J. SMART.

Heater.

No. 3,515. Patented March 28, 1844.

Fig. 1.

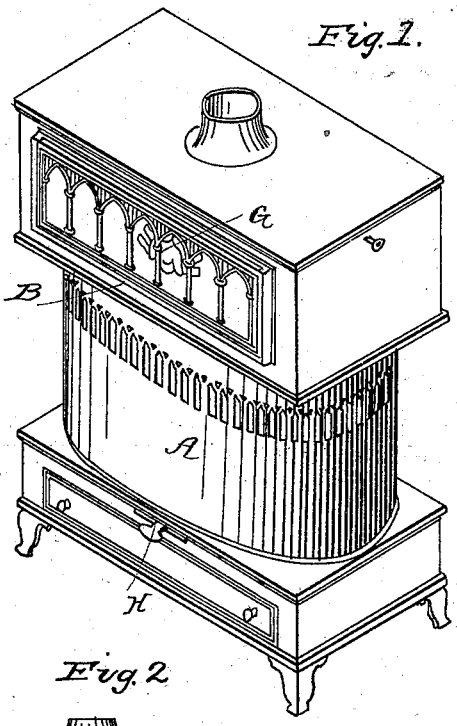


Fig. 8

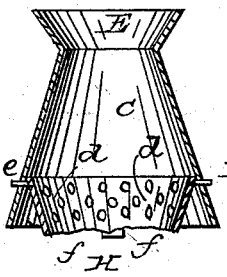


Fig. 5

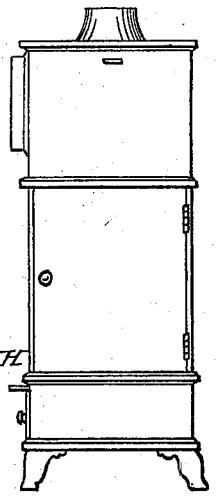


Fig. 2

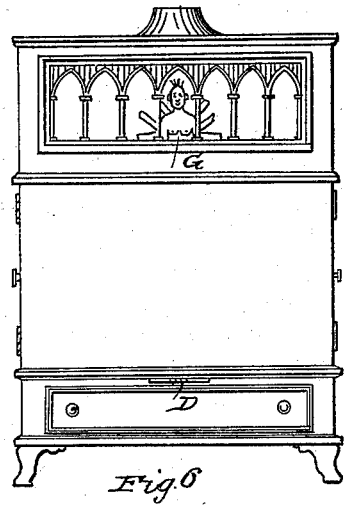


Fig. 3

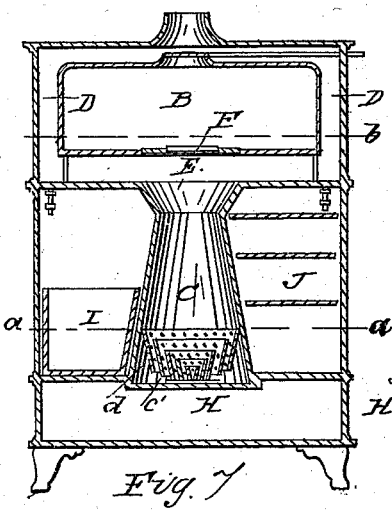


Fig. 4

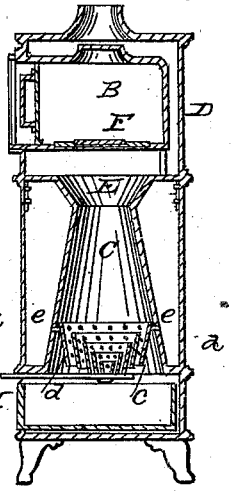


Fig. 6

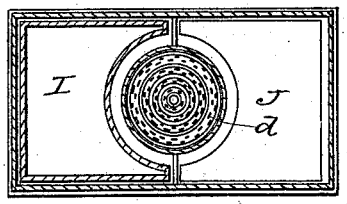
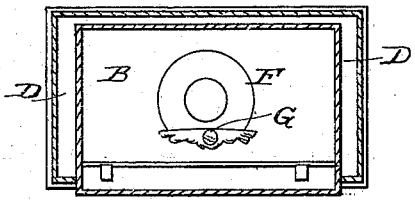


Fig. 7



UNITED STATES PATENT OFFICE.

JNO. SMART, OF PHILADELPHIA, PENNSYLVANIA.

STOVE.

Specification of Letters Patent No. 3,515, dated March 28, 1844.

To all whom it may concern:

Be it known that I, JOHN SMART, of the city of Philadelphia, in the State of Pennsylania, have made a new and useful improvement in the manner of constructing stoves or heating apparatus in which what is called "pea-coal" or the finer screenings of anthracite, such as has been heretofore rejected or used only in the burning of lime or for similar purposes, is advantageously employed either for heating apartments or for cooking; and I do hereby declare that the following is a full and exact description thereof.

My stove, so far as its exterior is concerned, may be made in various forms, according to the fancy of the constructor, or the particular purpose to which it is to be applied. The principal novelty consists in the manner in which I construct that part of it which is within the fire chamber, or heater, and upon which the fuel rests; this is so formed and arranged as to insure a free access of air to the coal, and to allow of its being agitated by means of a shaking apparatus, without permitting any considerable portion of the small coal to escape with the ashes. I sometimes allow the coal to rest, in part, upon grate bars of the ordinary construction, but more in number, and more close together, than usual; but, in lieu of this grate, I most commonly employ one of a peculiar construction, it being made in the following manner: I prepare three, four, five, or any suitable number of, circular rims of cast-iron, each of which is in the form of a short frustum of a cone, and this series of rims is to constitute the grate, said rims being different in size, so that they may be placed one within the other, and leave a space of an inch, more or less, between them. These rims are to differ in width as well as in diameter; the outermost, for example, may be four or five inches, and the innermost one inch wide; they are to be perforated with numerous holes, the object of this part of the structure being to admit air very freely to the fuel, this being absolutely necessary to its combustion when in the state of small particles, like that which it is the design of this stove to burn. These rims I attach, at their lower edges, to a shaker, by means of which they may be made to rotate to the required distance. On the outside of these I place another conical rim, similar in its form, but not attached to the shaker although it is to be acted upon by it. This outer rim is suspended at its upper edge by means of two pivots which enter the sides of a conical case, or heater, by which the grate is surmounted, and which contains the fuel. When the grate is rotated, this exterior rim is made to vibrate on its pivots, and thus to agitate the coal. This last-named conical rim I use whether I employ a grate with bars of the ordinary construction, or one formed of conical rims, as above described.

I have already observed that the exterior of my stove may be variously formed, according to the object to which it is to be applied, whether as a parlor stove, a cooking stove, or simply as a heating apparatus for houses, churches, or other buildings.

Figure 1, shows it in the form in which it may be used as a parlor stove; in this, the cylindrical, or other formed, case, A, is made to surround the fire chamber, or heater, to be presently described. The part marked B, may be used merely as a radiator, or it may constitute an oven in which articles may be baked, or other cooking processes performed. Fig. 2, shows a stove, the outer case of which is rectangular, and the great body of which is adapted to cooking. Fig. 3, is a vertical section through the middle of this stove, showing the heater, C, within it, which heater, in combination with the grate and the apparatus for agitating the coal, is common to it in all its forms, and constitutes my improvement. The part B, represents an oven, surrounded by flues, D, D, in a manner similar to that of many other ovens. Fig. 4, is a vertical section through the middle of the same stove, from front to back, and Fig. 5, an end view of it. Fig. 6, is a plan, in the line *a*, *a*, of Fig. 3; and Fig. 7, a plan in the line *b*, *b*.

The conical frustum, C, which I have denominated the heater, I form of cast-iron, and this constitutes the fire chamber, and is to contain the fuel. This part is shown in section, separated from the exterior case, in Fig. 8. The fuel is to be fed into the heater at its upper end, E. There is an opening for this purpose, leading from the oven, or radiator, B, to the mouth, E, of the heater, which opening is covered with a plate, F. An ornamental figure, G, may be placed within the radiator. H, is a shaker, to agitate the grate; and *c*, *c*, *c*, are the circular rims which I, in preference, use

as grate bars; these are perforated with holes, as shown in the drawing, and are attached to the shaker by their lower edges. The grate so constructed admits of a more free draft of air than bars of the ordinary kind. On the outside of the rims, *c*, *c*, there is a similar rim, *d*, *d*, which is hung by pivots, *e*, *e*, at its upper edge, so as to allow it to vibrate; this rim, *d*, *d*, is an essential feature of my heater, being used either with the ordinary flat grate, or with the rims, *c*, *c*. The upper edge of this is nearly in contact with the heater, C, so as to prevent the passing down of coal between them; and its lower edge is scalloped, as shown at *f*, *f*, and the shaker bar, H, bearing against these scallops, both at the front and back of it, causes the rim, *d*, *d*, to vibrate on its pivots, and thus to clear the ashes from the small coal with very little loss of the latter. When used as a cooking stove, there may be large compartments for baking, boiling, &c., on each side of the conical heater.

I, I, Fig. 3, and 6, represent a boiler standing on one side of the heater, and which may reach to its top. J, represents an oven, which may occupy the other half, if desired; but when the object is to heat a house, or other building, the heater may be placed in a cellar, be surrounded by a wall of brick, and surmounted by a heated air vessel, or drum, with tubes to conduct the heated air wherever it may be required; the ordinary modes being followed of effecting this object.

Having thus fully described the nature of my invention and shown the manner in which the same is to be carried into operation, I do hereby declare that I do not claim any of the devices, or apparatus, herein described and represented, as of my invention, with the exception of that for sustaining the fine coal within the heater, and of agitating the same—that is to say:

I claim—

1. The circular rim, *d*, *d*, formed as described, and suspended within the heater, so that it can be agitated by means of the shaker bar, operating on its lower edges.

2. I claim the combining with the said rim, *d*, *d*, any number of similar rims *c*, *c*, attached to the shaker bar, as set forth; or, instead of the rims *c*, *c*, the combining of the said rim *d*, *d*, with a grate of the ordinary form, with small bars and openings; by means of which arrangement I am enabled to burn the finer siftings of anthracite as effectually and advantageously as the nut, egg, or other sizes of this coal.

JOHN SMART.

Witnesses:
THOS. P. JONES,
EDWIN L. BRUNDAGE.