April 12, 1932. A. PISCIOTTA 1,853,574

FIVE-CORNERED BUCKWHEAT COAL GRATE

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Fig. 1.

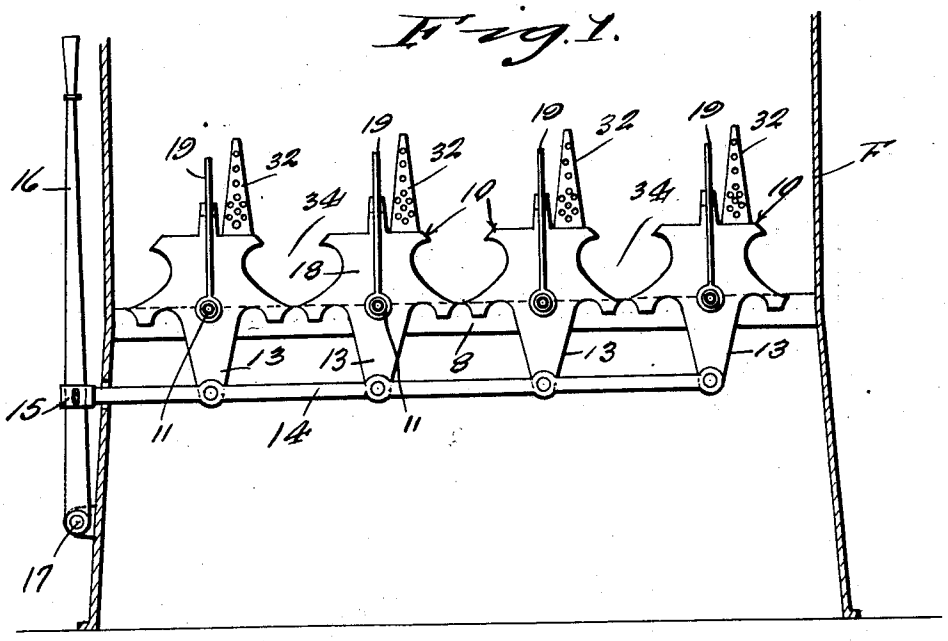

Fig. 2.

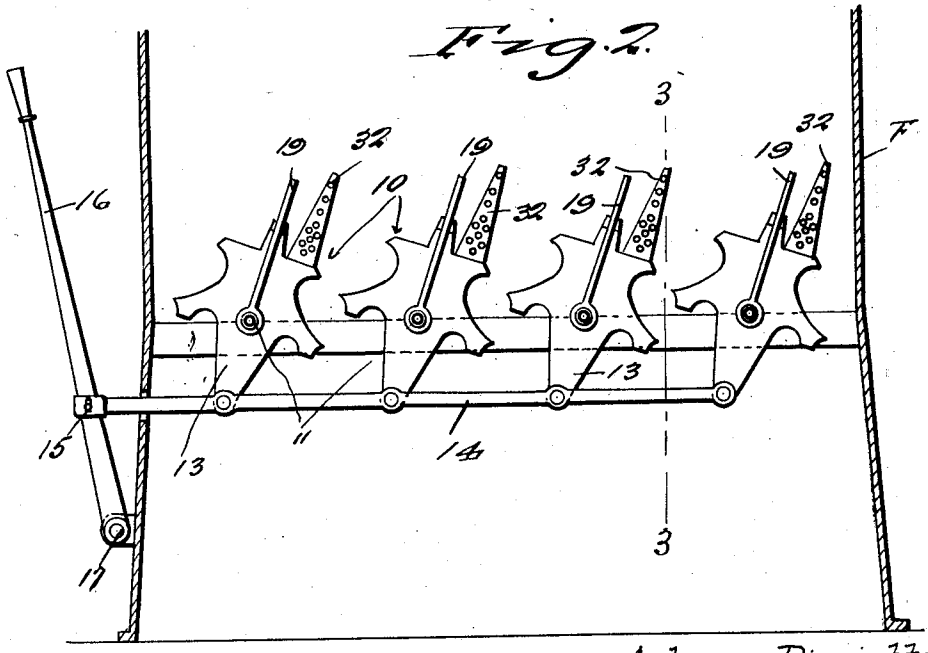

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Fig. 3.

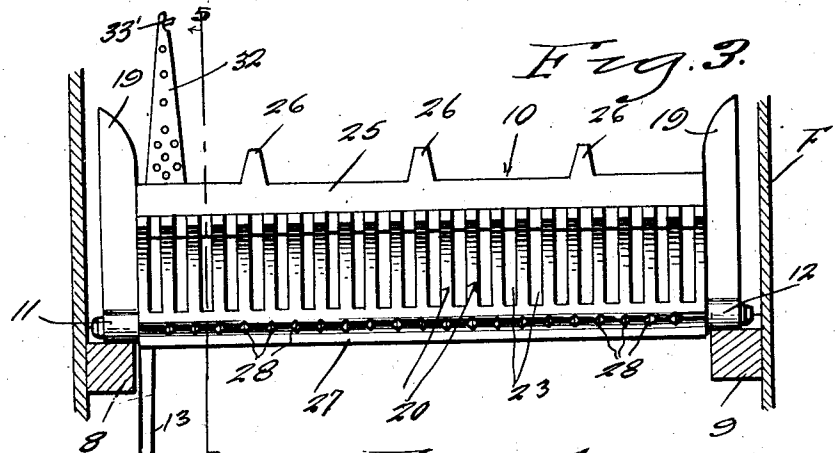


Fig. 4.

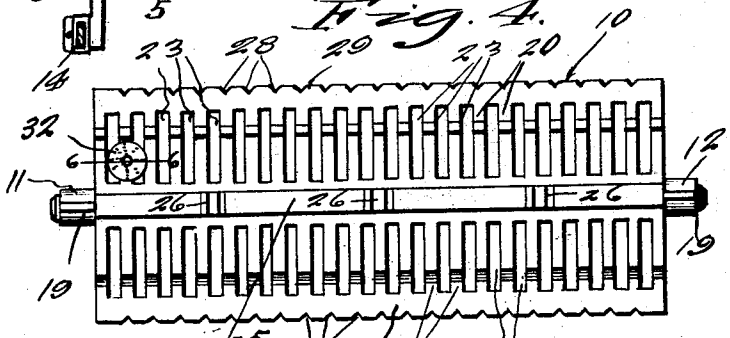


Fig. 5.

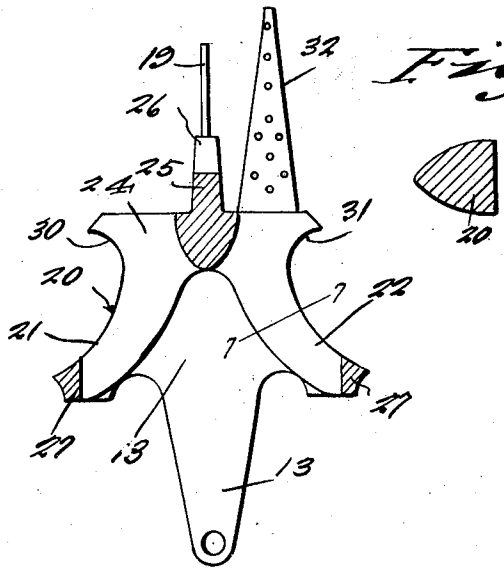
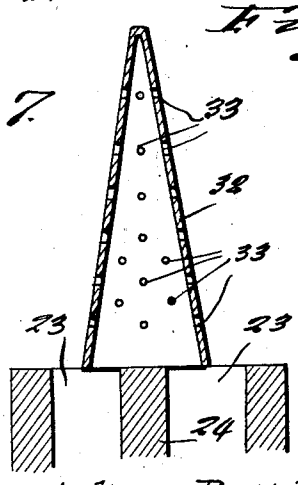


Fig. 7.

Fig 6



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UNITED STATES PATENT OFFICE

ANTONY PISCIOTTA, OF ELMHURST, NEW YORK

FIVE-CORNERED BUCKWHEAT COAL GRATE

Application filed September 26, 1929. Serial No. 395,332.

This invention relates to furnace grates and is particularly adaptable to burning buckwheat coal.

An object of the invention is to provide a grate, the configuration of which provides five points or corners that materially aid in stirring up the fire during the raking operation.

Another object of the invention is to provide projections on the grate bars that rock during the raking operation for the purpose of breaking up clinkers and stirring the bed of coals.

Another object of the invention is to provide a hollow column on each grate that provides interior drafts for the bed of coals and furthermore to provide a grate that is self-raking in operation and that supplies plenty of air for burning buckwheat coal.

Further objects of the invention are to provide, in a manner as hereinafter set forth, a grate of the character referred to, that is strong, compact and durable, thoroughly reliable for its intended purpose, very simple in its method of assembly and comparatively inexpensive to manufacture and install.

With the foregoing and other objects in view, the invention consists of a novel construction, combination and arrangement of parts as will be hereinafter more specifically described and illustrated in the accompanying drawings, wherein is disclosed an embodiment of the invention, but it is to be understood that changes, variations and modifications may be resorted to without departing from the spirit of the claims hereto appended.

In the drawings, wherein like reference characters denote corresponding parts throughout the several views:

Figure 1 is a fragmentary vertical section through a furnace illustrating in end elevation, an application of the present invention therewith.

Figure 2 is a fragmentary vertical section in detail through the furnace similar to Figure 1, illustrating the rocking movement of the grate bars in accordance with the present invention.

Figure 3 is a fragmentary transverse section in detail through a furnace taken substantially on line 3—3 of Figure 2.

Figure 4 is a top plan view of one of the grate bars.

Figure 5 is a vertical section in detail taken substantially on line 5—5 of Figure 3.

Figure 6 is a section taken substantially on line 6—6 of Figure 4.

Figure 7 is a section through one of the legs of the grate taken substantially on line 7—7 of Figure 5.

Considerable difficulty has been experienced in burning buckwheat coal, owing to the fact that the particles of coal are in the finely comminuted state, and moreover because the dirt or shale and slate contained in the coal has the effect of producing clinkers in the bed of coal. On the other hand, because of the fineness of the granulations of the buckwheat coal, there is very little space or interstices between the particles of coal in the bed to permit passage of air therethrough, and when a bed of coals of any thickness is utilized, it has been found that there are burnt out or dead spots occurring in the bed of coals which affects the heating efficiency of the furnace.

It is therefore within the contemplation of the present invention to provide a grate structure that will promote continuous burning throughout the entire bed of coals, to provide internal draft for the bed of coals, and moreover to provide projections on the grate that will stir and break up clinkers in the bed of coals during the raking operation of the grate.

Referring to the drawings in detail, F indicates vertically extending furnace walls between which the grate of the present invention is disposed. A pair of oppositely disposed, alined, longitudinally extending journal bars 8—9, are secured to the side walls of the furnace for the purpose of supporting the grate in accordance with the present invention. The grate for the furnace consists of a plurality of horizontally disposed grate bars indicated generally at 10 that are mounted for oscillatory movement on trunnions 11, 12 at each end of each grate bar that are journalled on the bars 8, 9.

Depending from the same end, each grate bar is provided with a leg 13 that is journalled to a shaker bar 14, the outer end 15 of which is connected to a shaker lever 16, pivoted as at 17, to the outside of the furnace F.

Each of the grate bars 10 is formed with solid ends 18 having upstanding raking arms 19 formed integral therewith and projecting above the upper face of the grate bar. The lower ends of the arms 19 merge with the trunnions 11, 12. Between the solid end sections 18, there are a plurality of inverted, U-shaped sections 20, the legs 21, 22 of which are curved.

Each section 20 is transversely spaced to provide pockets 23 between the respective sections for the purpose of permitting air to flow through the grate. The bight portion 24 of each section 20 is flat on its upper face and rising along the median line of said bight portion there is an integral rib 25 that merges at its opposite ends with the raking arms 19. Projecting above the rib are a plurality of lugs 26 that serve to break up clinkers in the bed of coals.

The interior grate sections 20 are interconnected along the ends of the legs by solid sections 27 and the bight portions 24 of each section are interconnected by the rib 25, so as to form one continuous grate 10. Along the interconnecting piece 27 at the bottom of the legs this piece is scored as at 28 to provide teeth 29 between the scorings for breaking clinkers. Where the curved legs 21, 22 merge with the bight portion 24 as indicated at 30 and 31, the radius of the curve is such that when the grate bars 10 are at rest, substantially heart shaped pockets are provided between adjacent grate bars.

Disposed above the sharp curves 30, 31, and supported on the bight portion 24 of the section 20 is a hollow member 32 of conical construction. The base of the hollow member 32 extends on the opposite sides of the bight portion 24 of one section 20 into the pockets 23 for providing internal draft through the bed of coals. The side walls of the member 32 are provided with staggered openings 33 to provide communication with the interior of the member.

It is also to be understood that the grate bars are reversible end for end.

At the extreme top of the conical members 32 there is an opening 33′ leading from the inner side of the grate.

There is one of these hollow members 32 provided for each grate bar 10 adjacent one end thereof. The upper surface of the bed of coals terminates below the upper ends of the member 32 so that the free end thereof will rise above the bed of coals. When the grate bars 10 are assembled in the relation shown in Figures 1 and 2 of the drawings, there is provided a heart shaped pocket 34 when the grate bars are at rest.

When the grate bars 10 are raked, at the end of the stroke, they assume the position shown in Figure 2 of the drawings and from this position it will be apparent that a crushing effect is produced by the walls surrounding the pocket 34.

From the foregoing construction it will be seen that a grate bar has been provided that has five points or corners thereon for stirring up the bed of coals and breaking clinkers, the five points being, each end of the legs which provides two points, two more points where the legs merge with the bight portion and the fifth is provided by the transverse rib 25 with its projection 26.

It is to be understood that by describing in detail herein, any particular form, structure, or arrangement, it is not intended to limit the invention beyond the terms of the several claims, or the requirements of the prior art.

Having described my invention, what I claim is:

1. A grate bar comprising a plurality of substantially inverted U-shaped sections interconnected together and arranged in spaced relation, each of said U-shaped sections having the legs thereof oppositely curved, with the convex edges of the legs being arranged in opposed relation, a hollow member supported on said grate bar, said hollow member being opened at one end, and the wall of the hollow member being perforated, and each of said inverted U-shaped sections provided at the bight portion thereof with a projection for stirring the coals during shaking operation.

2. A grate bar, means for rockably supporting the same, said grate bar being substantially of inverted U-shape in cross section, and having the legs of the inverted U oppositely curved, a projection extending upwardly from the bight portion of the inverted U, and the curvatures of said leg portion being of such a radius as to provide at opposite sides of the grate bar sharpened projections, which together with the free end of the leg portions and the projection rising from the bight portion of the inverted U provide a series of substantially five relatively spaced points or projections extending substantially laterally to the axis of the grate bar.

In testimony whereof I affix my signature.

ANTONY PISCIOTTA.