March 18, 1924. 1,487,078

J. H. ROACH

UNDERFEED STOKER FURNACE

Filed Aug. 20, 1920

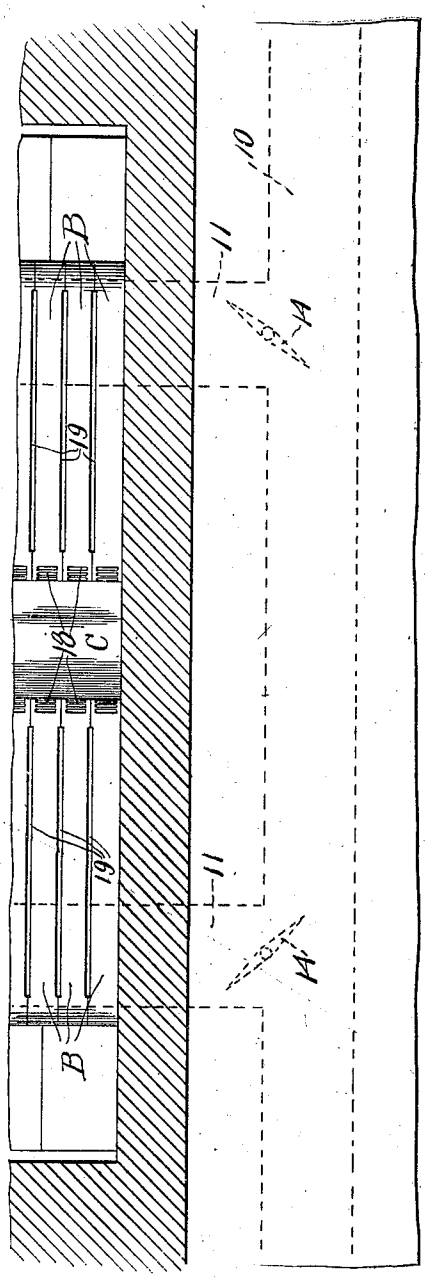


Fig. 1.

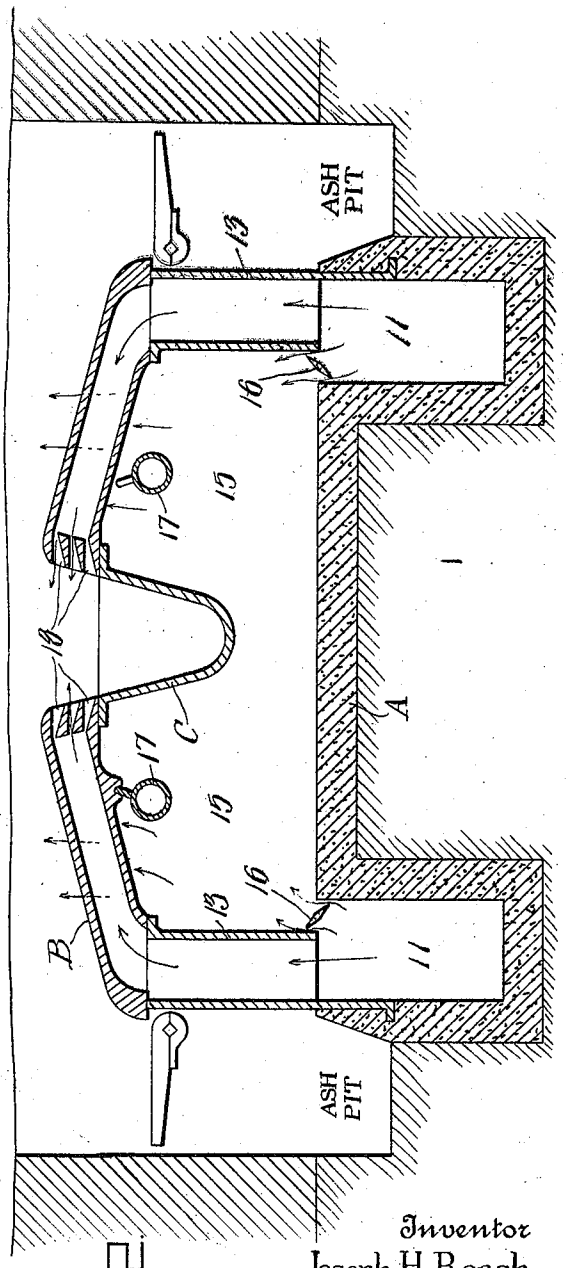


Fig. 2.

Inventor
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By

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Patented Mar. 18, 1924. 1,487,078

UNITED STATES PATENT OFFICE.

JOSEPH H. ROACH, OF BROOKLINE, PENNSYLVANIA; WALTER T. ROACH EXECUTOR OF SAID JOSEPH H. ROACH, DECEASED.

UNDERFEED STOKER FURNACE.

Application filed August 20, 1920. Serial No. 404,738.

To all whom it may concern:

Be it known that I, JOSEPH H. ROACH, a citizen of the United States, residing at Brookline, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Underfeed Stoker Furnaces, of which the following is a specification.

My said invention consists in an improved construction and arrangement of the grate-bars and air ducts for under-feed stoker furnaces whereby a construction is provided in which the air is circulated from the high pressure air chambers through the hollow grate-bars from the foot ends to the head ends thereof and discharged into the retort in a heated condition, and air from the low pressure air chamber is discharged through narrow openings or interstices between the sides of adjacent grate-bars, thereby serving to aid combustion and lower the coking zone in the retort and at the same time tending to reduce the temperature of the grate-bars and prolong the life thereof, all as will be hereinafter more fully described and claimed.

Throughout the description and claim the term "head" end refers to the extremity of a grate bar adjacent the retort, the term "foot" end referring to the opposite end which is adjacent the ash pit.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a fragmentary horizontal section of a furnace showing the grate structure and retort in plan.

Figure 2 a cross section through the same.

In said drawings the portions marked A represents the bed or foundation of the furnace, B the grate-bars, and C the retort or fluid channel, all of which parts are in the main of a type in common use and substantially the same as shown in Letters Patent No. 1,346,465 granted to me on July 13, 1920.

In my present construction, however, air comes through a main air duct 10 into the high pressure air chambers 11 positioned under the foot ends of the hollow grate-bars B and communicating therewith through a hollow wall or conduit 13 on which said grate bars rest at their foot ends. The passage of the air from the main air duct 10 to the high pressure chambers 11 is controlled by dampers or gates 14. A portion of the air from the high pressure chambers 11 is adapted to pass into the low pressure chamber 15 under the grate-bars, the amount of air so passing being controlled by dampers 16 positioned in openings between said chambers 11 and 15 as shown.

The grate-bars B are mounted so that alternate grate-bars will reciprocate, being connected to rock-shafts 17, as is common and illustrated in my above mentioned Letters Patent. The head ends of said grate-bars are formed with tuyère openings 18 through which the air passes into the retort C and air passes from the low pressure chamber 15 through the interstices 19 between said grate-bars into the fuel thereon. By this means the air before going into the retort is heated to a very high temperature in its passage through the grate-bars 12 and because of said high temperature not only facilitates combustion of the coal in the retort but serves to lower the zone of ignition thus increasing the coking capacity of the retort and the furnace. At the same time, the air passing through said grate-bars has a cooling effect thereon, and likewise the air passing from the low pressure chamber 15 between said grate-bars, thus tending to keep said grate-bars at a comparatively low temperature, which serves to prolong the life thereof.

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

In a furnace a rigid foundation, an elongated retort a low pressure chamber beneath the retort, grates at opposite sides of the retort each comprising spaced hollow grate-bars open at both ends, said grate-bars communicating at one end with the retort, high pressure chambers in the foundation parallel to said retort and open at the top, conduits supported at the outer side of said high pressure chambers and extending nearly across the same whereby passages are provided leading to a low pressure chamber beneath the grates and the retort, said con-

duits opening at their upper ends into said grate-bars, and pivoted dampers extending parallel to said retort between the adjacent inner walls of the conduits and the high pressure chambers respectively, substantially as set forth.

In witness whereof, I have hereunto set my hand and seal at Philadelphia, Pennsylvania, this 19th day of August, A. D. nineteen hundred and twenty.

JOSEPH H. ROACH [L. S.]

Witnesses:
JOSEPH C. LAIRD,
P. E. SMITH.