

(No Model.)

F. H. RICHARDS.

FURNACE FLOOR FOR TRAVELING GRATE FURNACES.

No. 535,402.

Patented Mar. 12, 1895.

Fig. 1.

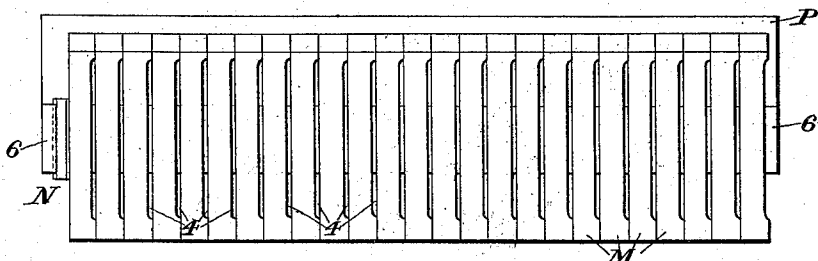
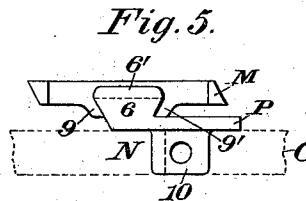
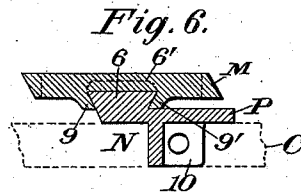
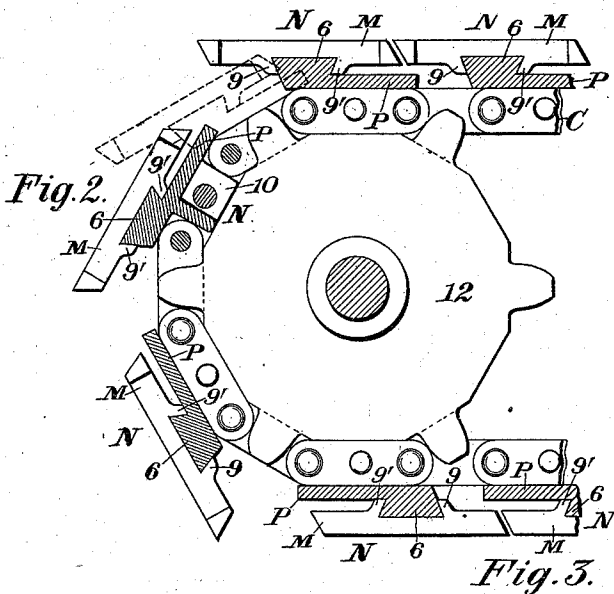
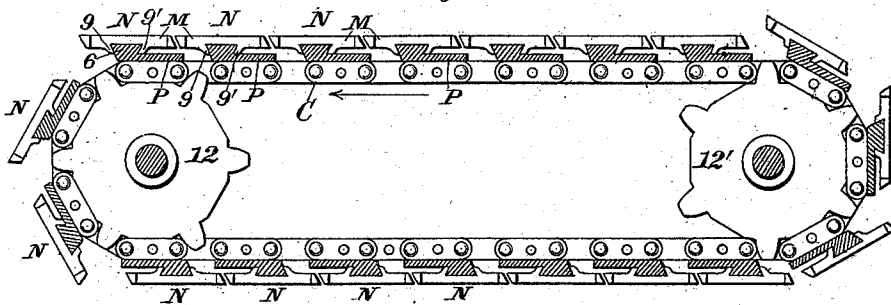
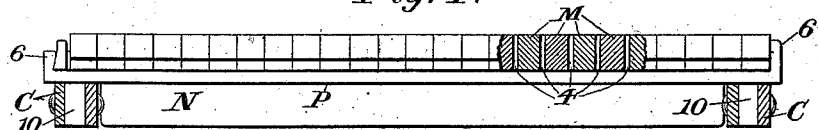


Fig. 4.



Witnesses:

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FURNACE-FLOOR FOR TRAVELING-GRATE FURNACES.

SPECIFICATION forming part of Letters Patent No. 535,402, dated March 12, 1895.

Application filed August 8, 1894. Serial No. 519,730. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Furnace-Floors for Traveling-Grate Furnaces, of which the following is a specification.

This invention relates to furnace-floors for traveling grate furnaces, and is in the nature of an improvement upon the traveling grates described in Letters Patent of the United States Nos. 515,656 and 515,657, granted to Eckley B. Coxe February 27, 1894, to which reference may be had.

The principal object of this present invention is to furnish a traveling furnace-floor or grate of the class described in the aforesaid patent, comprising a series of floor-sections, each section consisting of a floor-beam having a transverse plate at its upper edge which constitutes the lower floor-plate of the furnace-floor, and each floor-beam carrying a series of grate-bars which constitute the upper floor-plates of the furnace-floor, and each set of which upper floor-plates extend forward beyond the lower floor-plates of the floor-beam carrying the next preceding set of upper floor-plates; so that when the furnace-floor, during its traveling movement, turns downward in passing from the upper run to the lower run thereof, the spaces or openings between the successive floor-sections will be fully covered so as to prevent ashes or cinders from falling through said openings to the space within the circuit of the traveling furnace-floor or grate.

Another object of the invention is to so construct the floor-beams that the lower floor-plates thereof will have a wide bearing at opposite ends upon their carrier chains, and so that the grate-bars or upper floor-plates carried by said floor-beams will lie in a plane in close proximity to said chains, to thereby secure compactness, stability and cheapening the cost of manufacture.

In the drawings accompanying and forming part of this specification, Figure 1 is a sectional side elevation of an endless traveling grate or furnace-floor constructed and organized in accordance with my present inven-

tion, said figure showing the grate carried upon actuating rollers or chain-wheels. Fig. 2 is a sectional side elevation of a portion of said endless grate, upon an enlarged scale, one of the carrier-chain links being removed. Fig. 3 is a plan view of one of the grate-sections comprising a grate-beam and a series of grate-bars which are removably secured to said beam. Fig. 4 is a sectional side view of one of the grate-sections, showing its connection with the carrying-chains. Fig. 5 is a side view of one of the grate-sections, a portion of the carrying-chain being represented by dotted lines. Fig. 6 is a cross-sectional view of one of said grate-sections, a portion of the carrying-chain being represented by dotted lines. Fig. 7 is a sectional side elevation of a portion of an endless grate, illustrating a slight modification in the construction and organization thereof.

Similar characters designate like parts in all of the figures.

My present invention particularly resides in a novel and improved construction and organization of certain of the elements of the traveling grate, as will be hereinafter more fully described.

In the form thereof herein shown, the traveling grate or furnace-floor, as in the Patent No. 515,656, hereinbefore referred to, comprises a series of successive floor-beams or grate-beams, N, carried by endless chains, C, running over and driven by chain-wheels, 12 and 12', and a series of grate-bars or floor-plates, M, removably carried by each of said grate-beams, the construction and organization of which will be hereinafter more fully defined.

According to my present invention, each floor-section comprises, essentially, an oblong lower floor-plate, P, which is preferably formed integral with, and practically constitutes the main body of, the floor-beam N, and has at its upper side, at the extreme side edge thereof, a longitudinal floor-plate-supporting rib, 6, and a series of upper floor-plates or grate-bars, M, having downwardly-projecting flanges, 9 and 9', in engagement with the longitudinal rib 6 of the lower floor-plate P, said floor-plates or grate-bars being removably held in place by the interlocking engagement

of the flanges 9 and 9' with said rib 6, said floor-plates or grate-bars M having their fuel-supporting faces preferably in parallelism with the lower floor-plates P. These lower floor-plates P are longitudinally flanged at their under sides and have depending transverse lugs 10 formed at the opposite ends thereof at one side of said flange adapted to be entered between and secured to the links of the endless chains C, as most clearly shown in Figs. 2, 4, 5 and 6.

As shown most clearly in Figs. 1 and 2 of the drawings, the successive floor-beams are preferably carried by alternating links of the chains; and it will be seen by reference to said figures that the lower floor-plate, P, of each floor-beam has, at its under-face, and at opposite ends thereof, a bearing contact, substantially the entire width of said face, with the upper faces of the links carrying said floor-beam; and it will further be seen that the longitudinal upper-floor-plate-supporting rib, 6, of the lower floor-plate has its forward side-edge projected beyond the forward ends of the link supporting said lower floor-plate, and that the upper floor-plates or grate-bars, M, are carried midway of their length upon said rib 6, and have their forward ends projected at or beyond the axial line of the pivotal point of the links carrying the next adjacent preceding floor-beam and the next adjacent preceding series of upper floor-plates. Owing to this construction and organization, it will be seen that the upper floor-plates, M, have their points of support substantially in vertical alignment with the forward pivotal-points of the links which carry the floor-beam with which said upper floor-plates are connected, and that during the traveling movement of the furnace-floor the extreme forward ends of the upper floor-plates of successive floor-beams will, when passing from their upper to their lower-run positions at the forward end of the circuit, overlies for a considerable distance the upper floor-plates of the next adjacent preceding floor-beam.

The upper floor-plates, or grate-bars, M, may be of the same general construction as the floor-plates or grate-bars shown and described in Patent No. 515,656 hereinbefore referred to. As illustrated in the drawings, the longitudinal flanges of the grate-bars or floor-beams will be of substantially the same width as the links of the chains to which said floor-beam is secured, and said floor-beam will be secured to the chain-link so that the lower floor-plate P of said beam will have a bearing at opposite ends thereof at its under side upon the upper edge of the link to which said floor-beam is secured. These floor-plates M and P, respectively, when connected together in the manner described, constitute a nearly continuous "double-plate" furnace-floor.

As illustrated in Figs. 1 and 2, each lower floor-plate is of a width substantially equal to the distance between the rivets of one link

of the endless chain, and is secured to said link midway of the length of said link by means of a rivet extending through said link and the lugs 10, as will be understood by reference to said figures. As shown in said figures, the upper floor-plates or grate-bars, M, of each grate-section are supported midway of their width at the extreme forward side of the lower floor-plate P of the floor-beam, and have their forward ends extended normally beyond the rear side edge of the lower floor-plate of the next preceding grate-section, the ends of each series of floor-plates or grate-bars, being normally, in close proximity to the ends of the next preceding and succeeding series, respectively, sufficient space being left between the ends of said series of grate-bars to permit the requisite volume of air to pass there-through. By this construction and organization it will be seen that the forward ends of the successive series of upper floor-plates at all times project beyond the rearward side edges of the lower floor-plates P of the preceding grate-section, keeping the space between said sections fully covered at all times during the traveling movement of the grate, and thereby preventing fragments of coal, ashes and cinders from falling within the circuit of the traveling grate.

As a means for holding the upper floor-plates in place upon the lower floor-plate P of the grate-section, the rib 6 of said lower floor-plate is transversely flanged at one end thereof, as shown at 6' most clearly in Fig. 4, against which the last upper floor-plate or grate-bar of the series abuts. A portion of the opposite end of the rib 6 is cut away to permit the interlocking engagement of the upper floor-plates with the rib 6 substantially in the manner described in the Patent No. 515,656, hereinbefore referred to, a wedge being provided for holding said floor-plates in bearing contact. Said floor-plates are provided at one side thereof, at opposite ends, with lateral projections adapted to abut against the side face of the next adjacent floor-plate in the manner shown in Fig. 3, to form air-spaces, 4, between adjacent floor-plates.

In Fig. 7 I have shown each floor-beam as having transverse perforated flanges 5 at opposite ends thereof, which extend at one side slightly beyond the rear edge of the lower floor-plate P, and at the opposite end beyond the ribbed side of said floor-plate, which flanges have offsets at one end thereof and are pivotally connected with the adjacent end of the next preceding flange; said flanges 5, when pivotally connected together, constituting, practically, an endless chain of which the several floor-beams constitute an integral part.

Having thus described my invention, I claim—

1. The herein-described furnace-floor for furnaces, it consisting of two endless chains comprising a series of pivotally-connected links and carried at opposite ends of their circuit by suitable chain-wheels; a series of suc-

cessive floor-beams transversely disposed relatively to said chains and each having a lower floor-plate, P, substantially as described, having bearing contacts at its opposite ends and at the under-faces of said opposite ends, respectively, with the upper-faces of opposite links of opposite chains, and each having a longitudinally-disposed grate-bar-supporting rib the forward side-edge of which is projected beyond the forward end of the link upon which the said floor-plate is supported, and a series of grate bars supported midway of their length by the rib of each upper floor-plate and having their forward ends projected beyond the rearward ends of the links carrying the next preceding floor-plate and projecting beyond the rearward ends of said preceding floor-plate, substantially as described and for the purpose set forth.

2. In a furnace-floor for traveling-grate furnaces, two endless chains, each comprising a series of pivotally-connected links, in

combination with a series of parallel lower-floor-plates, P, secured at opposite ends to opposite links of the two chains and having, at their under-faces, and at opposite ends, bearing contacts, approximately the entire width of said under-faces, with the upper-faces of opposite links of said chains, and each having a longitudinal grate-bar-carrying rib at the upper-face thereof whose outer side-edge is at the edge of the forward side-edge of the upper floor-plate, and a series of upper floor-plates, or grate-bars, removably secured to the rib of the lower floor-plate with the forward ends thereof projected beyond the side-edge of the floor-plate which carries the same and overlapping the next adjacent preceding floor-plate, substantially as described and for the purpose set forth.

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