(No Model.)

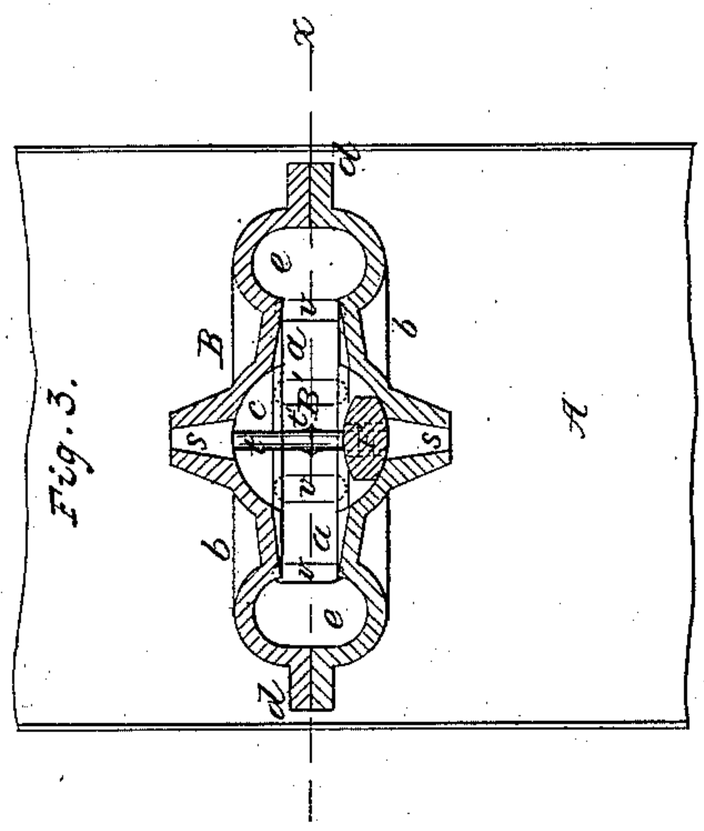
2 Sheets—Sheet 1.

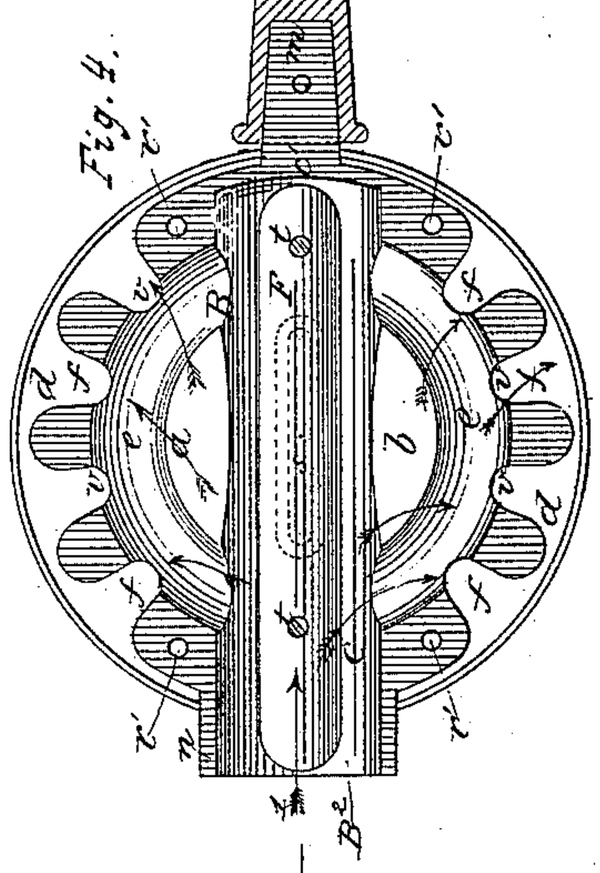
R. HILLSON, Dec'd.

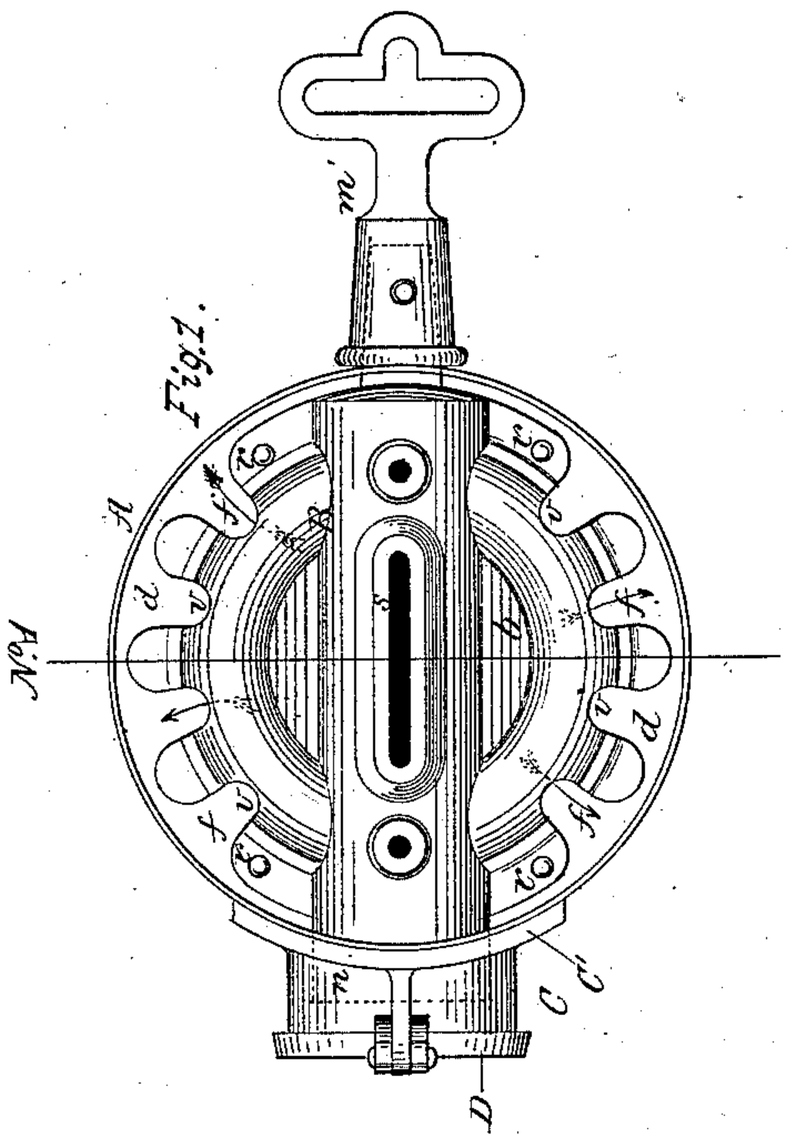
J. HILLSON, Administrator.

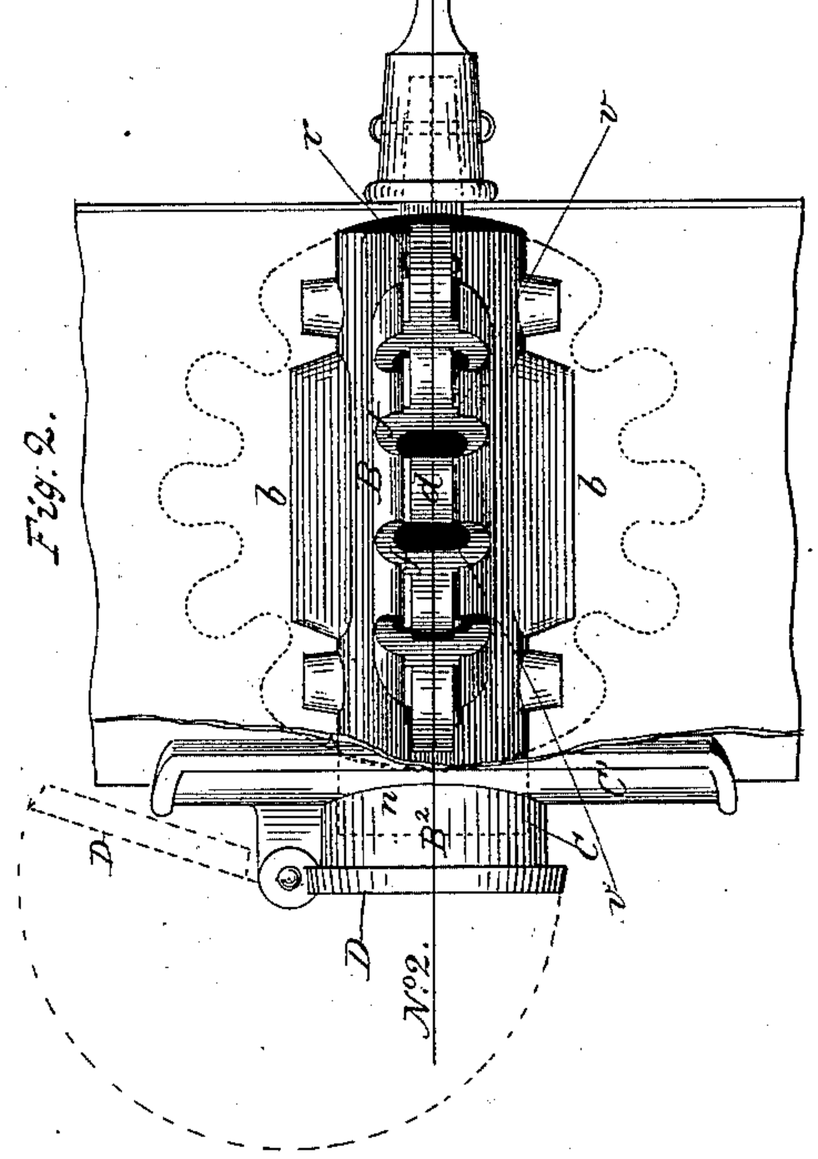
DAMPER.

No. 312,635. Patented Feb. 24, 1885.









Witnesses.
Ebnathan B. Tyler
Alex Selkirk Jr.

Robert Hillson
Inventor.
by his Attorney
Alex Selkirk

(No Model.)

2 Sheets—Sheet 2.

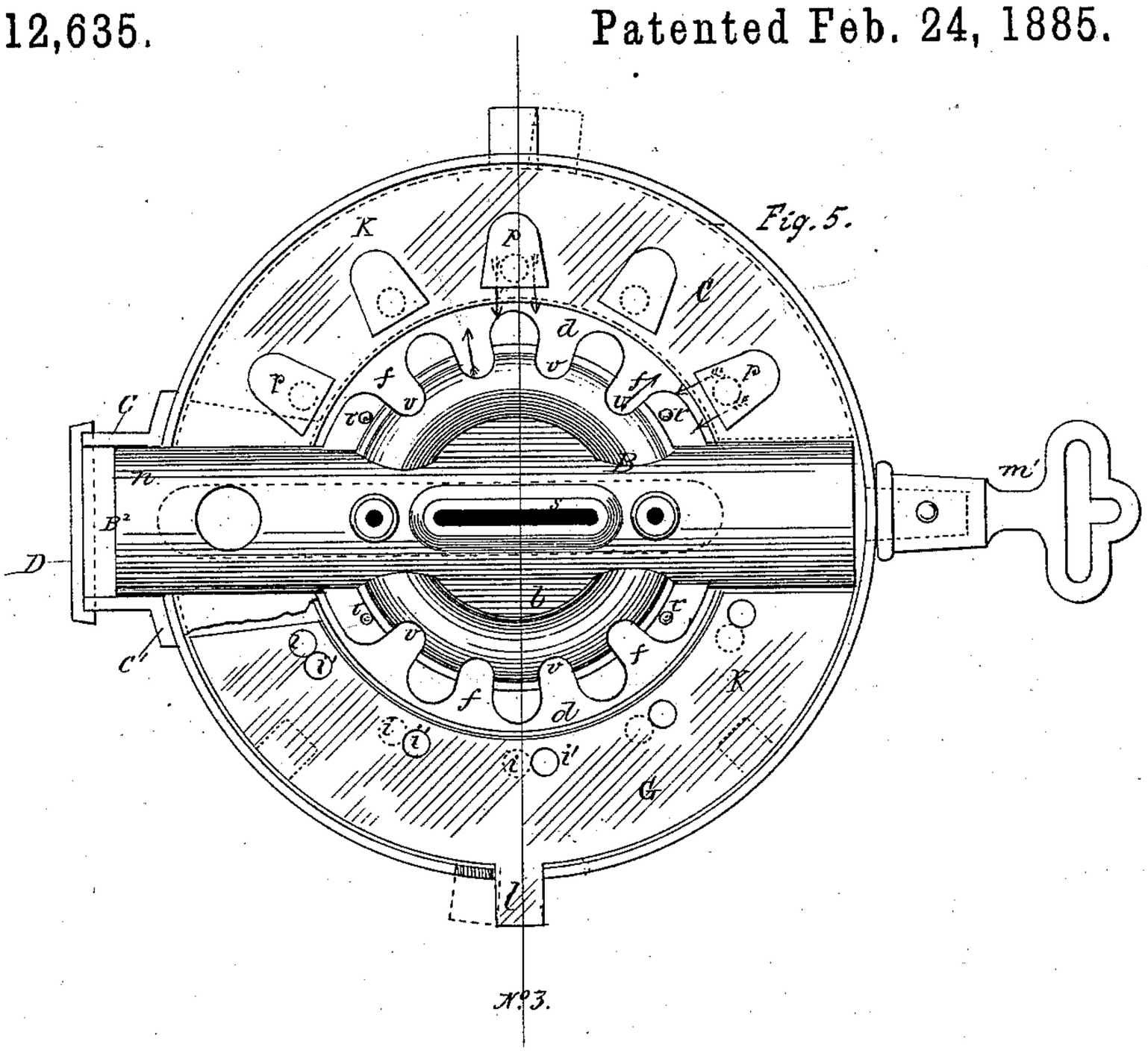
R. HILLSON, Dec'd.

J. HILLSON, Administrator.

DAMPER.

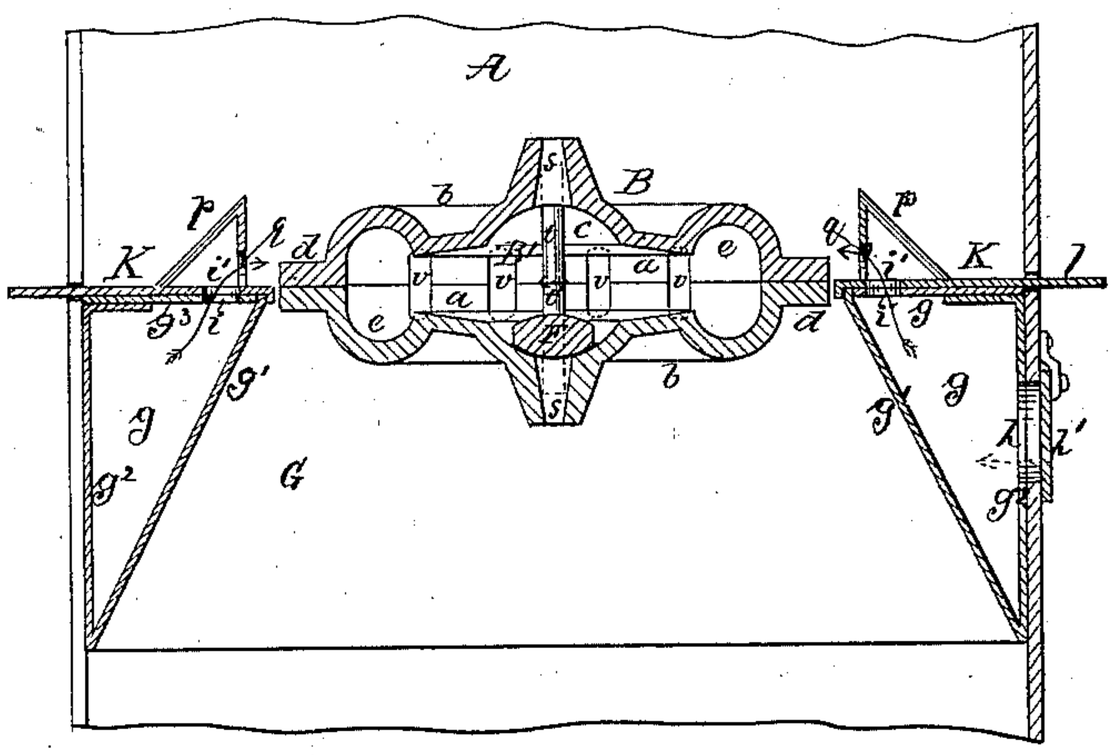
No. 312,635. Patented Feb. 24, 1885.

Fig. 5.



No. 3.

Fig. 6.



Witnesses:
Jonathan B. Tyler
Alex Selkirk Jr.

Robert Hillson
Inventor
by his Attorney
Alex Selkirk

UNITED STATES PATENT OFFICE.

ROBERT HILLSON, OF ALBANY, NEW YORK; JOHN HILLSON, OF SAME PLACE, ADMINISTRATOR OF SAID ROBERT HILLSON, DECEASED.

DAMPER.

SPECIFICATION forming part of Letters Patent No. 312,635, dated February 24, 1885.

Application filed November 2, 1883. (No model.)

To all whom it may concern:

Be it known that I, ROBERT HILLSON, a citizen of the United States, and a resident of the city and county of Albany, and State of New York, have invented certain new and useful Improvements in Dampers, of which the following is a specification.

My invention relates to dampers which are provided with an interior chamber, and a series of marginally-arranged escape-ports, and an inlet-opening provided with a door, as hereinafter fully described.

The objects of my invention are, first, to provide a damper which will utilize air for aiding to check the passage of the hot gases in a stove-pipe, thereby checking the draft of the same; second, by means of this damper to utilize air for aiding the combustion of the gases which escape unconsumed from the top surface of the fire; third, to provide an annular air-heating device having means for both the admission and discharge of air at will toward the periphery of the damper, by which, at will, an annular series of currents will be discharged into the smoke flue or chamber, whether or not the damper is turned to closed or open positions. I attain these objects by means of the mechanism illustrated in the accompanying drawings, in which drawings there are six figures illustrating my invention, in all of which the same letters of reference indicate like parts.

Referring to the drawings, Figure 1 is a plan view of my improved damper when arranged horizontally within the pipe. Fig. 2 is an edge view of the damper, arranged horizontally within the pipe. Fig. 3 is a sectional elevation of the same, taken at line No. 1 in Fig. 1. Fig. 4 is a view of a half-shell of the damper, from its inner side, when arranged within the pipe and taken at line No. 2 in Fig. 2. Fig. 5 is a plan view of my improved damper when arranged in connection with my improved contracting-ring within the smoke-flue, and Fig. 6 is a sectional elevation taken at line No. 3 in Fig. 5.

In the drawings, A represents a smoke-pipe, and B is my improved damper, which is composed of two halves, *b b*, each a duplicate of the other. Each half *b* of this damper is made with a circular form, and made to have a circular depression or cavity, *a*, extending inward from the plane of the line of the inner surface of the marginal edges, as from line *x* in Fig. 3. Sunken from this circular cavity *a*, and centrally across the same and through the entire diameter of the half-shell *b*, is a longitudinal cavity, *c*, which is made preferably with a curved form, as shown in Figs. 3 and 4. Sunken also in half-shell *b* is annular cavity *e*, which is also sunken below the plane of circular cavity *a* and line *x*. These three cavities—circular cavity *a*, longitudinal cavity *c*, and an annular cavity, *e*—each communicate with the other, as shown. When each of these duplicate half-shells *b b* are brought together with said cavities facing each other, as shown in Fig. 3, they are secured together by rivets *r r*, Fig. 1, passing through holes *r'*. (Shown in Fig. 4.) When these halves are so connected, the chamber B' within will have the one portion thereof formed by concavities *a a*, of shallow extension, and another portion formed by longitudinal cavities *c c*, of greater extension, and the third portion formed by annular concavities *e e*, of greater extension than central portions, *a a*. The circumferential marginal edge portion *d d* of these half-shells *b b* are made to have their inner side surfaces on the same line or plane as on line *x* in Fig. 3, and this marginal edge portion is provided at intervals with notches *f f*, formed so deep as to cut through the walls of the annular concavity *e* of each half shell, as shown in Fig. 4. When the two halves *b b* are secured together, as above described, notches *f* will form openings or ports *v*, which will have communication from the chamber B' (formed by cavities *a*, *c*, and *e*) with the outside of the damper or interior of pipe A, as shown.

Longitudinal recess *c* has one of its ends closed at *c'*; extending from said closed end, and made solid with the metal of the half-shells, is a projecting pintle, *m*, which receives a knot or finger-handle, *m'*, by which the damper is turned within pipe A. The opposite end portion of longitudinal cavity *c* has its walls extended outward past the circumferential line of marginal edge portions *d* to a short distance, as shown in Fig. 4. These

extended wall portions of said cavity are each made with a half-round form, and together form the opposite end pintle *n* of the damper, which pintle has its end made open, as shown in Fig. 4, so that air will readily enter the same from the outside and pass thence, as indicated by arrow 1 in Fig. 4, into interior chamber, B′, of the damper, and circulate therein and have passage from thence into the chamber-room of pipe A through ports *v v*, as indicated by arrows in Figs. 1 and 4. This projecting and round form of wall forming pintle *n* projects through the wall of the pipe, and is supported in bearing C, made with plate C′, Figs. 1 and 2, as indicated by dotted lines in said figures, which plate is secured to the wall of the pipe in any proper manner. The outer end of bearing C is made open, and has hinged thereto closing door D, which is adapted to be turned from a closed position, shown by full lines in Fig. 2, to that of dotted lines in the same figure.

Made in each half *b* of the damper are the oblong or slot form ports *s*, Figs. 1 and 3. These ports are made at about the middle of the longitudinal cavity *c*, and extend lengthwise with cavities *c*. A drop-valve, F, guided by transversely-arranged bars *t* passing through holes made in said valve, is employed for closing ports *s* when either of them are turned downward, as shown in Fig. 3. The guiding-bar *t* has made with it a central swell, *t′*, to check the valve from passing to the opposite port until the damper has been nearly fully turned to a reverse position, so as to bring the opposite side port *v*, down. The perforations in valve F, receiving pin *t*, are made with such a diameter as will permit the free passage of swell *t′* through the same.

The operation of this damper is as follows: When this damper is placed in pipe A, away from the fire, and is turned as indicated by dotted lines in Fig. 2, and transverse to that shown in Fig. 1, with door D closed against open end B^2 of the damper, the products of the fire readily have passage through the pipe to the exit. When in the same position, with door D thrown open, there will be a partial check of the draft of the stove by reason of air passing into the interior of the damper and escaping through ports *v v*, both downward and upward, and thence mingling with the products passing from the fire and reducing their temperature. When door D is closed and the damper is turned horizontally, as shown by full lines in Figs. 1 and 2, the draft will be materially checked by the room for the passage of the gases (between the damper and walls of the pipe) being materially lessened; and when the damper is turned horizontally, with door D open, the draft will be further checked by the passage of the air from the outside entering chamber B′, and passing thence outward through ports *v v* to mingle with the gases passing upward through the contracted passage-way between the pipe and the perforated marginal edges of the damper. In this latter case there will be but little draft, yet sufficient to maintain the fire alive for many hours without material combustion of fuel.

I also use my improved damper in another and different situation from that above described with different effects, which is this: This damper when placed in a pipe and near to the top surface of the fire, or in a proper chamber having a like circumference as the pipe, so as to be in a situation to become highly heated by the fire, will operate to contribute to the combustion of the gases escaping from the top surface of the fire unconsumed when the damper is turned horizontally and door D is opened to admit air to the interior of the damper, as the air thus admitted will become highly heated and pass out from the damper through ports *v v*. When this air will be discharged highly heated into the thin current of hot gases passing upward between the pipe or chamber wall and the notched edge of the damper, and, mingling with the hot gases without cooling, the same will contribute to the combustion of those gases, so that heat from them will be utilized for heating purposes. In this situation my improved damper will be advantageously used in soft-coal-burning stoves for burning the gases which freely escape unconsumed from the fire.

In case the flue or chamber of pipe A is considerably larger than the damper, I arrange within the pipe the annular air-heating device G, which is provided with chamber *g*, which has its inner walls, *g′*, made to incline upwardly and inwardly in a gradually-contracting manner, as shown in Fig. 6. Made at any proper joint in the outer walls, g^2, of chamber *g* and pipe A is an opening, *h*, which communicates from the outside of the pipe with chamber *g*.

The top portion, g^3, of the shell of device G is perforated at intervals with holes *i i*. (Shown by full lines in Fig. 6 and dotted lines in Fig. 5.) These perforations permit the escape of air from chamber *g*.

Placed upon the perforated top portions, g^3, of the shell of chamber *g* is a register-plate, *k*, provided with perforations *i′ i′*. (Shown in Figs. 5 and 6.) This register-plate is provided with one or more finger-pieces, *l*, (projecting through a narrow slit-opening, *l′*, made in the wall of the pipe,) for convenience for moving register-plate *k* in either direction, to open or close perforations *i i*, accordingly to prevent or permit the escape of air from chamber *g* to the pipe.

Arranged with register-plate *k* and over each perforation *i* are hoods *p*, provided each with a horizontal perforation, *q*, through which the air from the hoods will be made to escape toward the periphery of the damper B when the damper is in a horizontal position, as shown in Figs. 5 and 6. Damper B is made to have its shell form of pintle *n* extended outward to a distance, to rest in bearing C, attached to the

outside of pipe A, and the opposite end portion of the shell of longitudinal recess *c* will be also extended correspondingly, to carry pintle end *m* outward to have a bearing in the opposite side of the pipe.

When damper B is arranged within the air-heating device G as above described and shown, and the door *h'* of opening *h* is opened, air will be admitted into chamber *g*, and when register *k* is moved so that openings *i* and *i'* will be coincident the air within chamber *g* will be permitted to pass thence into hoods *p*, and thence escape through ports *q* in a series of small currents moving toward damper B, as indicated by arrows in Fig. 6. The heated gases from the fire, moving upward in contact with the gradually-contracting sides *g'*, will operate to heat the air within chamber *g*, so that when it escapes through ports *q* it will not lower the temperature of the gases moving up between the damper and device G. At the same time the heated air is being discharged from heating device G the air entering within chamber B' of the damper B will also be heated and discharged in a series of radial currents toward the circular line of the series of discharge-ports *q* in heating device G.

It is intended to arrange the air-heating device G, with damper B, as near the fire as possible, so that both the heating device and the damper will be in the best situation to become highly heated, and thereby heat the air entering them to a high temperature, which air, when discharged through ports *v v* and *q q*, will be made to mingle with the hot unconsumed gases escaping from the fire and contribute to their combustion, while at the same time a check will be given to the draft of the stove.

The damper may be employed in connection with the air-heating device G, to allow a full draft to the stove or to have its draft checked to different degrees, as above described, and the passage of the air through device G to the chamber of pipe A may be regulated by the register-plate *k*.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a stove-pipe damper provided with an interior air-chamber, the combination of air-inlets connecting with the outside air, the inlet-ports through the periphery of the damper, the central ports, *s s*, and valve F, governing the same, substantially as and for the purposes set forth.

2. The combination, with a damper adapted to be turned from a horizontal to a vertical position and the reverse, and provided with chamber B', having an inlet-opening, B^2, exit-ports *v*, and central ports, *s s*, of door D and valve F, substantially as and for the purpose set forth.

3. The air-heating device G, having annular chamber *g* about a central opening, which is adapted to receive a damper, and formed with inwardly and upwardly projecting walls, and provided in its exterior wall with means for admission of air to said chamber, and in its top portion of wall with a series of air-discharge perforations, *i i*, with register-plate *k*, adapted to be moved for opening or closing said perforations at will, substantially as and for the purpose set forth.

4. The combination, with pipe A and air-heating device G, provided with chamber *g*, having the upwardly and inwardly contracting wall *g'* and opening *h* communicating from said chamber to the outside air, and plates g^3 and *k*, provided with holes *i* and *i'*, respectively, one of the same being movable and registering with the other, of damper B, provided with an interior air-chamber communicating by an air-inlet with the outside air, and having outlet-ports through the periphery of the damper, and central ports, *s s*, and valve F, governing the same, all substantially as and for operations and purposes set forth.

ROBERT HILLSON.

Witnesses:
ELNATHAN B. TYLER,
ALEX. SELKIRK, Jr.