

F. A. DALEY.
FURNACE.

APPLICATION FILED JUNE 9, 1910.

997,604.

Patented July 11, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

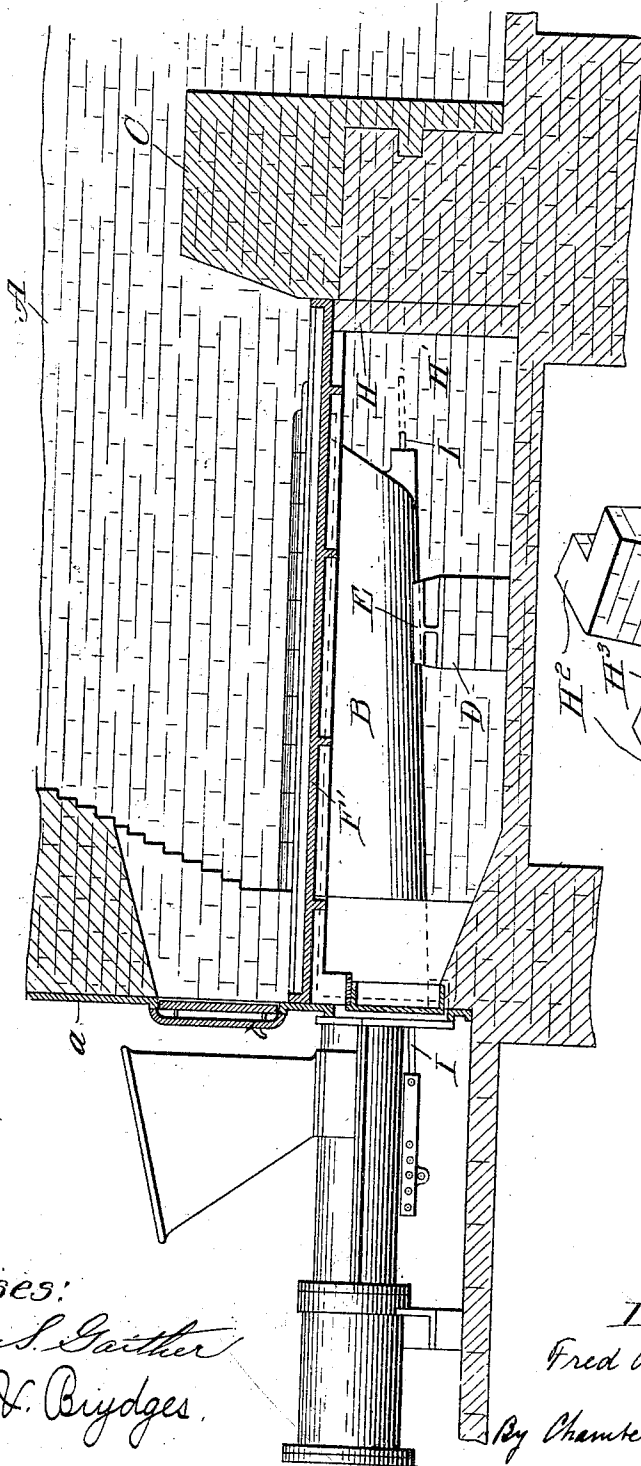
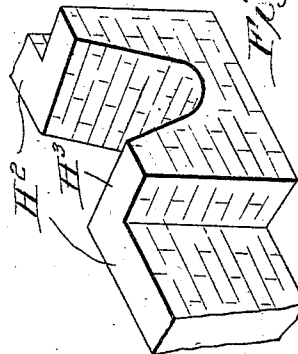


Fig. 6.



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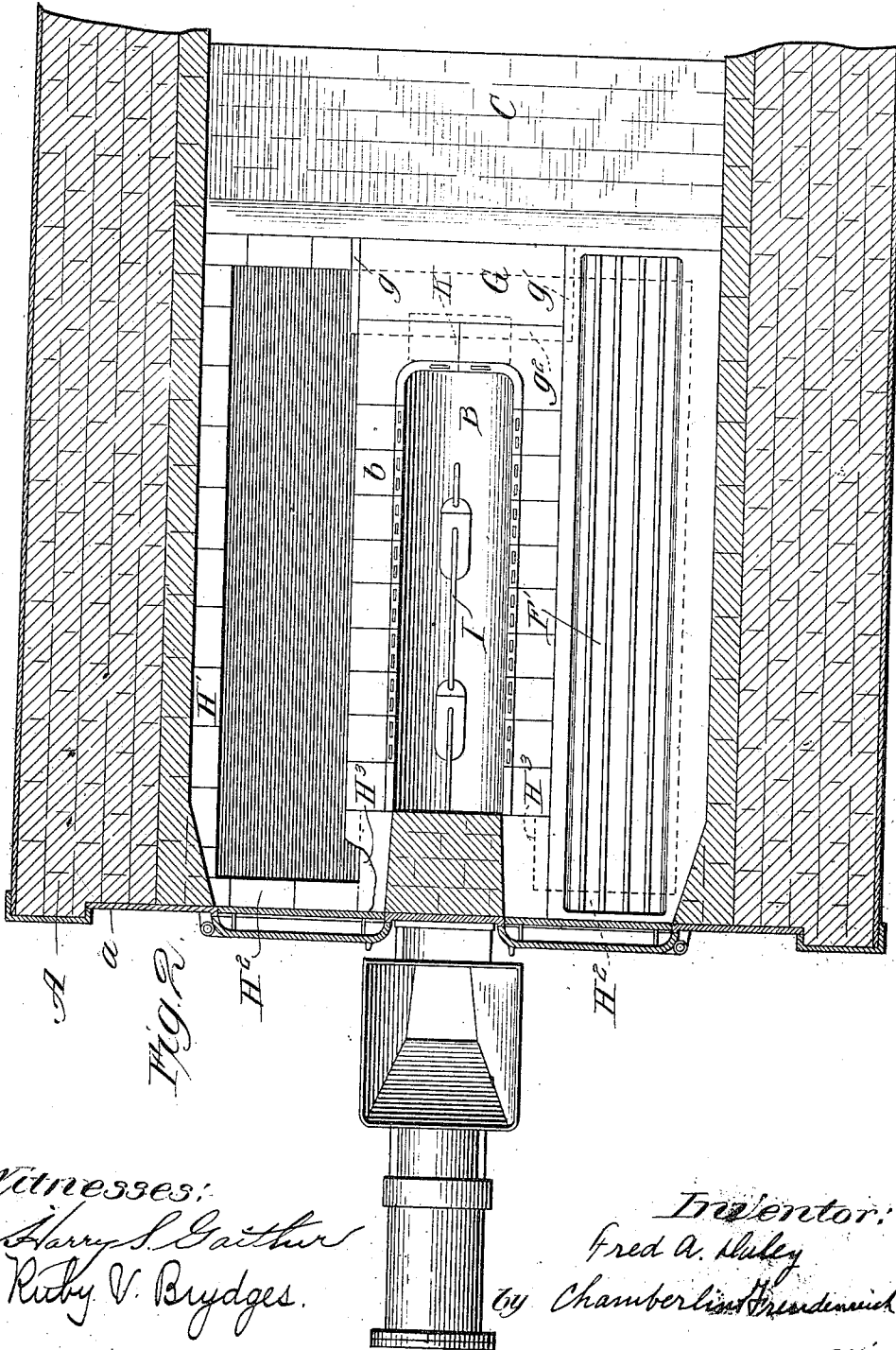
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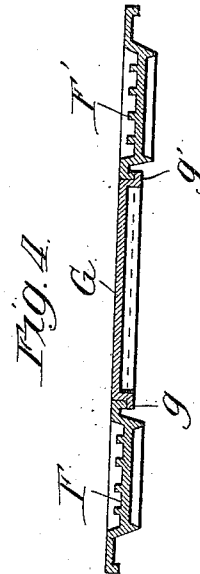
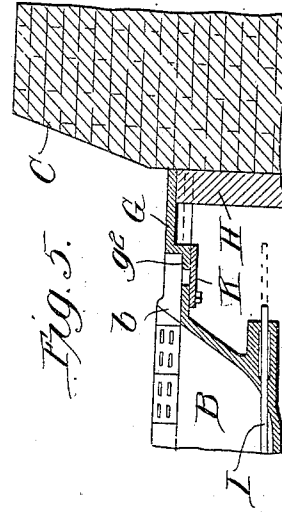
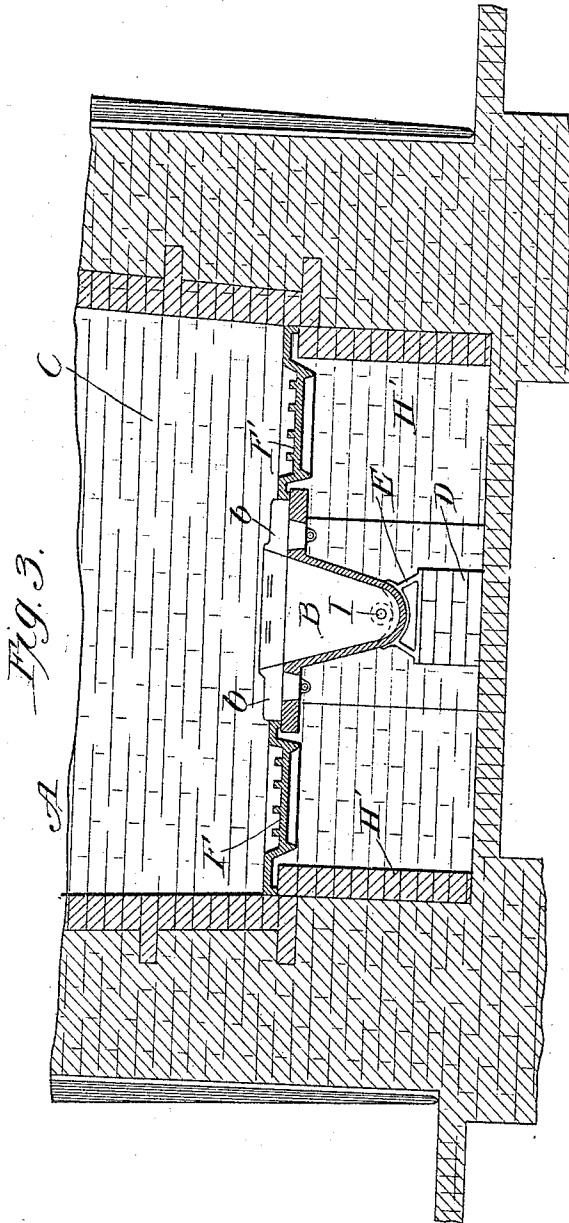


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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

FRED A. DALEY, OF CHICAGO, ILLINOIS, ASSIGNOR TO UNDERFEED STOKER COMPANY
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FURNACE.

997,604.

Specification of Letters Patent. Patented July 11, 1911.

Application filed June 9, 1910. Serial No. 566,066.

To all whom it may concern:

Be it known that I, FRED A. DALEY, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Furnaces, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

I have found that it is desirable, in underfeed stokers of the type disclosed and claimed in my Patent No. 644,644, to have the dead plates extend considerably beyond the rear end of the retort. This may of course be done by making the supporting wall for the rear end of the retort wide enough to permit the extended parts of the dead plates to lie thereon, but such an arrangement possesses several disadvantages. In the first place, the use of a supporting wall for the rear end of the retort makes it necessary to form a pocket in the wall in rear of the pusher rod so as to permit the latter to play back and forth. As the pusher rod reciprocates it carries more or less fine coal dust through the opening in the retort in which it plays; and this dust collects in the pocket after a time to a sufficient extent to interfere with the operation of the rod and make it necessary that the pocket be cleaned out. Again, by having a considerable dead plate area overlying the supporting wall, where there is no chance for the heat to be dissipated so as to permit this portion of the dead plates to remain cool, considerable difficulty is experienced due to over-heating and consequent warping and burning out of the rear portions of the dead plates. These objections are also present where any considerable dead plate area is covered by the supporting wall, so as to keep the cooling air away from it.

The present invention has for its main object to produce a construction and arrangement wherein as much dead plate area as is desired may be obtained without removing any considerable portion thereof beyond the reach of the air supplied to the furnace.

The various features of novelty whereby the present invention is characterized will hereinafter be pointed out with particular-

ity in the claims; but for a full understanding of the invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is a longitudinal section through a furnace arranged in accordance with a preferred form of the present invention, the section being taken at one side of the retort; Fig. 2 is a section on line 2-2 of Fig. 1; Fig. 3 is a transverse section; Fig. 4 is a transverse section through the dead plates in rear of the retort, the section being taken approximately on line 4-4 of Fig. 2; Fig. 5 is a central longitudinal section taken through the rear end of the retort and adjacent dead plate; and Fig. 6 is a perspective view of the portion of the front wall surrounding the retort.

Referring to the drawing, A represents a furnace and B the retort of an underfeed stoker associated with the furnace.

C is a bridge wall in rear of and at some distance removed from the retort.

In accordance with the present invention the inner end of the retort is supported upon a pedestal arranged beneath the same; the pedestal illustrated consisting of a short masonry column D having a metal cap or saddle E shaped to conform to the bottom of the retort. It will of course be understood, however, that the pedestal may be formed in any suitable way.

F and F' are dead plates arranged at the sides of the retort and extending from the front of the furnace into proximity to the bridge wall.

G is a third dead plate lying between the bridge wall and the rear end of the members F and F'.

By supporting the retort upon a pedestal, it becomes unnecessary to build up a wall directly adjacent to the rear end of the retort; but instead, it is sufficient to provide a supporting shoulder at the front of the bridge wall upon which the rear ends of the dead plates may lie. Such a supporting shoulder can conveniently be formed by building a shallow wall H of the desired height directly against the front of the bridge wall.

As in the patent to which reference has been made, the ash pit beneath the dead plates and around the retort serves as a

chamber into which air under pressure is introduced and from which it flows into the combustion chamber through the twyer blocks *b* at the top of the retort. It will thus be seen that all of the dead plate area in rear of the retort except the narrow strip lying upon the ledge formed by the top of the wall *H* is in contact with a constantly changing volume of air so that this portion of the dead plates, as well as that at the sides of the retort, is kept comparatively cool during the operation of the furnace, and the life thereof is greatly prolonged. Furthermore there is a comparatively large free space in rear of the retort in which the end of the usual pusher rod *I* may play without fear of meeting with any obstruction. The fine dust which is discharged through the pusher rod opening drops directly into the ash pit and can readily be removed.

Figs. 4 and 5 illustrate the relations between the dead plates *F*, *F'* and *G*, as well as the manner of supporting the front end of the member *G*. It will be seen that the member *G* is provided with laterally projecting flanges *g* and *g'* at the sides thereof, these extending respectively beneath the adjacent edges of the dead plates *F* and *F'*. At the front of the member *G* is another flange *g*² which projects underneath the twyer blocks at the rear end of the retort. A plate *K* is secured to the rear end of the retort so as to project beneath the flange *g*² and prevent the front end of the member *G* from dropping down.

There is another advantage which may be obtained from supporting the rear end of the retort upon a pedestal. It is a practice to make the retorts in furnaces of this kind shallower at the rear than at the front so that if the top of the retort is horizontal, the bottom thereof rises gradually from the front to the rear. It is therefore possible to secure a nice adjustment by simply shifting the pedestal toward the front or toward the rear and the retort can consequently be set very quickly and without taking pains to make the vertical dimensions of the pedestal extremely exact.

It is difficult to obtain a tight joint around the stoker at the point where it passes through the front wall *a* of the furnace and heretofore it has been customary to build a comparatively wide supporting wall across the front end of the furnace so as to secure considerable longitudinal depth to the joint between the stoker and the wall at this point. This arrangement prevents the air in the wind box from coming in contact with a considerable area of dead plate at the front end of the furnace, so that the dead plates at this point do not have the benefit of the cooling action of the air in the wind box.

In accordance with another feature of the

present invention, the entire supporting wall, both at the sides and at the front of the furnace, is made shallow the same as the rear supporting wall *II*. The side supporting walls are indicated at *H'*, *II'* and the front supporting wall at *H*². In order to secure the desired depth of joint at the front, the wall *H*² is provided with an inwardly projecting trough-like section *II*² which surrounds the sides and bottom of the retort but does not extend laterally farther than is necessary to give the requisite strength to the trough. In this way the front ends of the dead plates are fully exposed on the underside, except where they rest upon the narrow supporting surfaces, and are consequently subjected to the cooling influence of the air in the wind box, without in any way detracting from the tightness of the joint around the stoker or affecting the rigidity of the setting at this point.

It will now be seen that the present invention makes it possible to produce a stoker which can be set accurately with ease and convenience, one in which the life of the dead plates is greatly prolonged, and one in which the operation is satisfactory and reliable.

While only a single preferred form of my invention has been illustrated and described, it is not my intention to limit the present invention to the exact construction and arrangement of parts or to the particular type of furnace illustrated and described; but I desire to cover all forms and arrangement which fall within the terms of the definitions of my invention constituting the appended claims.

What I claim is:

1. In a stoker, a retort having an inclined bottom, and a pedestal having a correspondingly inclined seat arranged beneath the retort, said pedestal being adjustable longitudinally of the retort, the retort resting upon said seat in the pedestal.

2. In a furnace, inclosing walls, a stoker apparatus including a retort extending through the front wall of the furnace, dead plates at the sides and in rear of the retort, and a shallow supporting wall arranged within said inclosing walls beneath the edges of the dead plates, the front member of said supporting wall having a trough-like section projecting inwardly therefrom and extending around the bottom and sides of the retort.

3. In a furnace, inclosing walls, a stoker apparatus including a retort extending through the front wall of the furnace, dead plates at the sides and in rear of the retort, a pedestal beneath the retort near the rear end thereof, and a shallow supporting wall arranged within the inclosing walls beneath the edges of the dead plates, the front member of said supporting wall having an in-

wardly projecting trough-like section extending around the bottom and sides of the retort.

4. In a furnace, a retort, dead plates extending along the sides and across the rear end of the retort, a pedestal arranged beneath the rear end of the retort for supporting the same, and a shallow supporting wall lying beneath the outer edges of the dead plates at the sides and in rear of the retort, there being also a shallow supporting wall arranged beneath the front ends of the dead plates, the latter supporting wall having an elongated trough-like section projecting inwardly therefrom and extending around the bottom and the sides of the retort, the walls of said trough-like section being shallow measured transversely of the retort.

5. In a furnace, a retort, a shallow wall extending transversely at the front end of the retort, shallow side walls extending longitudinally of the retort at some distance removed therefrom, a shallow rear wall extending across the rear end of the retort at some distance removed therefrom, said walls extending approximately to the top of the retort, a pedestal under the rear end of the retort, and dead plates bridging the spaces between the retort and said walls and being supported by said retort and by said walls.

In testimony whereof, I sign this specification in the presence of two witnesses.

FRED A. DALEY.

Witnesses:

WM. F. FREDENREICH,
RUBY V. BRIDGES.