has shown that however the valve I may be adjusted, there will be a stronger current of air in some of the flues than in others, and that consequently some of the rooms will get more air than others. This is due not only to the difference in the height or location of the flues, but also to the varying conditions of the outer atmosphere, and to the direction and force of the wind. For these various reasons it is difficult by this system to so regulate the supply of air entering the various rooms, in a large school building for instance, as to secure a uniform volume of air in each.

40 To remedy this difficulty is the object of our invention, and to accomplish this result we provide at the warm air opening into each flue, an additional valve or damper H, which can be adjusted independently for each flue, and also independently of the valves I. These may be arranged in any suitable manner so that they can be closed and opened more or less at will. A simple plan, as shown in Figs. 1, 2, and 3, is to make them in the form of a plate, with suitable guides, to enable them to be raised or lowered at will. For the purpose of adjusting them, they are suspended by a chain or wire cord *n* which passes over pulleys *r r* as shown, and which has a weight or counterbalance *m* attached outside of the wall of the heating chamber, so that the janitor by lowering or raising the weight, can raise or lower the plate or valve H, and thus regulate the volume of warm air entering each flue, and by this means equalize the heat in the various rooms. In order to insure the smooth and easy working of these valves, we prefer

to connect a chain or cord near each upper corner as shown in Fig. 2, and pass them over pulleys, and then unite them to a single cord by which to operate them as described. It
5 will thus be seen that the object of these valves H is to act in connection with the mixing valve I, as equalizers of the air currents in the several flues; and that by the proper adjustment of the valves, not only the temperature but
10 also the volume of air supplied to each and all the rooms can be rendered perfectly uniform.

This improvement is simple and cheap, and can be readily applied in all cases where the
15 warm and cold air are both brought through the same flue, and a mixing valve is used as in the Smead system. Another advantage of this arrangement is, that it enables the flow of both cold and warm air to be shut off entirely
20 when desired. In some instances schools close for instance at eleven a. m., and then open again in the afternoon or evening; and in such cases, by dropping the valve I, the cold air is shut off, and by raising the valve
25 H the flow of the warm air is shut off, and as no air can enter at such times, the heat in the rooms will be retained therein to a considerable extent. So too, in very cold weather, at night when the fire is out, the flow of the
30 air can be shut off entirely, by which means the rooms will be cooled much less during the night, and will require a fire for a shorter period in the morning to bring the air in the rooms to the proper temperature, in both of
35 which cases a saving of fuel will be effected.

By means of a thermograph connecting the

various rooms to be warmed, with the janitor's room, he can at any instant ascertain the temperature of each room, and then adjust the valves I so as to increase or decrease the
40 flow of cold air into each separately, and thus equalize the temperature in all the rooms, while the current in the separate flues can be regulated by the valves H.

Having thus fully described our invention, 45 what we claim is—

1. In combination with a single flue arranged to conduct both cold and warm air to a room, and having a mixing valve I arranged therein to regulate the relative supply of the
50 cold and the warm air, a valve H arranged to close the warm air inlet to said flue more or less independently of the mixing valve, substantially as shown and described.

2. The combination in a building, of two
55 or more flues of different heights, each arranged to conduct both warm and cold air to a room therein, and having a mixing valve I for regulating the proportion of warm and cold air in each flue, a separate valve H
60 located at the warm air inlet of each flue arranged to be operated independently of the mixing valve, substantially as shown and described.

In witness whereof we hereunto set our
65 hands in the presence of two witnesses.

JAMES BARTLETT.

EUGENE B. BARTLETT.

Witnesses:

J. H. KUGEL,

F. S. BARTON.