2 Sheets—Sheet 1.

W. P. BROPHY.

MAGAZINE HEATING-STOVE.

No. 192,484. Patented June 26, 1877.

Fig. 1.

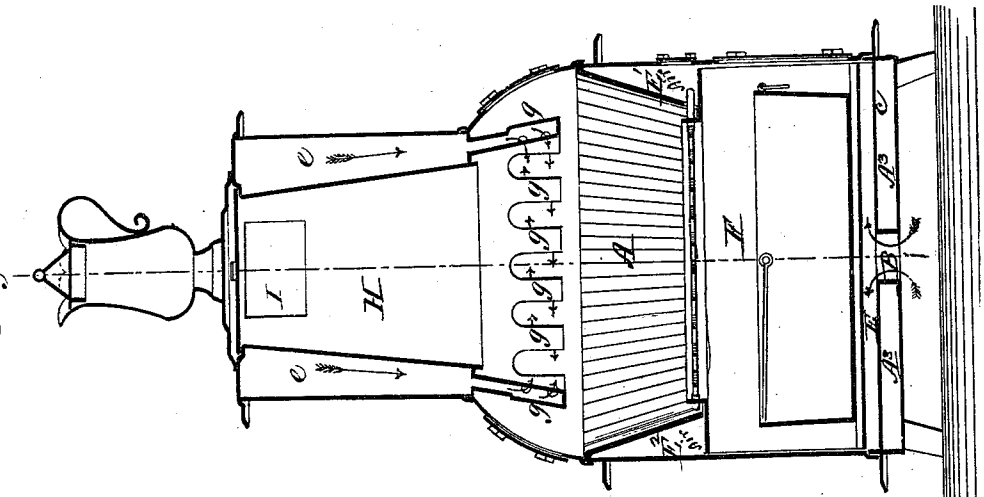
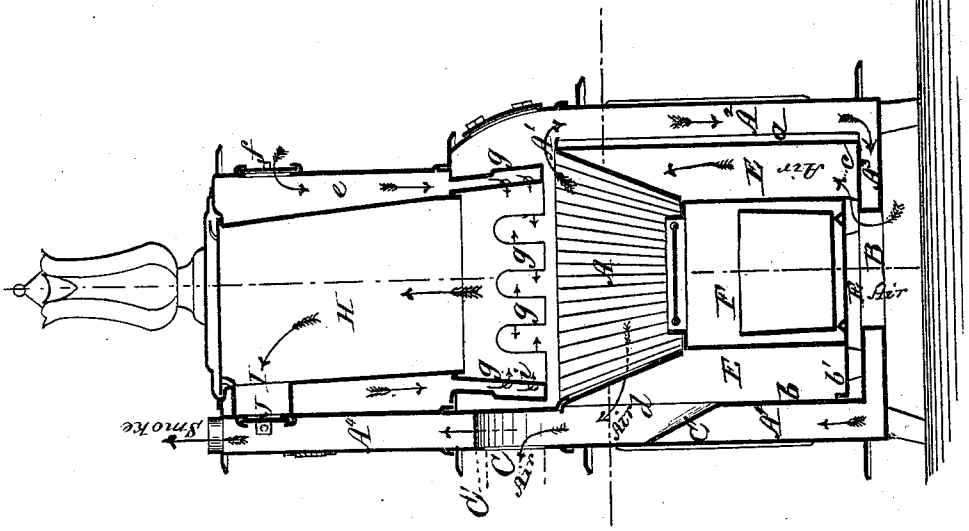
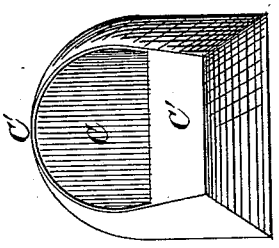


Fig. 2.





Witnesses:
Floyd Norris.
J. L. Wildman

William P. Brophy
Inventor:
by Johnson & Johnson
Attys

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

2 Sheets—Sheet 2.

W. P. BROPHY.

MAGAZINE HEATING-STOVE.

No. 192,484. *Fig. 3.* Patented June 26, 1877.

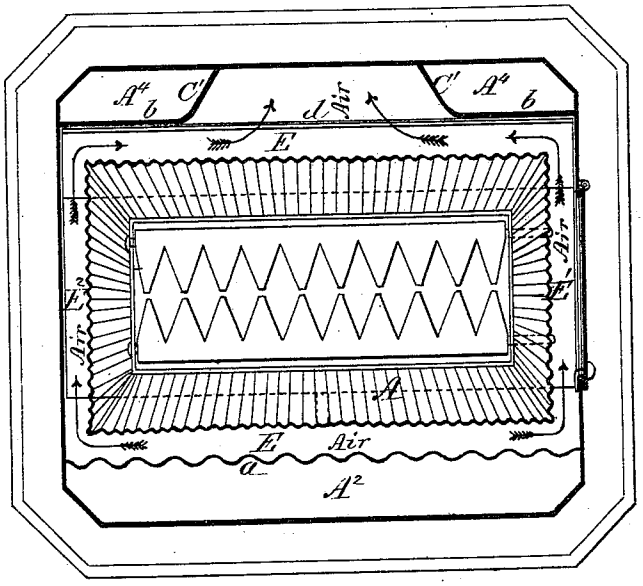


Fig. 4.

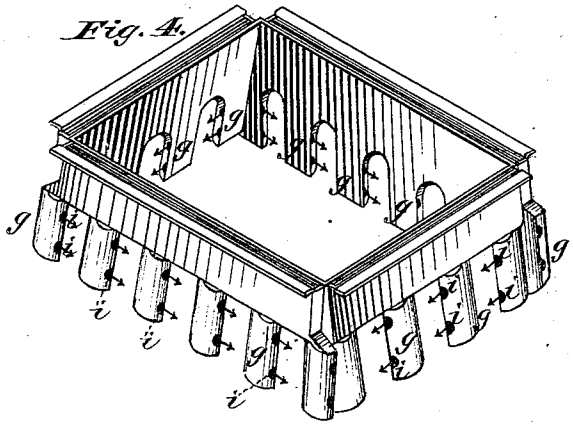
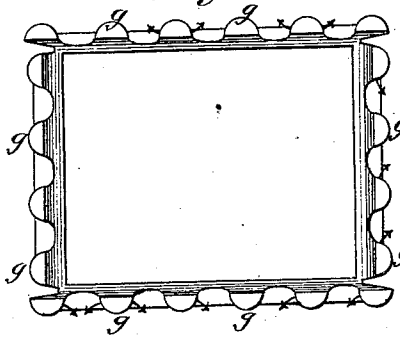


Fig. 5.



Witnesses:
Floyd Norris
D. C. Williamson

William P. Brophy
Inventor:
by Johnson & Johnson
Attys.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM P. BROPHY, OF BLOOMINGTON, ILLINOIS.

IMPROVEMENT IN MAGAZINE HEATING-STOVES.

Specification forming part of Letters Patent No. **192,484**, dated June 26, 1877; application filed April 30, 1877.

To all whom it may concern:

Be it known that I, WILLIAM P. BROPHY, of Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Heating-Stoves, which I denominate the "Cabinet Base-Burner," which improvements are fully set forth in the following specification and accompanying drawings.

The organization of the base-section gives a base-draft for the products of combustion down the front side of the stove, beneath the bottom, and up the rear side, occupying the entire area of these parts, and an air-heating chamber, having a central inlet at the bottom, into and through which cold air circulates and is heated primarily by the base-draft, which, in fact, surrounds the air-heating chamber, which, in turn, surrounds the fire-box, giving an intermediate position to said air-heating chamber, having a central bottom entrance for the cold air combined with a base-burner.

The draft of the air in the air-heating chamber is up the front and over the top of the ash-pit, passing through cross-flues at the ends of the fire-box to a rear exit-opening into the room. I have also combined, with an air-chamber of the magazine, a frame of hollow fingers, which, forming a pendent grate in the fire-chamber, form also air-jets communicating with the air-chamber surrounding the magazine, and from which fingers the air is injected into the fire-chamber in horizontal streams in the spaces between said fingers, giving the best effect in the combustion of the gases. This finger device, while being fitted to form a close joint with the magazine-chamber, can be removed and replaced when burned out without interfering with the magazine-plates.

The front plate, which divides the air-heating chamber and base-flue, is corrugated to give the largest heating-surface for the ascending air.

Referring to the drawings, Figure 1 represents a vertical section of a base-heater embodying my invention; Fig. 2, a similar section taken at right angles to Fig. 1; Fig. 3, a horizontal section taken through the fire-box; Fig. 4, the frame of hollow fingers for the air-jets, detached; and Fig. 5, a bottom view of the same.

The heater is designed for soft coal, and has for this purpose a large oblong fire box and grate.

Three rectangular sections—a base-section, a magazine-section, and an intermediate mica-section—comprise the heater, the base-section being the largest, and the superposed sections decreasing in size, and are of any suitable design.

The base-section has a flue for the products of combustion, the entrance into which from the combustion-chamber is at the front and top of the fire-box A, such opening being designated at A^1, and the flue, passing down the front at A^2, crosses the bottom at A^3, and rises at the back at A^4 to the smoke-pipe. This flue occupies the entire area of the front, the bottom, and the back, except certain closed crossings in the bottom and back flues, which form the entrance and exit flues B and C of an air-heating flue or chamber, E, which surround the ash-pit F and fire-box A, and which is intermediate between these parts and the flue A^2, through which passes the products of combustion. For this purpose front, back, and bottom plates *a b c* form the flues described, the front plate *a* extending from the top of the fire-box, and the back plate *b* rising above said box.

The entrance B of the air-heating flue E is at the center of the bottom plate, and the collar forming such entrance crosses the sheet-flue of the combustion-chamber, while the exit C for the hot air is formed by an opening, *d*, in the back plate *b* and a large collar, C′, which, crossing the back sheet-flue A^4, surrounds an opening, C, in the back wall of the stove, through which the hot air passes into the room or elsewhere. This air-heating chamber extends the full area of the front, bottom, and back of the base-section, and surrounds the sides of the ash-pit and the sides and ends of the fire-box; but the draft is not up the rear portion, so that the cold air is caused to pass from the bottom inlet B up round the front of the fire-box, and crosses over the ash-pit top, through flues E^1 E^2, between the ends of the fire-box and the stove walls, and passes into the rear portion of the flue E and out at the opening C in a highly-heated state. All these parts are constructed to form close joints and to exclude gas from the air-

heating chamber. The bottom plate of the ash-pit is extended to the back plate *b*, to cause the cold air to pass upward round the front. This closed portion of the flue is shown at *b'* in Fig. 2.

The end flues E^1 and E^2 being elevated and on a level, or nearly so, with the exit, gives a good circulation of the air within the flue, and in contact with the fire-box and the plates forming the sheet-flue from the fire-chamber.

To obtain the best effect by this construction the front plate *a* and the fire-box walls are corrugated to give out the greatest degree of heat to the air passing through the flues in the way described.

The magazine H is supplied at the top in the usual manner, being suitably provided with hinged covers to render it as tight as possible, and having a direct flue, I, at its upper part, provided with a damper, J, which, when open, causes the products of combustion to ascend in the magazine and pass out at the smoke-pipe; but, when closed, the draft is through the base sheet-flue to the smoke pipe, as already described.

The magazine-section is surrounded by an air-chamber, *e*, provided with suitable registers *f*, at or near the top, for the admission of cold air therein, and I have combined with such air-chamber a device for injecting air into the combustion-chamber. This device is secured in the mica-section, so as to form a close junction with the air-chamber of the magazine, and to be detachable for renewal when burned out.

It consists of a cast frame of hollow fingers, *g*, extending down nearly to the top of the fire-box, discharging the hot air at the point of combustion, and effecting a very complete consumption of the gases.

The important matter of this device is its being a separate thing from the magazine, and formed of a series of fingers with openings *i* in their edges, so as to inject the hot air in the spaces between the fingers, and form also a grated termination of the magazine.

By this construction the air is injected into the hot gases in horizontal jets between the fingers and around the flame-chamber, forming a hot-air blower.

It can be removed and replaced by a new one by taking off the magazine-section, and without interfering with the plates of the magazine.

The single damper gives a direct and indirect draft, and a check-damper may be arranged in the back sheet-flue, by which to control the base-draft.

The inner walls of the air-jet fingers are straight, and in line with the inner walls of the magazine, while the outer sides of such fingers are rounded, and the jet-openings are made in the opposite edges of these rounded portions, which gives the advantage of keeping the openings free from clogging or being covered by the coal.

A grate of any suitable construction may be used.

Cleaning-dampers are arranged within the sheet-flue, and a dust-damper may be arranged in the ash-pit.

A pipe-connection may be made with the hot-air exit to conduct the hot air to adjoining or upper rooms.

I have shown in the drawings a stove of peculiar configuration, which is not to be construed as prejudicing my right to subsequently apply for a patent for the design of the same.

I claim—

1. The base-draft flue A^1 A^2 A^3 A^4, the air-heating-chamber E E^1 E^2, the center bottom air-inlet B, the back air-outlet C, and the fire-pot, constructed and arranged in a base-burning stove, as herein set forth.

2. The collar C', arranged across the rear sheet-flue A^4 of the base-draft, combined with the opening *d* in the inner wall *b*, the heating-chamber E E^1 E^2, and the exit C in the rear wall, as set forth.

3. The cross-flues E^1 E^2 at the ends of the fire-box and above the ash-pit, in combination with the air-heating chamber, the bottom inlet, and the rear exit, substantially as herein set forth.

4. The division *b'* in the base air-heating chamber, in combination with entrance and exit openings and the cross end flues of the fire-box, whereby the air in said chamber is caused to pass up the front, around the fire-box ends, and across the rear portion of said chamber to the outlet.

5. The hollow frame and the hollow fingers depending therefrom, in combination with the magazine, the air-chamber *e*, and the combustion-chamber, constructed for use as herein set forth.

6. The hollow fingers *g*, closed at their lower ends, with open spaces between said fingers, and having openings *i* in their opposite edges, whereby the air is delivered in horizontal streams into the spaces between said fingers, as and for the purpose herein set forth.

7. The hollow fingers *g*, having inner straight and outer rounded sides, with openings *i* in their opposite edges, as and for the purpose described.

8. The plate *a*, corrugated and extending from the top edge of the fire-pot A to the inner bottom plate *c*, and combined with the corrugated fire-pot plate, between which corrugated plates the front portion of the hot-air chamber E is formed, for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

WILLIAM P. BROPHY.

Witnesses:
W. H. WINEGARDNER,
C. H. WINEGARDNER.