

No. 613,151.

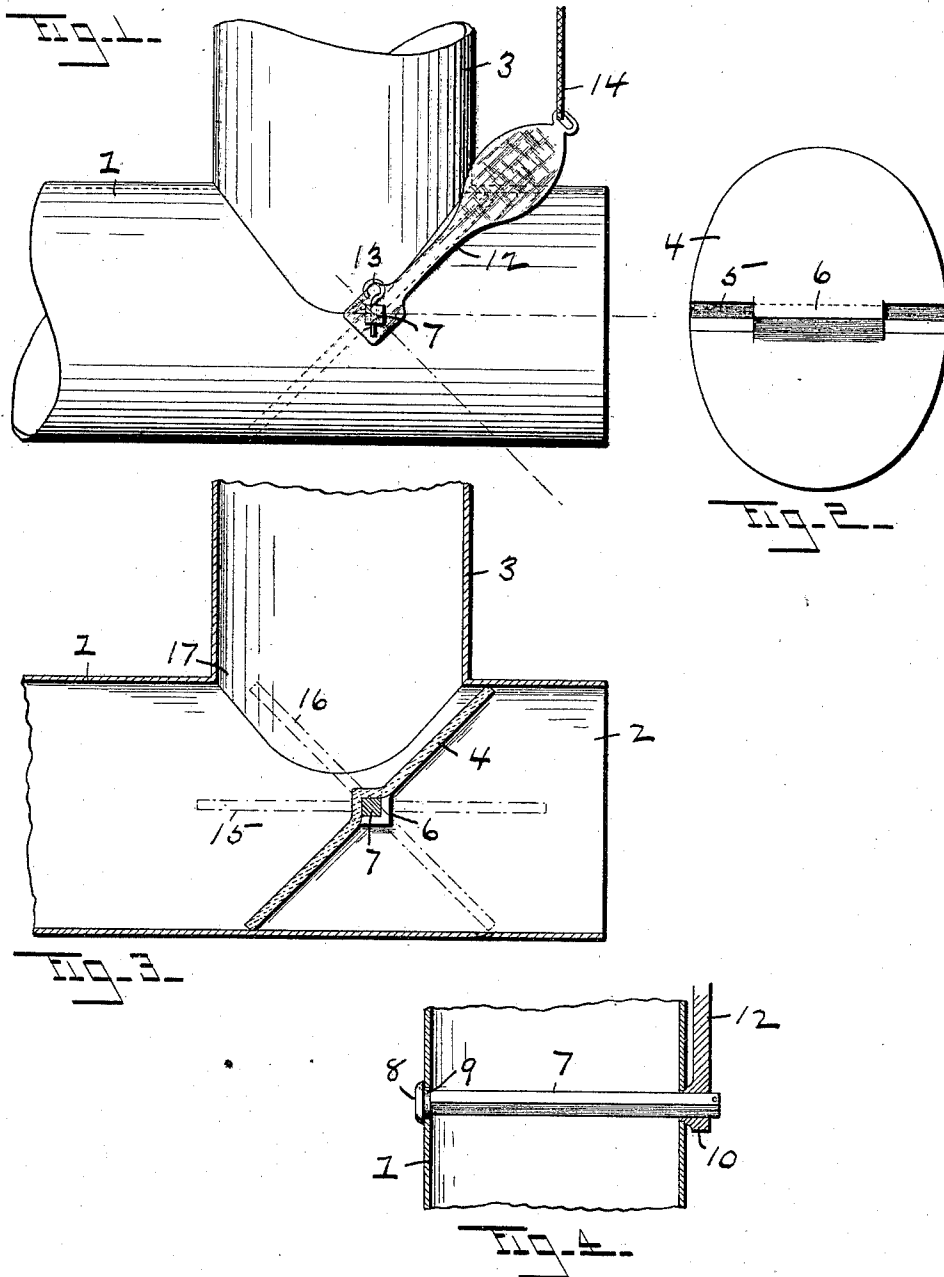
Patented Oct. 25, 1898.

C. M. & T. M. JOHNSON.

DAMPER.

(Application filed Mar. 15, 1898.)

(No Model.)



Witnesses.

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UNITED STATES PATENT OFFICE.

CORYDON M. JOHNSON AND THEODORE M. JOHNSON, OF NEW HAVEN,
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DAMPER.

SPECIFICATION forming part of Letters Patent No. 613,151, dated October 25, 1898.

Application filed March 15, 1898. Serial No. 673,920. (No model.)

To all whom it may concern:

Be it known that we, CORYDON M. JOHNSON and THEODORE M. JOHNSON, citizens of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Dampers, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of our invention is to provide an improved form of check-damper for hot-air furnaces by means of which the supply of cold air to the smoke-flue of the furnace can be very accurately governed and the escape of coal-gas into the rooms heated by the furnace prevented.

Our invention therefore consists in the combination, with the smoke-flue of a furnace, of the check-damper constructed and operating as hereinafter fully described, and particularly pointed out in the claims.

Referring to the drawings, in which like numerals designate like parts in the several views, Figure 1 is a side view of a smoke and chimney flue union having applied thereto a check-damper embodying our invention. Fig. 2 is a plan view of the damper-plate. Fig. 3 is a longitudinal section of the parts shown in Fig. 1. Fig. 4 is a horizontal section of the smoke-flue, showing the shaft which carries the damper-plate and the manner of mounting the same in said flue.

The numeral 1 designates the smoke-flue of a furnace, the same having the end 2 open to the atmosphere, and 3 designates the chimney-flue, forming a T-union with said smoke-flue in the usual manner. In applying our check-damper to said flue we employ a damper-plate 4 of elliptical shape, across one side of which extends a groove 5 of angular cross-section, the central portion of which groove is spanned by an angular socket-piece 6. Said groove and socket-piece receive squared shaft 7, which projects beyond the sides of the plate and is provided at one end with a head 8 and a round bearing-surface adjacent to said head, as shown at 9 in Fig. 4. Circular openings are made in the opposite sides of flue 1 to receive said shaft, said openings being located

in the center line of the flue 1, but to one side 50 of the center line of the chimney-flue 3 and between said line and the open end of flue 1, as shown in Fig. 2. The shaft 7 is thrust through the hole at one side of said flue, through the socket-piece 6 of the damper-plate within the flue, and through the hole at the opposite side, where it receives the circular hub 10 of a weighted lever 12, said hub having a squared opening to receive the shaft, and a pin 13, which locks the lever upon the shaft. The round inner end of the hub of said lever projects within the hole in the flue, as shown in Fig. 4, and coöperates with the bearing-surface 9 on the shaft to render the shaft free to revolve about its axis. A cord 65 or chain 14 connects the lever 12 with the usual damper-regulating mechanism of the furnace.

The elliptical damper-plate 4 when in the position shown by full lines in Fig. 3 bears at its upper end against the upper side of flue 1 between flue 3 and the open end of the former and at its lower end against the bottom of flue 1, and its elliptical shape causes it in said position to completely shut off the admission 75 of cold air to the flues, while leaving the flue 1 in full communication with flue 3. By turning shaft 7 to cause the damper-plate to move toward the position shown by broken lines at 15 more or less cold air is admitted to check 80 the fire, according to the amount of movement so imparted, and when the plate stands at said position 15, in which it is parallel with the axis of flue 1, the cold-air inlet is entirely open. When the damper-plate stands in the position shown by broken lines at 16, in which its lower end rests upon the bottom of flue 1 between the plane of flue 3 and the open end of the former, while its upper end projects within flue 3, it closes the communication be- 90 tween flue 1 and flue 3 with the exception of a narrow passage 17 and at the same time diverts the cold air from the flue 1 to flue 3. The circulation of air thus induced through flue 3 serves to draw the coal-gas from the fire 95 through the passage 17, thereby preventing any escape thereof into the rooms heated by the furnace. These important results are due

to the shape of the damper-plate and to the location of the shaft thereof between the center line of flue 3 and the open end of flue 1.

It will be observed that the damper thus
5 constructed and operating not only serves all of the purposes of the ordinary check-damper, but also acts as a flue-damper and causes the cold-air inlet and the chimney-flue to act as an injector to withdraw the gas from the fire.
10 It will also be noted that the damper devised by us can never be moved to a position in which it entirely prevents the escape of gas into the chimney-flue.

Having thus fully described our invention,
15 what we claim, and desire to secure by Letters Patent, is—

1. The combination with a furnace smoke-flue having an open end and a chimney-flue forming a T-union therewith, of a shaft passing
20 ing horizontally through said smoke-flue at a point slightly to one side of the center line of said chimney-flue on the side thereof toward the open end of the smoke-flue, and a damper-plate secured at its center to said shaft, within
25 said flue, the arrangement being such that

the duct through which the products of combustion flow is never entirely cut off, substantially as set forth.

2. The combination with the smoke-flue 1 having the open end 2 and the chimney-flue 30 3 forming a T-union therewith, of the square shaft 7 passing centrally through said flue 1 and having the head 8 and rounded bearing-surface 9, lever 12 having a squared socket to receive said shaft and the circular hub 10 35 which projects within the opening in the flue to form a bearing for the shaft, and the elliptical damper-plate 4 having the socket 6 to receive said shaft, the arrangement being such that the duct through which the products of 40 combustion flow is never entirely cut off, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

CORYDON M. JOHNSON.
THEODORE M. JOHNSON.

Witnesses:

WM. H. CHAPMAN,
GEORGE E. HALL.