

J. J. GILL.
HEATING STOVE.

No. 178,430.

Patented June 6, 1876.

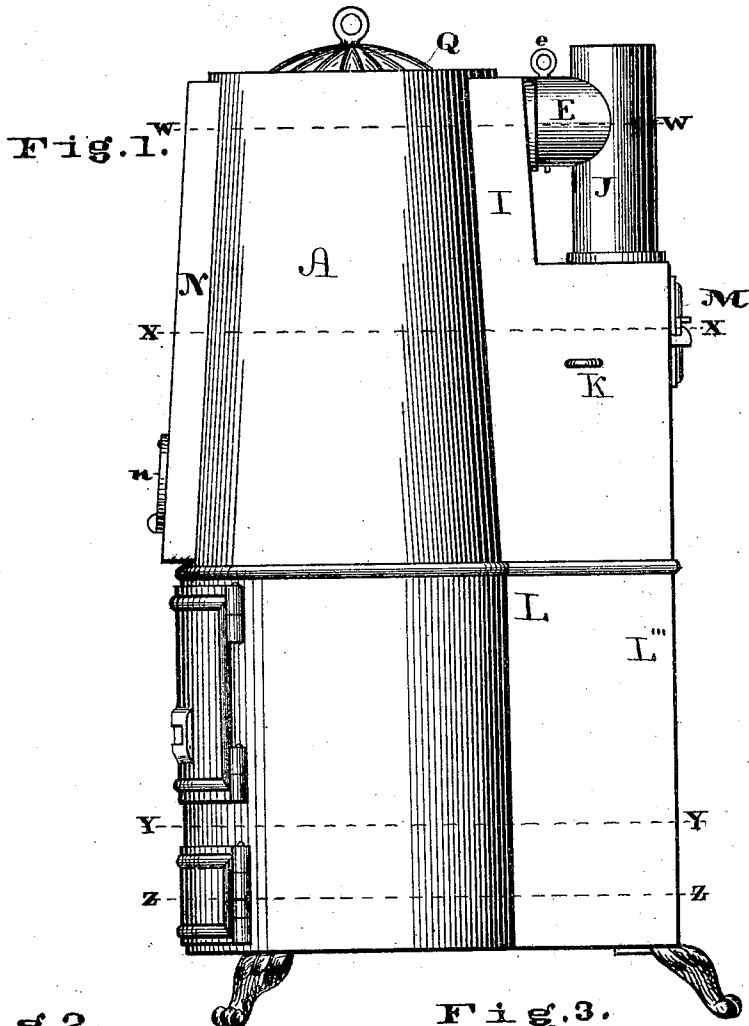
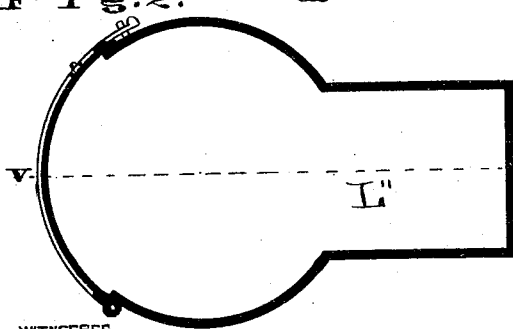


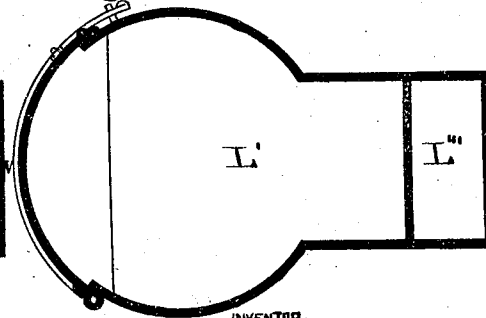
Fig. 2.



WITNESSES.

Saml. S. Boyd
J. H. Case

Fig. 3.



INVENTOR.

John J. Gill.
by Chas. D. Moody.
att'y.

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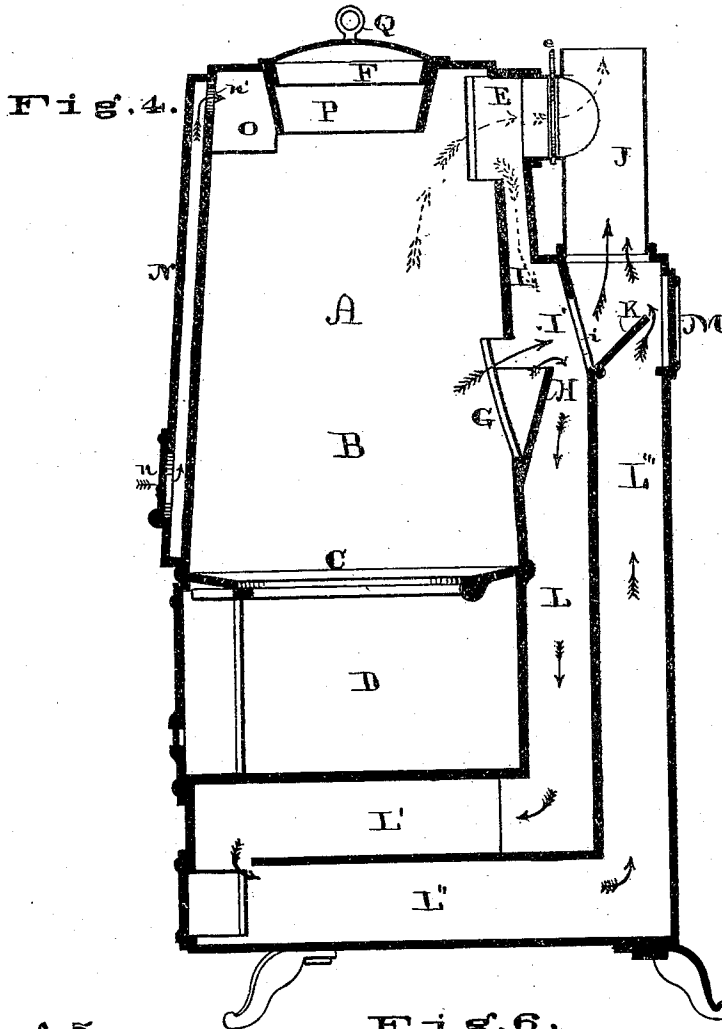
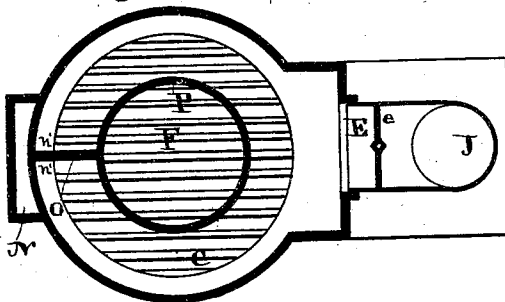


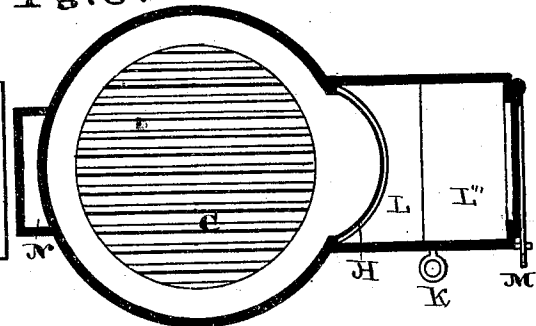
Fig. 5.



WITNESSES.

Samuel S. Boyd
Globe

Fig. 6.



INVENTOR.

John J. Gill,
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UNITED STATES PATENT OFFICE.

JOHN J. GILL, OF MEXICO, MISSOURI.

IMPROVEMENT IN HEATING-STOVES.

Specification forming part of Letters Patent No. **178,430**, dated June 6, 1876; application filed April 5, 1876.

To all whom it may concern:

Be it known that I, JOHN J. GILL, a resident of Mexico, Audrian county, State of Missouri, have invented new and useful Improvements in Heating-Stoves, of which the following is a full, clear, and exact description, reference being had to the annexed drawing, making part of this specification, in which—

Figure 1 is a side elevation of the invention; Fig. 2, a horizontal section taken on the line *z z* of Fig. 1; Fig. 3, a horizontal section on the line *y y* of Fig. 1; Fig. 4, a vertical section on the line *v v* of Fig. 2; Fig. 5, a horizontal section on the line *w w* of Fig. 1, and Fig. 6 a horizontal section on the line *x x* of Fig. 1.

Like letters indicate like parts.

By the present invention the following advantages are obtained: The fuel is burned more evenly and thoroughly; the smoke is largely consumed; a continuous fire is readily maintained; the base of the stove is warmed; a large amount of heating-surface is obtained; the ventilation of the apartment is promoted; the defect of the ordinary magazine-stove, arising from the escape of a portion of the products of combustion through the magazine into the apartment, is remedied; and, especially, the stove, as a base-burner, is adaptable to bituminous as well as anthracite coal.

To these ends the invention relates to the provision by which the principal portion of the products of combustion is enabled to escape at the side of the fuel-charge. It further relates to the means by which the remaining portion of the products of combustion, which ascends through the fuel-charge, is brought down to the main opening at the side of the fuel-charge, and there allowed to escape. It further relates to the provision by which an auxiliary air-current is introduced at the point where the products of combustion are escaping from the fire-chamber, and for the purpose of more thoroughly consuming the smoke; further, to the means whereby this air-current is caused to more effectually carry off that part of the products of combustion which collects above the fuel-charge; further, to the provision for diverting the products of combustion to the lower

part of the stove before discharging them into the exit-flue; and, further, to the construction by which the products of combustion can be discharged, either directly from the upper part of the fire-chamber or from the side thereof, and for the purpose of adapting the stove to drafts of varying intensity.

Referring to the annexed drawing, A represents a stove embodying my improvements. In its general outline and proportions it may be of any approved shape. It is provided with a fire-chamber, B, grating C, and ash-pit D. It also has the exit-flue E, leading directly from the upper part of the fire-chamber. The fuel is introduced into the fire-chamber, preferably, through the opening F in the top of the fire-chamber; but, if desired, there may be the usual opening in the side of the fire-chamber. G represents an additional vent for the escape of the products of combustion. It is arranged in the side of the fire-chamber, at a level below where the upper part of the fuel-charge comes, and, preferably, a little way above the grating. H represents a lip or guard arranged outside of the vent G, and to prevent the fuel from falling out of the fire-chamber. It is inclined, as shown in Fig. 4, to provide the necessary opening for the smoke to escape from the fire-chamber. I represents a flue arranged outside the fire-chamber, and leading from the flue E to the vent G.

Opposite the vent G, or thereabout, the flue I is enlarged, forming a space, I', in the outer side of which is an opening, *i*, leading into an outer exit-flue, J, and the products of combustion can, if desired, be discharged, through the space I' and opening *i*, into the flue J. The opening *i* can be closed by a valve, K. At its upper end the flue J preferably connects with the flue E. This last flue, at a point outside the flue I, is also furnished with a damper, *e*. The flue I is, when it is intended to make a base-heating stove, extended downward past the vent G, forming a flue, L, which is carried down to the level of the ash-pit. It is thence carried, at L', forward beneath the ash-pit; thence returned at L'', and then carried up, at L''', behind its descending part, and connected above with the flue J. In the latter flue, and opposite the opening *i*

and vent G, is a door, M, the opening, vent, and door being preferably so arranged relatively as to enable a suitable instrument, like a poker, to be introduced through them for the purpose of stirring up the fire at and about the vent G. N represents another flue arranged on the outside of the fire-chamber, and, preferably, at the side opposite that where the flue E is arranged, when that space is not occupied by a doorway leading into the fire-chamber. The lower end of the flue N is preferably brought down to the level of the bottom of the fire-chamber, and, at its lower end, is provided with an opening, *n*, (which can be regulated or closed by a damper,) through which air from the apartment can enter the flue. The flue is extended upward, leading into the fire-chamber at the top thereof, as shown at *n'*, Fig. 4. There are, preferably, two openings, *n' n'*, from the flue N into the fire-chamber, and which are arranged, respectively, on either side of a plate, O, Figs. 4 and 5, which extends from the wall of the fire-chamber inward to an annular flange, P, which depends from the opening F in the top of the stove, as shown in Figs. 4 and 5, and sufficiently to keep the fuel, when put into the stove from the top, from falling into the exit-flue E. The flange P is, preferably, made tapering, as shown, to facilitate the assembling of the gases (which escape directly upward from the fuel-charge) in the annular space surrounding the flange.

The operation of the invention is as follows: The fire-chamber is charged to a height above the vent G, and the fire is kindled at the bottom of the charge, in the usual way. If desired, the damper *e* can be opened and the products of combustion discharged entirely through the flue E; and when thus discharged the principal portion passes from above the fuel-charge into the flue E, and the remainder, through the vent G and flue I, into the flue E. This may be desirable at times in starting the fire, or when the draft is particularly weak. To secure the principal objects of the improvement, however, the damper *e* is closed, and the course of the products of combustion is directed entirely through the vent G, saving that portion which, penetrating the unconsumed fuel above the lower part of the fire, collects in the top of the fire-chamber, and is thence brought down through the flue I. In this condition the fire burns at the base only of the fuel-charge. The combustion is slow, even, and complete, and the escape is through the opening *i* into the flue J. The charge, in the main, gradually settles as the lower stratum is consumed; but if the fire is allowed to burn for several hours (as over night) without opening the stove, the upper part of the fuel-charge, when bituminous coal is used, acquires enough consistency to be self-sustaining when the grate C is dumped to remove the ashes. This enables the firing to be continuous. The gases collecting above the fuel-charge are drawn

down through the flue I and discharged through the flue J.

To consume the smoke the auxiliary air-current is admitted to the flue N, where, becoming heated, it rises, and, entering the fire-chamber at *n' n'*, is divided and deflected on either side of the plate O, and around the flange P, and is then drawn down the flue I, and to the mouth of the vent G. This current facilitates the discharge of the gases from the top of the fire-chamber; but it is also valuable in supplying oxygen to the fire opposite the vent G, to be there mingled with the escaping products of combustion, for the purpose of their more complete consumption. This consumption is the more complete by reason of the air-current being warmed in passing up the flue N. This current is also valuable as a source of ventilation, especially, in that the air is drawn from the lower part of the apartment. Instead of allowing the heat-currents to escape directly through the opening *i*, that opening can be closed, and the currents can be diverted downward through the flues L L', &c., to and throughout the lower part of the stove, and then allowed to escape in the direction indicated by the arrows into the flue J. In this way the base of the stove is warmed. It will be observed that these last-named flues L L' L'', &c., in combination with the fire-chamber, furnish a large amount of heating-surface.

If desired, the opening *i* can be closed and the damper *e* opened, and the products of combustion can be discharged both from the top of the fire-chamber and the vent G, and all into the flues E and I. After charging the fire-chamber the opening F is closed by means of a cover, Q.

What I claim is—

1. The combination, in a stove, of the fire-chamber B, vent G, flues E and I', opening *i*, damper *e*, and flue J, substantially as set forth.

2. The combination, in a stove, of the chamber B, vent G, opening *i*, and flues I' and J, substantially as described.

3. The combination, in a stove, of the chamber B, flue E, flue I, and vent G, substantially as described.

4. The combination, in a stove, of the chamber B, flue E, damper *e*, flues I I', vent G, opening *i*, and flue J, substantially as described.

5. The combination, in a stove, of the chamber B, vent G, opening *i*, flues I' and J, and door M, substantially as described.

6. The combination, in a stove, of the chamber B, flue N, exit E, and flue I, substantially as described.

7. The combination, in a stove, of the chamber B, flue N, openings *n* and *n' n'*, plate O, flange P, exit E, and flue I, substantially as described.

8. The combination, in a stove, of the chamber B, vent G, flue N, exit E, and flue I, substantially as described.

9. The combination, in a stove, of the chamber B, flue N, and flue E, substantially as described.

10. The combination, in a stove, of the chamber B, vent G, guard H, flues L L', &c., and flue J, substantially as described.

11. The combination, in a stove, of the chamber B, vent G, flue I', opening *i*, flue J, and flues L L', &c., substantially as described.

12. The combination, in a stove, of the chamber B, exit E, flues I I' and L L', &c., and J, substantially as described.

13. The combination, in a stove, of the chamber B, flue N, exit E, flues I I', vent G, and flues L L', &c., and J, substantially as described.

14. The combination, in a stove, of the chamber B, vent G, guard H, exit E, flue I and flue I', substantially as described.

15. The combination in a stove, of the chamber B, vent G, guard H, exit E, flue I, flue I', damper K, opening *i*, flue J, damper *e*, and door M, substantially as described.

16. The combination, in a stove, of the chamber B, vent G, guard H, exit E, flue I, flue I', damper K, opening *i*, flue J, damper *e*, door M, opening F, grate C, and ash-pit D, substantially as described.

17. The combination, in a stove, of the

chamber B, vent G, guard H, exit E, flues I, I', and J, damper K, opening *i*, damper *e*, door M, opening F, grate C, pit D, and flues L L', &c., substantially as described.

18. The combination, in a stove, of the chamber B, vent G, guard H, exit E, flues I, I', J, and N, damper K, opening *i*, damper *e*, door M, opening F, grate C, and ash-pit D, substantially as described.

19. The combination, in a stove, of the chamber B, vent G, guard H, exit E, flues I, I', J, and N, damper K, opening *i*, damper *e*, door M, opening F, grate C, ash-pit D, and flues L L', &c., substantially as described.

20. The combination, in a stove, of the chamber B, vent G, guard H, exit E, flues I, I', J, and N, damper K, openings *i* F n n', damper *e*, door M, plate O, flange P, grate C, and pit D, substantially as described.

21. The combination, in a stove, of the chamber B, vent G, guard H, exit E, flues I I' J N and L L', &c., damper K, openings *i* F n n' n', damper *e*, door M, plate O, flange P, grate C, and pit D, substantially as described.

JOHN J. GILL.

Witnesses:

DANL. T. POTTER,
CHAS. D. MOODY.