(No Model.)

O. WILSON.

FURNACE.

No. 301,943. Patented July 15, 1884.

Fig. 4.

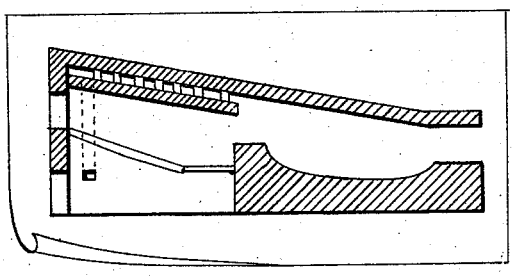
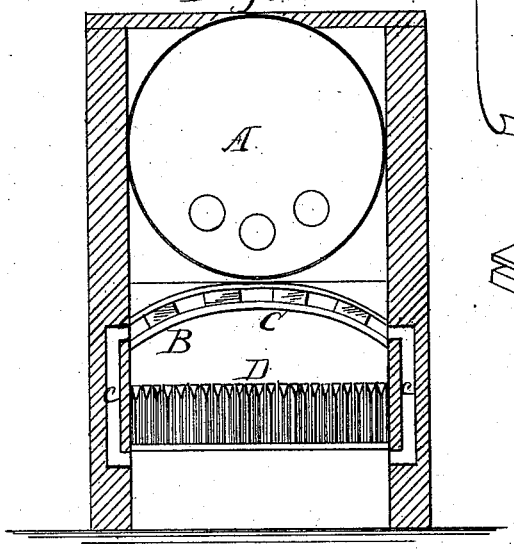


Fig. 2



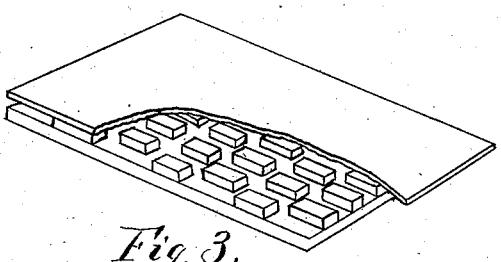
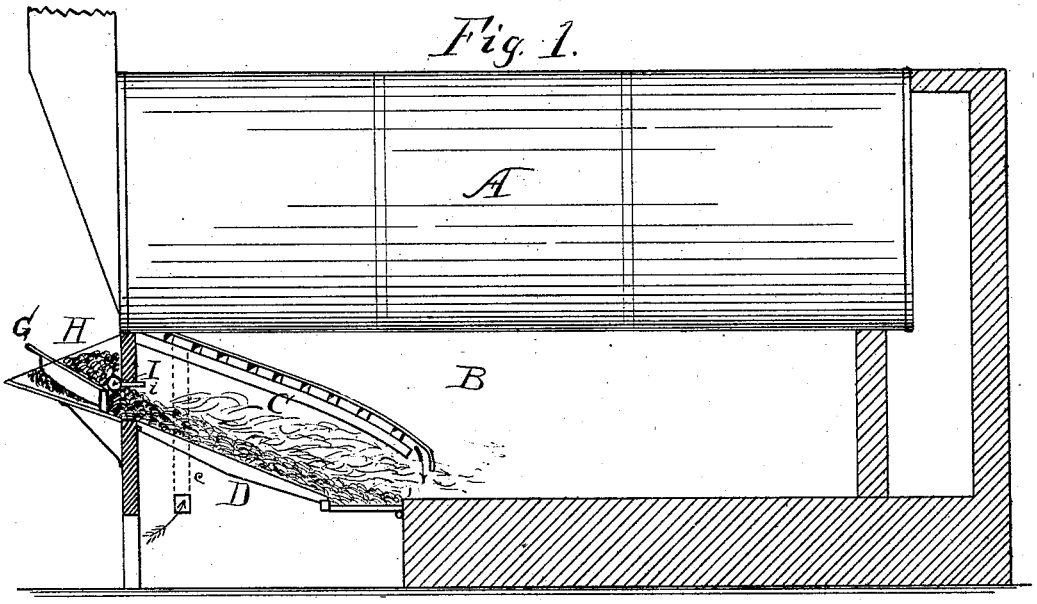


Fig. 3.

Fig. 1.



Witness
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UNITED STATES PATENT OFFICE.

ODELL WILSON, OF CLEVELAND, OHIO.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 301,943, dated July 15, 1884.

Application filed January 7, 1884. (No model.)

To all whom it may concern:

Be it known that I, ODELL WILSON, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

My improvements relate to furnaces for steam-boilers and general heating purposes; and it consists in placing a hollow reverberatory arch over the fire-place, through which hot air is fed to the throat of the furnace for consuming the gases from combustion. The fuel is fed to the furnace from a hopper onto inclined grate-bars by means of a pusher.

In the accompanying drawings, Figure 1 is a longitudinal section of a boiler and furnace, showing my improvements. Fig. 2 is a transverse section in line *x x* of Fig. 1. Fig. 3 is a view of the aforesaid arch, showing the manner of constructing it and applying the hot air. Fig. 4 shows the arch applied to a smelting-furnace.

A represents a boiler, and B the furnace.

D are the grate-bars, which I set in the inclined position from the front backward and downward, as shown, providing at their lower part a dump-grate for discharging the ashes when required.

In the furnace-front is made a suitable opening for inserting the fuel on a level with the highest part of the grate-bars. A suitable hopper, H, is attached to the front, for holding a quantity of fuel.

G is a push bar or lever, hung at one side of the hopper, for pushing in through the opening a suitable quantity of fuel at intervals, when needed.

I is a pipe, lying across the front, and just at the top of the fuel-opening, and is provided with a number of nipples, *i*, for injecting air into the fire-place, to enhance combustion.

C is a reverberatory arch, placed over the burning fuel, and slants backward and downward in a curved line to a point usually occupied by a bridge-wall, forming a throat from the fire-place into the combustion-chamber beyond and under the boiler. This arch is constructed of brick, with upper courses of brick disconnected from each other and in alternate rows in the form of checker-work, and forming obstructed passages from the upper toward the lower end, and are covered over by tiling or other suitable material.

In the side walls of the furnace are made flues *c*, opening from the ash-pit, and connecting at their top with the aforesaid air-passages in the arch. The object and effect of the said arch, with its air-passages, are to feed hot air to the throat for consuming the gases and smoke from the first combustion of the fuel. This is accomplished, as will appear from the foregoing, from the fact that the arch becomes greatly heated; consequently there is created a strong draft of air up the flue *c*, which, becoming highly heated, is discharged at the throat, as indicated by the arrows.

It will also be observed that the covering of the arch overhangs the discharge-openings. This is for deflecting the currents of air downward, and causes a thorough commingling of the air with the gases and smoke, and producing a complete combustion of the same.

Having described my improvements, I claim—

In a furnace, a reverberatory arch, constructed as shown, composed of refractory material having within it obstructed air-passages in the form of checker-work, the said arch being provided with an overhanging lip for the purpose of deflecting the heated air into the products of combustion, substantially as and for the purpose set forth.

ODELL WILSON.

Witnesses:
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