

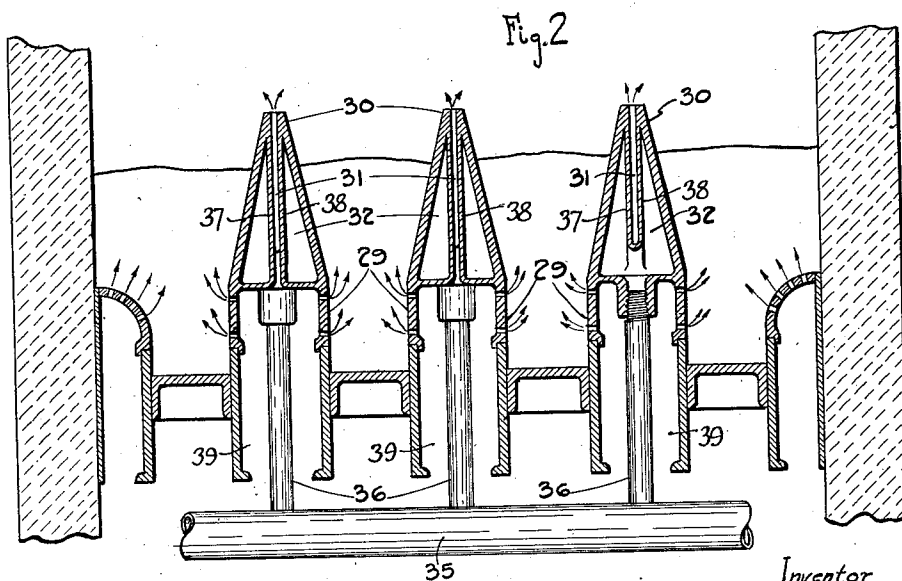
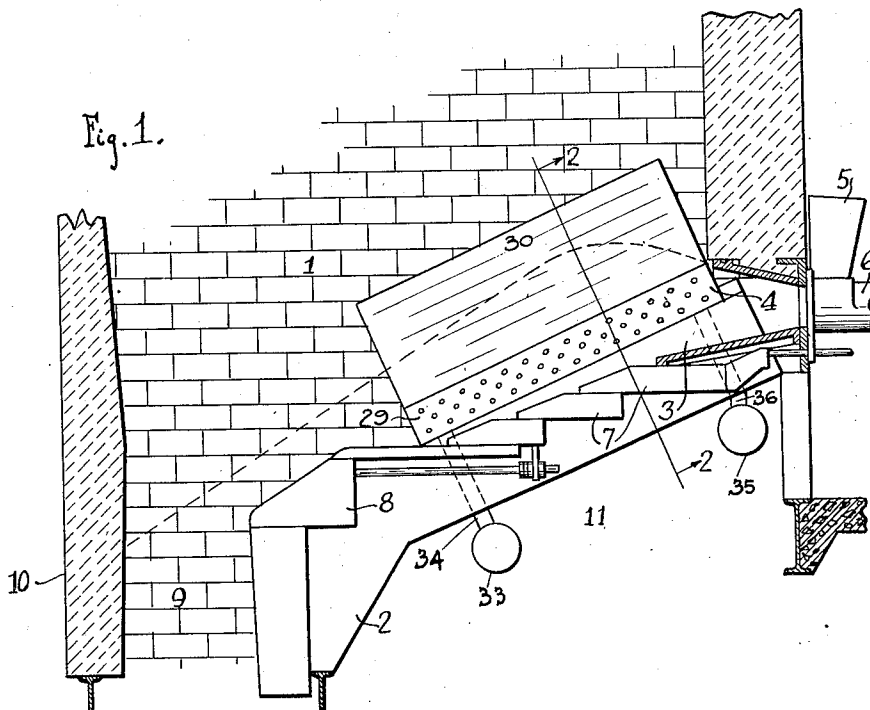
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STOKER FURNACE

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STOKER FURNACE

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3 Claims. (Cl. 122—4)

This invention relates to stoker furnaces, and more particularly to the means for supplying draft air thereto.

In the prior constructions it is customary to force secondary air through the fuel bed and in some cases to add a portion thereof through the walls of the furnace. Both methods in many cases have been found to be objectionable, since by forcing both primary and secondary air through the fuel bed a considerable quantity of the fuel is blown therefrom, especially when the furnace is operating at the higher ratings. This condition not only creates waste, since a large quantity of the fuel so removed from the fuel bed is discharged with the ash or passes out the stack in the form of cinders, but bare spots occur in the fuel bed which reduce the effective area thereof, and as a result the desired steaming rates may not be obtained. In constructions wherein a portion of the secondary air is supplied to the combustion chamber from the walls of the furnace, very little of such air flows inwardly over the fuel bed so as to be effective as secondary air. This is especially true in the larger furnace constructions.

One object of the present invention is to provide generally improved apparatus for supplying secondary air to stoker furnaces which eliminates the above mentioned difficulties, and effects complete combustion of the gaseous products of the fuel as well as cinders and other solid fuel particles suspended in the combustion chambers, thereby insuring efficient operation of the furnace under all conditions of operation.

Another object is to provide means within the combustion chamber and disposed above the fuel bed in such a manner that secondary air may be emitted where it will be most effective, thereby assuring complete combustion of the gaseous products as well as the solid fuel particles driven from the fuel.

Another object is to provide air emitting means above the fuel bed through which a large quantity of the air necessary for complete combustion of the volatile gases may be emitted, thereby reducing the amount of air passing through the fuel bed.

Other and further objects will become apparent as the description of the invention progresses.

Of the drawing:

Fig. 1 is a sectional elevational view taken through one of the retorts of a stoker showing still another form of secondary air emitting device.

Fig. 2 is a view taken substantially along line 2—2 of Fig. 1.

Referring to the drawing, the numeral 1 indicates generally a furnace having provided therein an inclined grate underfeed stoker 2. Stoker 2 comprises alternately disposed retorts 3, and tuyère rows 4. Fuel is supplied to the retorts 3 from a hopper 5 by any suitable fuel feeding mechanism shown at 6, and a series of pushers 7 feed the fuel along the retorts to extension 8 mounted at the rear thereof, which in turn overfeed the fuel into an ash pocket 9 disposed transversely of the stoker between the rear end thereof and a bridge wall 10. During operation of the stoker air is supplied to the tuyères 4 from a plenum chamber 11 located beneath the stoker which in turn is supplied with air under pressure from fans, in a well known manner. Under operating conditions the fuel bed supported on the stoker 2 assumes substantially the contour shown in dotted lines in Figs. 1 and 2.

The intermediate tuyère rows 29 of the stoker 2 are each provided with a vertical extension 30 having a longitudinally extending air passage 31 disposed centrally thereof. The air passages 31 are formed by spaced partitions 37 and 38 extending longitudinally of the extensions 30. The lower ends of passages 31 communicate with the tuyère chambers 39, as shown in Fig. 2. Extensions 30 are provided with water jackets 32 in order to withstand the intense heat of the furnace. Water is supplied to the jackets 32 from a transversely extending header 33 located beneath the stoker, said header being connected to the lower end of each jacket 32 by pipes 34. The upper end of each jacket is connected to a second header 35 by pipes 36. Headers 33 and 35 may be connected to the boiler or to a circulation pump, as desired. Air is supplied to the central chambers 31, as well as to the tuyères 29 from the plenum chamber 11 disposed beneath the stoker.

From the foregoing description of my invention it is seen that it is only necessary to pass through the fuel bed the primary air or the air required to effect partial burning of the fuel. The necessary secondary air, or the air required to effect final burning of the gaseous products, cinders and other solid particles of fuel suspended in the combustion chamber, which perhaps constitutes approximately 30 percent of the total air required for complete combustion, is supplied by means of the secondary air emitting device shown herein, thereby not only insuring complete combustion of the fuel, but efficient operation of the furnace

as well. By employment of constructions of this character, the fuel bed remains intact through the entire operating range of the furnace, and thus economic, as well as efficient operation thereof is assured.

While the embodiment herein described is admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to limit the invention thereto since it may be embodied in other forms, all coming within the scope of the claims which follow.

What is claimed is:

1. A furnace stoker comprising in combination, alternately disposed retorts and tuyère rows, said tuyère rows having a series of openings through which primary air may pass, a source of air supply communicating with said tuyère openings, water cooled extensions provided on said tuyère rows adapted to extend through the upper surface of the fuel bed, longitudinally extending partitions provided in spaced relation in each of said extensions forming long continuous passages for communicating with said source of air supply and through which secondary air may pass, and means for circulating a cooling fluid through said extensions.

2. A furnace stoker, comprising in combination alternately disposed retorts and tuyère units, a source of air supply, each of said units consisting of longitudinally extending supporting members having apertures therein communicating with

said source of air supply and through which primary air may pass, and a substantially vertical longitudinally extending fluid cooled portion adapted to extend through the upper surface of the fuel bed, a pair of spaced longitudinally extending partitions provided in each of said fluid cooled portions forming passages communicating with said source of air supply and through which secondary air may pass, and means for circulating a fluid cooling medium through said fluid cooled portion.

3. A stoker, comprising in combination, alternately disposed retorts and tuyère units extending longitudinally thereof, a source of air supply, each of said tuyère units comprising a supporting portion having apertures therein communicating with said source of air supply and through which primary air may pass, and a vertical longitudinally extending substantially hollow portion adapted to extend through and above the fuel bed, a pair of spaced vertically disposed longitudinally extending partitions provided in each of said hollow portions defining long continuous passages communicating with said source of air supply and through which secondary air may pass, said partitions forming with the outer walls of said units a pair of longitudinally extending chambers, and means for circulating a cooling medium through said chambers.

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