B. OWEN.

Damper for Stoves.

No. 6,546. Patented June 19, 1849.

FIG. 2.

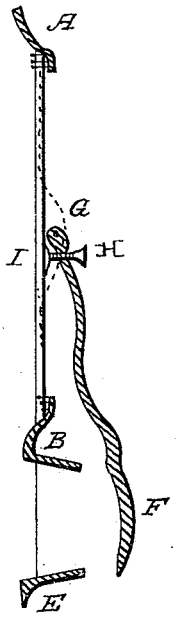
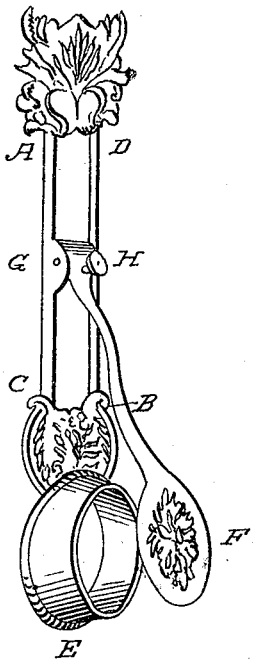


FIG. 1.



UNITED STATES PATENT OFFICE.

BENSON OWEN, OF SENECA FALLS, NEW YORK.

SELF-REGULATING DAMPER FOR STOVES.

Specification of Letters Patent No. 6,546, dated June 19, 1849.

To all whom it may concern:

Be it known that I, BENSON OWEN, of Seneca Falls, in the county of Seneca and State of New York, have invented a new and useful Improvement in the Mode of Regulating the Heat of Stoves and Close Fireplaces; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a perspective view and Fig. 2, in a vertical section through the middle.

The nature of my improvement consists in the application of the lateral motion produced by the expansion and contraction of a metallic plate or flexible rod fastened at both ends to a permanent support and having a lever acting upon a register combined therewith so as to avail myself of the greatest amount of motion caused by the expansion of said plate to act on said register.

Several devices have heretofore been made for the employment of the well known property of the expansion and contraction of metals by different degrees of heat for the purpose of regulating the admission of air to the fire, the most practical of which is the single inflexible expansion rod of Elisha Foote. Most of the devices essayed have been some modification of the plan of Doctor Ure of attaching together two flexible slips of metal of unequal expansibility and applying the curvature which the heat thereby produces. But these have not sufficient strength of structure to answer the purpose intended nor are they adapted to the high degree of heat to which they must necessarily be subjected and are consequently abandoned, for when they are subjected to a high heat, and consequently curved most they are often set or permanently bent into that position and rendered useless.

In my improvement I use a single flexible metallic plate in some respects like those in Regnauld's thermometer, but differing from the latter in having both ends of the plate fastened to a permanent support or frame and in having the lever bearing by its weight against the side of the plate, by which means I secure its lateral motion by different degrees of heat altogether independently of the property of elasticity in the plate.

The metallic plate producing the lateral motion aforesaid I usually cut from sheet brass. No precise dimensions are requisite but I usually make it about three-fourths of an inch wide and eight inches long. Both ends are riveted firmly to a cast iron frame which holds is at ordinary temperatures nearly straight.

The frame in its simplest form is a parallelogram, its sides so far apart as to admit between them the slip of brass its length the length of the slip and its strength and thickness such as to make it inflexible.

For sheet iron stoves it is convenient to connect and cast with the frame the base or stationary part of the register. I usually place it a few inches from the lower part of the frame. It may be of a circular or other ordinary form with its usual flange for riveting it to the stove, and it is closed by a plain disk or damper shutting on to it as represented in the drawings. It should project from the stove an inch or more beyond the perpendicular line from the point where the lever is suspended, that the damper may close the orifice by its own weight.

The damper is attached to the end of the lever and that connects by a joint with the frame—and for that purpose upon its sides and about $\frac{1}{2}$ of an inch above the middle of them are cast projections of $\frac{1}{2}$ of an inch suitable for holding a rivet. The upper end of the lever lies between these projections and is held in front of the brass slip and nearly in contact with it when straight by a rivet which passes through the projections and loosely through the lever. At about one fourth of an inch below this joint a screw passes through the lever and bears or presses against the brass plate. On the front end of the screw is a knob or head convenient for turning it, and to prevent wearing the brass plate a small piece of iron or steel should be riveted on to it where it comes in contact with the screw. The lateral action of the brass plate is thus communicated from the end of the screw to the lever and damper. And also by turning the screw the damper may be raised or depressed. To permit the lateral action of the brass plate it should stand out in front of

the stove at least ½ of an inch and for that purpose either depressions should be made in the stove or projections or flanges cast upon the frame to set it out that distance.

In the annexed drawings the same letters represent the same parts in both figures.

A B is the brass plate attached to the frame.

A C E B D, Fig. 1, represents the frame with ornaments and the base of the register attached.

At A and B, Fig. 2, are shown the flanges or projections upon the ends of the frame which set the brass plate out from the stove.

F is the disk or damper which shutting down over the base of the register closes the access of air to the stove.

F G is the lever or stem to the damper connected by a rivet joint with the frame at G, one of the projections upon the sides of the frame to hold the rivet are shown at G in Fig. 1.

H I represents the screw with its head which passing through the lever and bearing against the brass plate raises and depresses the damper, either by the action of the heat or by turning the screw. The base of the register is riveted to the stove in the ordinary way and one or two rivets through the upper part of the frame will be sufficient to hold the whole to its place. The plate of brass on being heated and expanded with the screw bearing against it will assume the form of the dotted line A I B and the damper falling by its own weight will shut off the access of air to the stove. On cooling and contracting it will press against the screw and open again the damper. It is also manifest that the degree of heat which will be required to close the damper will depend upon the distance at which the damper is set from the base by means of the screw. It therefore constitutes the means of setting the stove at different degrees of heat.

Considerable variety may exist in the mode of applying my improvement. Instead of the brass plate and the lever with the damper both lying in the same direction, they might if desired be placed at right angles to each other, riveting the lever to the side of the frame. The brass plate if desired might be placed on the inside of the stove and a small orifice made through the stove for the screw. In cast iron stoves the frame might be dispensed with. Suitable projections being cast upon the plate on which to attach the brass slip and the lever. Instead of riveting the upper end of the brass plate to the frame it may be fastened to a piece of iron and that held by a screw passing through the end of the frame, that the plate may be tightened should it become loose. A chain might be substituted for the brass plate and some other material than brass might be used provided it had greater expansibility than the iron frame from equal changes of heat and would not melt or be injured by the heat of the stove.

Having thus fully described my improvement what I claim therein as new and for which I desire to secure Letters Patent, is—

The employment of an expending flexible plate firmly secured at both ends in combination with and acting upon a pendulum lever or valve, regulating the draft substantially in the manner and for the purpose set forth.

BENSON OWEN.

Witnesses:
ELISHA FOOTE,
HORACE P. BOGUE.