W. A. HOLBROOK.

GRATE-BACK.

No. 193,514. Patented July 24, 1877.

Fig 1

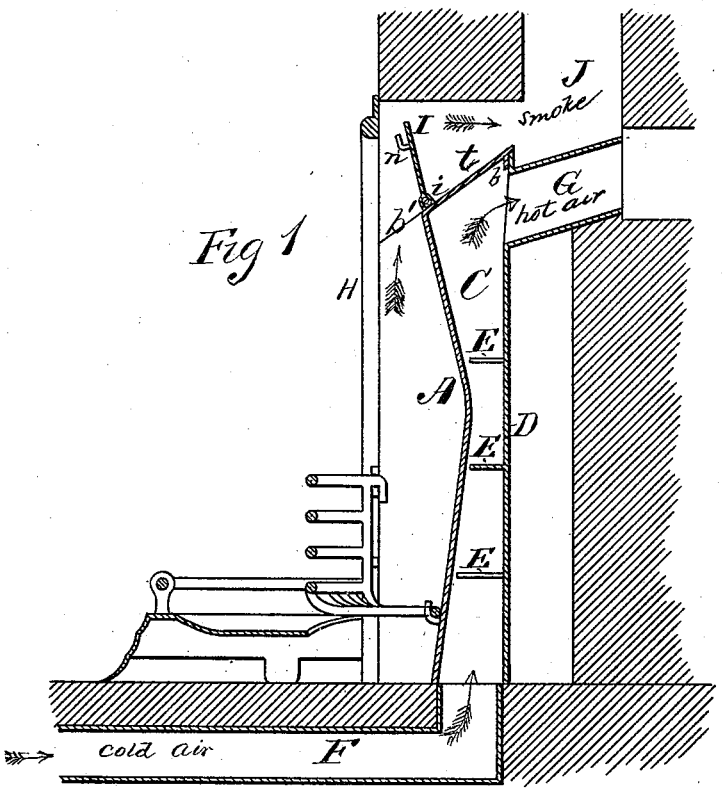
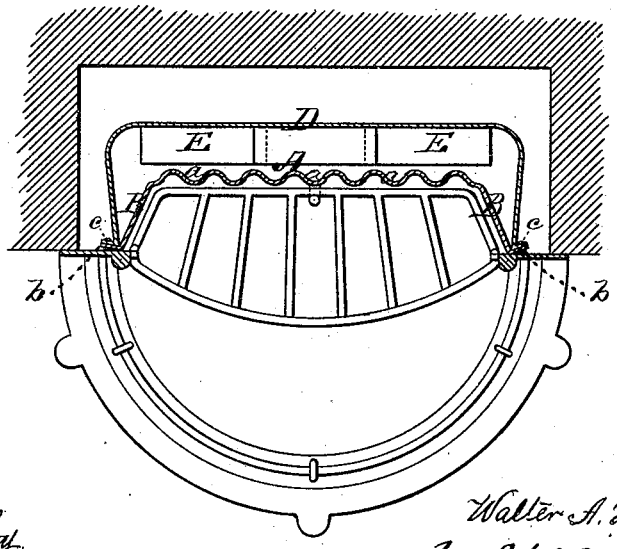


Fig 2



WITNESSES

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WALTER A. HOLBROOK, OF MILWAUKEE, WISCONSIN.

IMPROVEMENT IN GRATE-BACKS.

Specification forming part of Letters Patent No. 193,514, dated July 24, 1877; application filed June 9, 1877.

To all whom it may concern:

Be it known that I, WALTER A. HOLBROOK, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and valuable Improvement in Grate-Backs; 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, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical central cross-sectional view of my invention, and Fig. 2 is a horizontal section thereof.

This invention has relation to improvements in grates.

The object of the invention is to devise means for utilizing the heat from the back and sides of an ordinary open fire-place, usually wasted by passing into the brick or up the chimney-flue.

This invention consists in the construction and novel arrangement of a concave cast-iron grate-back having an inclined top and flanges on the margins of the sides and top, and, in connection therewith, of the sheet-metal jacket bent horizontally and bolted to said flanges to form the rear wall of a hollow grate-back, all as hereinafter shown and described.

In the annexed drawings, the letter A designates a cast metal fire-back, made concave vertically as well as horizontally, and let into the fire-place in the customary manner. This back is longitudinally corrugated, as shown at *a*, both for the purpose of increasing its heating-surface and for adding to its strength. The sides B of the back are inclined, as seen in Fig. 2, and provided at their front edges with a flange, *b*, while the top is carried upward and backward from the throat *b'* in a preferably inclined position to form the top *t* of the air-chamber C. This latter is formed by a galvanized-iron jacket, D, the sides of which are at right angles, or nearly so, to the back, and are secured to the grate-back flange *b* by means of bolts *c* passing through registering eyes respectively in the flanges of the grate-back and jacket. The flange *b* is first filled with stove-putty, and when the flange of the jacket is bolted thereto a close joint is formed which effectually prevents gas or smoke from penetrating into the air-chamber aforesaid. The jacket is provided with a number of projecting shelves, E, obliquely arranged at different heights, the object of which is to retard the air in its upward course sufficiently long to be well heated.

Air may be introduced into the chamber C through a pipe or conduit, F, from a room below, or from any suitable point, and after being properly and thoroughly heated passes out of the said chamber through a pipe, G. This latter in the drawings is shown opening into an adjacent room; but by the use of proper connections and flues the heated air may be discharged into a room or rooms above, and even conducted back into the apartment where the grate is.

By the employment of proper registers the supply of hot air discharged from the chamber may be regulated at pleasure.

The combined grate-back and air-chamber jacket will be set into the fire-place in the usual manner, but entirely independent of the frame, so that they will contract or expand without danger of breaking.

The frame A is secured in any suitable manner to the fire-place front, and forms with the upper end of the back a throat, *b'*, through which the products of combustion pass into the flue J with adequate draft. This latter is regulated through the medium of a damper, I, that works in spaced lugs or eyes *i* cast on the top plate *t* of the back.

One of these eyes is open, so that the damper may be removed when necessary, and the said damper is provided with a hook, *n*, by means of which it may be conveniently operated with a poker.

The grate-back, with its sides and inclined top plate, is cast in one piece, and as the jacket forms an air-tight joint therewith the penetration of smoke and gas into the chamber C is absolutely prevented.

In practice, the back will be bedded in mortar upon the hearth, the collar G upon the jacket being engaged in the flue opening into the room to be warmed.

What I claim as new, and desire to secure by Letters Patent, is—

1. The hollow grate-back, consisting of the

concave cast-iron plate A, having the top *t* inclined backward and upward from its upper bend, and flange *b* extending around its side and top edges, and the laterally-bent iron jacket D, having a corresponding side flange, and bolted to the sides and top of said plate, substantially as specified.

2. The combination, with the concave corrugated cast-iron grate-back A, having flange *b* and inclined top *t*, of the sheet-iron jacket D bolted thereto, and having the series of inner projecting ledges obliquely arranged at different heights, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

WALTER A. HOLBROOK.

Witnesses:
J. C. FINCH,
GEO. H. NOYES.