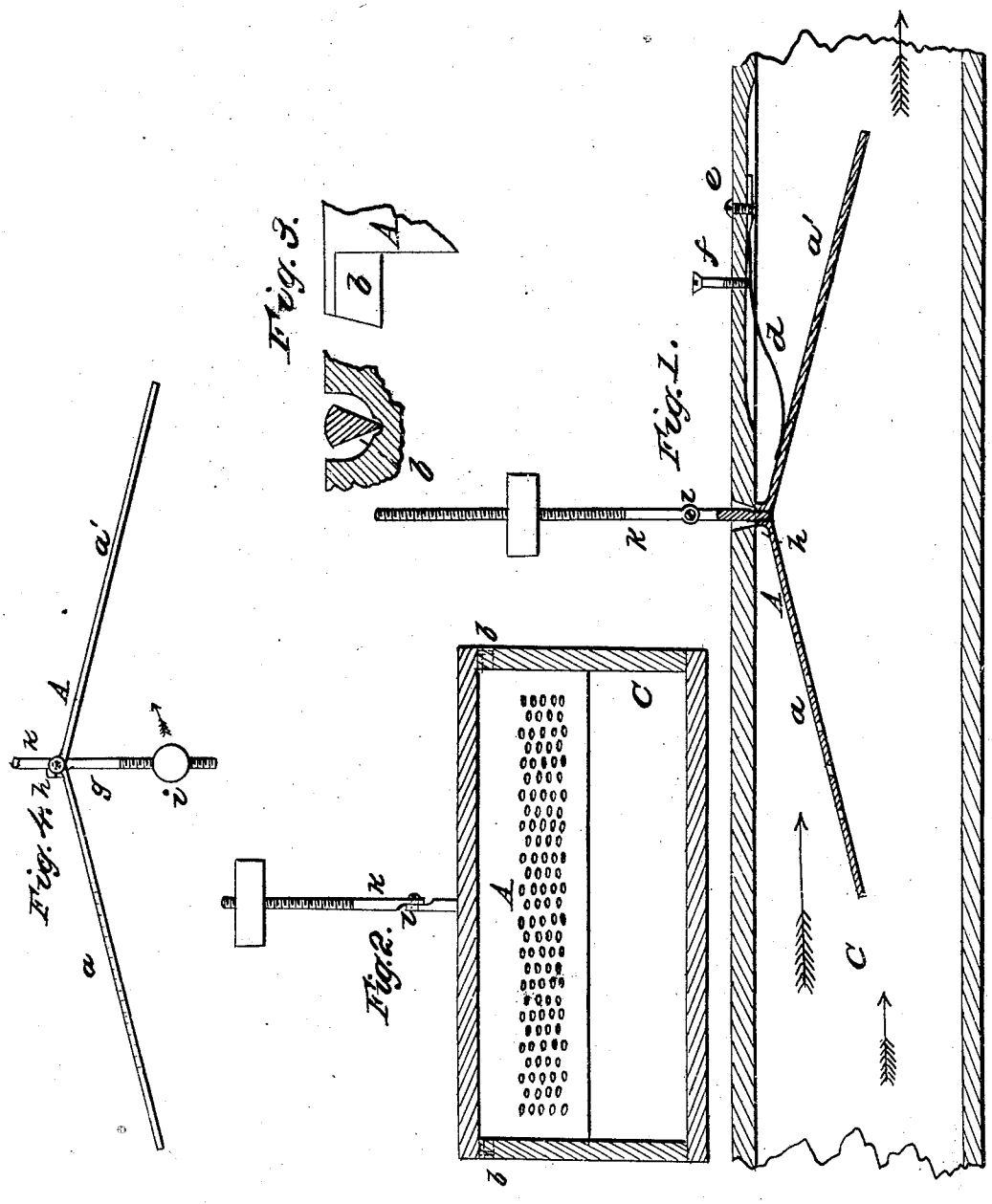
HAY & OSGOOD.

Damper.

No. 16,055. Patented Nov. 11, 1856.



N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

SAMUEL L. HAY AND H. B. OSGOOD, OF READING, MASSACHUSETTS.

METHOD OF REGULATING THE DRAFT OF HOUSE-FURNACES.

Specification of Letters Patent No. 16,055, dated November 11, 1856.

To all whom it may concern:

Be it known that we, SAML. L. HAY, of Reading, in the county of Middlesex and State of Massachusetts, and HENRY B. OSGOOD, of Dorchester, in the county of Norfolk and State of Massachusetts, have invented a new and useful article which we term a compound self-acting regulator, designed for cold-air or supply pipes to the heating chambers or rooms of furnaces and other apparatus for warming buildings; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a longitudinal section. Fig. 2 is a cross section of the supply pipe showing the outer wing of the regulator. Fig. 3 shows a method of making the bearings full size. Fig. 4, detail to be referred to hereafter.

The passage of air in ordinary cold air pipes, where there are no valves or dampers to reduce the area, is not uniform; high winds blowing toward that side of the building where the outer orifice is, causes so swift a current as to fan the heater too rapidly and the air carried into the apartments is too cold and not thoroughly and uniformly mixed. A vacuum also occurs on the lee side of the house, which causes currents from the cracks on that side of the house, thus aiding in urging the swift passage of the air through the supply pipes and heating chamber. From the wind blowing on the side of the building opposite the supply pipe, or from eddies, or other causes, a partial vacuum is formed about the outer orifice of the pipe, and is often sufficient to reverse the current and the warm air passes out of the building and is lost.

In very high, cold winds the cold air supply pipes have been closed entirely; when the heat about the furnace has accumulated to a high degree and extensive conflagrations—as is likely to be, if a fire occurs at such times—have been the consequence.

Dampers, or registers have been put into the supply pipes, to be opened in calm weather and partially or wholly closed when very windy; but they operate imperfectly, as the wind is fitful—one moment a strong gust and the next a lull; they are not self-regulating, and require a good deal of care to attend to them.

To remedy these difficulties is the object of our present invention, which consists in introducing into the supply pipe a compound valve, which is actuated by the currents and pressure of air; closing on the outer side according to the strength of air blowing against it; and closing on the inner side when a tendency to vacuum about the outer orifice of the supply pipe; produces a reverse current. The instant the valve is relieved from pressure it reopens, and the natural current caused by the operation of the heater occurs.

To enable others skilled in the art to make, and use our invention, we will proceed to describe its construction, and operation.

We construct a two-winged valve, A, which is pivoted at, *b*, in the sides, and near the top of the supply pipe, C. The spring, *d*, is to prevent the outer wing, *a*, from closing too freely, and is secured by the screw, *e*, to the pipe, C, and adjustable by the screws, *e*, and, *f*, as circumstances may require. Fig. 4 shows another method of accomplishing this object. *g*, is a rod connected with the valve, A, at its axis of oscillation, by a rule joint, *h*, having an adjusting weight, *i*, so that when the wing, *a*, falls, the ball is moved in the direction of the arrow, thereby increasing the resistance to its closing; when the wing, *a'*, falls the rule joint, *h*, allows the rod, *g*, to hang plumb. As it is desirable even in the highest winds, and most intense cold to have some fresh air introduced the wing, *a*, is perforated, to break the force of the current while it gives the needful supply.

To prevent the loss of heated air by a reverse current, it is desirable that the wing *a'*, be very sensitive, and its operation is made more perfect by the adjustable equipoise, *k*, which is jointed at, *l*, so that either side can be made to preponderate, and the wing, *a'*, be made to maintain its power as it closes.

The bearings of the valve, A, are constructed as shown, full size at Fig. 3, the ends of which bearings touch only near the axis of oscillation; and the wings of the

valve should be made to fit the box as near as they can well be without touching.

This regulator may be applied to the pipes of common stoves if the pipes which lead from them to the chimney, or smoke flue, be made rectangular—operating as a check upon the draft, and consequently economizing fuel, and closing when the wind down the chimney tends to throw the smoke, and gases into the building.

Having thus explained the construction and operation of our compound, self-acting regulator, what we claim as our invention and desire to secure by Letters Patent is—

The compound valve, A, with the spring, *d*,—or its equivalent—and equipoise, *k*, in combination with the pipe, C, substantially as herein described and for the purposes set forth.

SAML. L. HAY.
HENRY B. OSGOOD.

Witnesses:
DAVID N. B. COFFIN, JR.,
JOEL GILES.