(No Model.)

J. J. GRAVES.

COUNTERBALANCING DEVICE FOR DOORS.

No. 438,435. Patented Oct. 14, 1890.

Fig. 2.

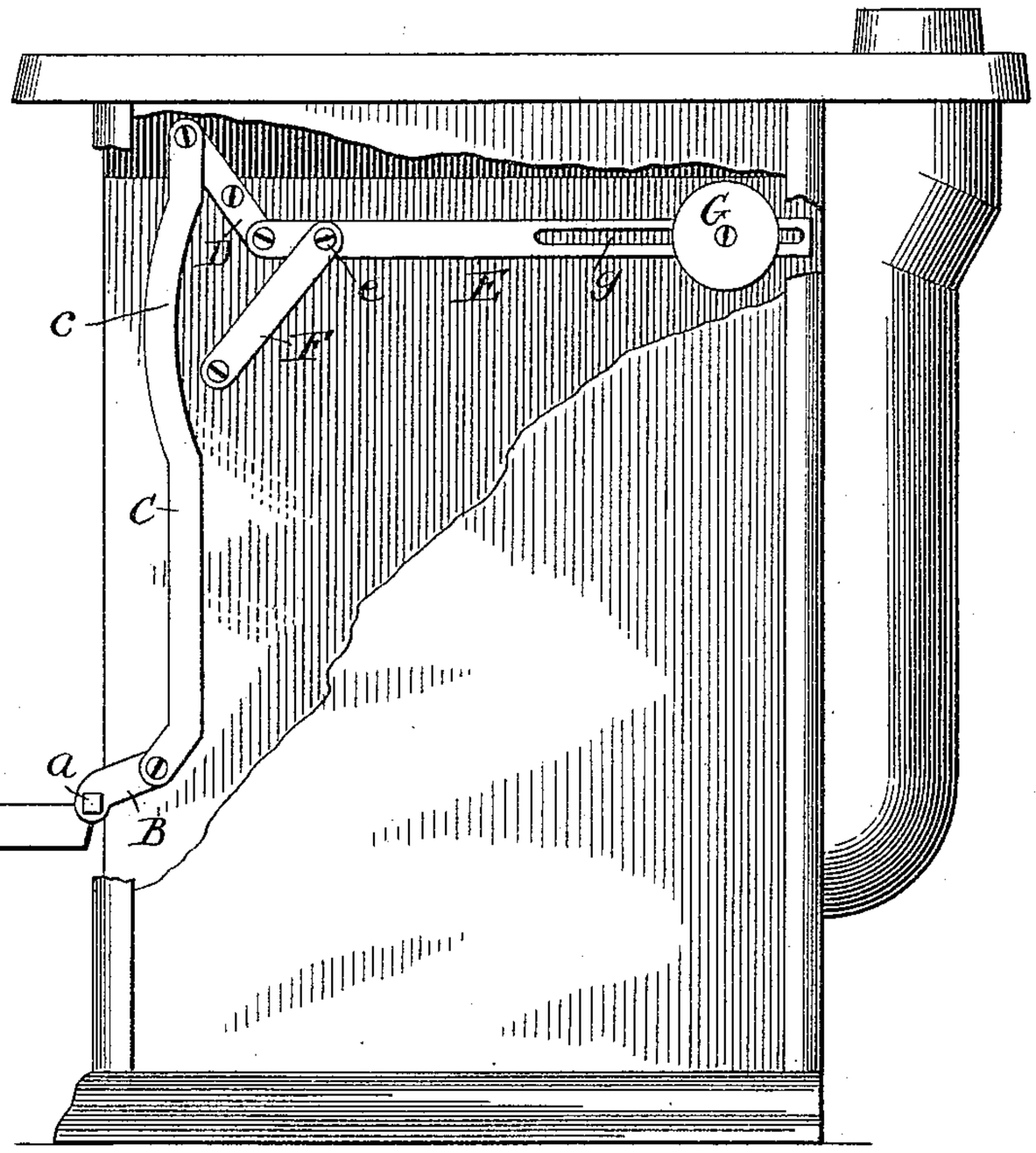
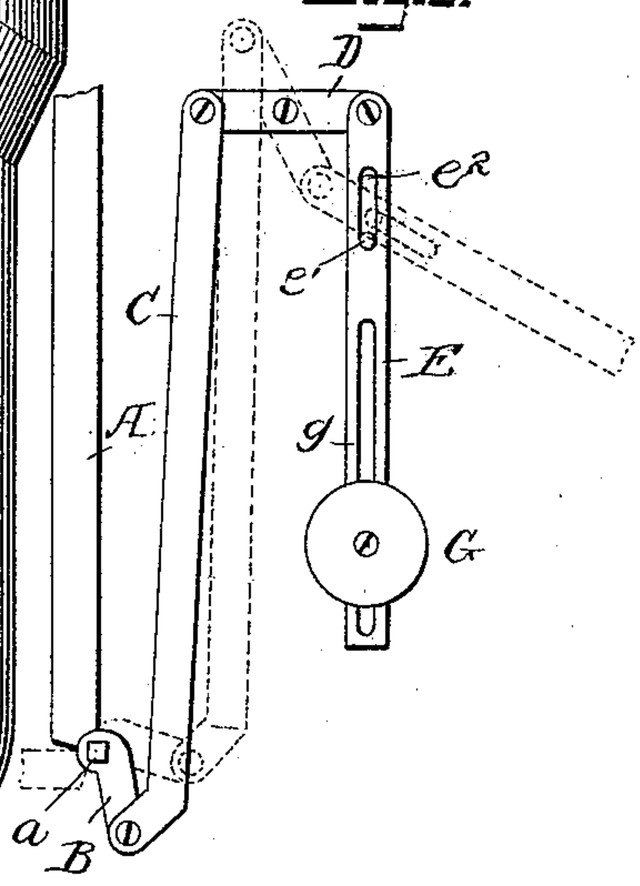


Fig. 1.

Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

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COUNTERBALANCING DEVICE FOR DOORS.

SPECIFICATION forming part of Letters Patent No. 438,435, dated October 14, 1890.

Application filed July 7, 1890. Serial No. 357,988. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. GRAVES, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Counterbalancing Devices for Doors, of which the following is a specification.

My invention relates to a counterbalancing device for doors swinging upon horizontally-arranged hinges, it being particularly intended and adapted for use in combination with drop oven-doors for cooking-stoves, though it is not exclusively adapted therefor; and it consists of the combination and arrangement of devices, to be hereinafter set forth.

In the drawings, wherein I have shown my invention applied to a drop oven-door, Figure 1 is a side view of a stove, part of the outer casing being broken away to show the counterbalancing devices, which are in the positions they occupy when the door is closed. Fig. 2 is a similar view showing the position of the parts when the door is let down or open, and Fig. 3 is a similar view showing another form of my invention.

In the drawings, A represents a drop-oven door swinging on a horizontally-arranged axis *a*. From the shaft of the axis of the door there extends a crank-arm B. This crank-arm is connected by a link C with a lever D, (of the first class,) and to the end of the lever opposite that to which the link is secured is pivotally connected a weighted lever or arm E. The weighted lever E is pendulous, and when the parts are in the position to close the door is substantially parallel with the link C, thus bringing the parts compactly together. To secure this arrangement, the weighted lever E has a shifting fulcrum, which in the construction shown in Figs. 1 and 2 is formed by its pivotal connection at *e* with the link F.

The weight G, carried by the lever E and which serves as a counterpoise for the door, is adjustable upon the lever, which is slotted, as at *g*, and in this slot a stud or shaft projecting from the weight is secured at the proper point to counterbalance the door.

In the construction shown in Fig. 3 I dispense with the link F, the shifting fulcrum in this case being formed by a pin e', which is mounted in a slot e^2, formed in the lever E. In this case the fulcral point changes as the lever E is moved, the lever sliding somewhat upon the pin e', such sliding being permitted by reason of the slot e^2.

When the counterbalancing devices described are used in combination with a stove-door, they are by preference mounted in the flue between the oven and the outer stove-plate. When so placed, it is advantageous to have the parts compactly arranged in the front portion of the flue, as they then offer the least obstruction to the free passage of the products of combustion through the flue, and so they may be the more easily gotten at should repairs be required or the weight need readjusting, and the combination and arrangement of the parts which I have invented secures this advantageous feature in the fullest degree possible, as when the parts are in the position shown in Figs. 1 and 3 the link C and the lever E lie side by side, substantially vertical.

In order to bring the parts closer together when the combination shown in Figs. 1 and 2 is used, I curve or bow the link C, as at *c*, so that the end of the link F may be brought forward into the line of the link C without its interfering therewith.

Without limiting myself to the precise construction and operation of parts shown, what I claim is—

1. The combination, with a door swinging on a horizontally-arranged axis and the crank-arm B, of the weighted lever having a shifting fulcrum, the lever D, to which the weighted lever is connected, and the link connecting the lever D with the crank-arm B, substantially as described.

2. The combination, with a door swinging on a horizontally-arranged axis, and the crank-arm B, of the weighted arm or lever E, the link, F constituting a shifting fulcrum therefor, the lever D to which the lever E is secured, and the link connecting the lever D and the arm B, substantially as described.

3. The combination, with a stove having a drop-door provided with a crank-arm, of a

counterbalancing device for the door arranged in the front portion of one of the interior flues of the stove, and consisting of a counterbalancing weighted pendulous lever, a lever to which the weighted lever is pivotally connected, and the link connecting the last said lever with the said crank-arm and arranged to lie substantially parallel with the weighted lever when the door is closed, the weighted lever when the door is open being swung upward and backward, substantially as described.

4. The combination, with a stove having a drop-door provided with a crank-arm, of a counterbalancing lever for the door having a shifting fulcrum and connecting devices between such lever and the crank-arm of the door, substantially as described.

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

JOHN J. GRAVES.

Witnesses:
W. C. LAKE,
H. D. FERRIS.