J. B. PHILLIPS & J. A. KAPLAN.

FURNACE DOOR OR DAMPER.

APPLICATION FILED NOV. 10, 1911.

1,068,925. Patented July 29, 1913.

Fig. 1.

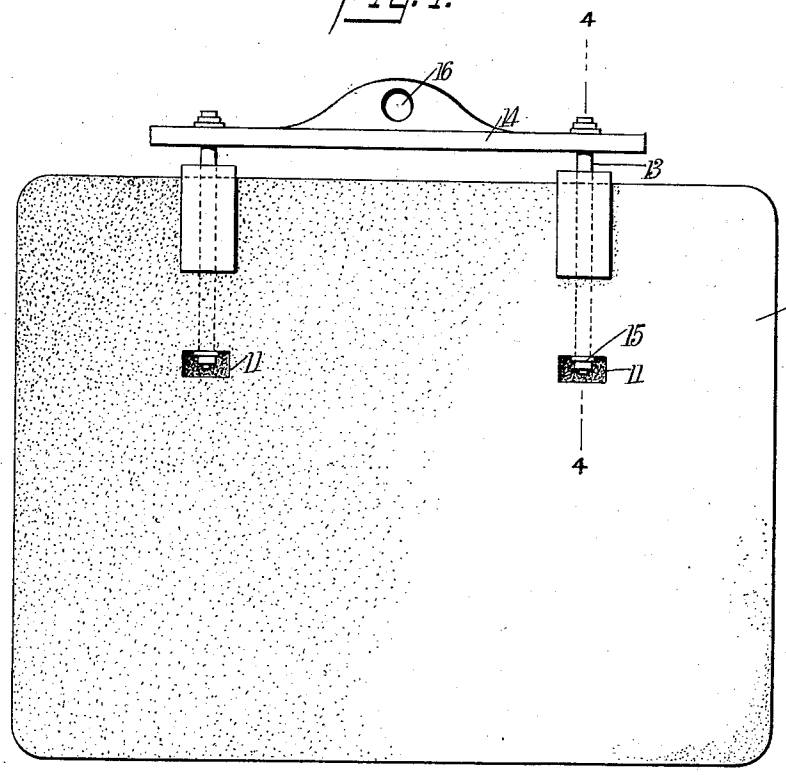


Fig. 2.

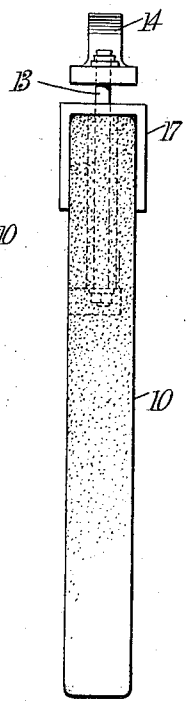


Fig. 3.

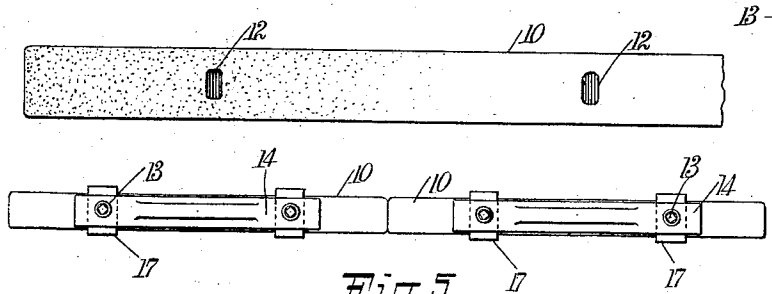


Fig. 4.

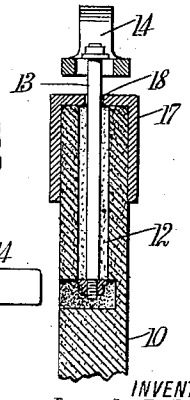


Fig. 5.

WITNESSES

William P. Goebel.

J. L. McAuliffe

INVENTOR

Joseph B. Phillips

Joseph A. Kaplan

BY Munn & Co

ATTORNEYS

COLUMBIA PLANOGRAPH CO., WASHINGTON, D.

UNITED STATES PATENT OFFICE.

JOSEPH B. PHILLIPS AND JOSEPH A. KAPLAN, OF ZANESVILLE, OHIO.

FURNACE DOOR OR DAMPER.

1,068,925. Specification of Letters Patent. Patented July 29, 1913.

Application filed November 10, 1911. Serial No. 659,525.

To all whom it may concern:

Be it known that we, JOSEPH B. PHILLIPS and JOSEPH A. KAPLAN, citizens of the United States, and residents of Zanesville, in the county of Muskingum and State of Ohio, have invented a new and Improved Furnace Door or Damper, of which the following is a full, clear, and exact description.

An object of the invention is to produce an improved device for use either as a door closure for smelting furnaces, or as a damper to regulate the draft of the furnace.

With the ordinary form of doors employed with smelting furnaces, the metallic body or frame provided for holding the brick facing is soon destroyed by the exceedingly high heat of the furnace, and its marked lack of durability causes considerable expense in the operation of the furnace. Also in the operation of furnaces at present, it is customary to lower a damper through a slot in the flue leading from the furnace to the stack to close the flue opening for regulating the draft, and it is customary for this purpose to employ a cast iron plate which burns or cracks off in a short time.

A device constructed in accordance with our present invention is adapted for use either as a door or damper and has greatly increased durability.

The body of our improved device provides the heat-resisting surface of the door or damper, and preferably consists of a unitary slab of refractory material of the nature of firebrick. Our construction does away with all metallic members at points where the device is subjected to destructive heat, and results in substantially an all-refractory door or damper, in so far as the exposed portions thereof are concerned, the metallic members employed being confined to simple hanger devices and connections of novel construction, so arranged as not to be subjected to destructive heat. The construction and arrangement of the metallic parts are such as to minimize the liability of the refractory slab being fractured by any blows or strains to which the metallic parts are subjected in the manipulation of the device.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a rear view of a door or damper constructed in accordance with our invention; Fig. 2 is an edge view thereof; Fig. 3 is a broken plan view of the refractory slab; Fig. 4 is a fragmentary vertical section; and Fig. 5 is a plan view showing two of our improved devices juxtaposed edgewise to constitute sections of a door closure for a furnace.

In constructing the refractory portion of our device, the same is preferably made in the shape of a single slab 10, and is formed in one face with recesses 11 extending beyond the center of thickness of the slab, communicating with which recesses are vertical bolt-holes 12, for receiving bolts 13, the upper ends of which pass through suitable holes formed in a hanger bar 14, near the ends thereof, the lower ends of the bolts being provided with nuts 15 in the recesses 11. The hanger bar 14 has a transverse hole 16 for receiving any approved suspending device connected with any ordinary means for swinging the door or damper, or raising it into an outer position.

It will be observed that the bolt-holes 12 are oblong, having their major axes transverse to the face of the slab 10, and in connection with the bolts we employ clips 17 of inverted U-shape, which fit over the top of the slab 10 and are each provided in their top member with a hole 18, sufficiently large to snugly receive a bolt 13, the diameter of the said bolts and the holes 18 being less than the major axis of a recess 11. By this arrangement, should the device have a tendency to swing when being manipulated, the clips form protectors and the bolts 13 are prevented from striking the walls of the vertical bolt-holes 12, so that any blow received by the bolt will not be communicated to the walls of the said hole, but will be distributed over a surface of the slab corresponding with that of one side of the clips, and thus the danger of fracture of the slab is minimized.

In some cases where very large doors are employed, say, five or six feet long, the ordinary construction requires that a single door be provided to reduce the exposed metallic surface; with our invention the slabs may be made of smaller size and a plurality of these employed to constitute a sectional closure, the vertical side edges of the slabs in this case being brought into close contact with each other, as indicated in Fig. 5. The sectional door also enables the sections to be raised or lowered separately or in unison,

as may be found desirable to suit the convenience of the operator.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. A closure or damper for furnaces comprising a body of refractory material having a protecting U-shaped device detachably fitting its upper end, and a detachable hanger, the said protecting device being separate from the hanger and independently detachable.

2. A closure or damper for furnaces comprising a body of refractory material having a protecting device detachably fitting its upper end, and a hanger comprising bolts connected with said body and passing through said protecting device, and a hanger bar engaging said bolts.

3. As an article of manufacture, a slab for furnace doors or dampers having oblong holes extending vertically therein from the upper edge, in combination with a hanger device including a bolt extending vertically through the said hole and having means at its lower end for preventing its withdrawal, and an inverted U-shaped clip fitting the upper end of the slab and formed at its top member with a hole through which the bolt extends, the diameter of the bolt and the diameter of the hole in the clip being less than the major axis of the oblong hole in the slab.

4. The combination with a slab of refractory material having vertical holes extending partially through the said slab, from the upper edge thereof, of a horizontal hanger bar, vertical members depending from said bar and extending through the holes in the slab, said holes being oblong transversely, and clips fitting the upper edge of the slab and formed with holes through which the said depending members of the hanger bar extend, the diameter of the said depending members and of the holes in the clips being less than the major axes of the oblong holes in the slab, the mentioned hanger bar having a transverse hole for receiving a suspending device.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOSEPH B. PHILLIPS.
JOSEPH A. KAPLAN.

Witnesses:
SEWARD R. WELLER,
MAUDE D. THOMPSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."