R. HILL.

DOORS FOR FURNACES.

No. 194,908. Patented Sept. 4, 1877.

Fig 1

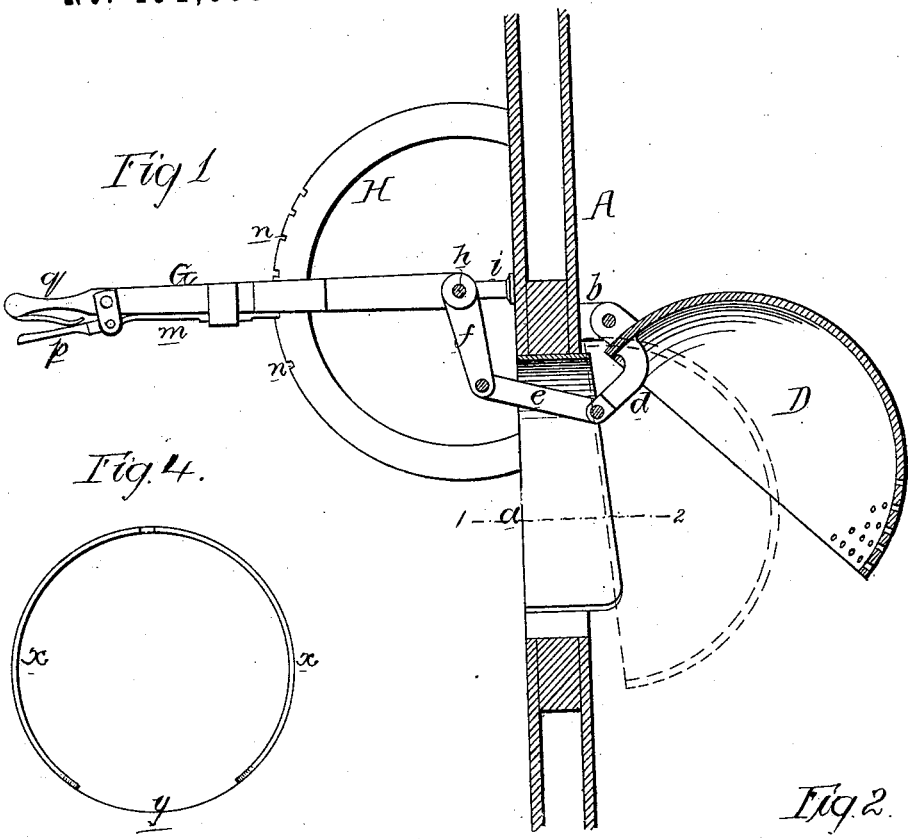


Fig 4.

Fig 2.

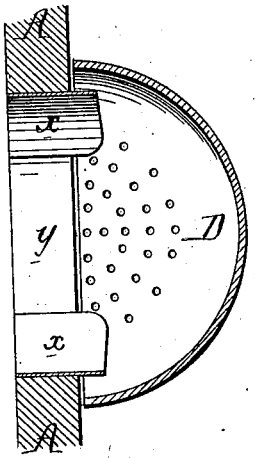
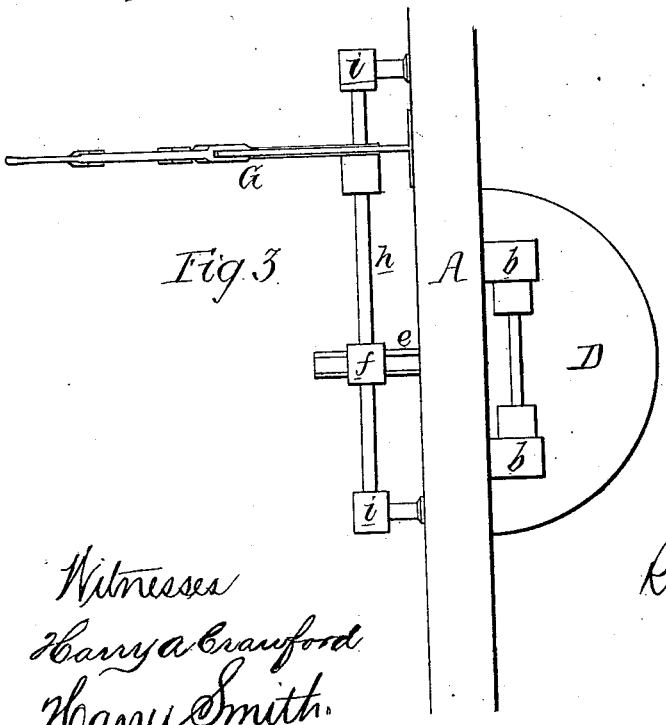


Fig 3



Witnesses

Harry a Crawford

Harry Smith.

Inventor.

Rufus Hill

by his Attorneys.

Howson and Sons

UNITED STATES PATENT OFFICE.

RUFUS HILL, OF CAMDEN, NEW JERSEY.

IMPROVEMENT IN DOORS FOR FURNACES.

Specification forming part of Letters Patent No. **194,908**, dated September 4, 1877; application filed April 26, 1877.

To all whom it may concern:

Be it known that I, RUFUS HILL, of Camden, New Jersey, have invented new and useful Improvements in Doors for Furnaces, of which the following is a specification:

The main object of my invention is to provide the fire-box of a steam-boiler with an internal door, which, when open, will serve to direct the air admitted through the doorway downward onto the fuel, instead of permitting it to take a direct course to the tubes, and, by chilling the same, detract from the steam-generating capacity of the boiler.

A further object of my invention is to retain the deflecting-door in any position to which it may be adjusted, so that the admission of air through the doorway may be under the entire control of the engineer.

In the accompanying drawings, Figure 1 is a vertical section of the front of a locomotive fire-box with my improvements; Fig. 2, a sectional plan on the line 1 2, showing the deflecting-door closed; Fig. 3, a plan view of Fig. 1; and Fig. 4, a view of the internal flange referred to hereinafter.

A represents the rear of a locomotive fire-box, and *a* the doorway through which the fuel is introduced, this doorway being, in the present instance, of circular form.

To studs *b b* projecting from the inner face of the fire-box is hinged the deflecting-door D, which I prefer to make in the form of a hollow hemisphere, as shown.

At the upper portion of the door is a projection, *d*, which is connected by a link or links, *e*, to an arm, *f*, on a shaft, *h*, which has its bearings in studs *i i* secured to the front of the fire-box, and to which is secured a lever, G, adapted to a notched segment, H, on the said fire-box, the lever being provided with a sliding bolt, *m*, the inner end of which is adapted to any one of the notches *n* in the segment, this bolt being connected to a spring-handle, *p*, adjoining the main handle *q*.

By means of this lever, which is similar to the starting-lever of a locomotive-engine, the deflecting-door may be opened, closed, or adjusted to any desired position, and may be retained after adjustment by the latch *m* and segment H.

By this combination of parts the engineer is enabled not only to maintain the deflecting-door in a proper elevated position for the admission of fuel to the fire-chamber, but to control the admission of air through the fire-door more effectually than by the ordinary door, while at the same time the connecting devices *f e d*, being arranged close to the top of the doorway, do not interfere with the proper manipulation of the shovel in feeding.

When the door is open, as shown in Fig. 1, it will deflect the volume of air which passes through the doorway *a* of the fire-box downward onto the top of the fuel, instead of permitting it to rush directly to and chill the tubes—an evil which seriously detracts from the steam-generating effect of the boiler, whereas the air deflected downward by the door will promote the combustion of the fuel.

On the edge of the doorway, in the inside of the fire-box, there is a flange, *x*, which is discontinued at *y*, as best observed in Fig. 4.

When it is desirable to admit a comparatively restricted volume of air into the fire-box, as is frequently the case, the door may be adjusted to, or about to, the position shown by dotted lines in Fig. 1, when the flange will aid the door in directing the air downward through the opening *y* presented by the gap in the flange *x* into the fire-box, instead of permitting it to take a direct course to the tubes.

I prefer to perforate the lower portion of the deflecting-door, as shown, so that when entirely closed small jets of air may be projected downward onto the fuel to promote combustion.

I claim as my invention—

The combination of the doorway *a* and flange *x* with the deflecting-door.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RUFUS HILL.

Witnesses:
HERMANN MOESSNER,
HARRY SMITH.