

(No Model.)

O. L. BILLINGS.
DRAFT REGULATOR.

No. 552,034.

Patented Dec. 24, 1895.

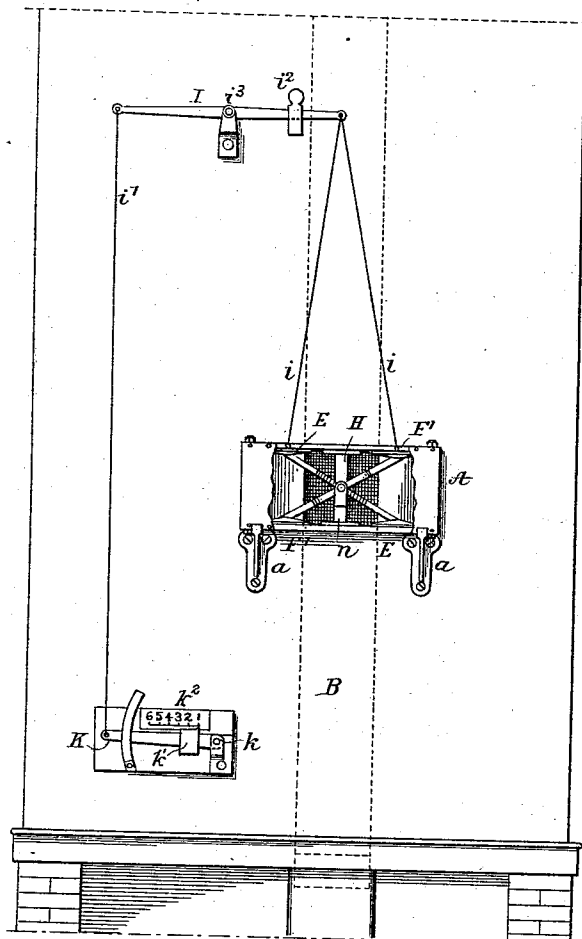


FIG. 1

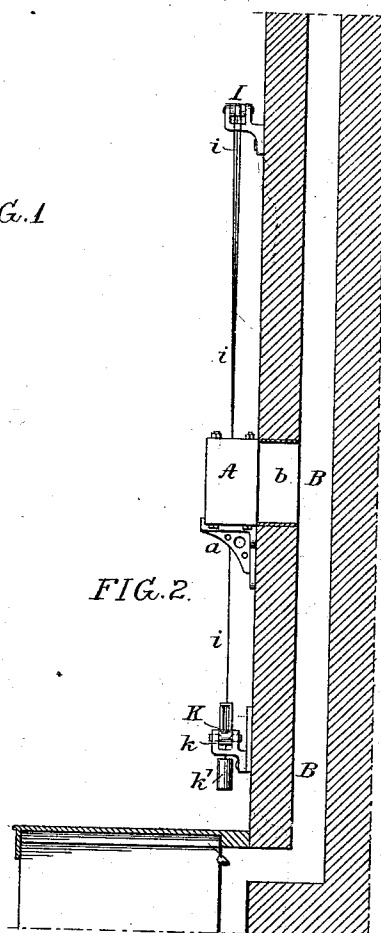


FIG. 2.

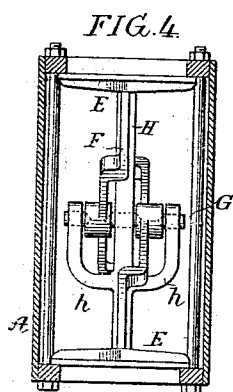


FIG. 4.

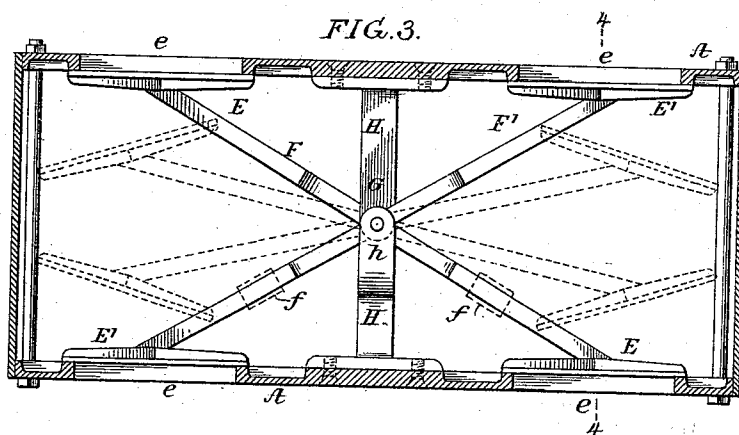


FIG. 3.

WITNESSES.

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OSCAR L. BILLINGS, OF PHILADELPHIA, PENNSYLVANIA.

DRAFT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 552,034, dated December 24, 1895.

Application filed August 18, 1894. Serial No. 520,656. (No model.)

To all whom it may concern:

Be it known that I, OSCAR L. BILLINGS, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain

Improvements in Draft-Regulators, of which the following is a specification.

My invention relates to improvements in apparatus for the automatic control of draft in flues.

My invention is used particularly in connection with cooking ranges or stoves, but it will be understood that it can be applied to other flues as well.

It is well known that the draft in any given flue is dependent upon certain conditions, and the draft in the flue can only be properly regulated by automatic mechanism. Such mechanism must be extremely sensitive and not subject to appreciable expansion, and safe from corrosion and clogging from the products of combustion. The invention which I will now proceed to describe I find by practical experiments meets these requirements.

Referring in the first instance to the accompanying drawings, Figure 1 is a front view showing my improved draft-regulator partly in section. Fig. 2 is a sectional view through the flue. Fig. 3 is a longitudinal sectional view of the draft-regulator detached; and Fig. 4 is a transverse sectional view of the draft-regulator on the line 4 4, Fig. 3.

A is the box or casing which communicates with the flue B through the opening *b*, (shown clearly in Fig. 2,) and in the casing are a series of inlet-ports *e*—four in the present instance, two in the upper portion of the casing and two in the lower portion of the casing—and these two sets of ports are arranged opposite each other, as indicated in Fig. 3. Each inlet-opening has a valve-seat, and adapted to the seats are the valves *E E'*. These valves are mounted on arms *F F'*, respectively, and the arms are pivoted on pivots *G*. The pivots are mounted in the frame *H* having arms *h h*, as clearly indicated in Fig. 4. It will be understood that this construction may be modified without departing from my invention. The main object of the construction is to make the adjustment so delicate that the least variation of draft in the flue will operate the valves.

In some instances I mount balance-weights *ff* on the arms *F F'*, as indicated in Fig. 3, as

the device when made in quantities may not be accurately fitted, so that by providing these adjustable weights the device can be properly set.

In the present instance the upper valves *E E'* are connected by wires or rods *i i* to one arm of a lever *I*, pivoted at *i²* to a bracket fixed in any suitable manner. The other arm of this lever is connected to the regulator-lever *K*, pivoted at *k* to a fixed point, and on this lever is an adjustable weight *k'*.

k² is a scale, mounted in the present instance back of the lever, so that the weight can be set to certain given positions.

I preferably mount on the lever *I* a weight *i²*, which can be permanently fixed to the lever after the apparatus is set up, so that all the parts will be properly balanced.

The lever *I* may be dispensed with, and the regulating-lever may be attached directly to the valves *E E'* in some instances, as lack of vertical space will compel the omission of the lever *I* and the attachment of the valves *E E'* direct to the regulating-lever *K*. This arrangement is not as satisfactory, however, as the one described above.

The operation of the device is as follows: If, for instance, the device is connected to a kitchen-range flue, as shown in the drawings, and the regulating-weight *k'* is set at No 1 of the scale, which is, in the present instance, nearest the fulcrum of the regulating-lever, the weight *i²* is fixed upon the lever *I* at such a point that the valves *E E'* will yield to any force of draft at all in excess of what is required to carry off the gases through the flue. The device is now properly adjusted. It will be apparent that the pressure of the air upon the exterior of the box *A* will tend to open the valves *E E'* and effect a passage for itself through the inlet-ports and through the box into the flue *B*, and that this pressure is resisted by the regulating-weight *k'* more or less, according to the position of the weight on the lever *K*. Thus, having determined the effect of the weight *k'* at any given point on the lever—say, for instance, at No. 4—and having made a record of results upon a tabulated card kept for the purpose, the operator can again secure the same result at any time with accuracy and maintain it so long as the fuel can support the necessary combustion, for all

changes in the conditions of the draft are at once antagonized by the opening or closing of the valves, and a steady flow of air through the fuel of sufficient velocity is secured.

5 I claim as my invention—

1. In a heat or draft regulating device, the combination with a draft conduit of a casing having one or more pairs of inlet ports, and an exhaust port connected to the flue, and connected valves for said inlet ports one valve balancing the other, and mechanism whereby the valves are set to open under given conditions, substantially as described.

2. The combination in a heat or draft regulating device, of the casing, inlet and exhaust openings therein, said exhaust opening communicating with a flue, balanced valve closing the inlet opening, a plate adapted to be secured to a wall, a regulating lever pivoted to the plate and connected to the valve, an adjustable weight on said lever, and a graduated scale on the plate directly back of and in close proximity to the lever, substantially as and for the purpose described.

3. The combination of the box, two sets of inlet openings therein, one set opposite the other, exhaust opening communicating with a flue, valves for closing the said inlet openings, two arms carrying said valves, said arms being pivoted, with means for regulating the opening of said valves under certain conditions, substantially as described.

4. The combination of the casing, two sets of inlet openings therein, one set opposite the other, exhaust opening communicating with a flue, valves adapted to close said openings, arms carrying said valves, said arms being pivoted at a common center, a lever I connected to the valves, a regulating lever K connected to the lever I, an adjustable weight k' on the lever, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OSCAR L. BILLINGS.

Witnesses:

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