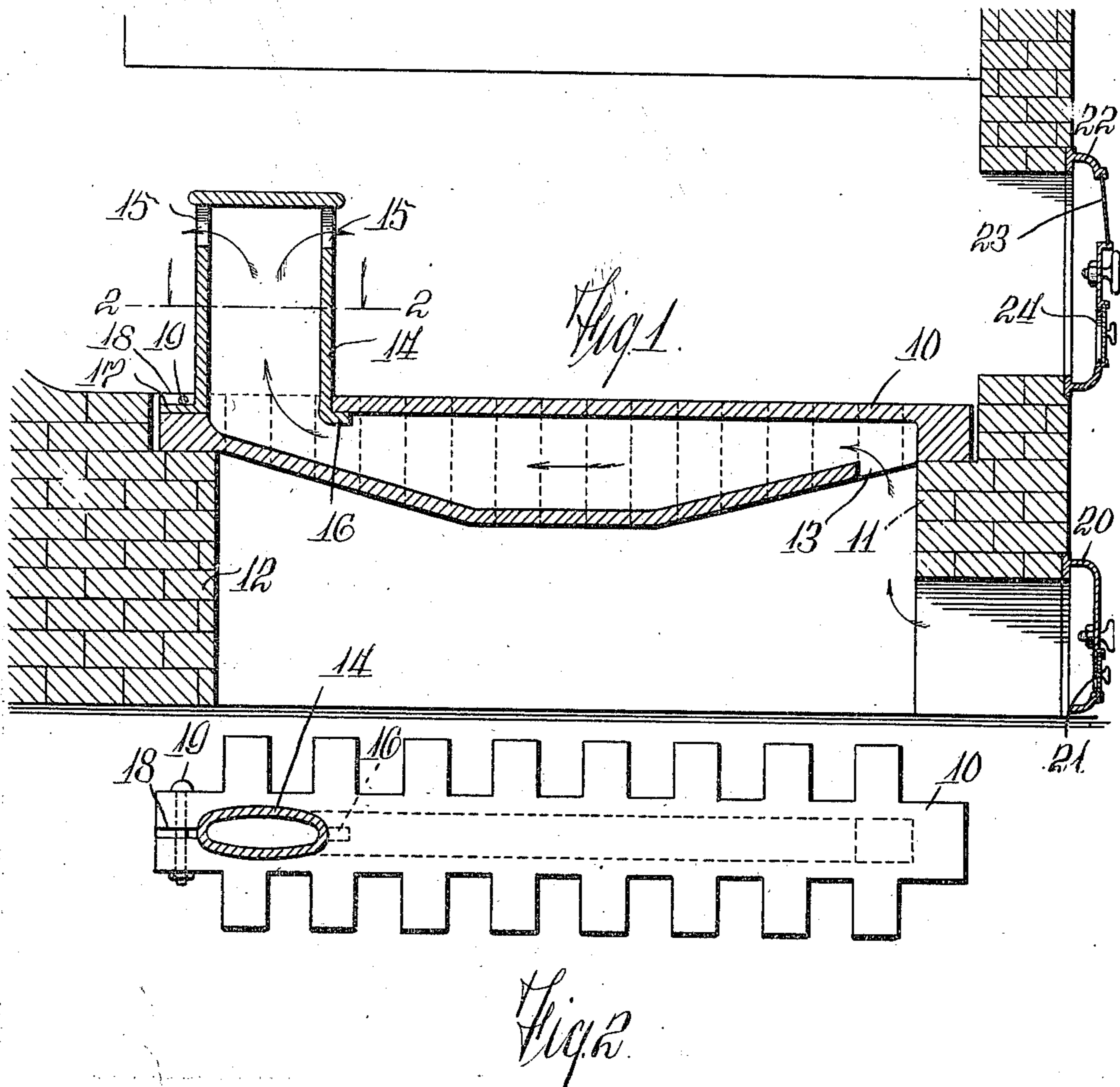


C. NORDELL.
FURNACE.

APPLICATION FILED MAY 12, 1909.

966,233.

Patented Aug. 2, 1910.



Witnesses:
Frank L. Smith.
Arthur E. Dammell.

Carl Nordell. Inventor
By his Attorney,
W. D. Hutchinson.

UNITED STATES PATENT OFFICE.

CARL NORDELL, OF STAMFORD, CONNECTICUT.

FURNACE.

966,233.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed May 12, 1909. Serial No. 495,510.

To all whom it may concern:

Be it known that I, CARL NORDELL, of Stamford, Fairfield county, Connecticut, have invented a new and useful Improvement in Furnaces, of which the following is a full, clear, and exact description.

My invention relates to improvements in furnaces of various kinds and more especially to coal-burning furnaces, and particularly to the grate construction of such furnaces. Much of the waste occurring in coal combustion, and most of the smoke, is caused by the fact that there is imperfect combustion in the furnace. This is occasioned by the fact that there is improper admixture of gases in the furnace.

The object of my invention is to provide a simple means of getting this correct admixture of gases so that practically perfect combustion will result. I accomplish this result preferably by the use of a special form of grate-bar in connection with regulable air inlets above and below the grate, but generally by providing means for admitting air beneath the grate, discharging super-heated air into the fire-box above the grate, and having a regulable air inlet and a peep hole through the furnace door, so that hot air can be discharged into the fire box, and by observing the condition of the flames through the door and regulating the draft above and below the grate, just the proper effect can be obtained. In carrying out the above ideas, I prefer to have the air inlet through a hollow grate bar and through an air distributor which projects upward from the grate-bar to a point above the normal coal bed, so that the air will be in this way super-heated, and the construction will be simple. I also prefer to provide a detachable air distributor for the grate bar, as this part is likely to be burned out first, and by making it detachable, a new one can be easily substituted.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a sectional elevation of a furnace provided with my improved grate-bar. Fig. 2 is a sectional plan on the line 2—2 of Fig. 1 of the grate-bar.

The grate bar 10 can be of any usual design, and I have shown the customary grate with its lateral arms, and with its ends resting on the furnace wall 11 and on the bridge

work 12 as usual. The grate-bar is hollow and has on its under side and near the front end an air inlet 13 while the outlet is through the air distributor 14 which projects from the rear part of the grate-bar to a point above the normal coal bed, where it has outlets 15, the air distributor being preferably closed at the top so that the heated air will issue, mingle with the gases of the furnace, and the combustible material to be consumed. As this air distributor is likely to be burned out before the body of the grate bar, I prefer to make it detachable, and to this end it has on the front lower edge, a hook or lug 16 adapted to enter the opening in the grate-bar and hook beneath the top surface of the grate-bar, while on the opposite lower edge is a lug 17 adapted to rest in a slot 18 in the grate-bar, in which the lug may be fastened by a transverse bolt 19, or by any equivalent fastening.

The furnace has the usual ash-pit door 20, and this door is provided with a common form of draft regulating slide 21. The fire-box has also the customary door 22 which has a sight hole closed by mica 23 and a draft regulating slide 24. It will be seen that the air entering the ash-pit will pass up through the grate-bar and through the air distributor 14 and be mingled with the coal gases so as to promote combustion, and the fireman can look through the mica 23 and see just the actual appearance of the fire, and by manipulating the slides 21 and 24, can provide for the correct admixture of gases. This is more important than would at first sight appear, because if it is necessary to open the door 22 to see how the fire looks, the great inrush of air has such an effect that the fireman really does not know the normal condition of the fire-box.

My invention is not limited to the particular furnace, grates and boilers shown, and obviously the idea can be applied to grates of many varieties without affecting the principle of the invention. Where, however, the air distributor 14 is used, it is better to have the air distributor flattened and with the longest diameter arranged parallel with the draft or smoke exit so that as little obstruction as possible will be offered to the furnace draft.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent:—

In a furnace; the combination of a hollow grate bar having an inlet at its front end

and lower edge, and an outlet near the rear part thereof, said bar having a slot in its upper surface near said rear outlet, and a detachable air distributor adapted to form a
5 continuation of said rear outlet, said air distributor having lugs upon its lower edge, one of said lugs being adapted to hook be-

neath the top surface of said bar and the other lug to fit said slot and be detachably held in place therein.

CARL NORDELL.

Witnesses:

WARREN B. HUTCHINSON,
FRANK L. STUBBS.