2 Sheets—Sheet 1.

J. W. CRARY.

Automatic Hot and Cold Air Damper.

No. 222,387. Patented Dec. 9, 1879.

FIG. 1

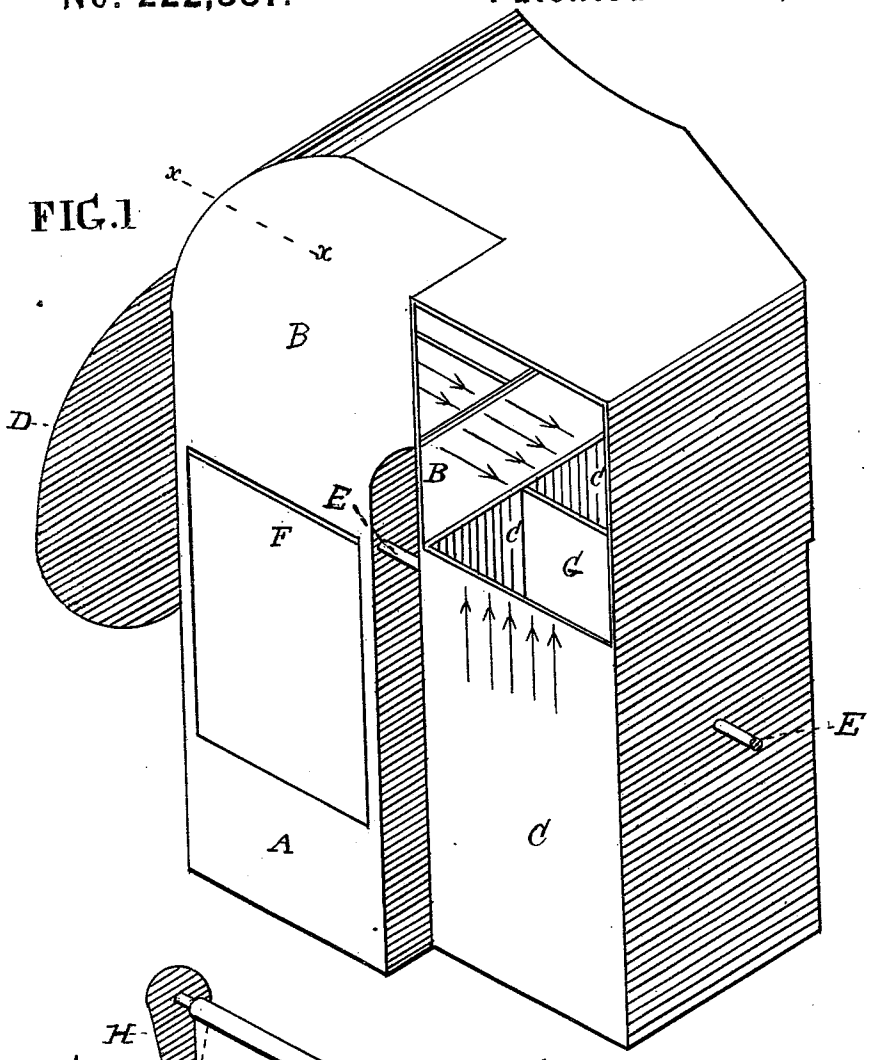
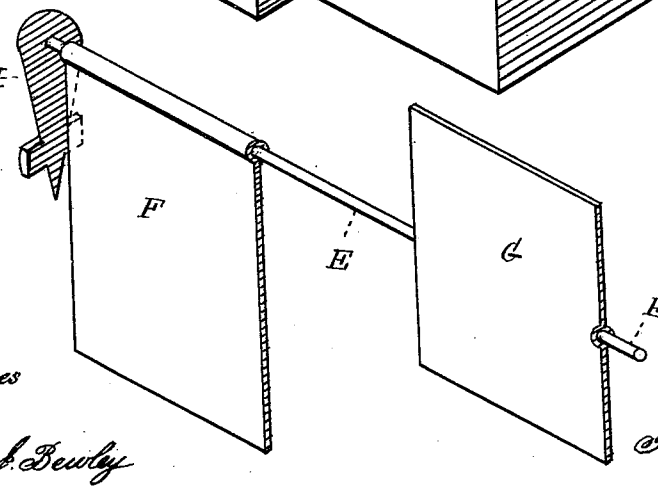


FIG. 2



Witnesses

Thomas J. Bewley

John Haworth

Inventor

John W. Crary.

per Stephen Ustick attorney

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

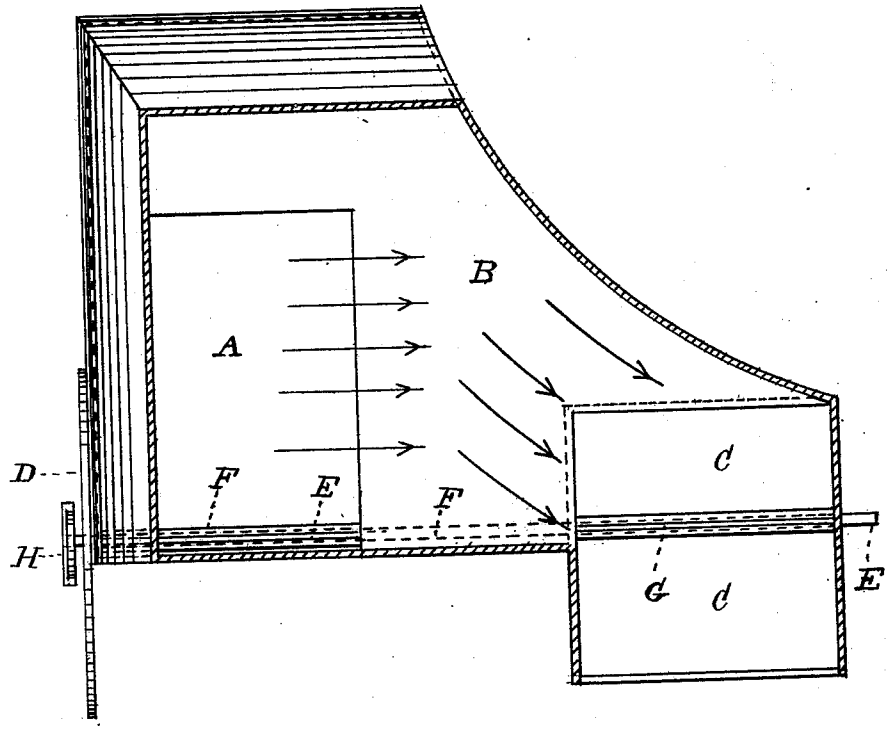
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FIG. 3



Witnesses.

Thomas J. Bewley.

John Haworth

Inventor.

John W. Crary.

per Stephen Ustick Attorney

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UNITED STATES PATENT OFFICE.

JOHN W. CRARY, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN AUTOMATIC HOT AND COLD AIR DAMPERS.

Specification forming part of Letters Patent No. **222,387**, dated December 9, 1879; application filed May 27, 1878.

To all whom it may concern:

Be it known that I, JOHN W. CRARY, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Automatic Hot and Cold Air Dampers, of which the following is a specification.

The object of my invention is a simple, cheap, and durable automatic damper that will check the draft of a furnace by admitting cold-air pressure at the same time the smoke-flue is partly closed; and the invention consists in the combination of a cold-air damper and hot-air damper on the same rod with a cold-air box and smoke-flue, the cold-air box having a flue which has an open communication with the smoke-flue, which may be located any desirable distance therefrom, all as hereinafter fully described.

I am aware that it is not new to operate two dampers simultaneously by means of the same rod, so as to close one while the other is being opened, as this is shown in the patent of Hessenburch, dated January 19, 1869, and in that of Tingley, dated September 28, 1875. In the patent of Hessenburch the dampers *a'* and *b'* in the pipes A and B, respectively, are on separate rods, which have no connection with each other. A connection of the dampers is made by a rod pivoted at one end to one end of the damper *b'*, and at the other end to the damper *a'*, in such a manner that the opening of one damper causes the other to close, and vice versa. Tingley has two dampers upon the same rod; but the rod is in the center of each damper, so that neither damper is automatically moved by the pressure of the air upon it; but my damper is essentially different from Tingley's, and also from that of Hessenburch's, the cold-air damper being connected at one of its edges with the damper-rod, so that the pressure of the air upon it automatically moves it, and consequently the smoke-damper, as hereinafter fully described.

In the accompanying drawings, which make a part of this specification, Figure 1 is an isometrical view of my automatic damper. Fig. 2 is a like view of the dampers F and G, damper-rod E, and indicator H, detached from the cold-air box A and smoke-flue C. Fig. 3 is a horizontal view at the broken line *x x* of Fig. 1.

Like letters of reference in all the figures indicate the same parts.

A is the cold-air box, which, in the drawings, is shown in a vertical position, and B a cold-air flue connected at one end therewith, to be inserted in a wall or pipe wherever they are intended to be used. C is the smoke-flue, which, in practice, is made separate from the flue B, so as to be located any desirable distance from the cold-air box A. D is a dial on the outer end of the cold-air box A. E is the damper-rod, one end of which has a bearing in the center of the dial D and the end of the box A, to which the dial is attached. The other end has its bearing in the far side of the smoke-flue C. F is the cold-air damper in the cold-air box A, and G the smoke-damper in the smoke-flue C, both dampers being on the same rod E. They are in the same plane; but the openings to be opened and closed are at right angles to each other. Hence one is closed by one of the dampers, while the other is opened by the other damper. The cold-air damper F is attached at one edge to the rod E, so as to be automatically moved by the pressure of the air.

It will be readily understood that, as the cold-air box A has an open communication by means of its connecting-flue B with the smoke-flue C, the temperature of the air within the box will be more or less raised by the increase of its temperature in the smoke-flue, and will thus lessen the pressure of the air upon the inner surface of the cold-air damper, while the pressure of the air on the outer surface of the damper will not be changed thereby, and that, consequently, the preponderance of pressure thus caused upon the outer surface of the valve over that on its inside will, according to the difference of pressure, cause the valve to open, and thus partly close the smoke-damper, and that a reverse action will be produced by a diminution of the temperature of the air in the smoke-flue C.

Outside of the dial D on the projecting end of the rod E is the hand or indicator H, which is adjustable on the rod by any suitable means, so as to balance the cold-air damper F to give

sensitiveness to its movements, and thus to insure its being easily moved by cold-air pressure.

Either metal or clay is a suitable material for the cold-air box and flues or for the dampers. The simultaneous action of the dampers admits of a certain pressure against the outflowing products of combustion in the flue C at the same time the flue is partly closed by the damper G. This is desirable, because this damper is never sufficiently closed to prevent the escape of noxious gases, while the entering cold air cools the smoke-flue only above the damper, and the gas is thus carried off without any unnecessary loss of heat from the furnace.

The cold-air box A, and also the smoke-flue C, may be set either in a horizontal or vertical position, as may be desired.

I claim as my invention—

1. The cold-air box A, having an ingress-opening for the passage of cold air and a cold-air flue, B, in combination with the smoke-flue C, the cold-air box being placed at any desirable distance from the smoke-flue, and having an open communication therewith by means of the flue B, and the air-box and smoke-flue being provided with suitable automatic dampers, substantially in the manner and for the purpose set forth.

2. The combination of the cold-air damper F, smoke-damper G, and rod E, the damper F being adapted to automatically open and close the mouth of the cold-air box A, and thereby regulate the draft of the smoke-flue C, substantially as set forth.

3. The combination of the dampers F and G, rod E, cold-air box A, having a flue, B, and the smoke-flue C, the several parts being constructed and combined in relation to each other substantially in the manner and for the purpose set forth.

JOHN W. CRARY.

Witnesses:

THOMAS J. BEWLEY,

STEPHEN USTICK.