

N. PRUITT.
DAMPER.

APPLICATION FILED MAR. 10, 1906.

2 SHEETS—SHEET 1.

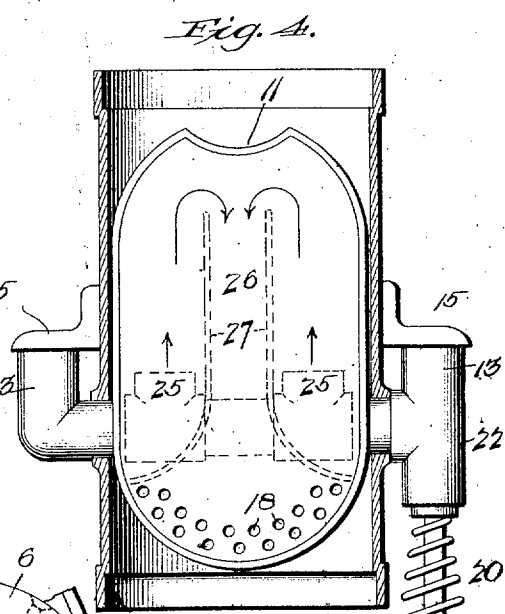
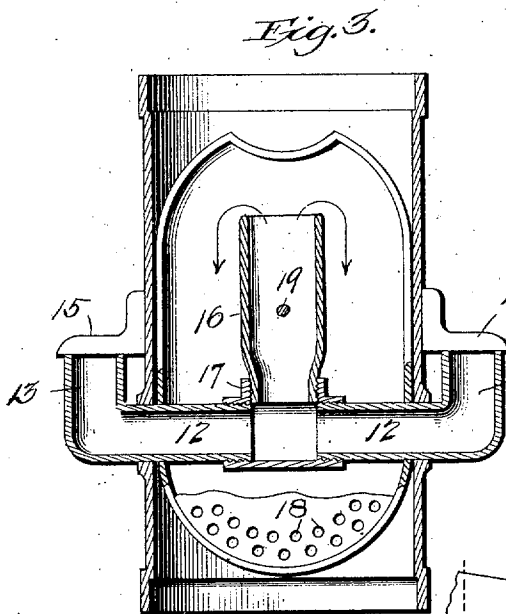
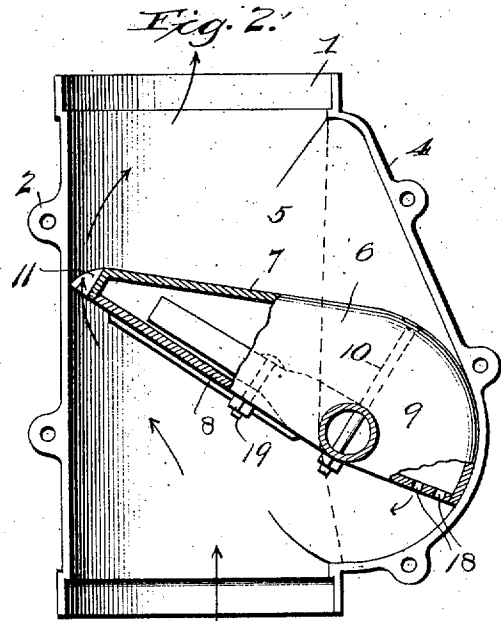
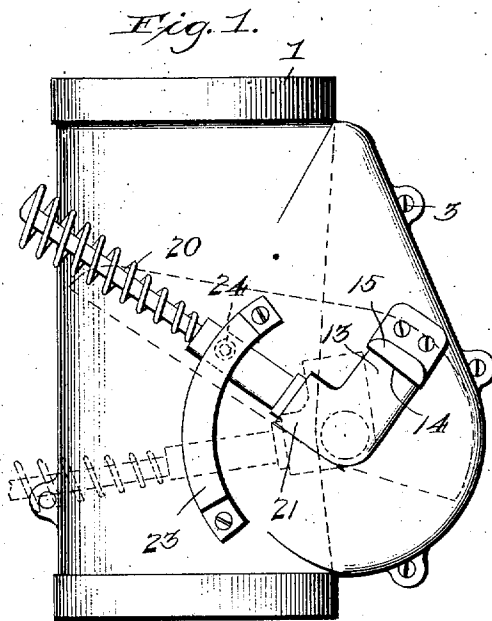
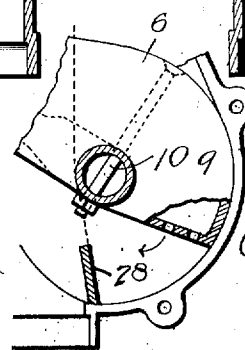


Fig. 5.

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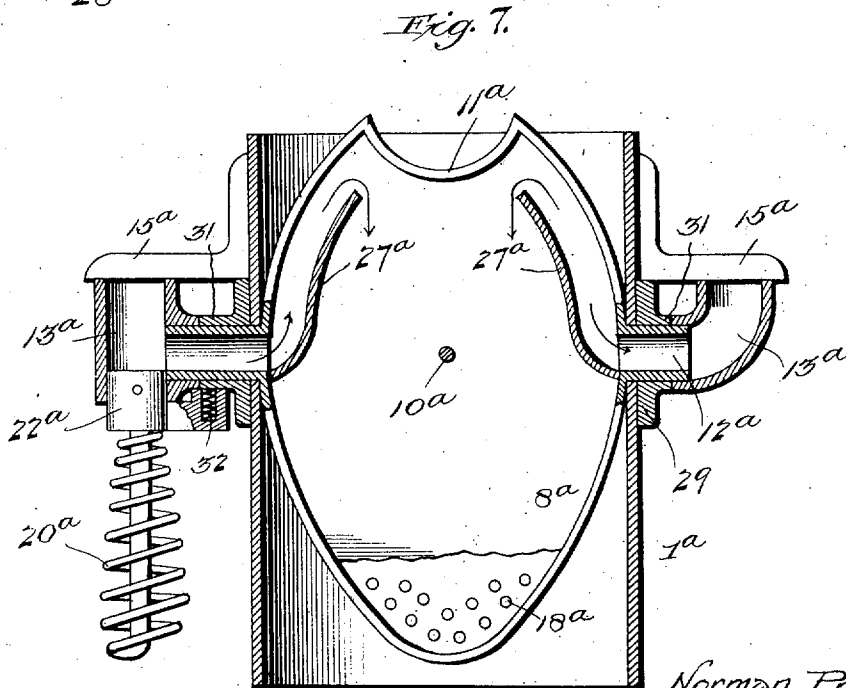
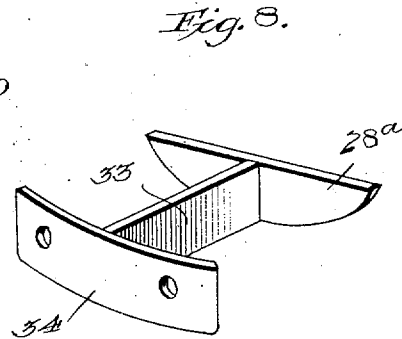
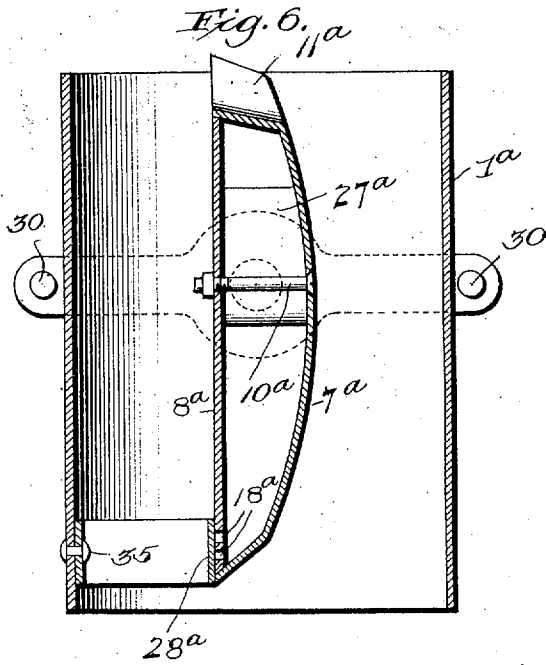
No. 835,915.

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N. PRUITT.
DAMPER.

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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

NORMAN PRUITT, OF WASHINGTON, DISTRICT OF COLUMBIA.

DAMPER.

No. 835,915.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, NORMAN PRUITT, a citizen of the United States, residing at Washington, in the District of Columbia, have invented a certain new and useful Damper, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to dampers or smoke-preventing and draft-promoting apparatus, the object of the present invention being to provide a practical and effective device for the purpose referred to by means of which fresh air is admitted from the exterior to the interior of the flue leading outward from the stove or furnace and heated during its passage to the interior of the flue and discharged at such point as to mingle with the gases and unconsumed products of combustion, thereby greatly promoting combustion of the unconsumed matter and effecting a material saving and economy in the consumption of fuel.

A further object of the invention is to provide means for effecting a thorough circulation of fresh air through the damper prior to the discharge of said air into the flue, whereby the air is more thoroughly heated and thereby better adapted to promote combustion.

A further object of the invention is to provide means controlled by the movement and position of the damper to cut off communication between the interior of the flue and the outer atmosphere when the damper is thrown open, or, in other words, when the damper is moved to a position where it leaves a free and unobstructed passage through the flue, thus preventing admission of cold air to check the draft and also preventing the ejection of unconsumed gases and products of combustion into the room in which the apparatus is located.

With the above and other objects in view the invention consists in the novel construction, combination, and arrangement hereinafter fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a flue-section equipped with a damper or combustion-promoting device of this invention. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a longitudinal section taken at right angles to Fig. 2 and extending through the hollow shaft of the damper. Fig. 4 is a similar view showing the damper in elevation and a

slightly-modified arrangement of the air-circulating means. Fig. 5 is a detail section similar to Fig. 2, showing a modified form of abutment or cut-off. Fig. 6 is a longitudinal section through a flue-section and damper, showing a modified arrangement involving the same principle. Fig. 7 is a longitudinal section through the same, taken at right angles to Fig. 6. Fig. 8 is a detail perspective view of the abutment or cut-off.

In the accompanying drawings, 1 represents a flue-section which constitutes a housing or casing for the damper, the said housing being preferably formed in two sections, one of which is shown in Fig. 2, said sections being the counterpart of each other and provided with lugs 2, having openings to receive fasteners 3, by means of which the sections are secured together.

The housing or casing which forms the flue-section is preferably provided with a pocket 4, offset to one side of the main flue-passage 5, into which the damper 6 is adapted to be moved, as indicated by the dotted line in Fig. 2, the full lines showing the position of the damper when closed to obstruct the flue-passage.

The damper is of oblong and somewhat elliptical shape and is hollow, comprising the oppositely-arranged walls 7 and 8 and the sides 9, the latter being shown as formed integrally with the wall 7, while the opposite wall 8 is made in a separate piece and secured to the remainder of the damper by one or more bolts 10. The swinging end or extremity of the damper is provided with a segmented or half-moon-shaped recess 11, which when the damper is moved to its closed position leaves a vent or passage, as shown in Fig. 2, between the end of the damper and the inner wall of the flue, against which the projecting end of the damper rests, thus allowing for the necessary draft to maintain combustion. Otherwise the damper when closed fits snugly within the flue-space, and said damper is mounted on a hollow shaft 12, which extends through the sides of the damper and also through openings in the sides of the flue, as shown in Fig. 3. The projecting ends of the hollow shaft 12 are extended at an angle to form air-inlet extensions 13, and these air-inlets are so disposed that when the damper is open, as indicated by dotted lines in Fig. 1, the outer extremities of the inlets 13, which are beveled off, as shown at 14, lie beneath abutments or cut-offs 15 in the form

of lugs projecting laterally from opposite sides of the flue or housing 1, whereby the supply of air entering the inlets 13 and hollow shaft 12 is cut off. When, however, the damper is closed, as shown in Fig. 2, the air-inlets 13, having been moved outward from beneath the cut-offs 15 are left open to receive fresh air from the exterior of the flue.

As shown in Fig. 3, an air-discharge nozzle 16 projects from the hollow shaft 12 about centrally within the hollow damper, said nozzle being shown as connected about centrally to the shaft 12 by means of a T-coupling 17.

The nozzle 16 communicates with and receives air from the hollow shaft 12 and may extend any desired distance toward the swinging end of the damper, so as to carry the air well toward that portion of the damper which is subjected to the direct action of the heat, and in this way the air is caused to traverse the length of the damper back and forth, and is thoroughly heated before it is allowed to pass out through exit-holes or discharge-openings 18 at the opposite end of the damper from the point where it is emitted from the nozzle 16. Direction-arrows have been placed on the drawings to indicate the circulation of the air through the damper.

By passing one of the bolts 10 through the hollow shaft 12 the shaft is prevented from turning in the damper, and it may also be further desirable to pass a short bolt 19 through the nozzle 16 to secure said nozzle firmly within the hollow damper and to also assist in preventing a relative turning movement between the damper and the hollow shaft.

20 designates the handle for turning or adjusting the damper, and said handle may be connected to an elbow 21, forming an extension of one of the air-inlets 13, as shown in Fig. 1, or one of the air-inlets may be extended in the form of a T 22, as shown in Fig. 4, and the handle 20 connected to said T. It is also desirable in some cases to use a friction-segment 23, beneath which the handle moves, said segment being secured to the flue or housing 1, while the handle carries a friction-spring 24, which bears against the inner side of the friction-segment and operates to hold the handle 20 at any desired angle, thus enabling the damper to be partially or wholly closed and the air-inlets 13 to be partially or wholly covered by the abutments 15.

Instead of providing a long nozzle 16, as shown in Fig. 3, a pair of short nozzles 25 may be employed, as shown in Fig. 4, said nozzles discharging the air close up to the hollow shaft 12. In order to cause said air to pass to the highly-heated portion of the damper, a baffle 26 is employed, the same consisting of oppositely-arranged walls or plates 27, spaced apart at their receiving ends and having their other ends deflected outward in

opposite directions until they reach the sides of the damper. Thus the air delivered into the damper by the nozzle 25 is caused to pass to the opposite end of the damper, where it enters the space between the baffle-plates 27, and thence passes again lengthwise of the damper and outward through the holes or perforations 18.

Instead of employing the abutments or cut-offs 15 hereinabove described an abutment or cut-off 28 may be arranged inside of the damper, as shown in Fig. 5, so that when the damper is closed said cut-off will cover the exit-holes 18, thereby cutting off the supply of air to the interior of the flue or housing 1.

When the damper is closed, as shown at Fig. 2, it is necessary to admit air through the hollow shaft 12 to the interior of the damper and to the interior of the flue to promote combustion. When, however, the damper is open, it is necessary to cut off communication between the interior of the flue and the outer atmosphere in order to prevent cold air from entering the flue and checking the draft and also to prevent the gases from being blown outward into the room in which the apparatus is located. It will be seen that this cutting off of the air-supply is automatically provided for and is accomplished by the same means used for adjusting the position of the damper.

The handle 20 may be located at either side of the flue or housing, and this is important in many cases where on account of the location of the apparatus in a corner or contiguous to some other object the handle must necessarily be placed on one side of the flue rather than the other. This may be easily accomplished, as will be noted by reference to Fig. 4, in which it will be seen that the T-shaped air-inlet at one end of the hollow shaft, and which carries the handle 20, may be interchanged with the elbow 13 at the opposite end of said shaft. The provision of the T-coupling 17 on the T-nozzles 25, enables this interchange of parts to be easily and readily effected.

In Figs. 6, 7, and 8 I have shown the damper mounted within a plain cylindrical flue-section or housing, the damper being mounted centrally within the flue and the laterally-offset pocket above described being dispensed with. In the form of the device shown in Figs. 6 and 7 the flue or housing 1^a may consist of sheet metal, and in order to provide the necessary strength for mounting and operating the damper a two-part band 29 is passed around the section 1^a, the ends thereof being provided with holes 30, adapting the parts of the band 29 to be bolted together or otherwise connected so as to secure said band to the flue-section.

At diametrically opposite points hollow bosses 31 extend outward from the band 29.

to form bearings in which are received oppositely-arranged hollow journals 12^a, extending outward from the hollow damper formed by the walls 7^a and 8^a and similar in construction to the damper hereinabove described, the hollow journals 12^a serving to admit fresh air to the interior of the damper.

Mounted upon the projecting ends of the hollow journals 12^a are the angular air-inlet extensions 13^a, in connection with which the abutments or cut-offs 15^a are used, the arrangement for cutting off the supply of air being the same as that previously described. The damper shown in Figs. 6 and 7 is provided with the segmental or half-moon-shaped recess 11^a, heretofore described, and also the exit-holes 18^a.

The air-inlet extensions 13^a are interchangeable, as previously described, and one of them is shown as provided with an operating-handle 20^a, which contains and carries a friction-spring 32, that bears against one of the stationary bosses 31 and holds the handle and the damper at any angle to which the same are adjusted for regulating the draft.

Within the damper are oppositely-arranged baffles 27^a, which lead from the hollow journals 12^a upward and outward to the hottest portion of the damper, where the recess 11^a is located, said baffles causing the air received through the hollow journals 12^a to pass upward to the highly-heated portion of the damper over the extremities of the baffles 27^a and thence to the opposite end of the damper, where said air escapes through the exit-holes 18^a into the flue.

The point of exit of the heated air from the damper is at the lowest part of the damper and should be as close to the fire or bed of coals as possible in order to obtain the best results.

When the damper is moved to its open position, as shown in Fig. 6, the exit-holes 18^a are closed by means of an abutment or cut-off 28^a, (shown in Figs. 6 and 8,) consisting of a plate against which the lower end of the damper is adapted to rest when open. The cut-off 28^a is provided with a supporting-arm 33, having a base-flange 34, which is riveted or otherwise permanently connected to the flue-section, as shown at 35.

In starting a fire it is important and necessary to open the damper to obtain good and unobstructed draft, and at such time cold air should not be admitted above the fire, as it would operate to check the draft.

By means of the arrangement described for cutting off the supply of fresh air when the damper is open it will be seen that no air can enter the flue above the fire to check the draft and by becoming heated ignite and explode the gases. Furthermore, by closing

the fresh-air inlets when the damper is open should the unconsumed gases and products of combustion accumulate in the flue by reason of some impediment to the draft, such as contrary air-currents or back draft, such gases and products cannot be blown out into the room in which the flue is located by an ignition or explosion of said gases and products, because such path of egress is closed, and their only way of escape is by way of the flue or smoke-pipe and chimney.

I claim—

1. The combination with a flue, of a hollow air-injecting damper the interior of which is in communication with a fresh-air inlet, and means controlled by the movement of the damper whereby upon closing the damper the air-supply is opened and upon opening the damper the air-supply is cut off.

2. The combination with a flue, of a damper having a hollow air heating and transmitting body in communication with the outer atmosphere, and means controlled by the movement of the damper operating to turn on and cut off the air-supply of the damper.

3. The combination with a flue, of a hollow air-transmitting damper having an air-outlet, a hollow air-intake shaft on which the damper is mounted to turn, and a nozzle projecting from the hollow shaft within the damper and adapted to inject fresh air into the damper at a distance from the air-outlet.

4. The combination with a flue, of a hollow damper having an air-inlet and an air-outlet, and means within the damper for conducting the air back and forth therein to thoroughly heat the air prior to its discharge from the damper.

5. The combination with a flue, of a hollow damper, interchangeable air-inlets or extensions one of which is provided with a damper-operating handle, and means operating to close said inlets when the damper is open.

6. The combination with a flue, of a hollow damper, a hollow air-inlet shaft for the damper having interchangeable air-inlet sections one of which is provided with a handle, and means operating to close the inlet-sections when the damper is open.

7. The combination with a flue, of a hollow damper having inlet and outlet openings, means for impeding the passage of air through the damper, and means controlled by the movement of the damper for turning on and cutting off the air-supply when the damper is respectively closed and open.

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

NORMAN PRUITT.

Witnesses:

REXFORD M. SMITH,
MAE H. BARNES.