(No Model.)

E. W. WELLS.

FURNACE CHAMBER.

No. 421,998. Patented Feb. 25, 1890.

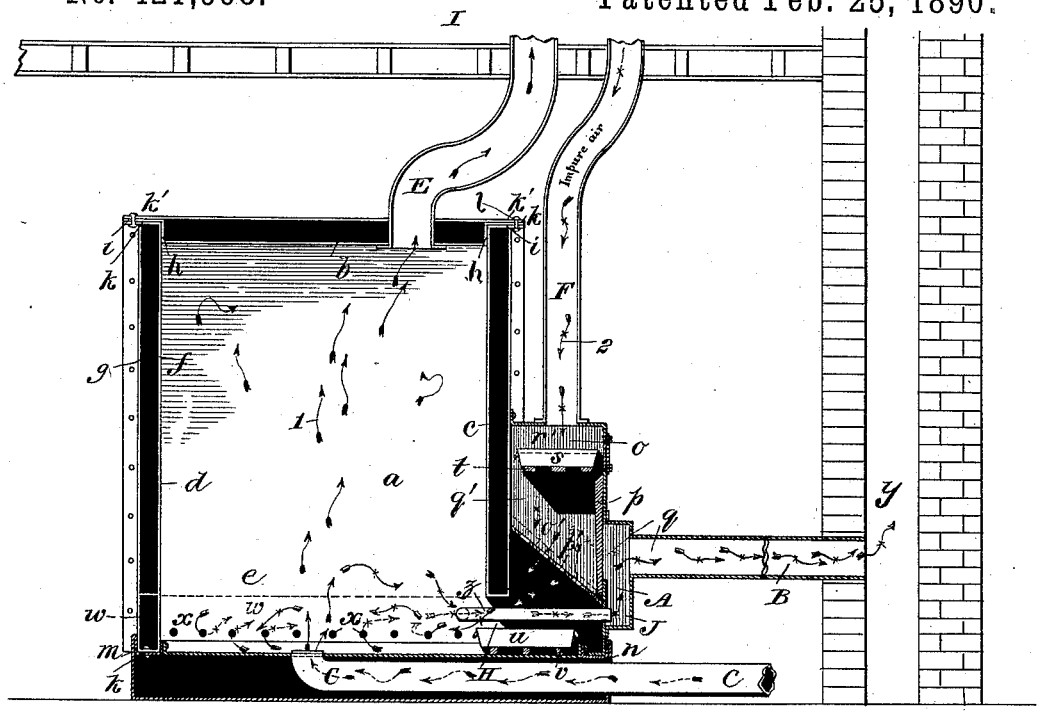

FIG. 1.

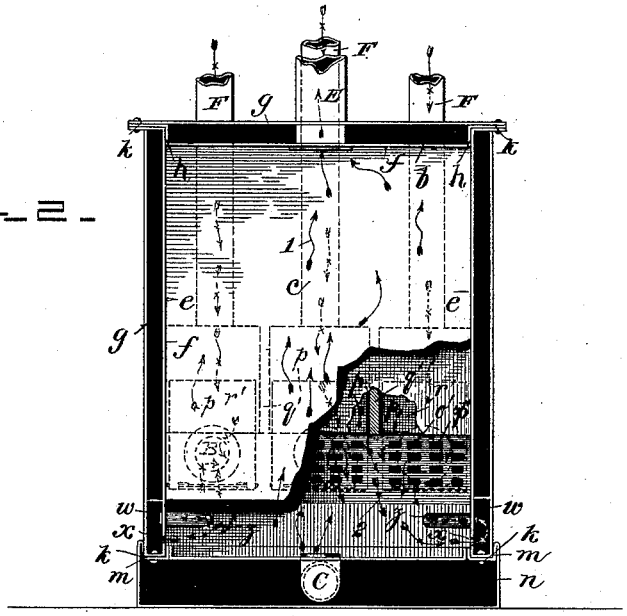

FIG. 2.

WITNESSES:

L. A. Commy Jr.

F. P. Davis.

INVENTOR,

Edward Walter Wells,

per R. G. Dorsey

his Att'y.

UNITED STATES PATENT OFFICE.

EDWARD WALTER WELLS, OF OSKALOOSA, IOWA.

FURNACE-CHAMBER.

SPECIFICATION forming part of Letters Patent No. 421,998, dated February 25, 1890.

Application filed June 21, 1889. Serial No. 315,035. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WALTER WELLS, a citizen of the United States, residing at Oskaloosa, in the county of Mahaska and State of Iowa, have invented certain new and useful Improvements in Furnace-Chambers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has especial reference to the construction and arrangement of a hot-air chamber for portable furnaces, although it could be used for other kinds.

The object of my device is to keep up a constant circulation of fresh air in the rooms supplied with heat, to utilize the heat to its fullest capacity, to provide means for taking the air away from a sick-room without vitiating the air in the other rooms, and to purify and moisten the air.

With these ends in view my invention consists in the peculiar features and combinations of parts more fully described hereinafter, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation in cross-section, and Fig. 2 an end view with the back wall removed.

The reference-letter *a* denotes the interior of the heating or hot-air chamber, which is composed of the top, end, and side walls *b*, *c*, *d*, and *e*, respectively. These are what may be termed "double walls," each consisting of an outer and inner sheet *f* and *g*, arranged to leave a space between them to prevent the heat from radiating from the exterior of the chamber and into the room where the furnace is placed. The top wall is provided with a shoulder *h*, formed by bending up the lower sheet *f*, which operation leaves an overlapping flange *i*, to rest upon the top of the side walls *e* and form a lap-joint. The inner sheet of the end walls *c* is bent outwardly over the edges of the outer sheet *g*, to form a flange *k* along the top for the purpose of enabling the flange to be secured to the flange *k'* by means of bolts or rivets *l*. The lower edges of the side walls rest in sockets or grooves *m*, formed around the upper edges of the hollow base *n*, and thus make a dust-tight joint, and they are lap-joined and riveted to the flange *k* like the top. The base *n* is made deeper than the walls are thick, in order to elevate the bottom of the heater from the floor, and the base is preferably composed of sheet metal with air-tight joints to exclude noxious gases which might arise from the ground or floor of the furnace-room.

A damper-box *o* is located at the rear of the hot-air chamber *a* and contains the dampers *p*, which have their lower ends pivoted below the mouth of the outlet-flue *q*, to close the latter when the dampers are raised. An inclined plate *o'* is placed diagonally across the damper-box and is provided with openings *p'*. This plate forms a seat for the dampers when they are closed over the openings *p'*. The damper-box is provided with vertical partitions *q'*, which divide it into three compartments *r'*, so that when there are three return-pipes each one has its own damper. The partitions extend from the top of the damper-box down to the plate *o'*, but below the plate there are no partitions. By this arrangement the dampers are made to serve the double purpose of returning the hot air to the chambers *a* or directing it out of the chimney, as will be explained hereinafter. In the upper part of the damper-box a water-pan *s* rests upon an open grate *t*, so that the downflowing air will come in contact with the water in the pan to purify and moisten it, and a similar pan *u* is placed upon grate-bars *v* below the valve, to still further purify and moisten the air. A foul-air flue *w*, which comprises the lower portion of the side walls *e*, is provided with perforations *x*, and this flue is made to communicate with the chimney *y* by way of the diagonal flues *z*, the transverse flue A, and outlet-flue B. Arrows 1 show the course the foul air pursues, and arrows 2 that of the pure air. Fresh air is supplied to the chamber through the flue C, which enters the base. The hot air passes out of the chamber through an uptake-flue E, extending out of the top of the chamber and into the room above, and is drawn off by a downtake-flue F, which communicates with the top of the damper-box *o*. The arrows represent the course pursued by the hot air.

It is apparent from the foregoing description that the fresh air after entering through

the flue C passes into the hot-air chamber *a*, where it is heated by the furnace, and from this chamber it passes into the room or rooms I above through the offtake-flue E. After having circulated around the room it is drawn off by the downtake-pipe F, and entering the damper-box *o* it comes in contact with the water-pan *s*. If the damper *p* is thrown back, as shown in full lines in Fig. 1, the air will flow on down to the opening H, where it will be directed again into the hot-air chamber, but the impure heavier portion, which is laden with carbonic gas, will pass out through the perforations in the side walls *e*, and thence to the chimney J by way of the diagonal flues *z*, transverse flues A, and outlet-flue B. In this way the impure portion of the air is eliminated, while the purer portion is again utilized. When, however, the hot air passes through a sick-room and it is not desirable to have it again enter the hot-air chamber, then the damper *p* is turned down, as shown in dotted lines, and the air passes out to the chimney through the outlet-flue B.

The advantages of my device are that a constant circulation is kept up, a large percentage of the heat which would otherwise be lost by passing directly out of the chimney is saved by using the pure portion of the air over again, and the vitiated air from a sick-room may be passed directly out of the chimney and entirely cut off from the other parts of the house.

It is evident that my invention could be changed in many slight ways which might suggest themselves to a skilled mechanic. Therefore I do not limit myself to the exact construction herein shown; but,

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a hot-air chamber for furnaces, the combination of an offtake-flue communicating with its interior, a damper-box located upon the outside of the chamber and provided with an opening leading into the lower part of said chamber, a downtake-flue communicating with the upper part of the damper-box, an outlet-flue connecting the box with the chimney, and a damper pivoted to command the mouth of said outlet-flue and lower portion of the box, in the manner and for the purpose substantially as set forth.

2. In a hot-air chamber for furnaces, a take-off flue leading out of the hot-air chamber, in combination with a return-flue leading into said chamber, and a damper-box provided with a damper interposed between the return-flue and chamber, in the manner and for the purpose substantially as described.

3. In a hot-air chamber for furnaces, a take-off flue leading out of said chamber, in combination with flues leading to the chimney and a damper commanding said flues, whereby the escaping air may be directed up the chimney or returned to the hot-air chamber, in the manner and for the purpose substantially as described.

4. In a hot-air chamber for furnaces, the combination of a take-off flue connecting the hot-air chamber with the room to be heated, a return or downtake flue connected with a damper-box located upon the outside of said chamber, and a water-pan located within said box, in the manner and for the purpose substantially as described.

5. A hot-air chamber for furnaces, having its side and end walls hollow and provided with shoulders and flanges bent out of one of the wall-sheets and lap-joined together, in the manner and for the purpose substantially as described.

6. The combination, in a hot-air chamber provided with an offtake-flue, of the hollow side and end walls, lap-joined as described, a fresh-air flue entering the base of the chamber, a damper-box located upon the outside of the chamber, a return-flue leading into said box, the latter being connected with a flue leading into the chimney, said box having an opening leading into the lower part of the hot-air chamber, a valve commanding said outlet-flue and opening, water-pans located within the valve-box, foul-air flues located along the lower part of the chamber-walls, and flues connecting them with the chimney, all arranged and adapted to operate in the manner and for the purpose substantially as described.

7. In a hot-air chamber having the usual offtake-flue for conveying the heat to the apartments to be heated, a return-flue arranged to return the hot air from said compartment to the lower portion of said chamber for reheating, in combination with a foul-air flue arranged to carry off the vitiated air, in the manner and for the purpose substantially as described.

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

EDWARD WALTER WELLS.

Witnesses:
JAMES A. RICE,
W. R. CAMMACK.