This invention relates to coal dust furnaces and more particularly to coal dust furnaces for flue boilers, marine boilers and the like, and consists essentially therein that the combustion space is positioned within a refractory lining provided at the front part of the flue and that said refractory lining is constructed to form an air admission space which is in connection with said combustion space by means of slots or the like, such as is generally the case in ordinary coal dust furnaces for flue boilers.

My invention consists further in providing a channel for clinker within said refractory lining at the under part of the flue.

For the construction of coal dust furnaces for flue boilers it had been proposed to arrange the combustion space at the front part of the flue. In a construction of this kind, however, there will be considerable difficulties, because a complete combustion cannot be attained in the part of the flue which is provided with a refractory lining with the result that clinker will be formed at this part of the flue.

These disadvantages are avoided by my invention according to which I propose to construct and arrange the aforementioned refractory lining in the flue in such a manner that said lining will form an air admission space in proximity to the wall of the flue. This air admission space according to my invention further communicates with the combustion space by means of slots or the like which serve for introducing the secondary air in tangential direction into the combustion space at the periphery of the latter. The aforementioned refractory lining which I arrange according to my invention in the front part of the flue will be heated to a high temperature during operation of the boiler and thus effect a pre-heating of the secondary air, but in addition to this pre-heating it further supplies heat through the air space to the wall of the flue by radiation. By reason of the helical motion of the coal dust mixture and the admission of secondary air as far as to the end of the combustion space the combustion of the coal dust will be carried on within said refractory lining. As a result of this, the coal dust will therefore be most effectively utilized and exploited for heating the boiler with a minimum of space required.

Preferably, the aforementioned refractory lining leaves free a longitudinal channel at the under part of the flue, said channel serving to separate and discharge clinker. An interstice will thus be provided in the aforementioned refractory lining, this interstice preventing second-

ary air currents from entering the combustion space and, besides, effecting cooling of the combustion gases at this place with the result that the clinders produced at this place will be of granulated structure and may be withdrawn from the channel towards the front part of the boiler.

In the drawing which forms part of this specification I have represented an example of construction of a coal dust furnace constructed according to the principles of my present invention, Fig. 1 being a longitudinal section and Fig. 2 a transverse section along line 2—2 of Fig. 1 in the direction of arrows through my new furnace.

The lining a of the flue h is made up from refractory or fireclay bricks in such a manner that there will be left an intermediary space b between said lining and the wall of the flue, said space being in connection with the air supply pipe d. The refractory or fireclay bricks which serve as spacing members are designated by i in the drawing. Surrounding the bricks i is a jacket j for retaining the same in position against the outer peripheral wall of the lining. The lining a is further provided with tangentially directed slots c which serve for the introduction of secondary air into the combustion space k. The mixture of coal dust and air is supplied to the furnace at e. The aforementioned channel which is left free in the refractory lining at the under part of the flue is designated by f in Fig. 2 of the drawing. The clinker will thus deposit within this channel as at this place there will be no secondary air currents which could act upon the mixture of coal dust and air. At this place there will also be an effective cooling and by reason of this the clinders will be of granulated structure and may be drawn out of the channel f towards the clinder door g.

I claim:

1. In a coal dust furnace, a horizontal flue, a transversely slotted cylindrical refractory lining within the front part of the flue, the interior of the lining forming a combustion space for fuel mixtures, said lining having a longitudinal section cut away forming a channel extending the full length of the lining for the collection of clinders, means at the front end of the channel for the removal of clinders in the channel, refractory bricks in spaced apart relation around the lining, a jacket bearing against the bricks enclosing the same and the refractory lining, part of said jacket forming the floor of the channel, said jacket forming also secondary air admission spaces with the bricks and the lining.
2. In a coal dust furnace, a horizontal flue, a transversely slotted refractory lining within the front part of the flue, said lining having a longitudinally extending channel for the collection of clinkers and forming an interior combustion space, a plurality of refractory bricks in spaced apart relation surrounding the outer surface wall of the lining, a jacket enclosing the lining and the bricks forming intermediary air admission spaces between the bricks, said jacket having a portion forming the floor of said channel, and a secondary conduit at the front part of the lining in connection with the air admission spaces for supplying auxiliary air currents through the air spaces and slots into the combustion space of the lining for complete burning of the coal dust therein.

3. In a coal dust furnace, a horizontal tubular combustion chamber flue having an inner circumferential refractory lining, with spaced air entrance openings therein, a substantially concentric enclosing flue wall surrounding the refractory lining and forming with a recessed portion of the inner lining, a channel for the removal of clinkers, a plurality of spaced circumferentially disposed bricks intermediate the exterior of the refractory lining and enclosing flue wall, providing circumferential and longitudinal spaces therebetween, and means at one end of said lining for closing said spaces, and means at the opposite end for guiding air to said spaces whereby the incoming air is pre-heated in said circumferential and longitudinal spaces, and passes therefrom through the air entrance openings of the lining into the interior of the combustion chamber flue.

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