(No Model.)

C. O. AREY.

FURNACE OR SETTING FOR STEAM GENERATORS.

No. 473,053. Patented Apr. 19, 1892.

Fig. 1

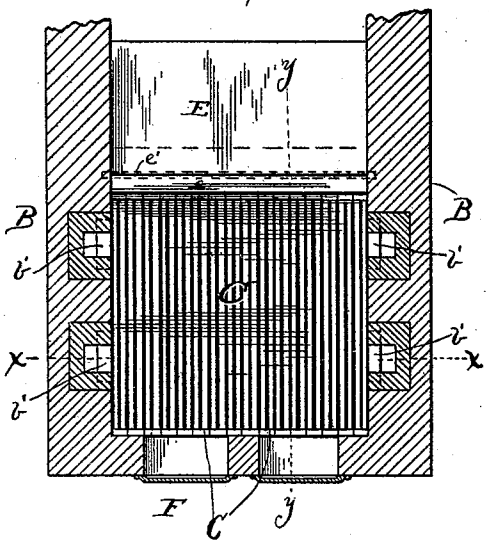


Fig. 2.

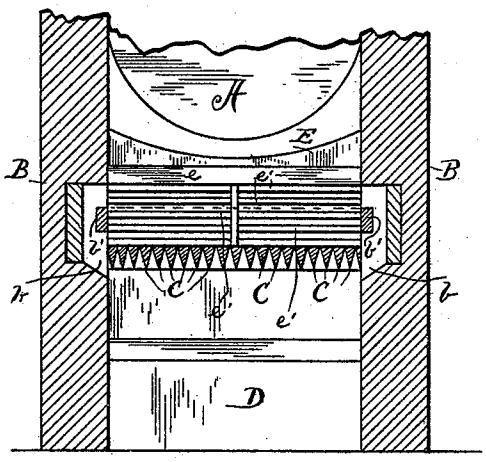
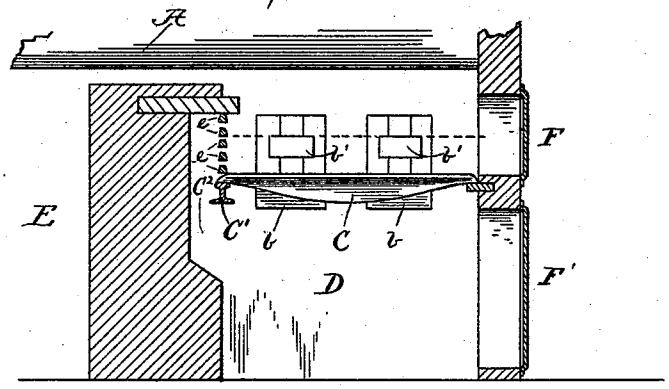


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

CLARENCE O. AREY, OF CLEVELAND, OHIO.

FURNACE OR SETTING FOR STEAM-GENERATORS.

SPECIFICATION forming part of Letters Patent No. 473,053, dated April 19, 1892.

Application filed August 27, 1891. Serial No. 403,875. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE O. AREY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Furnaces or Settings for Steam-Generators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in furnaces or settings for steam-generators; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claim.

In the accompanying drawings, Figure 1 is a horizontal section taken at the top of the grate. Fig. 2 is a transverse vertical section on line *x x*, Fig. 1. Fig. 3 is a longitudinal vertical section on line *y y*, Fig. 1.

A represents a steam-boiler; B, the side walls of the setting; C, the ordinary grates in contradistinction to other grates hereinafter mentioned; D, the ash-pit; E, the bridge-wall, and F F′ the furnace and ash-pit doors.

In constructing walls B B one or more approximately vertical recesses *b* are left in each wall opposite grate C, these recesses opening inward and extending below the bottom line of the grates and extending so far above the grates as to leave a free opening above the top of the fuel into the fire-box. Just above the top line of the grate—say an inch or two, more or less—a fire-brick or plate *b′* or other obstruction is set crosswise the recess to prevent the coals from falling into the recess. Each recess constitutes a passage-way or duct whereby air from the ash-pit is discharged laterally across the top of the fuel, and the products of combustion pass from the body of the fire underneath member *b′* into the recess to commingle with the air-current from the ash-pit passing up through such recess. Hence if slack or fine coal is laid upon the fire in such quantities as would otherwise smother the fire the products of combustion can find vent easier than by passing up through the body of slack above the fire—to wit, by passing laterally under member *b′* and from thence up through recess *b*—and such discharge of fresh air commingled with gases directed across the upper surface of the fuel soon ignites the fuel on top. Even with coarser coal I consider the side recesses an advantage in admitting a fresh supply of air from the ash-pit into the fire-box above the fuel, especially where the grates have become more or less clogged with clinkers and ashes. The rear ends of grates C are supported by a cross-bar C′, leaving an uninterrupted space of some inches between grates C and the bridge-wall, as at C^2, this space constituting a duct for the passage of the air up from the ash-pit. The bridge-wall is provided with a forwardly-projecting overhanging member *e*, this member being constructed usually of fire-brick or tile, and between the forward or overhanging section of member *e* and the rear section of grate C is located an upright series of horizontal cross-grates *e′*, that prevent the coal from falling into duct C^2. Member *e* from its location becomes intensely heated, and the air-current passing from the ash-pit up through duct C′ impinges member *e*, and is thereby heated and deflected forward, and passes from thence through the spaces between grates *e′* and meets and commingles with the products of combustion passing rearward from the body of the fire on their way over the bridge-wall. The meeting and consequent breaking up of these two heated currents at the part of the fire-box where the heat is likely to be most intense is most favorable for the perfect combustion of the gases at a point up to which there has been no opportunity for the gases to become condensed in the smoke, and hence, with my improved construction after the fire is once well under way slack or fine coal may be placed on the fire in large quantities without producing smoke.

What I claim is—

The combination, with a boiler-setting provided at its sides and rear end with air-recesses leading from the ash-pit to a point above the fuel-line, of transverse grate-bars *e′* and an overhanging member located at the rear end of the setting over the transverse bars, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 23d day of June, 1891.

CLARENCE O. AREY.

Witnesses:

C. H. DORER,

WARD HOOVER.