

D. NEEDHAM.  
 Steam Heating Apparatus.

No. 199,564.

Patented Jan. 22, 1878.

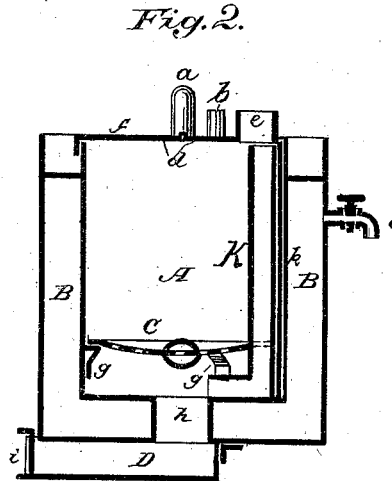
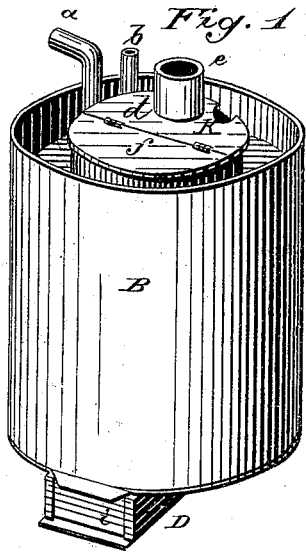


Fig. 4.

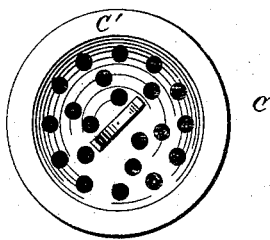
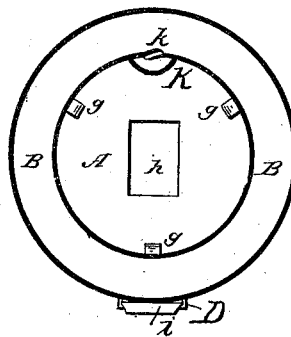


Fig. 3.



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# UNITED STATES PATENT OFFICE.

DAVID NEEDHAM, OF OSKALOOSA, IOWA.

## IMPROVEMENT IN STEAM-HEATING APPARATUS.

Specification forming part of Letters Patent No. **199,564**, dated January 22, 1878; application filed September 24, 1877.

*To all whom it may concern:*

Be it known that I, DAVID NEEDHAM, of Oskaloosa, in the county of Mahaska and State of Iowa, have invented certain new and useful Improvements in Steam-Heating Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view. Fig. 2 is a vertical section. Fig. 3 is a cross-section, the grate being removed; and Fig. 4 is a plan view of the grate detached.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates to a vertical steam-boiler, in which the fuel is fed from the top and the ashes removed at the bottom; and it consists in the construction and arrangement of parts, which I shall now proceed more fully to describe.

In the drawings, A is the fire-chamber, which is surrounded by the water-chamber or boiler B, both of which are, preferably, cylindrical in shape. The boiler B is provided with the gage-cock *c*, water-pipe *b*, (through which water is fed,) and steam pipe or conductor *a*. The top of the fire-chamber is closed by a cover, *d*, having the smoke-stack *e*, and a hinged door, *f*, through which latter the fuel is fed.

Upon the inner walls of the fire-chamber, at some distance from the bottom, are three or more cleats or projections, *g g*, forming supports for the grate C, which is loose and removable. The object of thus raising the grate above the level of the bottom of fire-chamber and boiler is to obviate the shock or jar to both in feeding the fuel.

The construction of the grate itself will be readily understood by reference to Fig. 4 of the drawings. It is concavo-convex in shape, and is provided with a circumferential rim, *C'*, which rests upon the supporting-cleats *g*. Being removable, it may be reversed, so as to present either a concave or convex upper surface, according to the nature of the fuel used.

The bottom of the fire-chamber, under the grate, has an opening, *h*, through which the ashes fall into the sliding ash box or pit D, arranged under the fire-chamber and boiler, as shown.

The front of box D has a slide, *i*, to regulate the draft. The whole device may be elevated upon suitable legs or supports, so as to make the ash-box conveniently removable.

The seam *k* of the fire-chamber is covered with an air-pipe, K, leading from the ash-pit to the upper cover, as shown in Figs. 2 and 3 of the drawings, in order to prevent the seam from being destroyed by the heat of the fire.

In steam-heaters, as ordinarily constructed, the ashes have to be removed through the side of the boiler, which is less convenient than when, as in my invention, they fall into the sliding and removable ash-box at the bottom.

The advantage of the adjustable concavo-convex grate will be readily seen, inasmuch as it enables various kinds of fuel which cannot otherwise be used in the same furnace to be utilized simply by turning the grate, thus adapting the furnace to the character of the fuel.

The grate being elevated upon the cleats *g g* above the bottom of the fire-chamber and boiler, the shock or jar in feeding fuel is, as above stated, materially lessened, thus rendering the boiler more durable.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

In a steam-heater constructed substantially as herein described, the air-pipe K, leading from the ash-pit to the upper cover, and covering the seam *k* of the fire-chamber, substantially as described, for the purpose herein shown and specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

DAVID NEEDHAM.

Witnesses:

ROBERT KISSICK,  
W. TENNANT.