W. McFARLAND.

Hot-Air Furnace.

No. 161,535. Patented March 30, 1875.

Fig. 1

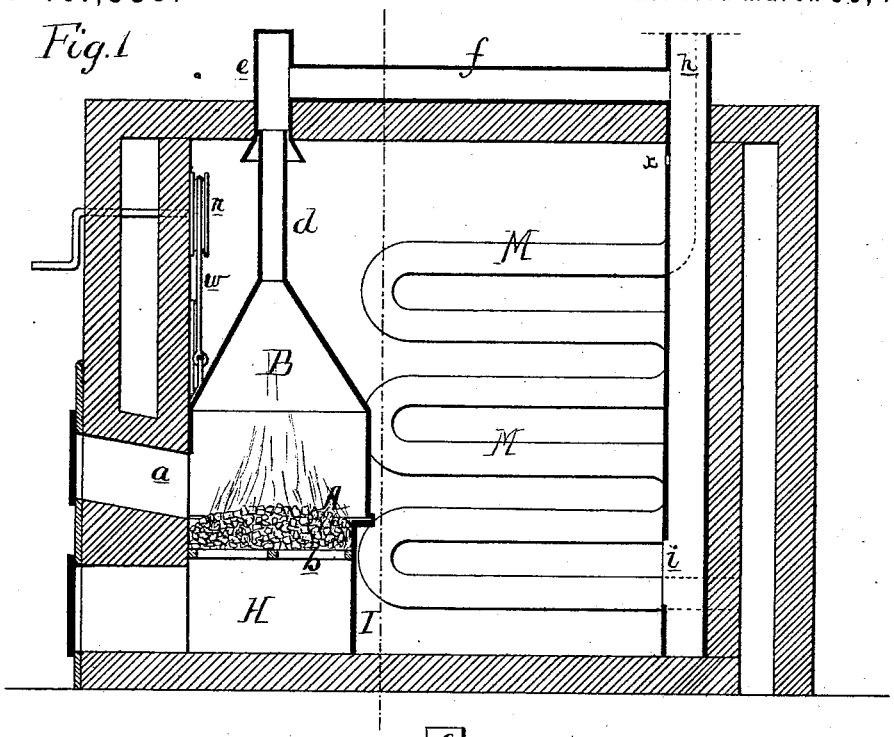
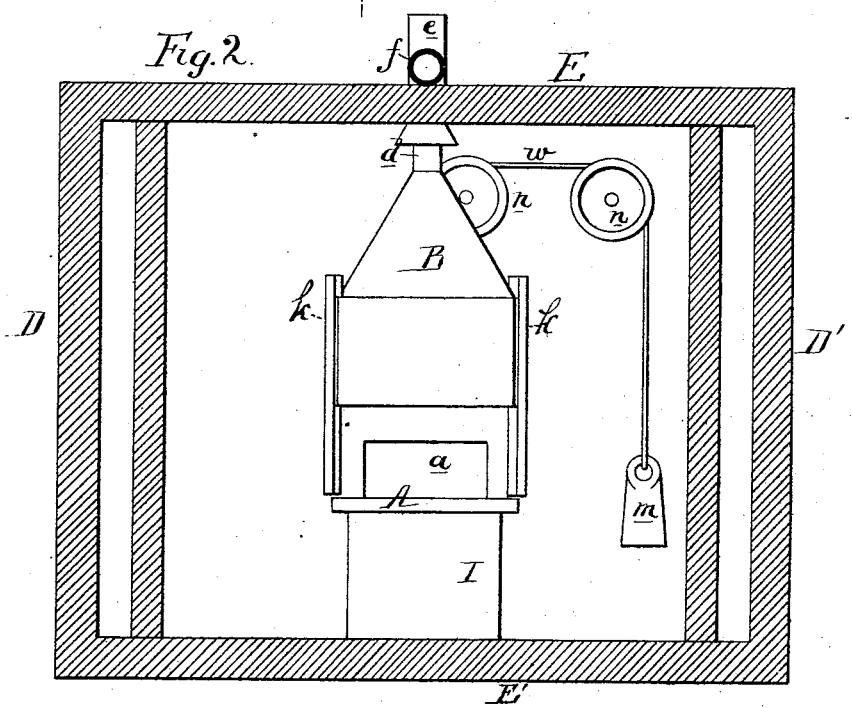


Fig. 2.



Witnesses, Harry Smith
Thomas McElvain

Wm McFarland
by his Attys.
Howson and Sons

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UNITED STATES PATENT OFFICE.

WILLIAM McFARLAND, OF TRENTON, NEW JERSEY.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **161,535**, dated March 30, 1875; application filed September 23, 1874.

To all whom it may concern:

Be it known that I, WILLIAM McFARLAND, of Trenton, New Jersey, have invented certain Improvements in Heating Apparatus, of which the following is a specification:

My invention consists of a hot-air furnace, constructed so that on the adjustment of a hood or slide the products of combustion from the fire-place may be directed either to the chimney or to the chamber containing the hot-air pipes.

These objects I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section, and Fig. 2 a transverse vertical section, of my improved heater.

E E′ and D D′ are the walls of the furnace, and inclose a rectangular space, containing any suitable system of air-heating pipes M. A is the fire-place, to which fuel can be introduced through the usual opening *a*, in the front wall, and *b* is the grate and H the ash-pit. A hood, B, is arranged to slide in suitable vertical guides *k*, secured to the inner face of the front wall of the furnace, and is so shaped, that, when depressed and in contact with the upper edge of the casing I, containing the fire-place and ash-pit, the products of combustion cannot gain access to the exterior or interior of the air-heating pipes M. The hood terminates above in a pipe, *d*, which is arranged to slide in a vertical pipe, *e*, communicating with the smoke-pipe *h*, the latter extending downward into the furnace, and having at or near its lower end an opening, *i*. A chain, *w*, is attached to the hood, passes over pulleys *n n*, and terminates in a weight, *m*, which may nearly balance the hood. The shaft of one of the pulleys passes through the wall of the furnace, and has a handle, by turning which the hood may be raised or lowered at pleasure.

When the fire is burning brilliantly the hood B is elevated, and the pipes M are subjected to the direct action of the products of combustion, which escape through the opening *i* in the smoke-pipe *h*. By arranging this outlet *i* at the lower part of the furnace, the gases while at their highest temperature remain in contact with the pipes, and only pass to the outlet when, after having parted with their heat, they descend to the bottom of the chamber, thus utilizing a large proportion of heat which, in ordinary furnaces, escapes to the chimney. When the fire-place has to be replaced with fresh fuel, the hood B is lowered to its seat on the edge of the casing I, so that the products of combustion will pass upward through the pipe *d*, and thence through the pipe *f* to the smoke-pipe. The hood thus prevents the escape of smoke and gas into the room when fresh fuel is added to the fire, and also prevents the access of cold air to the heating-pipes. When either wood or soft coal is used as fuel, it will be necessary to have a small vent, *i*, in the pipe *h*, in order to permit the escape of noxious and explosive gases, which may accumulate in the chamber of the heater.

I claim as my invention—

The combination, in a hot-air furnace, of a fire-place, a flue communicating with the chimney, air-heating pipes arranged in a chamber, and a hood or cap, on the adjustment of which the heated gases from the fire-place may be directed either to the chimney or to the said chamber, as set forth.

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

WILLIAM McFARLAND.

Witnesses:

HUBERT HOWSON,

HARRY SMITH.