W. WHEELER.

Stove.

No. 45,783. Patented Jan. 3. 1865.

Fig: 4.

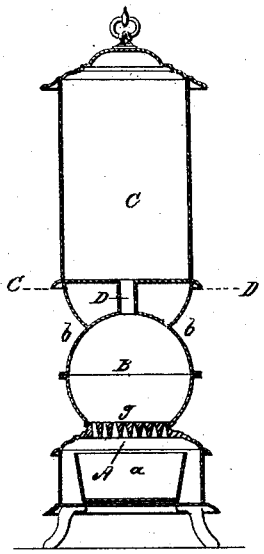


Fig: 1.

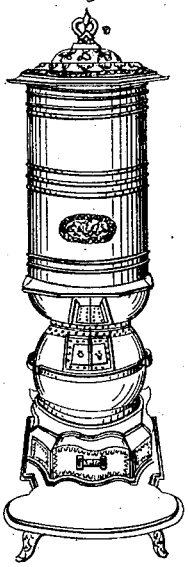


Fig: 2.

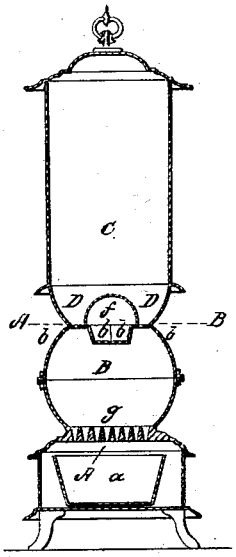


Fig: 10.

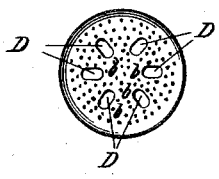


Fig: 5.

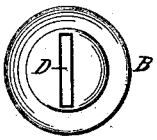


Fig: 6

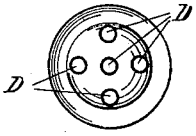


Fig: 3.

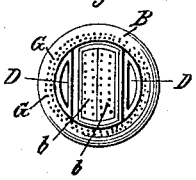


Fig: 9

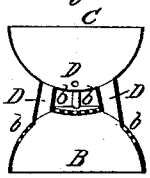


Fig: 8.

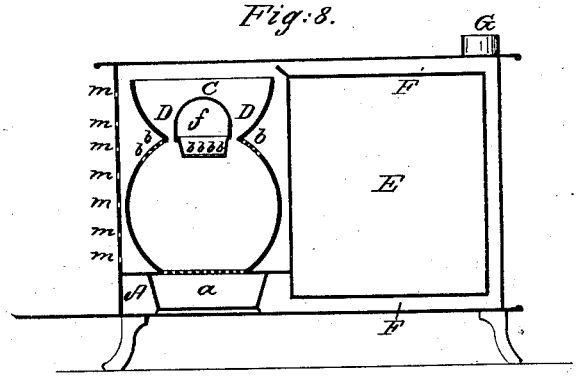
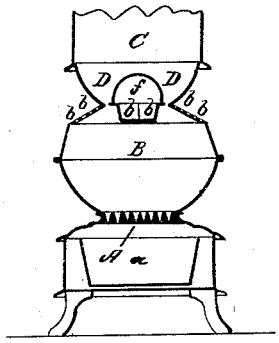


Fig: 7.



Witnesses:

L. S. Bloor.

Edw. F. Brown

Inventor:

William Wheeler.

UNITED STATES PATENT OFFICE.

WILLIAM WHEELER, OF POULTNEY, VERMONT.

IMPROVED STOVE.

Specification forming part of Letters Patent No. **45,783**, dated January 3, 1865.

To all whom it may concern:

Be it known that I, WILLIAM WHEELER, of Poultney, county of Rutland, State of Vermont, have invented certain new and useful Improvements in Stoves, such as Heating, Parlor, and Cooking Stoves; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being hereby had to the accompanying drawings and to letters of reference marked thereon, which said drawings make a part of this specification.

Figure 1 is a front view of the stove herein described and set forth. Fig. 2 is a vertical section through the center of the stove, containing the parts or devices shown at Fig. 3 and hereinafter described. Fig. 3 is a cross-section through line A B of Fig. 2, showing apertures, &c., hereinafter described more fully. Fig. 4 is another vertical section through the center of the stove, containing the parts or devices shown at Fig. 5 and hereinafter described. Fig. 5 is a cross-section of Fig. 4, through the line C D, showing the single throat or exit D, more fully described hereinafter. Fig. 6 is a cross-section, showing several throats or exits, D D D D D, and described hereinafter. Fig. 7 shows that fire-chamber B may have many flat surfaces in contracting the top, instead of being spherical, if deemed best so to do, as hereinafter described. Fig. 8 shows the manner of the application of my invention and improvements in coal-stoves to cooking-stoves, which evidently may also be applied to furnaces and locomotive-engines, while the character of the improvements will not in anywise be changed. Fig. 9 shows the fire-chamber B and heating-chamber C connected by means of the throats or exit-pipes D D in the manner substantially as hereinafter described and set forth. Fig. 10 shows the perforations or numerous apertures in the upper surface of the fire-chamber, where several throats or exit-pipes are used.

It is manifest by reference to the several figures aforesaid that the upper part of the fire-chamber may have flat surfaces contracting toward the center of such fire-chamber, through which surfaces numerous small apertures may pass in the manner and for the purposes herein described and set forth. The said upper part of said fire pot or chamber may be of any desirable form or shape between the vertical and horizontal center of the same, and that the said fire-pot or chamber may communicate with the heating or radiating chamber, immediately above such fire-chamber, by means of one, two, or more throats, flues or exit pipes, as hereinafter more fully described and set forth.

The nature of my invention and improvements consists in the employment of a spherical fire-pot or chamber, or any equivalent shape, which shall in its purpose or operation gather the gases, air, and heat near to the top of the fire before the same shall pass from such chamber to the throat, flue or flues leading into the space or chamber of radiation above such fire-chamber, and which fire-pot or chamber of combustion shall be pierced with numerous small apertures having a downward direction or direction toward the common center of such sphere, by means of which a general diffusion of air into the gases and heat is accomplished, so that a most thorough and perfect admixture of the same takes place, causing thereby the most perfect combustion of the gases and smoke. I admit through these numerous apertures to the fire in the fire-chamber cold air or air directly from the room where this stove may be used. Cold atmospheric air I deem the best to use.

It also consists in the admission of cold air to the entire upper surface of the fuel in a downward direction from the spherical or otherwise constructed portion of the fire pot or chamber thus contracted, directly around and over the entire upper surface of the burning fuel in such fire-chamber, for the purposes hereinafter described.

It also consists in the employment of contracted or narrow communicating throat flue or flues between the fire pot or chamber of combustion and the radiating-chamber above the same, for the purposes hereinafter described.

Having thus described the nature of my invention and improvements, or the main and leading features thereof, I will here proceed to describe the construction and operation thereof, which is as follows—to wit:

I construct the base in the ordinary manner and of any shape or size deemed best. This base shall contain the ash-pan drawer and

damper for the purpose of letting in a supply of air to the lower part of the fire in the fire-chamber, for the purpose of starting the combustion and continuing the same, as may be required. The damper for this purpose may be in the front part of the said ash-pan drawer *a*. When I desire strong combustion, I continue open the said draft-damper, but perfect combustion will go on in this stove with the said damper closed, the air or draft necessary to combustion being admitted above the upper surface of the fire, through the numerous small apertures, *b b*, herein described, or the draft of air above and below the fire may be combined and used in that manner with the most perfect results in the combustion of the fuel and in the consumption of the arising and escaping gases and smoke. The draft is, however, admitted from below and through the fire-grate whenever found necessary so to do. The draft above the burning fuel and through said apertures may be used with the draft below the fire entirely closed, or used in connection or combination therewith, as hereinbefore stated.

B is the spherical fire pot or chamber of combustion. I usually make this chamber in two distinct parts for convenience in the manufacture as well as in repairs of this stove. *b*, Figs. 2, 3, 4, 7, 8, 9, and 10, represent the numerous small apertures hereinbefore referred to. These apertures are drilled or otherwise made through the upper part of the said spherically-shaped chamber of combustion B, and each and all have direction downward toward the common center of said spherically-shaped fire-chamber. They may be of any size or shape deemed best. There may be as many in each stove or chamber of combustion as may be necessary to supply the gases and smoke with the required amount of atmospheric air for perfect combustion. The number and size of such apertures will, however, depend somewhat upon the kind of fuel used and the size of the spherical fire-chamber. The direction of the said apertures in the sides and in the top of the said spherical fire pot or chamber of combustion being downward and toward one common center, and the gases and the smoke arising from the burning fuel below toward such apertures, the mixture of the atmospheric air, the gases, and the smoke must necessarily be thorough and complete above the entire upper surface of the burning fuel. The gases and smoke being thus arrested by the atmospheric air entering such chamber in numerous small streams or jets, as aforesaid, complete and perfect combustion of the same immediately takes place.

To confine the gases and smoke in such chamber for the purpose of perfect combustion thereof, and at the same time furnish necessary draft and exit to the chimney, I construct upon the top of such spherical fire-chamber a long narrow throat flue or opening, as seen at D, Figs. 4 and 5, or there may be several small throats, openings, or flues, as shown at D, Figs. 6 and 10, or there may be two circular throats, openings, or flues, D D, Figs. 2, 3, 7, and 8. These are made only large enough to give the necessary draft to the fire below, and for the escape of any unconsumed matter to the chimney. I also pierce these throats or flues D with several small apertures near to the surface of the said spherical fire-chamber, where these throats or flues join, so as to then admit atmospheric air, if deemed best so to do, and thereby consume such of the gases and smoke which were not consumed in the said spherical chamber of combustion immediately below, as aforesaid. Thus all or nearly all of the combustible matter is consumed, whereby the fuel is greatly economized and a much greater degree of heat obtained from the given quantity and quality of the fuel used. *f*, Figs. 1, 2, 7, and 8, is an open space immediately over the top of the spherical fire-pot or combustion-chamber B, and between the circular throats or flues D D, same figures. Through this space atmospheric air passes for the purpose of supplying the apertures *b*, Figs. 2, 3, 7, and 8, and through which it passes in small streams or jets directly downward into the said fire and combustion chamber, thus causing a thorough admixture of the atmospheric air thus introduced with the gases and smoke arising from the center of the burning fuel below, as aforesaid, and thereby forming a more perfect combustion of the gases in said spherical chamber. The said throats or flues D D extend upward for a short distance and there unite, thereby forming an arch above the said space *f*. Upon the top of this arch, thus formed, I construct an upper chamber, *c*, which is a chamber for the radiation of heat. This chamber may be of any form or size desirable. To this chamber I attach the exit-pipe leading to the chimney. This upper chamber may be made of sheet-iron and ornamented, if so desired. The throats or flues D D, constructed as aforesaid, I make of cast-iron. *h*, Fig. 1, is the door for supplying the said combustion-chamber with fuel, which door is also perforated with numerous small apertures, if deemed best so to do. All that part of the said spherically-shaped fire-chamber above a line horizontally through the center of the same and below the said arch-space *f* may be of any shape desirable. It may be in the form of a pyramid, or it may have many sides, as seen at Fig. 7, and then contain small apertures.

By reference to Fig. 8 it will be seen that this invention may also be applied to cooking-stoves without changing its character in the least. Over and immediately above the radiating or heating chamber C, Fig. 8, I construct the necessary boiler-holes for a cooking-stove, and with that chamber connect the heating-flues F, which pass around the oven E. The entire spherically-shaped fire-chamber B, draft-flues D D, and radiating or heating cham-

ber C may be inclosed, as shown at Fig. 8, in which case there may be in the front plate a large number of openings, *m m m*, &c., of any size or shape to allow the atmospheric air to freely circulate around the said devices, so that the said apertures may be supplied with necessary amount of oxygen to insure complete and perfect combustion, as aforesaid. These improvements may also be applied to furnaces or locomotive-engines by means of any proper mechanical construction which will permit of a successful combination therewith, no invention being required for that purpose.

This stove or invention is especially adapted to the use of bituminous coal, and for the burning of such kind of coal, consuming the gases and smoke arising therefrom. It is entirely successful for that purpose. Any other kind of coal or fuel may, however, be used with equal or proportional success, only changing the number and perhaps the size of the said apertures for the bituminous coal, which requires a larger amount of atmospheric air, the gases and smoke evolved being greater from the same bulk of coal.

Having thus described my invention and improvements, what I claim, and desire to secure by Letters Patent, is—

1. The employment of the spherically-shaped fire pot or chamber of combustion B, or its equivalent, with numerous small apertures *b* in the upper surface thereof, in the manner and for the purposes substantially as herein described and set forth.

2. The employment of the contracted and oblong throat D and the narrow circular flues or throats D D, in the manner and for the purposes substantially as herein described and set forth.

3. The combination of the said throats or flues D with the said fire-pot or combustion-chamber B, and with the heating or radiating chamber C, substantially as and for the purpose herein described and set forth.

In testimony whereof I have, on this 17th day of June, A. D. 1864, hereto set my hand.

WILLIAM WHEELER.

Witnesses:
J. S. BROWN,
EDM. F. BROWN.