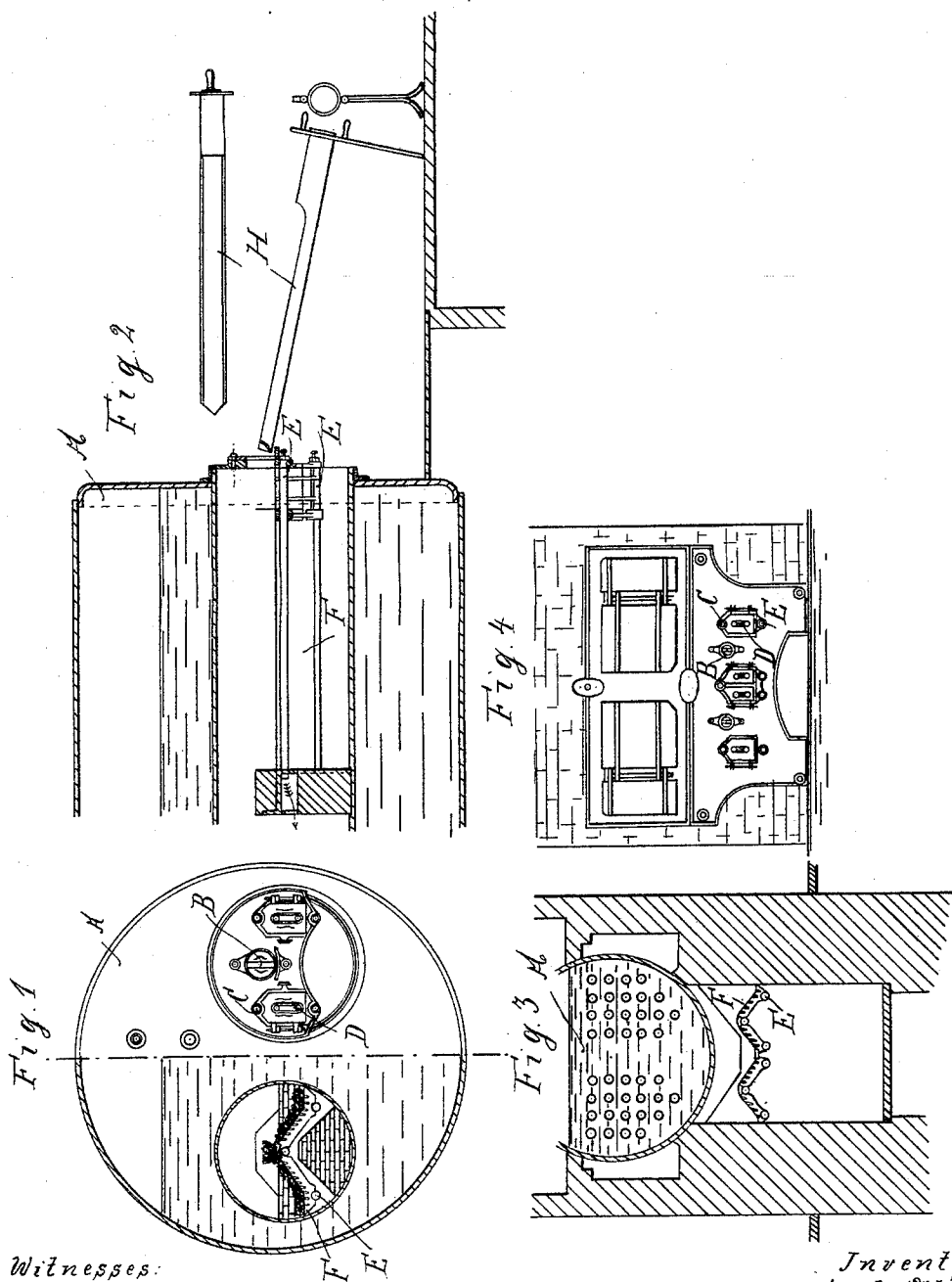


(No Model.)

W. O. THOST.
SMOKE CONSUMING FURNACE.

No. 497,841.

Patented May 23, 1893.



Witnesses:

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Eng'g.

Inventor:
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UNITED STATES PATENT OFFICE.

WILHELM OTTO THOST, OF ZWICKAU, GERMANY.

SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 497,841, dated May 23, 1893.

Application filed April 26, 1892. Serial No. 430,809. (No model.)

To all whom it may concern:

Be it known that I, WILHELM OTTO THOST, a subject of the King of Saxony, and a resident of Zwickau, in the Kingdom of Saxony, German Empire, have invented certain new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a full and exact specification.

My invention relates to a furnace arrangement which insures complete and smokeless combustion of the fuel, and the working of which is very simple and efficient.

My invention consists in a grate composed of two sets of grate bars which are supported by air-tubes, said grate being placed on the incline, whereby the grate surface is considerably increased. The angle of inclination is dependent on the kind of fuel used and is in every case such as to cause the latter to be equally distributed when placed upon the ridge of the grate. For stoking I employ a special trough-shaped shovel having the same length as the grate itself.

The better to make my meaning clear I will proceed to describe a furnace constructed and operated according to my improvements, referring to the accompanying drawings, on which—

Figure 1 is an end elevation of the furnace, partly in section. Fig. 2 is a longitudinal sectional elevation of the same. Fig. 3 is a cross-sectional elevation of a modification. Fig. 4 is an end elevation of the same.

Similar letters denote similar parts throughout the several views.

The front plate of the furnace is provided with swing doors B, with doors D and with openings C covered by panes of mica. Air-tubes E E pass under the whole length of the grate F. The latter is in Fig. 1 formed with two inclines, and with four of them in the modification illustrated by Fig. 3. The grate F is supported by the air-tubes E. In the modification shown on Figs. 5 and 6 the grate F is formed with two inclines, the lowest point being however in the middle of the furnace. Instead of the front doors B I provide lateral doors G G in this modification. The other parts, the boiler A and its fittings are constructed in the usual manner and do not form part of this invention.

The shovel H which I employ for my improved furnace is shown at Fig 2. The same is of the trough-shape illustrated by the drawings, so as to permit of its introduction through the swing-doors B, and of such length, as to reach to the back end of the grate F when fully pushed in through said doors.

The manner of tending the fire and of using the furnace is the following: The shovel H being charged with fuel is passed through the swing doors B into the furnace and emptied by turning it around on its axis. The sharpened forward end of the shovel H, when the same is pushed into the furnace, removes the fuel lying on the ridge of the grate. The swing-doors B are constructed in such manner that they open automatically upon introducing the shovel H and close automatically when the shovel is withdrawn. It will be seen by a glance at Figs. 1 to 4 that the shovel is inserted over the highest point of the grate F, in order that the fuel may be distributed equally on all inclines. Through the openings C, having panes of mica, the fire may be watched continually. The slag is removed through the doors D. As the continual opening and closing of the doors is rendered unnecessary by the described arrangement, cold air does not enter the furnace and a uniform and economical combustion of the fuel is thereby insured. It will be seen that the distribution of the fuel over the surface of the grate is very easy and requires no special work and trouble on the part of the stoker.

Another advantage of the described manner of charging the furnace is that the fresh cold fuel is not placed so as to cover the glowing fire, but as to lie beside the same, whereby a more regular and less impetuous combustion is obtained. The glowing fire is not removed and is therefore able thoroughly to consume smoke and soot.

The heating effect of the furnace is a very powerful one, and has been ascertained to yield, when employed for a boiler, a production of steam about ten per cent. larger than that obtained with other systems of furnace. The consumed fuel by degrees slides down the inclined surfaces of the grate, and the clinker or scoria accumulates at the lowest parts of the same, whence it may be easily

removed through the doors D, as already mentioned. By means of the air-tubes E heated air is led behind the fire-bridge, where it mixes with the gases of combustion and prevents the formation of smoke and soot. The quantity of air supplied through these tubes E may easily be regulated by closing the front ends of a number of the same.

The improved furnace which I have described hereinbefore is also particularly advantageous because the work of the stoker is easier, less tiring and more expeditious, and the fire is rendered less dependent upon the skill and good will of the stoker.

Though I have described the furnace as applied for heating a boiler, I may of course also employ the same for stoves or for any other purpose where it may be used with advantage.

I do not confine myself to the several forms of construction shown and described, and the same may be altered to suit special circumstances, without departing from the nature of my invention.

Having thus fully described the nature of

my invention, what I desire to secure by Letters Patent of the United States is—

1. A smoke consuming furnace having a saddle shaped grate the bars of which are placed transversely to the axis of the furnace and supported by air tubes open at both ends, having closed walls and extending longitudinally, for the purpose as described.

2. In a furnace of the kind described, the combination, with the swing-doors B, adapted to close automatically, of the trough-shaped shovel H, having the same length as the furnace and adapted to be entered through the swing-doors B so as to rest on the ridge of the saddle-shaped grate F, for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILHELM OTTO THOST.

Witnesses:

PAUL ROBERT OSCAR TITTMANN,
CRUP GEORG NICKLER.