

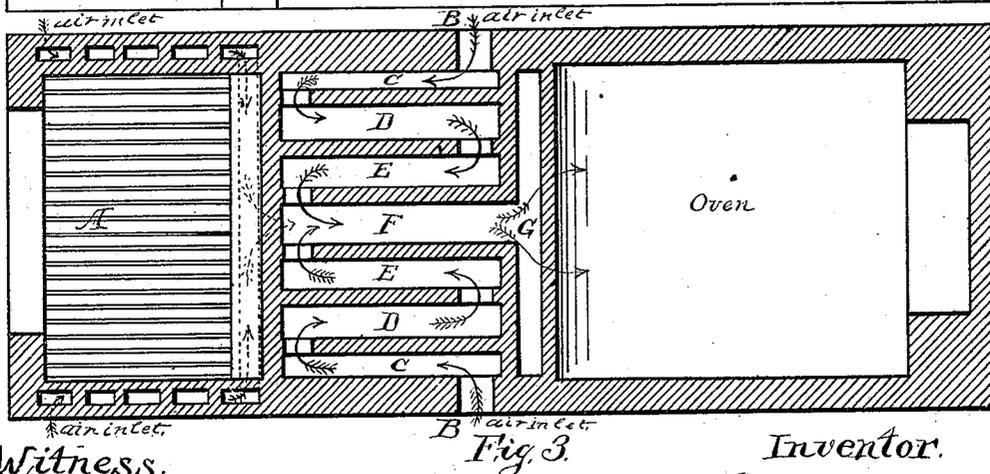
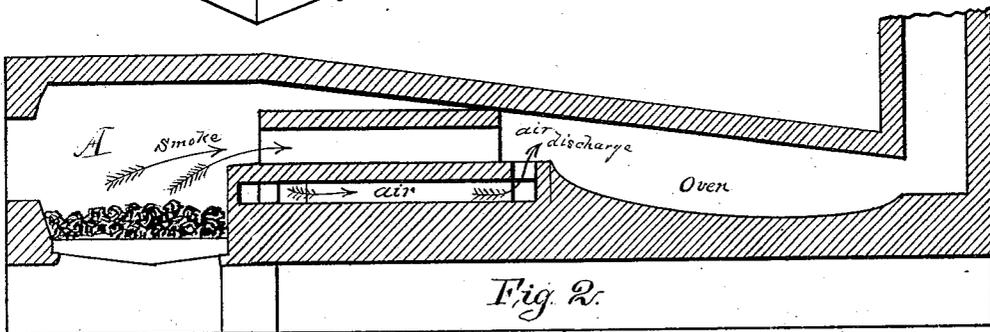
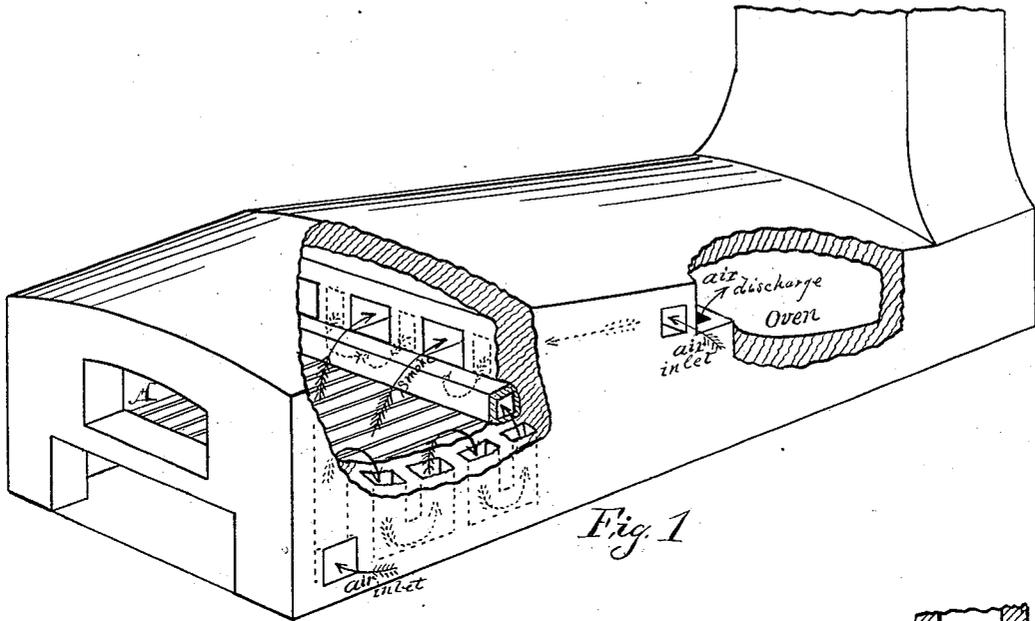
(No Model.)

2 Sheets—Sheet 1.

O. WILSON. FURNACE.

No. 298,534.

Patented May 13, 1884.



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Albert Barmitz

Inventor,
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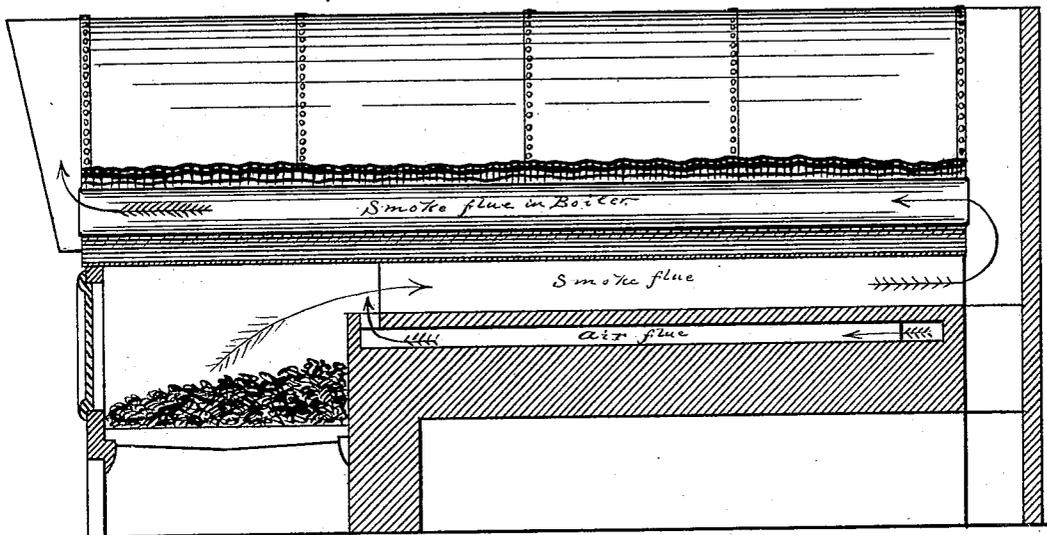


Fig. 4.

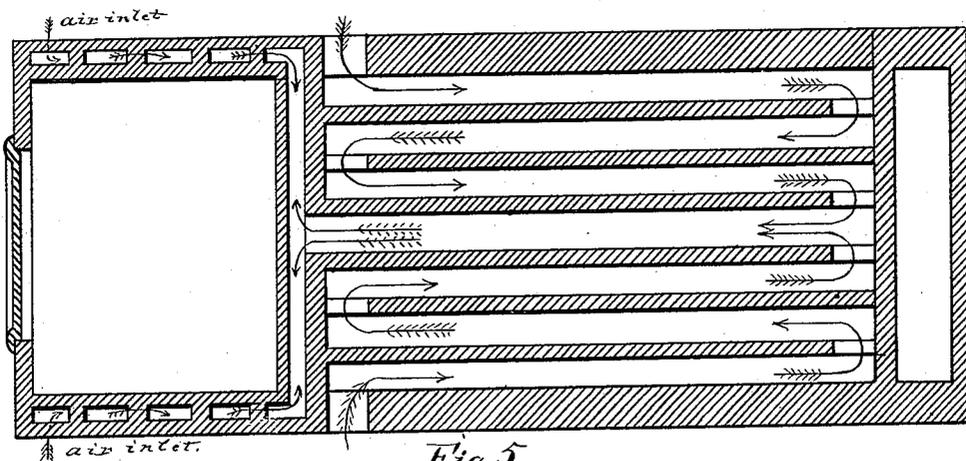


Fig. 5.

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UNITED STATES PATENT OFFICE.

ODELL WILSON, OF CLEVELAND, OHIO.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 298,534, dated May 13, 1884.

Application filed October 29, 1883. (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.

These improvements relate to furnaces for steam-boiler, smelting, or other purposes; and they consist in the construction and arrangement of air-flues, in combination with the smoke-flues and fire-walls, whereby air is admitted from without and becomes heated and is discharged at the point of combustion where the gases and smoke from the fire are consumed, the object being to provide a means of enhancing combustion and to avoid waste of fuel by consuming all the combustible material contained in fuel, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a smelting-furnace, having portions of the outer walls broken out to show the interior construction of flues. Fig. 2 is a longitudinal section of the same. Fig. 3 is a horizontal section of the same; Fig. 4, a longitudinal and vertical section of a steam-boiler, showing arrangement of air-flues as adapted to that purpose. Fig. 5 is a horizontal section through the flues, showing their arrangement for conducting and discharging heated air at the connection of the fire-flues with the fire-box.

A is a fire-box of the usual construction, provided with ash-pit and grate.

Instead of the usual bridge-wall, I construct a series of smoke or fire flues and air-ducts, which occupy, in a smelting-furnace, a suitable proportion of space between the fire-box and the smelting-oven, as seen in Figs. 1, 2, and 3; but in a boiler-furnace they occupy the full distance under the boiler from the fire-box to the rear end of the boiler. The said flues may be constructed in the masonry, and preferably so in case of all stationary furnaces, but may be constructed of iron in the case of movable or portable furnaces, as locomotives and the like. These flues are arranged in two courses—one above the other—and the fire-flues arranged alternately with the air-flues, whereby the air shall be-

come heated in its course through said air-flues.

As shown in all the figures, the smoke-flues lead straight through from the fire-box into the oven, or to the back space at rear of boiler, so that the fire has a direct and unobstructed passage. The air-flues are arranged and so connected as to lead the air back and forth from the outer into a central flue and discharge heated air through gratings or openings in a transverse flues at the point where the fire enters the oven, or at the point where the fire first enters the smoke-flues, directly from the fire-box, as in the boiler-furnace. This discharges hot air at the points of combustion, supplying oxygen for completing the consumption of the gases.

In Figs. 1, 2, and 3 the air is admitted from without through an opening, B, in the two side walls, which leads into the side flues, C C. The air passes along in the direction indicated by the arrows. It passes thence into flue D, backward and into flue E, thence into the central flue, F, thence into the transverse flue G, the upper side of which is provided with openings through which the air escapes or discharges. In Figs. 4 and 5 the course of the air is reversed for discharging the air in front. In the walls at the sides of the fire-box are also provided perpendicular air-flues, in which air is also conveyed to the same point of combustion, as auxiliaries to the before-described flues for the supply of heated air.

A steam-jet may be injected at the air-inlets for the purpose of giving greater force to the draft of air.

It has been customary to heat the air-supply of furnaces by means of flues located above the fire-box, also by flues beneath the working chamber or bed of furnaces. My construction and arrangement of flues, however, is novel. My air-flues are constructed to receive at a point between the fire-box and the smoke-stack and conduct it forward to or near the fire-box, and then back through shallow return-flues. Said return air-flues are located beneath the smoke-exit flues. They may communicate with other deep flues leading toward the fire-box, and at that point discharge into other shallow return-flues. Thus

each smoke-flue is between two air-flues and over a shallow return air-flue, and the smoke-flues and return air-flues discharge at about the same transverse line, as shown in Fig. 2 of the drawings.

Having thus described my invention, what I claim is—

1. The combination, in a furnace, of the large air-inlet flues, the intermediate shallow return air-flues, and the smoke-flues located above the return air-flues and between the large flues, substantially as shown and described.

2. The combination, in a furnace, of the large air-inlet flues, the intermediate shallow return air-flues, and the smoke-flues located above the return air-flues and between the large flues, and a series of flues constructed in the side walls of the fire-box, conveying the heated air to the point of combustion, substantially as described.

ODELL WILSON.

Witnesses:

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