

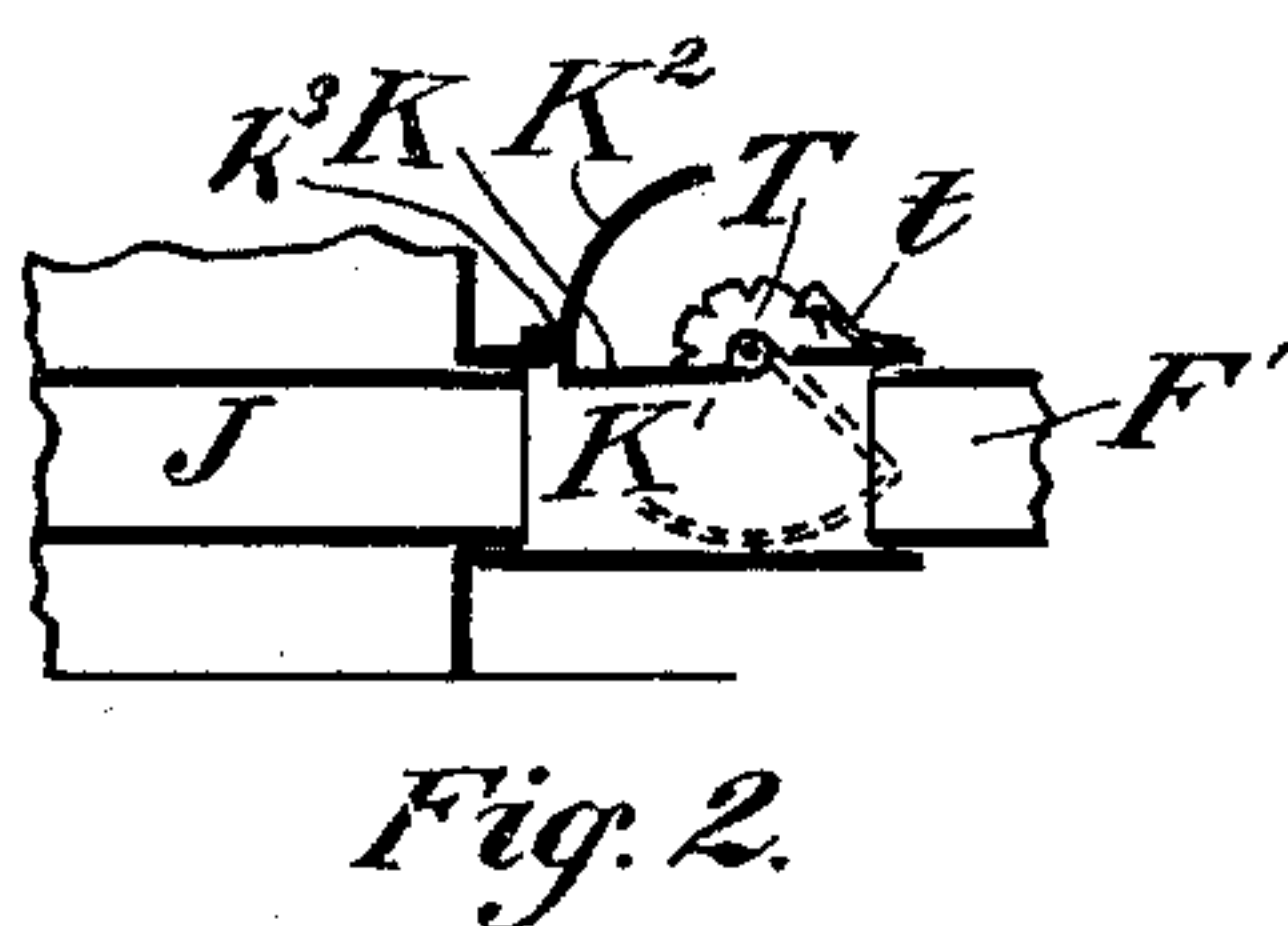
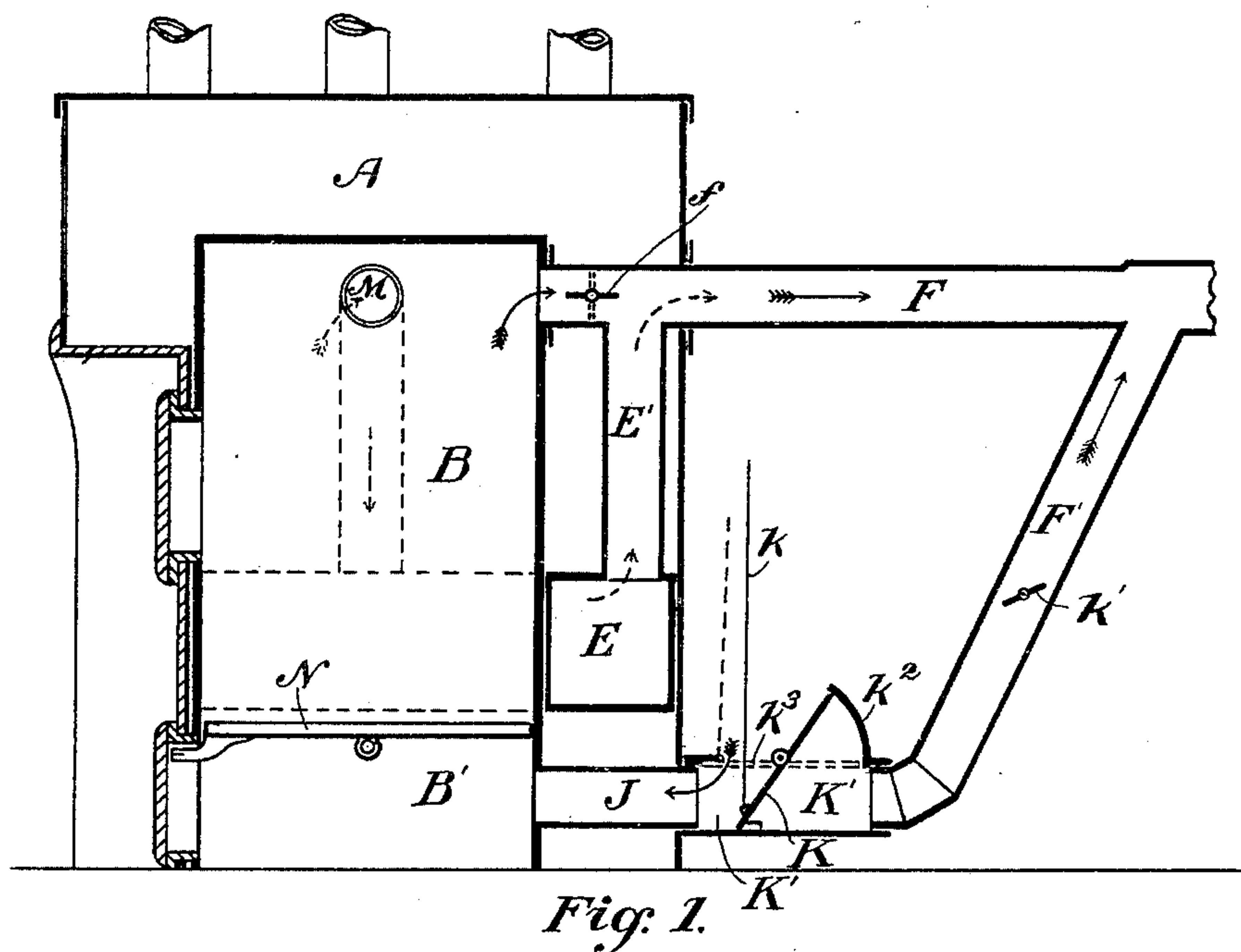
(No Model.)

G. L. SHOREY.

DRAFT REGULATING AND FIRE CHECKING DEVICE.

No. 460,995.

Patented Oct. 13, 1891.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE L. SHOREY, OF LYNN, MASSACHUSETTS.

DRAFT-REGULATING AND FIRE-CHECKING DEVICE.

SPECIFICATION forming part of Letters Patent No. 460,995, dated October 13, 1891.

Application filed December 11, 1890. Serial No. 374,285. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. SHOREY, a citizen of the United States, residing at Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Draft-Regulating and Fire-Checking Devices, of which the following is a full specification.

My invention, which is to be applied to furnaces and stoves, consists of a certain arrangement of flue-pipes and a regulating-damper so constructed and arranged that the fire may be controlled by a single damper only. My object is, moreover, aside from the convenience in regulating the draft, to render it absolutely impossible for coal-gas to escape from the stove or furnace through cracks, seams, or doors, even when fresh coal is put on, the construction being such that the gas is at once carried off either from above the grate, where it escapes into the chimney, or below the grate, where it is more liable to be burned.

I will describe my invention as applied to a hot-air furnace, it being understood that the arrangement is equally applicable to stoves.

Referring to the accompanying drawings, Figure 1 is a sectional view through a hot-air furnace fitted with devices embodying the principle of my invention, and Fig. 2 shows in section an improved form of draft-damper.

A is the outer casing of the furnace, within which is inclosed the fire-pot and dome B and the ash-pit B' underneath it, the two being separated by the grate N.

F F² is the chimney-flue, passing from near the top of the dome to the chimney. The furnace herein shown is of the type wherein the hot gases and products of combustion may pass either directly or indirectly to the chimney, as desired. When passing directly to the chimney, the damper *f* in the pipe F is open in the position shown in Fig. 1, thereby allowing said products of combustion to take the shortest path outward. The indirect path which the products of combustion take when the damper *f* is closed, as indicated by the dotted lines in Fig. 1, is outward and downward through one or more pipes M, leading from the interior of the dome to the compartment E, partially surrounding the fire-pot,

thence upward through the pipe E' to the chimney-flue F. The particular construction is, however, immaterial as long as there is a passage, either direct or indirect, from the dome to the chimney. It is also essential to provide a passage from the ash-pit to the chimney.

J is a pipe passing from the ash-pit to the outside of the outer casing A of the furnace, communicating through a casing K' with a pipe F', passing into the chimney-flue F², the construction being such that there is communication with the chimney both from above and from below the grate. The pipe J and the casing K' form a passage or funnel passing from the ash-pit to the chimney-pipe F'.

The casing K' is open at the top at *k*³ to allow outside air to enter the ash-pit when the damper K is in the position shown in Fig. 1. When, however, the opening *k*³ is closed by the damper K and assuming the existence of an upward draft in the chimney, it will be readily seen that the fire is completely checked, since there would be substantially an equal pull through the pipes F and F' both above and below the grate N, and substantially no air would pass through the fire. A static equilibrium is thus maintained without destroying the force of the draft, and any gas that is present must at once be drawn off, either through the pipe F or the pipe F', or both. When, however, the damper K is opened, as shown in Fig. 1, outside air entering the opening *k*³ is immediately drawn into the ash-pit and carried up through the grate to supply the fire with air, and at the same time the movement of air up the pipe F' is prevented, so that the whole force of the chimney is exerted upon the upper pipe F.

k' is a damper in the pipe F' to be permanently set in such a position as to throttle to just the right degree the pipe F', so that even with the damper K completely closing the opening *k*³ the downward draft under any conditions will not preponderate to too great a degree.

The damper K (shown in Fig. 1) is a balanced damper, being pivoted in the center. The curved hood *k*² forms a casing over the outer flap of the damper K, thus preventing outside air from entering the casing K' oth-

erwise than through the opening k^3 . The damper K may be operated either by hand or automatically by means of a thermostat through the cord or chain k . It is best adapted for use with the thermostat, however, because it is alternately carried to one or the other of its extreme positions. A modified form of damper (shown in Fig. 2) would accomplish the same purpose in rather a more approved manner when operated by hand, requiring less care and attention. This damper, in addition to the flap K, has a curved portion K^2 , arranged in such a manner that the damper completely closes the passage up the chimney-pipe F' before the inlet-draft aperture k^3 is opened in the least.

On the spindle k^4 of the hand-damper is fixed for convenience the wheel or disk T, having teeth or indentations, with which the dog t engages in such a manner that the damper may be firmly set in any desired position.

In practice, when my improved damper is applied to any furnace wherein the path to the chimney is rather indirect from over the fire or wherein the point at which the products of combustion from over the fire-pot leave the furnace is lower than the ash-pit flue, the effect of opening a passage for air over the fire is to cause a downward draft, whereby the gas is carried through the ash-pit flue to the chimney and is not emitted above the coal. Thus when opening the feed-door to put on coal all possibility of gas coming into the cellar is avoided by this downward draft, no matter how large the door or how many leaks there may be in the furnace. This gas, moreover, in passing down through the fire is heated and lighted and burns in the ash-pit and ash-pit flue, causing generation of heat where none would occur over the coal-covered fire. In this respect the damper could advantageously be applied to cook-stoves, wherein by closing the damper when coal was put on and opening an aperture over the fire heat would be secured which would otherwise be lost.

Under normal conditions the heated products of combustion do not pass through the casing K' at all, and hence, since the damper works in the open air, there is no tendency to clogging up the damper with creosote and corroding substances, which is of great importance to the easy operation of the damper, especially when the damper is worked automatically. It will be observed, moreover, that all the air for the draft enters the opening in the casing K', and that the complete control-

ling of the draft, both in checking the fire and in forcing the combustion, is accomplished by one damper only.

I claim—

1. A stove or furnace having a passage from the ash-pit to the chimney-flue, said passage being provided with an air-admitting aperture, and a single air-supply controlling and checking damper, substantially as described.

2. In a stove or furnace, a funnel or passage from the ash-pit into the chimney-flue, having an aperture to the outside air, and a damper in said funnel, forming when closed part of the funnel-shell and when opened uncovering said aperture, establishing communication between the outside air through said funnel with the ash-pit and at the same time closing said funnel between said aperture and the chimney-flue, substantially as and for the purposes described.

3. In a stove or furnace, a funnel or passage from the ash-pit into the chimney-flue, having an aperture to the outside air, and a damper in said funnel, forming when closed part of the funnel-shell and when opened uncovering said aperture, establishing communication between the outside air through said funnel with the ash-pit and at the same time closing said funnel between said aperture and the chimney, said damper being provided with a segment or curved portion, whereby said funnel is closed before said aperture is opened, substantially as described.

4. In a stove or furnace, a flue pipe or casing provided with an inlet-opening from the outside air to the ash-pit and an outlet-opening to the chimney, in combination with a single combined checking and draft-giving damper adapted to close either of said openings, constructed and arranged in such a manner that the second opening must be closed before the first is opened, substantially as and for the purposes described.

5. In a stove or furnace, a flue pipe or casing K', provided with an inlet-opening k^3 to the ash-pit and an outlet-opening to the chimney, in combination with a damper K, provided with a curved portion K^2 , a toothed wheel T, fixed on the spindle of the damper, and a dog t , engaging with the teeth of the wheel, constructed, arranged, and operating substantially as described.

In witness whereof I have hereunto set my hand.

GEO. L. SHOREY.

Witnesses:

WM. B. H. DOWSE,
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