J. WOODRUFF.

Damper for Furnaces.

No. 160,496. Patented March 2, 1875.

Fig: 3

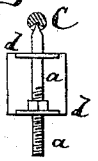


Fig: 5

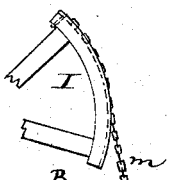


Fig: 2

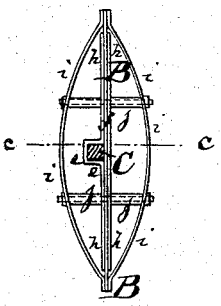


Fig: 1

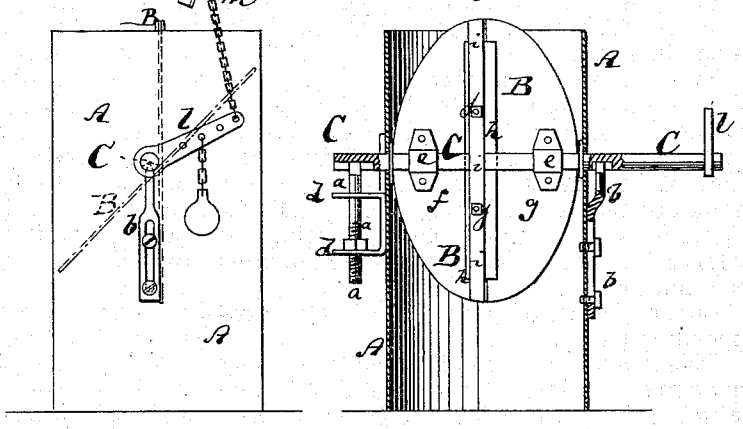
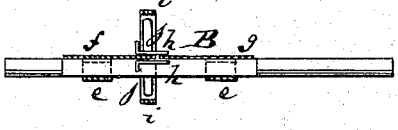


Fig: 4



Witnesses:

A. Moraga

O. Kreidner

Inventor:

J. Woodruff

by his attorney

A. V. Briesen

UNITED STATES PATENT OFFICE.

JOSEPH WOODRUFF, OF RAHWAY, NEW JERSEY.

IMPROVEMENT IN DAMPERS FOR FURNACES.

Specification forming part of Letters Patent No. **160,496**, dated March 2, 1875; application filed February 1, 1875.

CASE A.

To all whom it may concern:

Be it known that I, JOSEPH WOODRUFF, of Rahway, in the county of Union and State of New Jersey, have invented a new and Improved Damper for Furnaces, and mode of hanging the same, of which the following is a specification:

Figure 1 is a face view of my improved damper, showing it within the chimney, and showing, also, how it is hung. Fig. 2 is an end view of said damper. Fig. 3 is an end view of its axle and support; Fig. 4, a horizontal section on the line *c c*, Fig. 2; and Fig. 5, a side view of the chimney, showing the connection of the damper with the regulating mechanism.

Similar letters of reference indicate corresponding parts in all the figures.

This invention has for its object to produce a damper for large furnaces and chimneys which can be conveniently secured in place and conveniently removed for repair, and also to improve the mode of hanging heavy dampers.

My invention consists, first, in the novel construction of a sectional damper; and, secondly, in a new mode of hanging the same, all as hereinafter more fully described.

The letter A in the drawing represents a chimney or flue of suitable style, and B is the damper placed therein. This damper, for a cylindrical chimney or flue, is made of oval form, as indicated in Fig. 1, whereas for a rectangular chimney or flue the shape of the damper would be correspondingly changed; but I intend in either case to make the damper longer than the diameter of the flue, so that it may close said flue while in an inclined position, (indicated by dotted lines in Fig. 5,) because in this manner I can entirely open and entirely close the flue by a shorter motion of the damper than I could if the damper were so formed as to close the flue only at right angles to its open position. This feature of elongation in the damper I do not, however, claim as my invention.

The damper B is fitted upon an axle or shaft, C, that passes through the flue A and rests on supporting-pins *a b*, that are attached to the outer side of said flue. The pins *a b* are made adjustable at right angles to the axis of the shaft C, either by being screwed into their supporting-lugs *d*, or through a nut resting thereon, as in Fig. 3, or by having the shank of the pin *b* slotted, and fastened by proper set-screws, as shown in Fig. 5, or otherwise, so that by the adjustability of said pins the shaft C may be brought to the proper position and requisite height. The upper ends of the pins *a b* are pointed, or at least brought to a knife-edge, as indicated in Figs. 3 and 5, and enter **V**-shaped recesses in the axle, as shown in the same figures, so that the supporting-points of these pins will reach to the axis of the shaft C, and allow said shaft to vibrate on its supports without any displacement of surface thereon, thus avoiding all avoidable friction. The shaft C, which may be, and preferably is, of cylindrical form where it passes through the sides of the chimney, is, by preference, of prismatic form within the chimney, as indicated in Figs. 1, 2, and 4, in order to give a proper hold to the straps *e e*, that are attached to the damper B and pass around such shaft, and to prevent the damper from vibrating on the axle. The damper B is made in two sections, *f g*, that are divided at the longer diameter of the damper, each being thus about one-half of the entire damper. The section *f* of the damper has fastened near its straight inner edge two ribs, *h h*, projecting beyond the edge; and the section *g* enters, with its inner edge, between these two ribs, as clearly indicated in Figs. 1 and 4, so that thus the ribs serve to properly connect the two sections of the damper, and to close the joint between them, permitting at the same time the two sections to be separated whenever the damper is withdrawn from within the flue. Each of the sections *f g* has a strap, *e*, attached to it for connection with the shaft C. *i i* are arched braces connecting with the ends of the section *f* at opposite sides thereof, as shown in Fig. 2, and connecting, further, with the middle part of such section by horizontal braces *j j*, all for the purpose of strengthening a heavy damper lengthwise, where it would be weakest if not strengthened by the ribs *h* or braces *i i j j*.

A damper of the construction herein speci-

fied can be conveniently placed in the chimney by applying one section first, passing the shaft through the strap *e* thereof, then applying the other section, fitting it between the ribs *h*, and finally securing it by pushing the shaft C through the strap *e* of the second section, and then adjusting the supports *a b* to properly sustain the shaft.

For operating the damper a crank, *l*, of the shaft C, weighted or otherwise, may be connected by a chain, *m*, with a vibrating lever, I, which lever may be operated by a draft-regulator in any suitable manner.

The damper may be hung in a vertical, inclined, or horizontal chimney. In a horizontal chimney the adjustable pins *a b* may be secured in the ends of a strap that is put around the upper half of the chimney.

I claim as my invention—

1. The damper B, made in two sections, *f g*, each section having a strap, *e*, for connection with the shaft C, with which said damper is combined, substantially as described.

2. The arched braces *i* and ribs *h*, applied to and combined with a sectional damper, B, substantially as and for the purpose specified.

3. The adjustable supporting-pins *a b*, combined with a recessed shaft, C, and with a damper, substantially as and for the purpose specified.

JOSEPH WOODRUFF.

Witnesses:
E. C. WEBB,
F. V. BRIESEN.