Dec. 20, 1949 H. G. MEISSNER 2,491,996

SELF-SPACING GRATE LINK

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Fig. 1

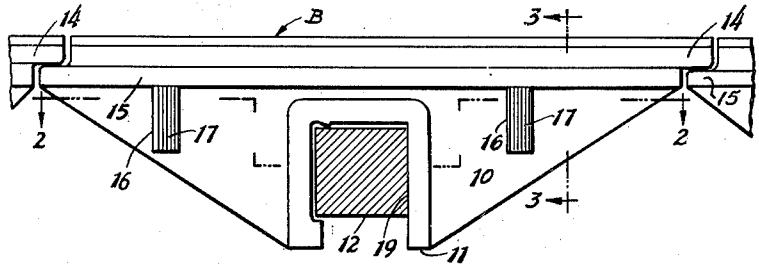


Fig. 2

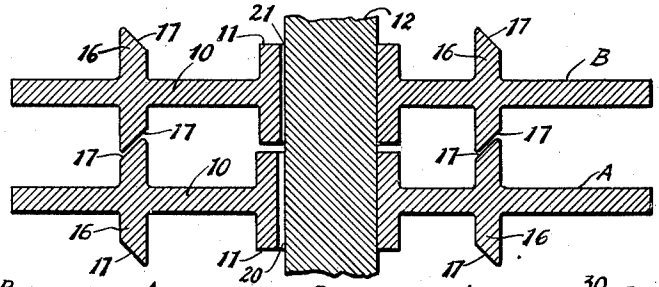


Fig. 3

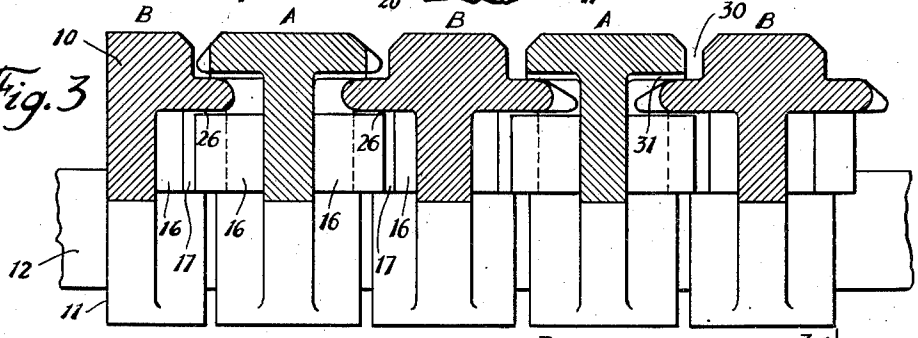


Fig. 4

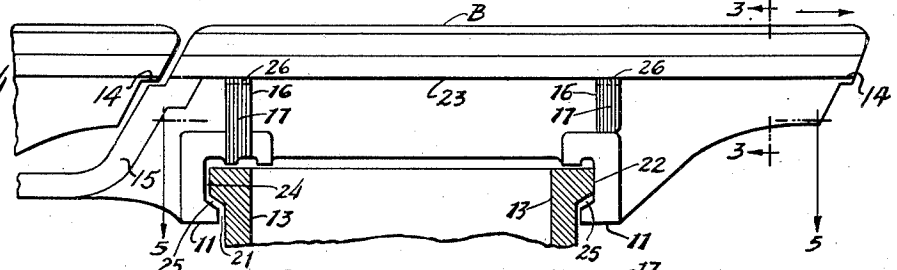
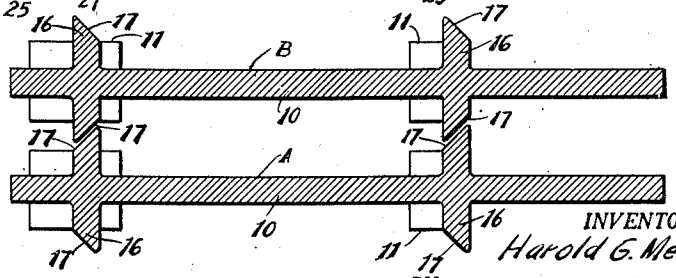


Fig. 5



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SELF-SPACING GRATE LINK

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5 Claims. (Cl. 110—40)

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This invention relates to grates for stokers and particularly to grates comprising links assembled on carrier bars.

In dump grates and traveling grates in which a plurality of carrier bars each support a multiplicity of links assembled thereon, it is desirable to maintain the links at substantially equal spacings so that the air spaces between links will remain substantially the same. A spacing between links in some portions of the grate which is larger than in other portions would reduce the air resistance and admit an excess of air at these portions. This would cause an unequal burning rate of the fuel with the possibility of local clinkering of the fuel ash.

In traveling grates through which air is blown under pressure, the grate is usually divided into zones arranged longitudinally of the grate, each zone being separately supplied with air from a chamber below the grate. Adjacent chambers may be under different air pressures and it is desirable to effect an air seal between the top of the partition separating the chambers and underside of the grate and also to effect an air seal between the adjacent links of the grate as they pass over the partition. This last seal is usually effected by providing projecting portions on the ends of adjacent links which abut or overlap to form a seal when the links are properly spaced longitudinally. However, proper clearances must be allowed between the links assembled on a bar when they are cold so that they will just contact each other when expanded due to heating. Obviously this is a difficult condition to meet for varying temperatures of the grate. Any space between links will permit air leakage between the adjacent chambers.

An object of this invention is to provide improved grate links that automatically maintain a substantially uniform spacing of the links transverse'y of a grate bar.

Another object is to provide improved stoker links that automatically maintain an air seal between adjacent links, longitudinally of the bar on which the links are assembled.

Figure 1 is an elevation of a portion of a grate made up of links embodying the invention.

Figure 2 is a sectional view taken on line 2—2 of Figure 1.

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Figure 3 is a transverse section on line 3—3 of Figure 1.

Figure 4 is an elevation of stoker links embodying another form of the invention.

Figure 5 is a section on line 5—5 of Figure 4.

Referring to the drawings, each of the grate links has on its underside a longitudinal web 10 formed with a saddle portion 11 so shaped as to permit the link being supported by any desired well-known type of carrier bar, such as shown at 12 in Figure 1 or at 13 in Figure 4. Each link at its front end has an overhanging portion 14 which normally extends over a mating shelf portion 15 on the rear end of the next forward link. Extending transversely from the web portion 10 are wedges 16 which have faces 17 inclined with respect to the longitudinal axis of the links. On alternate links A assembled on a single bar the faces 17 slope toward the rear of the links and slope toward the front on the intermediate links B.

Figure 2 shows a pair of links assembled on a carrier bar 12 as used in a dumping type of grate. Here the saddle portions 11 of the links rest against the forward vertical face 19 of the bar 12 when the inclined faces 17 of the wedge portions 16 of adjacent links contact. When the links are in this position with respect to the bar and each other, the spacing of all of the adjacent links is then normally uniform. Should the spacing become less than normal among a group of adjacent links assembled along one bar, the alternate links A of the group having wedge faces 17 facing rearwardly would be moved forwardly and out of contact with face 19 of the bar 12. The spacing of some of the links beyond said group will then be greater than normal and their wedge faces will be spaced from those of adjacent links. This unequal spacing of the links is undesirable, for as mentioned above, the unequal gaps between links produces a varied resistance to the air flow.

According to the invention, the unequal spacing of the links longitudinally of the bar is corrected when the grate is dumped to remove the accumulated ashes therefrom. In dumping, the bar 12 is rotated counterclockwise in Fig. 1 until the tops of the links reach an incline that discharges the ash. Any links A which have been moved forward by interaction of the wedge faces 17 so that their saddle portions do not rest against

the face 19 of bar 12, will due to gravity on being inclined when dumping exert a sidewise force against the wedge faces of the adjacent links B and force them rearwardly so as to separate them until all links A again rest against the face 19 of bar 12. In this manner the normally uniform spacing of all of the links is re-established each time the grate is dumped. Should the temperature of the links cause expansion increasing their width beyond that assumed for a spacing such that all links just contact face 19 of bar 12, alternate links A will be moved forwardly by the wedge faces 17. The desired contact between faces 17 of adjacent links may be preserved. To accommodate the movement of links A on bar 12 due to expansion, the clearance 20 for links A may be made greater than the clearance 21 of links B, as shown in Fig. 2.

The links illustrated in Figs. 4 and 5 are of the type used on a traveling grate stoker, the direction of travel being shown by the arrow. When assembled on a bar 13, the saddle portions 11 of all of the links contact the forward vertical face 22 of the bar 13 when the inclined faces 17 of the wedge portions 16 of adjacent links contact. When the links are in this position with respect to the bar and each other, the spacing of all of the adjacent links is then normally uniform. Should the spacing become less than normal for a group of the links assembled along one bar, the alternate links A in that group having the wedge faces facing rearwardly are moved forwardly and out of contact with the face 22 of the bar 13. The spacing of some of the links beyond said group is then greater than normal and their adjacent wedge faces will be spaced apart which, as stated above, is undesirable.

This unequal spacing is corrected in a manner similar to that with a dump grate. As the traveling grate passes upwardly around the usual rear sprocket of the stoker all of the links on a bar pass through an inclined position in which their front ends are vertically above their rear ends. Any links A which have been moved forward by the wedge faces 17 will due to gravity in this position exert a sideward force, forcing adjacent links B apart until all links again rest upon the side 22 of bar 13. In this manner the normally uniform spacing of all of the links is re-established each time the grate travels through a revolution.

This novel correction of the link spacing accomplishes another purpose in the case of the traveling grate. As shown in Fig. 4 the rear wedges 16 of all of the links extend vertically from the underside of the fuel support 23 downwardly to the top of the carrier bar 13. When the links are substantially uniformly spaced, the wedges of adjacent links are in contact and form a transverse seal between the top of the bar 13 and the bottom of the fuel supporting surface 23 which seal is continuous for the length of the bar, or the width of the stoker. The automatic readjustments of the spaced relations of the links as described above by keeping the rear wedges of adjacent links in contact maintain a continuous seal between links.

Preferably the links A in a traveling grate have a greater clearance 25 below bar 13 as well as gaps 26 above wedges 16 so that upon the return travel of the grate, when the links are turned upside down, they drop a greater distance on the bar than links B, thereby opening the air gaps between links and allowing any ash to fall out.

The actual air control through the grates is accomplished by the horizontal slots below the top surface of the links. As shown more clearly in Figure 3, the vertical slot 30 between adjacent links is considerably larger than the horizontal space 31 so that the latter acts as an orifice, the velocity then being reduced as the air flows through the vertical slot 30 and to the fuel bed. The wedging effect of the self spacing links then keeps the horizontal overlap effective, as without this self-spacing action the links could pull apart so that the horizontal orifice action was destroyed.

What I claim is:

1. A stoker grate comprising a bar; links loosely mounted on said bar for movement transversely thereof, a web on each link extending transversely of the bar; lugs extending laterally on each side of the web, at least some of the lugs on each link having wedge-shaped portions with faces inclined to its web and lugs on adjacent links being in contact for moving the links contiguous to certain links transversely of said bar with respect to said certain links when the positions of the links on the bar vary.

2. A stoker grate comprising a bar; links loosely mounted on said bar for movement transversely thereof, a web of each link extending transversely of the bar; lugs extending laterally on each side of each web, the lugs having wedge-shaped portions with end faces inclined to the web and adjacent links on opposing webs having the lug faces inclined in opposite directions at such relative angles that the faces of lugs on said adjacent links when assembled on the bar may be parallel and in surface contact.

3. A stoker grate comprising a horizontal carrier bar; links loosely mounted on said bar for movement transversely thereof; a vertical web portion on each link extending transversely of the bar; wedge-shaped lugs extending laterally on each side of the web of each link, the lugs having end faces in a vertical plane inclined to the web, alternate links having the lug faces inclined in opposite directions at such relative angles that the faces of adjacent links when assembled on the bar are parallel and in surface contact.

4. A stoker grate comprising a carrier bar rotatable on a horizontal axis; links loosely mounted on said bar for movement transversely thereof; a vertical web on each link extending transversely of the bar; lugs extending laterally in each side of the web of each link, the lugs having end faces in vertical planes inclined to the web and alternate links having their lug faces inclined in opposite directions at such relative angles that the faces of adjacent links when assembled on the bar are in surface contact for spacing the links apart a predetermined distance and in substantial alignment longitudinally of the bar whereby upon turning the bar on its horizontal axis the ends of misaligned links are raised above the ends of adjacent links and the faces on the lugs of the links cause those links higher than other links to wedge the adjacent links apart by force of gravity thereby re-establishing the substantial alignment of the links longitudinally of the bar.

5. In a stoker grate; a plurality of mutually spaced grate links mounted in side by side relation each having a longitudinal web; similarly positioned lugs projecting laterally into mutual engagement from the opposed side faces of the webs of adjacent links, said lugs being formed with parallel end faces reversely inclined on adjacent links; a rotatable carrier bar extending transversely of said links; and saddles formed on the

webs of said links loosely engaged with said carrier bar with clearance normally existing between one vertical face of said carrier bar and the saddles of said links whereby on displacement of links in a direction resulting in transfer of said clearance to the opposite face of said bar rotation of said carrier bar raises said displaced links so that gravity may act through the engaged faces of said lugs to restore said links to normal positions with respect to each other and said carrier bar.

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