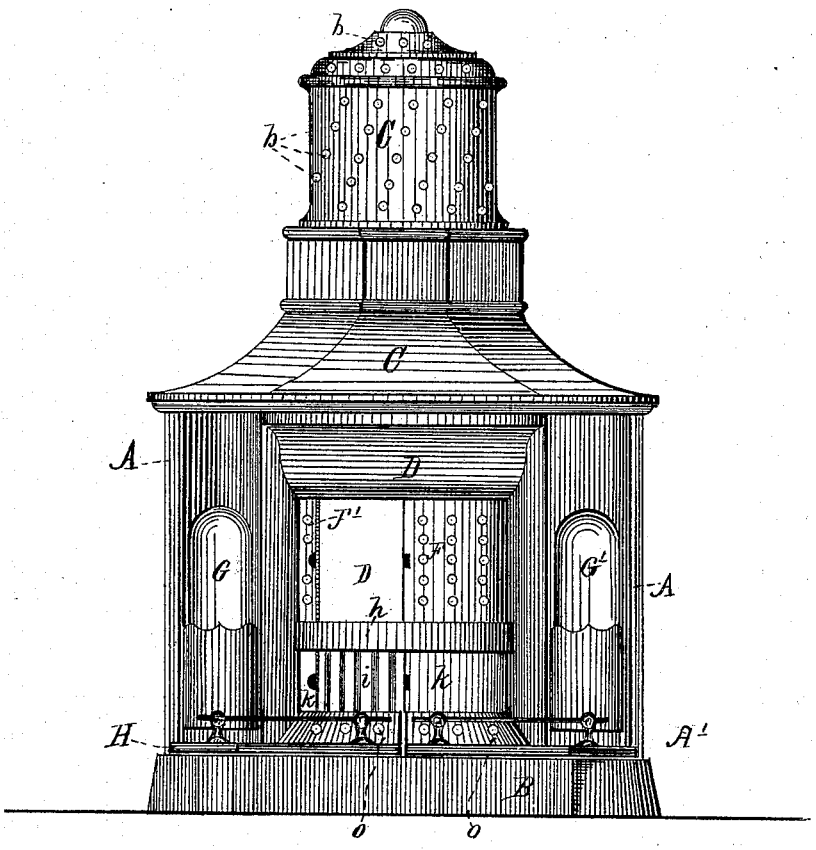
3 Sheets—Sheet 1.

A. T. BENNETT.

Open Fire-Place Stove.

No. 211,081. **Patented Jan. 7, 1879.**

Fig 1.



Witnesses;
E. G. Ward;
E. A. Heath.

Inventor;
Allan T. Bennett.
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Fig. 2

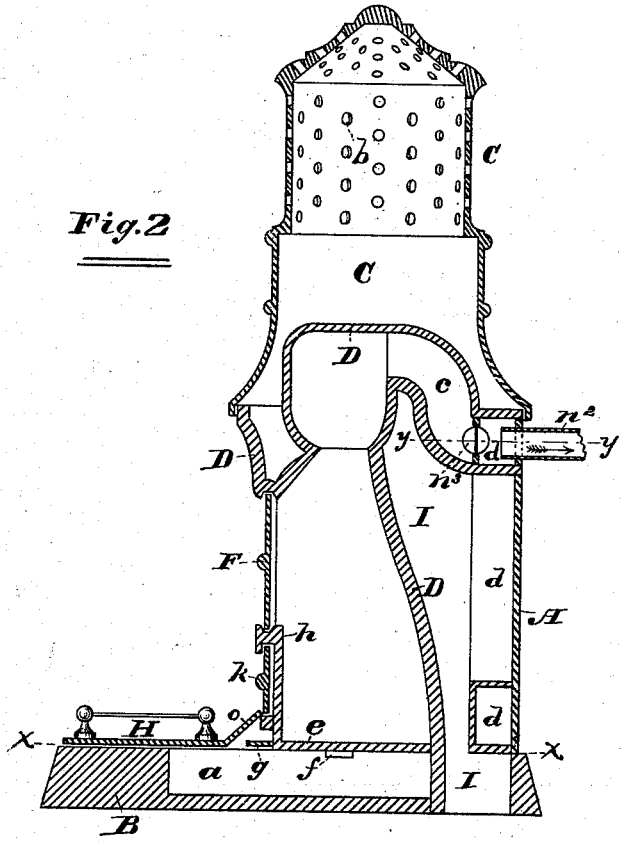
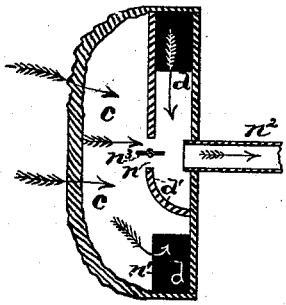


Fig. 4



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Attorney.

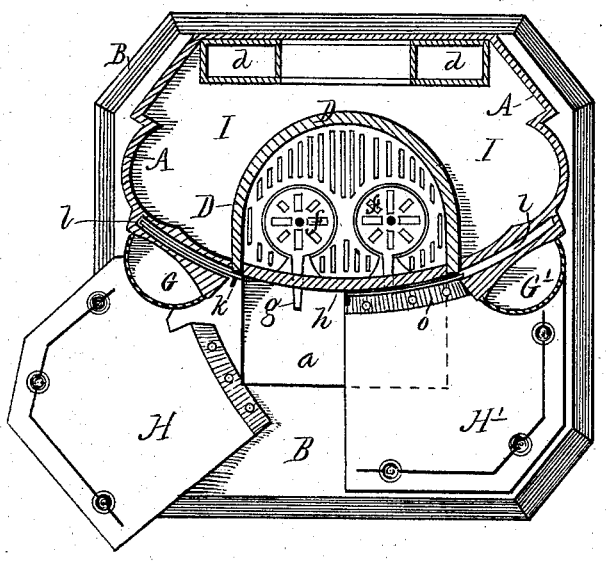
3 Sheets—Sheet 3.

A. T. BENNETT.

Open Fire-Place Stove.

No. 211,081. **Patented Jan. 7, 1879.**

Fig. 3.



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E. G. Ward;
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Inventor;
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UNITED STATES PATENT OFFICE.

ALLAN T. BENNETT, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO AUSTIN P. WHITE, OF SAME PLACE.

IMPROVEMENT IN OPEN FIRE-PLACE STOVES.

Specification forming part of Letters Patent No. **211,081**, dated January 7, 1879; application filed March 2, 1878.

To all whom it may concern:

Be it known that I, ALLAN T. BENNETT, of the city of Chicago, Cook county, and State of Illinois, have invented certain new and useful Improvements in Open Fire-Place Stoves, of which the following is a specification:

This invention relates to open fire-place stoves, or stoves having an open front, exposing the incandescent fuel, and has for its object to combine therewith means for producing greater radiation and for controlling the heat and draft, substantially as hereinafter set forth. It also consists of the combination of the parts above referred to with certain other novel features of construction hereinafter specified.

In the drawings, which form an essential part of this specification, Figure 1 is a front view of a stove in which my invention is fully embodied. Fig. 2 is a vertical cross-section, showing the interior construction thereof. Fig. 3 is a horizontal sectional view, taken on the line *x x* in Fig. 2. Fig. 4 is a horizontal section in the plane of the line *y y*.

The same reference-letters marked on the several figures of the drawings will designate corresponding parts.

A represents the frame of the stove, which may be cast in such manner as may be deemed best, either in one piece or in sections, which are afterward bolted together. B is the base of the stove, to which the frame A and other parts are attached, and in which the ash-pit *a* is formed. C is the ornamental top or cap of the stove, which is bolted to the frame A. Above the fire-pot its apex is provided with a series of perforations, *b*, through which the heated air escapes.

D is the fire chamber or pot, which is cast in one piece, and is inserted in place within the frame A, and secured therein and to the base B in the position shown. It is provided with a smoke-flue, *c*, which connects the throat or apex of the fire or fuel chamber with the flue *d*, to the latter of which more particular reference will be hereinafter made.

In the base of the fire-pot D is the grate *e*, such grate being provided with oscillating shaking grates *f f*, which are operated by means of arms *g*, which project forward into the ash-pit under the swinging hearth. These auxiliary grates *f* may be pivoted in any approved manner.

G G′ are the pockets or baskets for the reception of the stove-fixtures, formed in the face of the frames A at both sides of the stove. They are either formed wholly in the casting of the frame A or partially in the casting, the front formed of sheet metal or in a separate casting in ornamental form, or the pockets may be formed separately and afterward bolted to the frame of the stove.

H and H′ are the swinging hearth, (seen best in Fig. 3,) the pivot of each half thereof being located below the base of the pockets G G′, such pivots being attached permanently to the base B. As illustrated in Fig. 3 this swinging hearth gives access to the ash-pit and the levers by which to operate the oscillating grates. The front of this swinging hearth is raised at an angle, as shown, forming a guard, *o*, which rests against the crown, closing the bottom portion of the front of the grates up to the base of the blower rest and guide.

The flue *d* connects at its upper part with the flue *c* through an opening, *n*, in which opening a damper, n^3, is arranged, and n^2 is a pipe entering the rear upper part of the flue *d*. When the damper n^3 is open the smoke and products of combustion escape from the apex or throat of the fire-pot through the flue *c*, and passing through the opening *n* enter the flue *d*, and passing directly across the upper part of the latter flue they escape into the chimney or other flue through the pipe n^2, or through the opening through which that pipe enters the flue *d*. This produces a direct draft, the same as in all ordinary fire-places and open stoves. The flue *d*, however, which is arranged in the back of the stove in any suitable way, dives down to the lower part of the stove, crosses over, and rises to the top of the stove, where it again communicates with the flue *c* or fire-pot through an opening, n^1.

It will be perceived that a wall, *d′*, of the flue *d* causes the draft-current to move throughout the length of the flue when the damper is closed, instead of merely across the flue, as when the damper is open. In the former case the draft, being circuitous, moves more slowly

than in the latter case. Therefore, when the damper n^3 is closed the smoke and products of combustion pass from the fire-pot into the flue *d* through the opening or mouth n^1, dive down one side of the said flue, cross over to the other side, and then up the other side and out through the pipe n^2, thus producing an indirect draft, it being understood that there is a constant draft, or may be, through the pipe n^2, whether the damper n^3 be open or not.

It will be perceived from the foregoing description, and by reference to the drawing, that the flue *d* is a reverse flue, and furnishes an increased radiating-surface, which is heated by the passage through it of the heated air and products of combustion drawn directly from the chamber over the bed of incandescent fuel. The heated flue *d* also reacts upon the other parts of the stove, and is arranged to affect the air entering the air-spaces I I. The heat and heated products, which commonly escape through the direct-draft passages, are therefore utilized to a great extent by means of the flue *d*, and the result is greater heat with economy in fuel, in addition to the even temperature produced by means of the spaces I I.

It will also be perceived that, whether the draft be direct or indirect, no material difference is made in the amount of air drawn in through the bed of incandescent fuel, the bulk of air in both cases being taken from over the bed of fuel when the upper part of the stove is open, and only enough being drawn through the fuel to start and support combustion, while, on the contrary, the draft in a closed stove is always wholly through the dampers in front and through the burning fuel, whether the draft be direct or carried through diving or reverse flues.

It is evident that both of these results may be obtained by means of the construction herein described, with the advantage that a slow fire may be kept by using either the direct or indirect drafts. The combustion will be slowest when the direct draft is closed, but it will be more complete at that time, for the reason that the inflammable gases and products of combustion will not be drawn away from over the fuel as quickly as when the damper n^3 is open, and hence they will be more liable to be consumed before passing into the chimney.

The heated air, however, and unconsumed products of combustion will result in heating the flue *d* in the manner described. A novel feature in the construction and arrangement of the flue *d* is that it begins and terminates in what is in reality the smoke-flue, and may in fact be regarded as a part of that flue, and is so arranged and combined with a damper as to admit of the escaping currents being shifted with facility from a direct to an indirect course with the results and advantages already set forth, thus making a reverse flue practical in connection with an open-front stove.

The air-chamber I may be supplied by means of a flue extending from its bottom into a lower room or cellar, or into the open air.

I am aware that stoves having closed fronts have heretofore been combined with reverse flues, which, when in operation, draw the outer or vital air slowly through the bed of incandescent fuel; but I do not claim such.

Having thus fully described my invention, what I claim as new is—

The combination, in an open stove, of the frame A, fire-pot D, base B, perforated cap C, and air-spaces I I, such combination of parts provided with oscillating grates *f*, reverse draft-flue *d*, swinging hearth H H′, and pockets or baskets G G′, all arranged, applied, and operating as and for the purposes substantially as herein shown and described.

ALLAN T. BENNETT.

Witnesses:
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DAVID S. COOK.