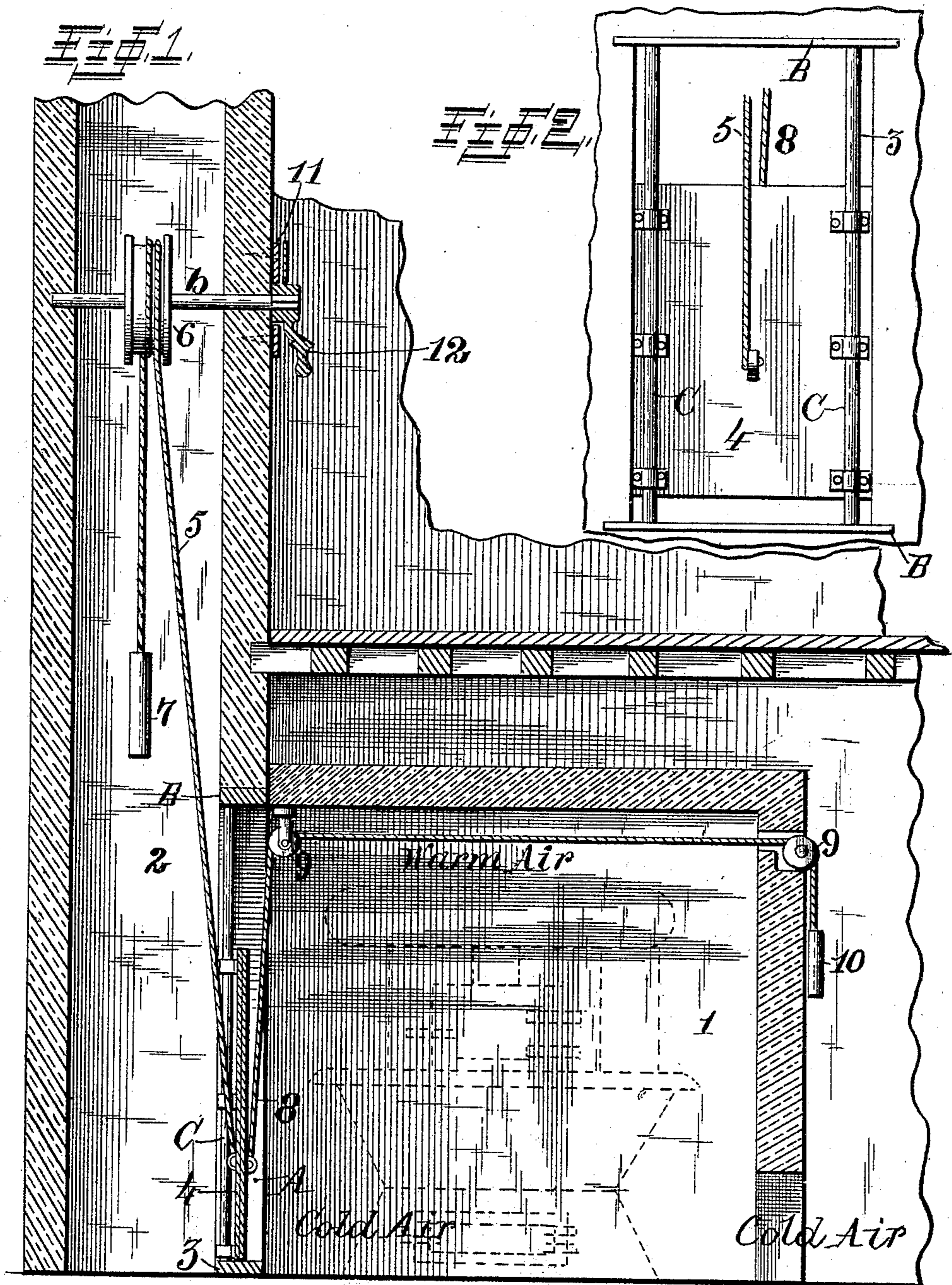


(No Model.)

C. G. & R. L. SHORT.
MIXING VALVE FOR CONTINUOUS VENTILATION.

No. 464,945.

Patented Dec. 8, 1891.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES G. SHORT AND ROBERT L. SHORT, OF ST. LOUIS, MISSOURI; SAID
ROBERT L. SHORT ASSIGNOR TO SAID CHARLES G. SHORT.

MIXING-VALVE FOR CONTINUOUS VENTILATION.

SPECIFICATION forming part of Letters Patent No. 464,945, dated December 8, 1891.

Application filed September 6, 1890. Serial No. 364,125. (No model.)

To all whom it may concern:

Be it known that we, CHARLES G. SHORT and ROBERT L. SHORT, of St. Louis, State of Missouri, have invented certain new and useful Improvements in Mixing-Valves for Continuous Ventilation, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention is a valve of the class known as "mixing-valves;" and it consists in certain novel features of construction and combination, as will be hereinafter set forth and claimed.

In the drawings, Figure 1 is a vertical section of our complete device as applied to a warm-air chamber and flue, and Fig. 2 is a detail view of the valve.

Referring to the drawings, 1 1 represent a warm-air chamber with the cold air entering at the bottom, and which chamber may be occupied by a warm-air furnace, coil of steam-pipe, hot-water radiator, or any other device used for heating a current of air.

2 is the flue for conveying a current of air from the chamber 1 to a room or rooms above. The face of the flue 2 is provided with an opening A, which may be of any desired size and connecting the warm-air chamber 1 with the flue 2.

3 indicates the frame which supports and guides the valve 4. This frame consists of two horizontal pieces of metal B, one of which is situated at the top of the opening and the other at the bottom thereof, both being securely fastened to the flue. Between these horizontal bars and at any desired distance from the center are two or more vertical rods C, the ends of which are secured to the bars B.

4 is a valve, which may be constructed of one or more sheets of metal or other non-combustible material. Secured to this valve are one or more series of keepers *a*, so arranged that they move readily upon the rods of frame 3. To this valve is attached a cable or a chain 5, which is carried over a pulley 6, which is operated by a shaft *b*, journaled in the walls of the flue, and from this pulley said cable or chain returns down the flue any desired distance. To the free end of this cable is attached a weight 7 or its equivalent, ar-

ranged to balance any desired fraction of the weight of the valve.

Attached to the valve, as shown in Fig. 1, is a second cable or chain 8, which is carried over a pulley or a series of pulleys 9 9 and extending through the warm-air chamber 1 into the furnace-room. To the free end of this second cable or chain is attached a second weight 10, or an equivalent therefor which completes the balancing of the valve, and is also useful as an index when the valve is operated by means of the first-mentioned cable or chain, said weight moving up and down when said valve is so operated.

It will be understood that the weights together are sufficient to balance the valve, and consequently either one of them is insufficient, so that by lifting one of the weights the valve is unbalanced, and is thereby operated by the other.

Referring to the shaft above mentioned, it passes through the flue and has one end extended through the wall thereof into the room from which the valve is to be operated. This projecting end passes through a dial-plate 11, secured to the wall of the room, and is operated by a lever 12, mounted upon or secured to the shaft *b* or by any proper means.

It may be observed that the valve is shorter or smaller than the opening of the flue, the object being when the valve is down to allow a volume of air sufficient to fill the flue to pass between the top of the valve and the top of the opening. It is of course understood that when the furnace is in operation the air at the top of the chamber will be warm, while that at the bottom of the chamber will be comparatively cold.

The object of the valve is to regulate the temperature of the room without reducing the temperature of the inflowing air, and it will be readily seen that the lifting of the valve will tend to close the opening at the top, thereby cutting off to a more or less degree the current of heated air, and at the same time will open a corresponding space at the bottom of the chamber, thereby allowing the cool air to flow upward in the flue through the same area and in the same quantity as was cut off at the top.

We are aware that various forms of mix-

ing-valves have heretofore been employed, but operated from only one point.

By our construction the valve may be operated by either of the chains or cables, and the corresponding devices in the other portion or apartment of the building cannot fail to indicate the position of the valve.

The advantages of our invention are that the valve is balanced and of the same weight in all positions, is silent in its operation, and that it can be so accurately balanced that it will remain wherever placed without any fastening, and is therefore at all times in condition to be operated by either of the devices hereinbefore described.

Having thus described our invention, what we claim is—

1. In a warm-air flue, the combination, with a damper controlling the flow of heated air into the said flue, of a device for operating the damper from a floor above, and a second device for operating the damper from the room in which the heater is situated, said devices serving together to balance the damper in any adjusted position, either device of itself being insufficient to balance the said damper, substantially as specified.

2. In combination with a chamber adapted to contain a source of heat, the warm-air flue of a building adjacent thereto and having an inlet-opening connecting with said chamber, in combination with a vertically-sliding valve that is smaller than said opening and arranged to slide therein, and suitable means for sliding and holding said valve at any desired adjustment, whereby warm and cold air may be mixed and supplied to a room, substantially as specified.

3. A building having therein a chamber adapted to contain a source of heat, a verti-

cal warm-air flue and guides in said flue, an opening connecting said chamber and said warm-air flue, a vertically-sliding valve that is smaller than said opening and adapted to permit passage of air either above or below itself, and means for balancing and locking said valve at the desired adjustment, substantially as specified.

4. The combination, with a chamber having an undivided interior with a source of heat located therein above its floor, of a flue contiguous to the said chamber and communicating therewith by an opening in the walls of the said chamber, extending from the top to the bottom thereof, and a valve of less height than the said opening adapted to reciprocate therein, as described.

5. The combination, with a chamber having an undivided interior with a source of heat located therein above its floor, of a flue contiguous to the said chamber and communicating therewith by an opening in the walls of the said chamber, extending from the top to the bottom thereof, vertical guides in the said opening, a valve of less height than the said opening sliding on the said guides, and a plurality of counterpoises located in different apartments, the aggregate weight of the said counterpoises being sufficient to counterbalance the said valve, but the aggregate weight of less than all of the said counterpoises being insufficient to counterbalance it, as described.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES G. SHORT.
ROBERT L. SHORT.

Witnesses.

C. F. KELLER,
JNO. C. HIGDON.