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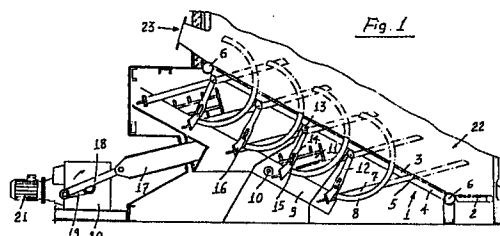
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54 **Boiler specifically designed for burning fat and semifat coals, including an improved cleaning grill.**

57 The invention relates to a boiler adapted to be supplied with fat or semifat coals, that is coals with a high contents of volatile substances which may be self-compacted during the burning starting step so as to prevent, in conventional boilers, a proper fine distribution of the burning air.

The boiler comprises a grill which is mounted on a slanting frame and consists of a plurality of adjoining elements having slots therethrough differently shaped blades are reciprocated, the blades being articulated on a movable frame which may be displaced in parallel planes and parallelly to the grill, by means of a coupling rod-crank mechanism.



Description

BOILER SPECIFICALLY DESIGNED FOR BURNING FAT AND SEMIFAT COALS, INCLUDING AN IMPROVED CLEANING GRILL

BACKGROUND OF THE INVENTION

The present invention relates to a boiler, specifically designed for burning fat and semi-fat coals, provided with an improved cleaning grill.

As is known, fat and semi-fat coals or, in general, coals with a high contents of volatile substances, tend to self-compacting in the burning starting step.

This fact, as it should be apparent, prevents burning air from properly flowing through the fuel pieces which are supplied to the burner, thereby providing a poor burning.

Thus, a great amount of fuel is disadvantageously burnt, which increases the cost of the produced burning heat.

Moreover, because of the above mentioned poor burning, the boiler can not be brought to the desired operation temperature and will be not able of properly processing the thermal exchange fluid.

SUMMARY OF THE INVENTION

Accordingly, the task of the present invention is to overcome the above-mentioned drawbacks by providing a boiler for flat and semi-flat coals which is able to perfectly burn these types of coals.

Within this task, a main object of the present invention is to provide such a boiler for flat and semi-flat coals which is constructionally simple and able to operate in a very flexible and reliable manner.

Another object of the present invention is to provide a boiler for flat and semi-flat coals which may be fitted to the specific volatility rates of the burnt coals.

According to one aspect of the present invention, the above mentioned task and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a burner, specifically designed for burning fat and semi-fat coals, characterized in that it comprises a grill mounted on a slanting frame and consisting of a plurality of adjoining elements provided with slots therethrough differently shaped blades may be reciprocated, said blades being articulated on a movable frame which is able to be displaced parallelly to itself and to the grill, by means of a suitable driving mechanism, preferably of the rod-crank type.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the boiler for fat and semi-fat coals according to the present invention, will become more apparent from the following detailed description of a preferred embodiment of the boiler, being illustrated, by way of an indicative but not limitative example, in the accompanying drawings, where:

fig.1 is a schematic side view illustrating the cleaning grill included in the boiler according to the present invention; and

fig.2 is a cross-sectional view illustrating the same grill.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures of the accompanying drawings, the boiler specifically designed for burning fat and semi-fat coals according to the present invention, comprises a furnace consisting of a grill, indicated generally at (1) which is suitably slanted and ends with a tiltable portion (2) arranged above an ashpit.

More specifically, the grill is formed by arranging one adjoining the other a plurality of square or rectangular elements (3) which are supported in longitudinal rows by pairs of pipes (4) therethrough water or other fluid to be heated is caused to pass.

In this connection it should be pointed out that each grill element is provided with a slot (5) of suitable shape, and that the mentioned water pipes (4), extending with a mutual parallel relationship, lead to end manifold pipes (6).

Through the mentioned slots, rectilinear blades (7) and curved blades (8) may be longitudinally reciprocated.

In particular, these blades are affixed to a frame, or chassis (9), which is able to move parallelly to itself and the grill (1), through bearing members (10) which may slide along corresponding guide pairs (11) parallelly extending along suitably slanted paths.

More specifically, the above mentioned rectilinear blades are directly articulated to the movable frame, whilst the curved blades are coupled to one end of an arm (12) the other end of which is pivoted to a lug (13) which is rigid with the grill (1).

The arms, in particular, are provided, at their end portions bearing said curved blades, with a longitudinally extending slot (14), therein a bush pin (15) is slidingly engaged, coupled near the vertex of a substantially triangular structure (16) rigid with said movable frame.

To the two longitudinal walls of said movable frame corresponding arms (17) are coupled, which are articulated to a rod-crank assembly 18-19 which is driven, through a reducing unit, by means of a motor (21).

The thus constructed assembly is mounted in a burning chamber, indicated overallly at (22), on the upstream wall of which there is formed a suitable loading mouth (23).

In operation, the reciprocating motion of the mentioned movable frame causes the rectilinear blades (7) to rectilinearly move through a portion of the grill forming elements and the curved blades (8) to arcuately move through the other grill forming elements.

Accordingly, the mentioned blades will jointly provide a scissors movement adapted to remove the bed coal sliding on the grill, thereby aiding the burning air flow therethrough and providing a perfect burning of the coal.

It should moreover be pointed out that the possibility is provided of changing the turning speed

of the crank (19) so as to remove the coal bed with the desired frequency, depending on the volatile substance amount present in the used coal.

While the invention has been disclosed with reference to a preferred embodiment thereof, it should be apparent that the disclosed embodiment is susceptible to many modifications and variations all of which come within the invention scope.

said crank in order to remove the coal bed with the desired frequency, depending on the volatile substance contents in said coal.

7- A boiler for fat and semi-fat coals, according to the preceding claims, and substantially as broadly disclosed and illustrated in the figures of the drawings, which form an integrating portion of this patent application.

Claims

1- A boiler, specifically designed for burning fat and semi-fat coals, characterized in that it comprises a grill, mounted on a slanted frame and consisting of a plurality of adjoining elements, provided with slots therethrough blades are able of reciprocating, said blades, of different shapes, being mounted on a movable frame which is able to move parallelly to itself and said grill, by means of a driving mechanism preferably of the rod-crank type.

2- A boiler, according to the preceding claim, characterized in that said grill ends with a tiltable portion, arranged above an ashpit and is formed by a plurality of adjoining square or rectangular elements which are supported, in longitudinal rows, by pairs of pipes therethrough water or other fluid to be heated is caused to pass.

3- A boiler, according to the preceding claims, characterized in that each said grill element is provided with a suitably sized and arranged slot, and in that said water pipes, which extend parallel to one another, lead to end manifold pipes.

4- A boiler, according to one or more of the preceding claims, characterized in that rectilinear blades and curved blades are adapted to longitudinally reciprocate through the slots of said grill elements, said blades being affixed to a movable frame which is able of moving parallelly to itself and the grill, through bearing members which may slide along corresponding guide pairs extending along suitably slanted parallel paths.

5- A boiler, according to one or more of the preceding claims, characterized in that said rectilinear blades are directly articulated to said movable frame, whilst the curved blades are coupled to one end of a respective arm the other end of which is pivoted in a lug rigid with the grill, said arms being provided, at their ends, which support said curved blades, with a longitudinal slot therein there is slidingly engaged a bush pin coupled near the vertex of a substantially triangular structure, rigid with said movable frame, to the two longitudinal walls of which there are coupled corresponding arms, articulated to a rod-crank assembly which is driven, through a reducing unit, by a motor.

6- A boiler, according to one or more of the preceding claims, characterized in that it comprises means for changing the turning speed of

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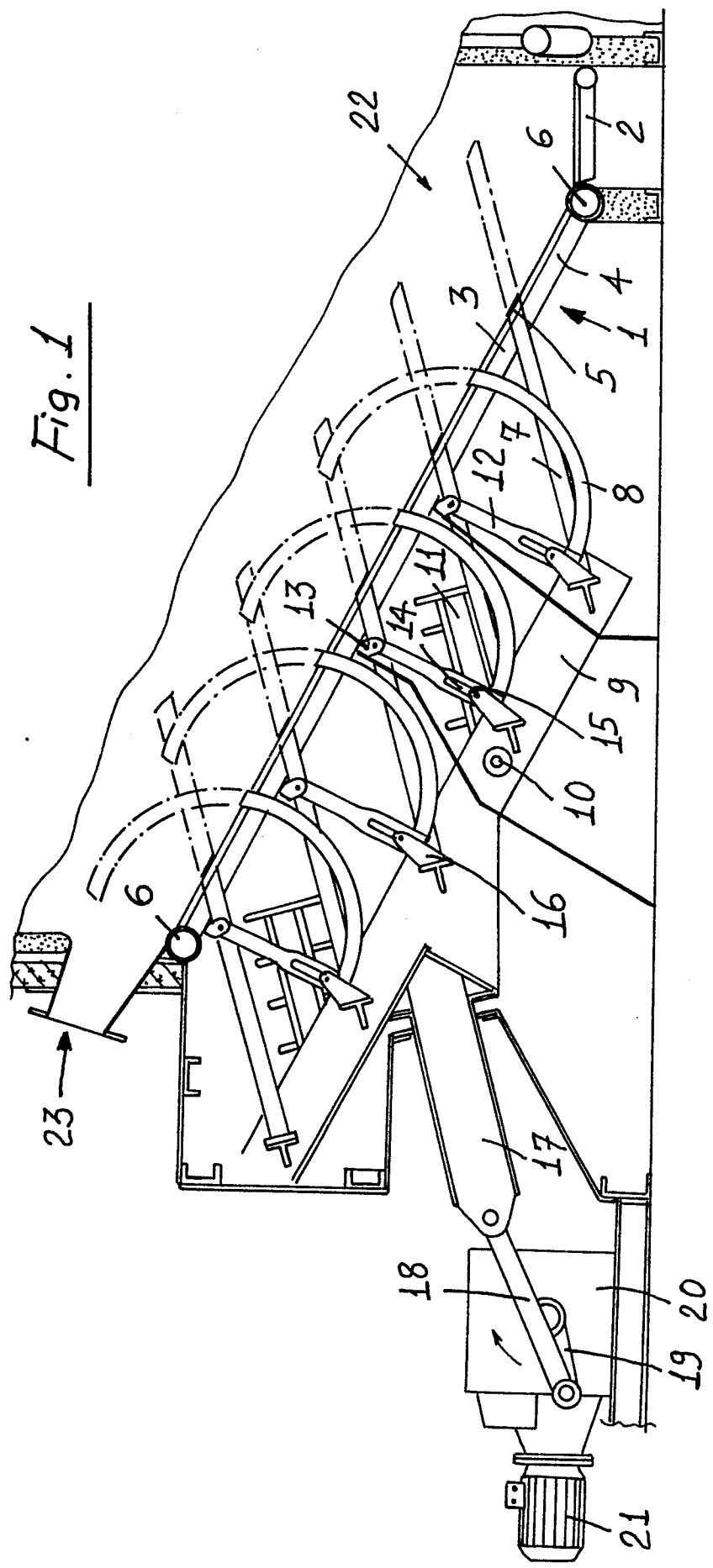
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