W. SILVESTER.

FURNACES FOR BURNING COAL-SLACK UNDER STEAM-BOILERS, &c.

No. 195,409. Patented Sept. 18, 1877.

Fig: 1.

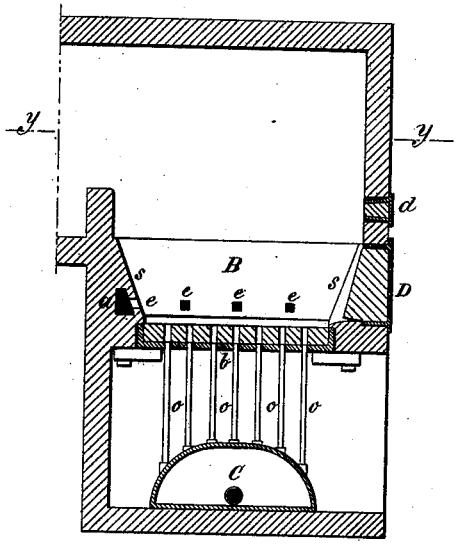


Fig: 2.

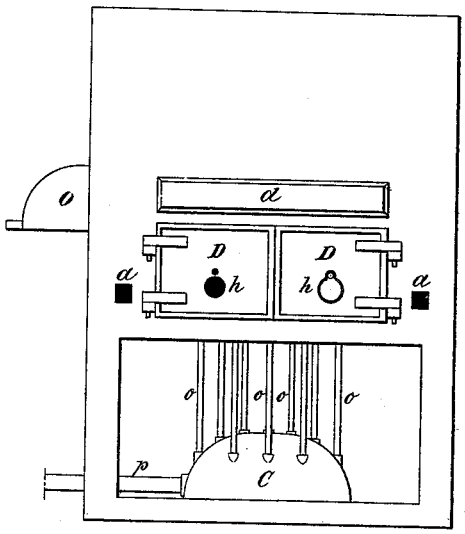
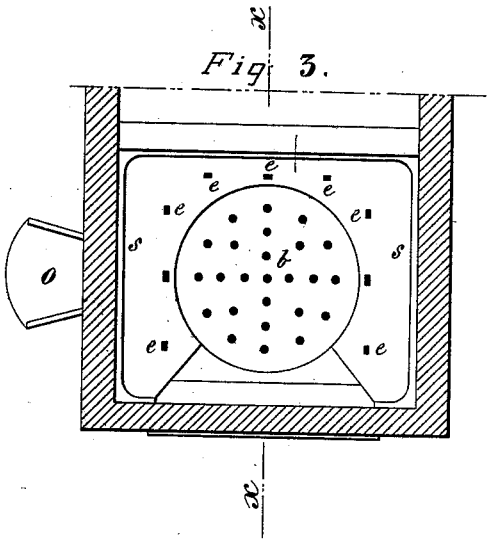


Fig: 3.



WITNESSES:

Robert Boreham

Sebastian Stuntz

INVENTOR:

William Silvester

UNITED STATES PATENT OFFICE.

WILLIAM SILVESTER, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO W. WALTON, OF SAME PLACE.

IMPROVEMENT IN FURNACES FOR BURNING COAL-SLACK UNDER STEAM-BOILERS, &c.

Specification forming part of Letters Patent No. **195,409**, dated September 18, 1877; application filed March 9, 1877.

To all whom it may concern:

Be it known that I, WILLIAM SILVESTER, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, and of which—

Figure 1 represents a vertical section taken at line *x x* of Fig. 3. Fig. 2 is a front view, and Fig. 3 a horizontal section taken at line *y y* of Fig. 1.

The invention consists in the construction of a fire-grate with improved means for the purpose of burning slack coal for heating boilers or other furnaces.

In place of the ordinary burning-chamber with grate-bars, a tapered fire-box, B, having a perforated bottom, *b*, is substituted. It may be of any desired size, and is constructed of the usual materials. The inclined sides *s s* surrounding the box B are hollow, and the latter may be of a rectangular, circular, or any other desired shape. The bottom *b* is supported by a frame-work, and is made of cast-iron, lined with fire-bricks. A blast-chamber, C, receiving the blast through the pipe *p*, is located below the fire-box. By means of a number of small pipes, *o o o o*, screwed into the chamber C and the bottom piece *b*, the blast is directed below the slack coal, and thus facilitates the burning process.

D D are doors for the introduction of fuel and the cleaning of the box. They are provided with circular holes *h h*, through which an iron bar may be introduced to stir up the fire. Outside of the doors air-inlets *a a* are provided, which communicate with the hollow space surrounding the fire-box B. For the purpose of letting air above the fire, a second opening, *d*, is left a little above the doors D D. It is closed by a hinged door, the same as the lower ones, and all are lined with fire-bricks.

Instead of introducing fuel by the doors D D, it may also be done from the side of the furnace by an opening, *o*.

The circulation of cool air around the fire-box will reduce the temperature of the bricks. Small openings *e e e e*, communicating between the inside of the fire-box B and the surrounding space, may be established for the same purpose; but in this case the pressure of the blast must be very low.

The grate being constructed substantially as above described, its operation is as follows: Previous to the kindling of the fire a very light blast is started to prevent the clogging up of the pipes *o o o o* by the fine coal, and only after the fire is burning more blast can be turned on.

The cleaning of the grate of ashes, &c., is done through the doors D D.

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

1. In a fire-grate for burning slack coal, the combination of the bottom *b*, lined with fire-bricks, and the blast-pipes *o o o o* fixed therein, as described, and for the purpose set forth.

2. In a fire-grate, the blast-chamber C and pipes *o o o o*, in combination with the bottom piece *b*, as described and for the purpose set forth.

WILLIAM SILVESTER.

Witnesses:
J. H. HILLEMAN,
SEBASTIAN STUTZ.