(No Model.)

W. J. KEEP.

OVEN DOOR OPENING AND CLOSING MECHANISM.

No. 455,750. Patented July 14, 1891.

Fig. 2.

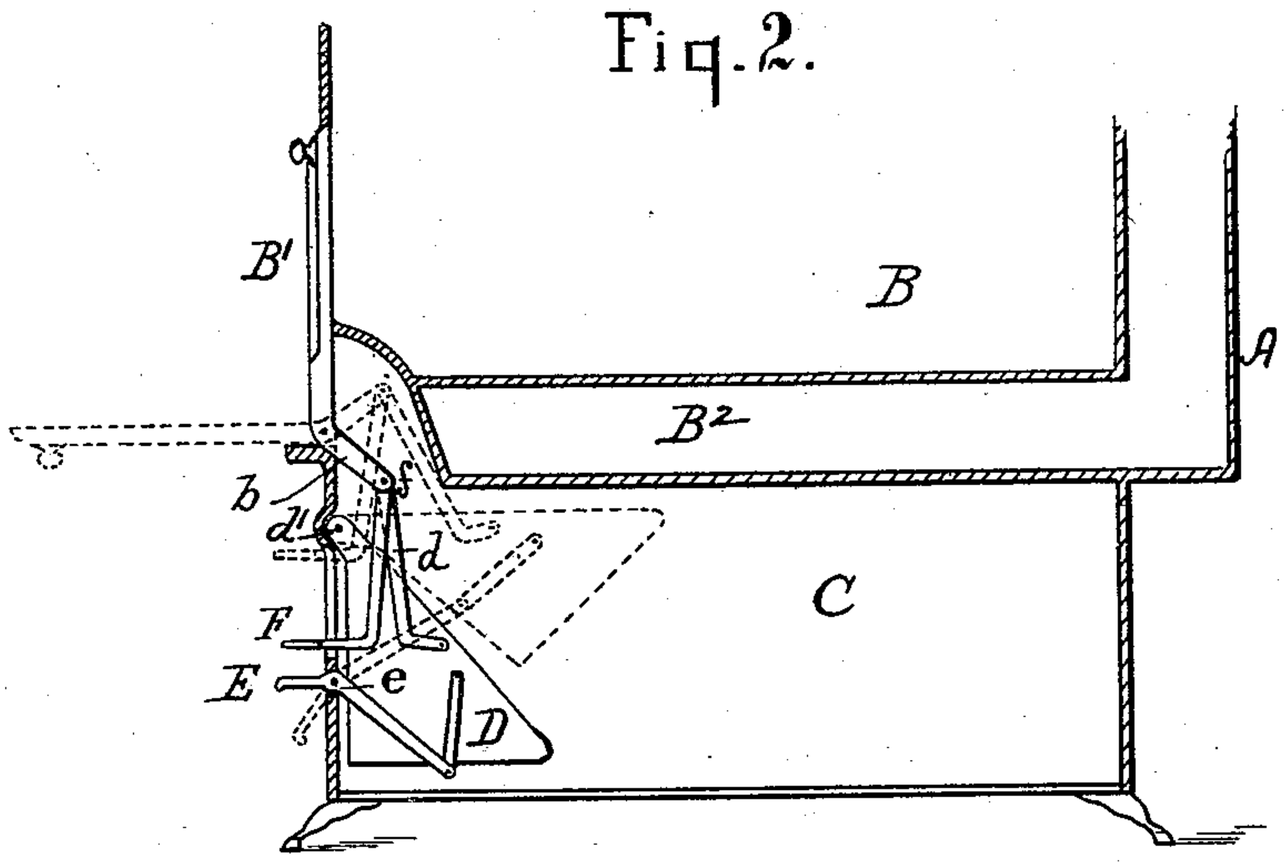


Fig. 3.

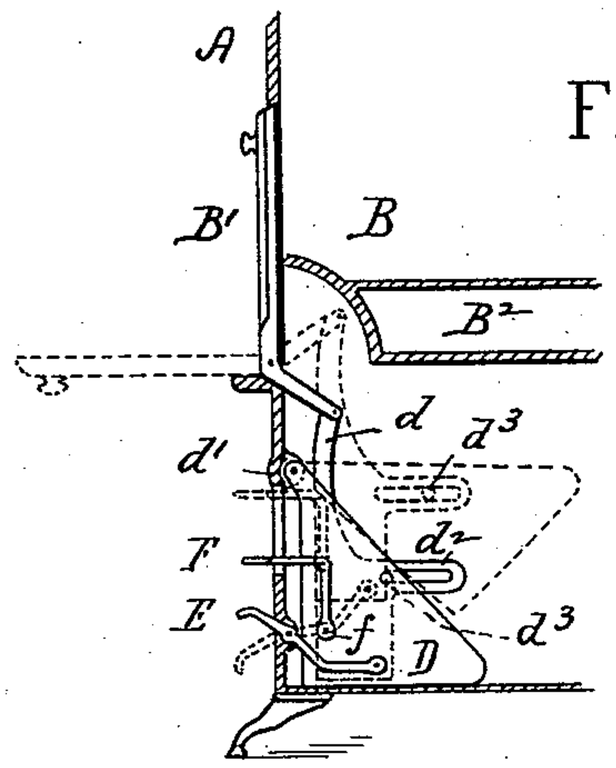


Fig. 1.

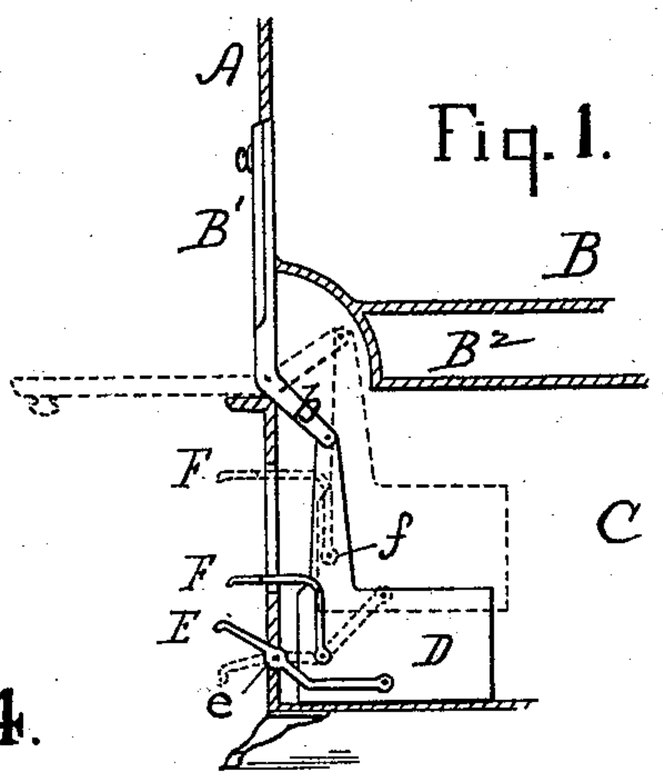
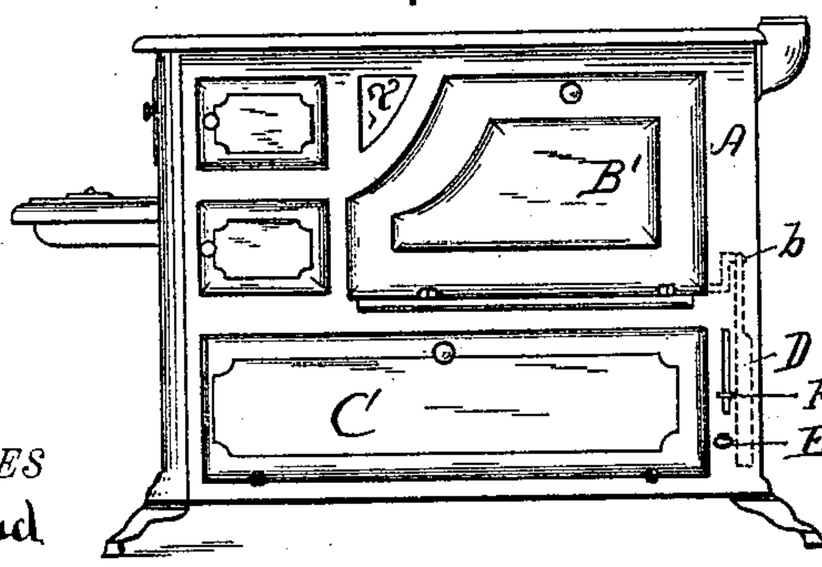


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM J. KEEP, OF DETROIT, MICHIGAN, ASSIGNOR TO THE MICHIGAN STOVE COMPANY.

OVEN-DOOR OPENING AND CLOSING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 455,750, dated July 14, 1891.

Application filed February 19, 1891. Serial No. 382,054. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. KEEP, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Oven-Door Opening and Closing Mechanism; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

In the drawings, Figure 1 is a sectional view of a stove embodying my invention. Fig. 2 represents a variation of the same; Fig. 3, another variation. Fig. 4 is a side elevation of a stove, showing the locality of my opening mechanism.

It is the purpose of my invention to produce mechanism whereby an oven-door may be opened and closed by the foot operating upon a lever or levers, and whereby the door may be counterpoised in its movements.

This invention is designed as an improvement upon the apparatus patented to Miller, No. 440,848, of November 18, 1890. In the said device reliance is had for counterpoising the door to a weighted foot-rail which rises up beneath the door upon the outside of the stove or range as the door opens outwardly.

My invention contemplates the location of the entire counterpoise mechanism upon the interior of the outer wall of the stove and beneath the oven-flues, whereby said mechanism shall not operate to obstruct the flues and shall present no unsightly or inconvenient weight upon the exterior of the stove.

In carrying out my invention, A represents the outer wall of the stove; B, its oven; B′, its oven-door; B^2, the oven-flues; C, the warming-oven beneath the oven-flues. Upon the oven-door is a rigid projecting arm *b*. To this arm, as shown in Fig. 1, is suspended a weight D through the medium of an arm *d*.

E is a foot-lever pivoted at *e* in the wall of the stove and projecting therefrom. The inner end of this lever engages the weight in such manner that by pressing the foot upon the exterior end of the lever it will lift the weight. This lifting of the weight serves to tilt open the oven-door, and as the oven-door descends the weight D serves to counterpoise the same and prevent its falling down into its open position.

F is another lever pivoted at *f* and projecting outwardly through the outer wall of the stove. This lever moves bodily up and down with the weight. When it is desired to close the door, it may be accomplished by pressing with the foot upon this lever F. This apparatus may be varied without departing from the principle of my invention. Thus it is apparent that in the construction shown in Fig. 1 the door in closing may slam shut instead of closing easily. This may be more or less remedied, as shown in Fig. 2. In this case the weight D is pivoted to the wall of the stove at *d′*, and the arm *d* may be likewise pivoted to the weight at the lower end of the arm. It is apparent that in this variation the weight, being chiefly suspended from the pivot *d′* when the door is closed, exerts but little effort upon the oven-door at the time of closing. The resisting weight, however, becomes greater and greater as the door opens downwardly into its horizontal position, so that the counterpoise resistance is increased in the same proportion that the center of gravity of the door is carried out from the vertical plane of its hinges; but in closing the door the weight ceases to exert its action on the door in proportion as the center of gravity of the door is brought nearer to the vertical plane of the door, so that it ceases almost entirely to act at the moment the door is closing into its upright position, and it therefore closes easily. The same effect may be accomplished without the use of so many pivoted arms by the construction shown in Fig. 3. In this case the arm *d* is itself continued downwardly and itself constitutes more or less of a counterpoise-weight. It is provided with a slotted arm d^2. The weight D, pivoted at *d′*, is engaged with this arm *d* by a pin or lug d^3, which projects into the slot d^2. In this contrivance the same graduated effect of the weight on the door is accomplished as was accomplished by the construction shown in Fig. 2.

I would have it understood that these various forms of construction are contemplated as equivalent embodiments of my invention.

So, also, I would have it understood that the lifting or actuating levers may simply act against the weight directly, or they might have toothed segments on their inner ends engaging corresponding rack-bars on the weight. Such construction would of course serve in like manner to lift or depress the weight. I would also have it understood that, while levers E and F are both illustrated in the drawings, the lever F may be dispensed with, and in that case the oven-door may be closed by simply lifting up beneath the foot-lever E by the toes of the foot, and so a single lever may accomplish all the purposes of both said levers.

It will be observed that this mechanism is all located within the walls of the stove, but entirely beneath the oven-flues, so that the same does not in any way obstruct the flues. Moreover, the weights are always the same and are not varied by accumulations upon them. Again, none of the weights are upon the exterior of the stove to interfere with the proper manipulation of the warming-oven door nor to be in the way.

The weight D might be at any other point in the stove and at a level higher than or lower than the arm *b*. In that event it would only be necessary to properly lead the arm *d* to the weight and connect the foot-treadle by any suitable connecting rod or bar with the said arm *b*, so as to leave the foot treadle or treadles at the same position shown in the drawings. I do not deem it necessary to illustrate such variations, since the same are obvious and will embody precisely the same principle of construction.

I am not aware that prior to my invention a device has been made in which the lever-arm *b* and the weights and their actuating mechanism have been located wholly within the stove and adapted to be operated by a foot-treadle projecting out through the wall of the stove near its base.

What I claim is—

1. In a stove or range, the combination, with its oven-door, of a lever-arm projecting from its hinged edge toward the interior of the stove or range, a counterpoise-weight suspended from said arm within the confines of the stove or range, and a foot-lever adapted to lift said weight, whereby the door is opened and counterpoised, substantially as described.

2. In a stove or range, the combination, with its oven-door, of a lever-arm projecting from its hinged edge to the interior of the structure, a counterpoise-weight suspended from said arm upon the interior of the structure in a locality beneath the oven-flues, and a foot-lever whereby said weight may be lifted and the door opened and counterpoised, the construction being such that the weight shall be always beneath the oven-flues, substantially as described.

3. In a stove or range, the combination, with its oven-door, of a lever-arm projecting inwardly from its hinged edge at the side of the oven farthest from the grate and a counterpoise-weight suspended therefrom beneath the oven-flues, and a foot-lever adapted to lift the said weight, whereby the door is opened and counterpoised, substantially as described.

4. In a stove or range, the combination, with its oven-door, of an arm projecting inwardly from its hinged edge, a weight suspended from said arm, said weight hinged at one edge, and a foot-lever adapted to lift said weight, the construction being such that as the weight is lifted about its hinge its gravity will act with increasing effect to counterpoise the opening door, substantially as described.

5. In a stove or range, its oven-door provided with a lever-arm projecting inwardly from its hinged edge, a counterpoise-weight suspended from said arm within the said stove, a foot-lever adapted to lift said counterpoise-weight, and another lever whereby the weight may be pressed downward again to its initial position, substantially as described.

6. In a stove or range, the combination, with its oven-door, of a lever-arm projecting from its hinged edge, a counterpoise-weight suspended therefrom, said suspender extending down past the weight and said weight being pivoted at one edge and engaged with the suspender by a slot-and-pin connection, and a foot-lever adapted to lift the said suspender and its weight, substantially as described.

7. In a stove or range, the combination, with its oven-door, of an arm projecting inwardly from its hinged edge, a counterpoise-weight engaged therewith and likewise located within the confines of the stove, and a foot-treadle adapted to actuate the said weight, said treadle located near the base of the stove and projecting from the side thereof to the exterior, substantially as and for the purposes described.

In testimony whereof I sign this specification in the presence of two witnesses.

WILLIAM J. KEEP.

Witnesses:
WELLS W. LEGGETT,
MARION A. REEVE.