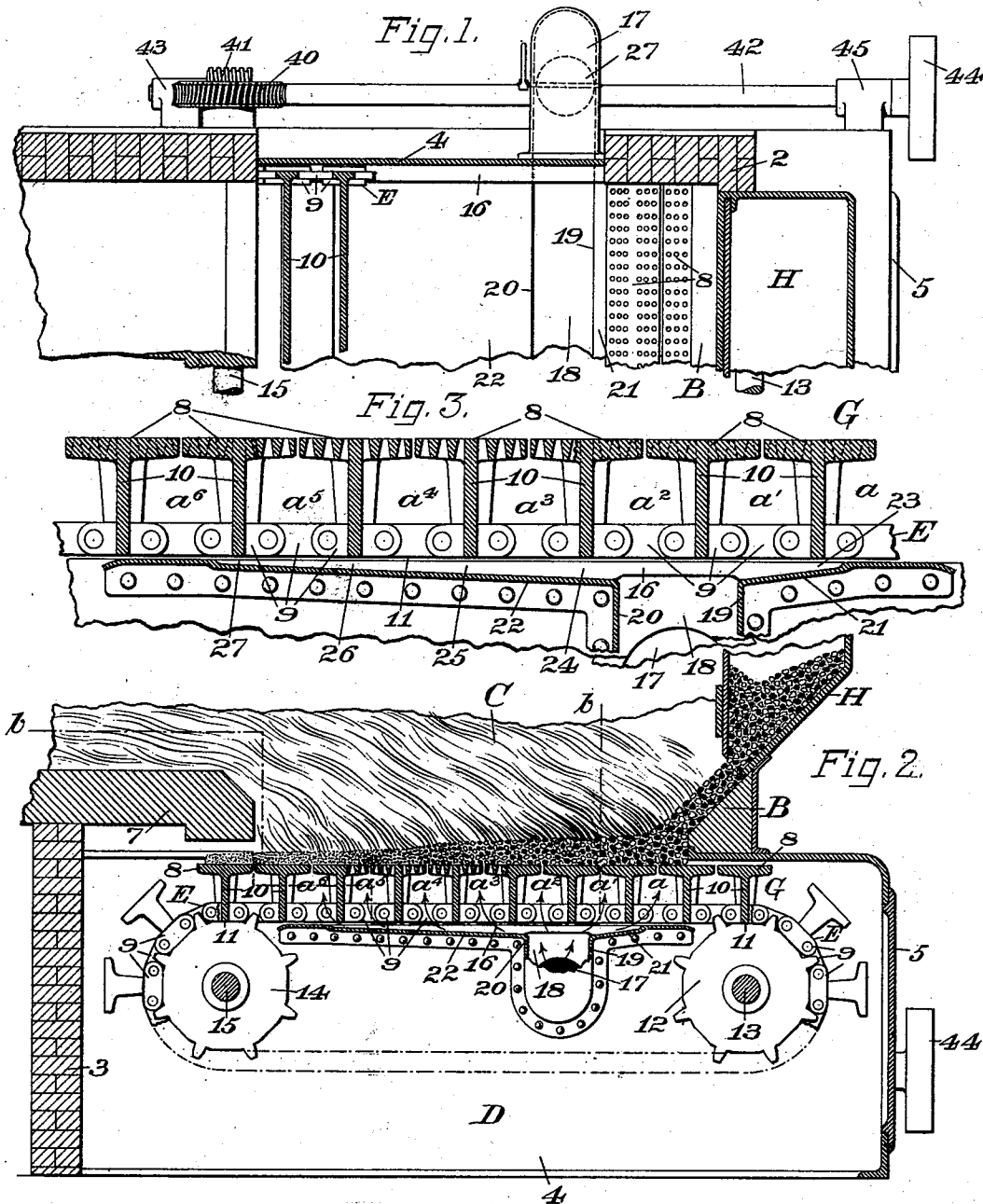


(No Model.)

E. B. COXE.
FURNACE.

No. 510,577.

Patented Dec. 12, 1893.



Witnesses:
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UNITED STATES PATENT OFFICE.

ECKLEY B. COXE, OF DRIFTON, PENNSYLVANIA.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 510,577, dated December 12, 1893.

Application filed July 26, 1893. Serial No. 481,525. (No model.)

To all whom it may concern:

Be it known that I, ECKLEY B. COXE, a citizen of the United States, residing at Drifton, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

This invention relates to that class of traveling-grate furnaces described and claimed in the Letters Patent of the United States No. 499,716, granted to me June 20, 1893; the object being to provide a furnace of that class in which the successive air-blasts of the required varying pressures may be obtained by improved means that are simple in construction and effective in operation.

In the drawings accompanying and forming a part of this specification, Figure 1 is a sectional plan view of a portion of a furnace embodying my present improvements. Fig. 2 is a sectional side elevation of the same. Fig. 3 is an enlarged view, similar to a portion of Fig. 2, for more clearly illustrating the essential features of my present improvement. In Fig. 1, the parts are shown broken away down to the dot-and-dash line *b-b*, Fig. 2, for the purpose of more clearly illustrating the details of the structure.

Similar characters designate like parts in all the figures.

The furnace in connection with which my present improvements are shown, is or may be, as to the general construction and arrangement thereof, substantially the same as the one described in my aforesaid Letters Patent No. 499,716.

The furnace-chamber C extends from the bridge-wall 7 forwardly to the front-wall of the furnace, which, in the preferred form thereof herein shown, consists of the ignition-block B and the fuel-supply hopper H; the sides of the furnace are inclosed by the usual walls, one of which is partially shown at 2, Fig. 1.

The grate-mechanism is placed below the furnace-chamber the grate-bars forming a floor therefor, and is usually inclosed by suitable walls or framework for supporting the furnace structure and preventing leakage of the air-blast. The rearward end of the grate-mechanism chamber D is shown closed by the wall 3, the forward end being closed by the

plate or door 5, and the sides being closed by walls, one of which is designated by 4 in Figs. 1 and 2.

The grate-mechanism consists of an endless traveling grate, designated in a general way by G, wheels and shafts for carrying said grate, and means for actuating said shafts. The endless grate is shown supported on the chain-wheels 12 and 14 fixed on the shafts 13 and 15 respectively, these shafts being supported in any suitable bearings carried by the framework of the furnace structure. As a means for actuating the grate-mechanism, the shaft 15 is shown provided, on its projecting outer end, with the worm-wheel 40, which meshes with a worm, 41, that is fixed on a shaft, 42, supported in bearings 43 and 45, and operated by means of a driving-pulley, 44. This driving-mechanism is or may be substantially the same as described in my aforesaid Letters Patent. The traveling grate G is shown consisting of a series of similar floor-plates 8, which may be formed on (as herein shown) or attached to, the grate-beams 10, which are connected at each end thereof by the links 9 of the endless chain (or chains) E, in the manner described in my prior application, Serial No. 472,264, filed June 12, 1893. Said chains engage with the chain-wheels, or sprocket-wheels 12 and 14 whereby the same are actuated. The several grate-beams 10 come at their lower edges downward to the same horizontal line, in the present instance coinciding with the lower edge of the upper run, 11, of the endless chain, each chain being supported upon a track, as 16, on the inner side of the side-walls, as indicated in Figs. 2 and 3.

In operating the furnace, the air-blast is supplied to the furnace-chamber through an ordinary supply-pipe, 17, in which is shown, in Fig. 1, a valve or damper, 27, for controlling the pressure of the air-blast. The supply-pipe 17 connects with an air-chamber, 18, which is open on the upper side thereof, and whose sides 19 and 20 connect with the inclined distribution-plates 21 and 22, which extend, respectively, forwardly and rearwardly of the furnace, to distribute the air-blast and direct the air-currents upward, as indicated by the several small arrows in Fig. 2, into the air-spaces or chambers, *a*, *a'*, *a*², *a*³, *a*⁴, *a*⁵ and *a*⁶, between the successive bars or beams 10

of the furnace-floor. Owing to the position of said furnace-floor beams, which are immediately over the air-chamber 18 in Fig. 3, the second and third of said air-spaces, a' and a^2 , receive the full pressure of the air-blast; but the first of said air-spaces, a , which is immediately adjacent to the ignition-block B, only receives such an amount of air as will pass through the narrow space at 23, Fig. 3, where- by the pressure is reduced in said air space a to a relatively low pressure. In like manner, the fourth space, a^3 , in Fig. 3, receives its air through the space 24, under the grate-beam; and the succeeding spaces, a^4 , a^5 and a^6 , each receive a lesser supply of air, by reason of the decreasing sizes, respectively, of the spaces under the successive grate-beams at 25, 26 and 27. By this means, the middle portion of the grate, immediately following the point of ignition of the fuel, is supplied with air at the normal pressure of the air-supply, and the successive portions of the grate more distant from the air-chamber 18 are supplied with air at successively reduced pressures corresponding to the distance from said air-chamber and the sizes of the several air-spaces underneath the successive grate-beams. The inclination of the plate 22 relatively to grate forms between said plate and the grate, a passage-way of reducing capacity* from the air-chamber outwardly therefrom.

It will be understood that my present invention is not limited as to all of the claims herein made, to the kind of grate herein shown, but that the grate described in my aforesaid Letters Patent may, in some cases, be substituted for the more improved kind of grate herein described.

Having thus described my invention, I claim—

1. In a furnace, the combination with a traveling grate, and with means for actuating the same, of an air-supply chamber underneath the grate at one point in the length

thereof and communicating with more distant portions of the grate through a passage-way of reducing capacity from the air-chamber outwardly therefrom, substantially as described.

2. In a furnace, the combination with a traveling grate, comprising a series of adjacent grate-bars, of the air-chamber underneath the grate and communicating with one or more of the spaces underneath said bars, and the distribution plate extending from said chamber underneath the grate-bars beyond said chamber and having the air-passages between said plate and the successive grate-bars of successively reduced capacities, substantially as described and for the purpose specified.

3. In a furnace, the combination with a traveling grate, comprising a series of grate-beams provided at their upper edges with plates forming a continuous furnace-floor, and with means for carrying forward the grate, of the air-supply chamber and the air-distributing plates extending one forwardly and one rearwardly of said chamber, whereby one portion of the grate is supplied with air at a reduced pressure, a succeeding portion supplied with air at the normal pressure of the air-blast, and other successive portions supplied with air at successively reduced pressures, substantially as described.

4. In a furnace, the combination with a traveling grate, comprising the beams 10 carried by chains connecting the beams and provided with fuel-supporting plates, of the distributing plate 22 inclined to the traveling grate and connecting at its lower end with an air-supply chamber, substantially as described.

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