

June 29, 1943.

W. H. MORIARTY

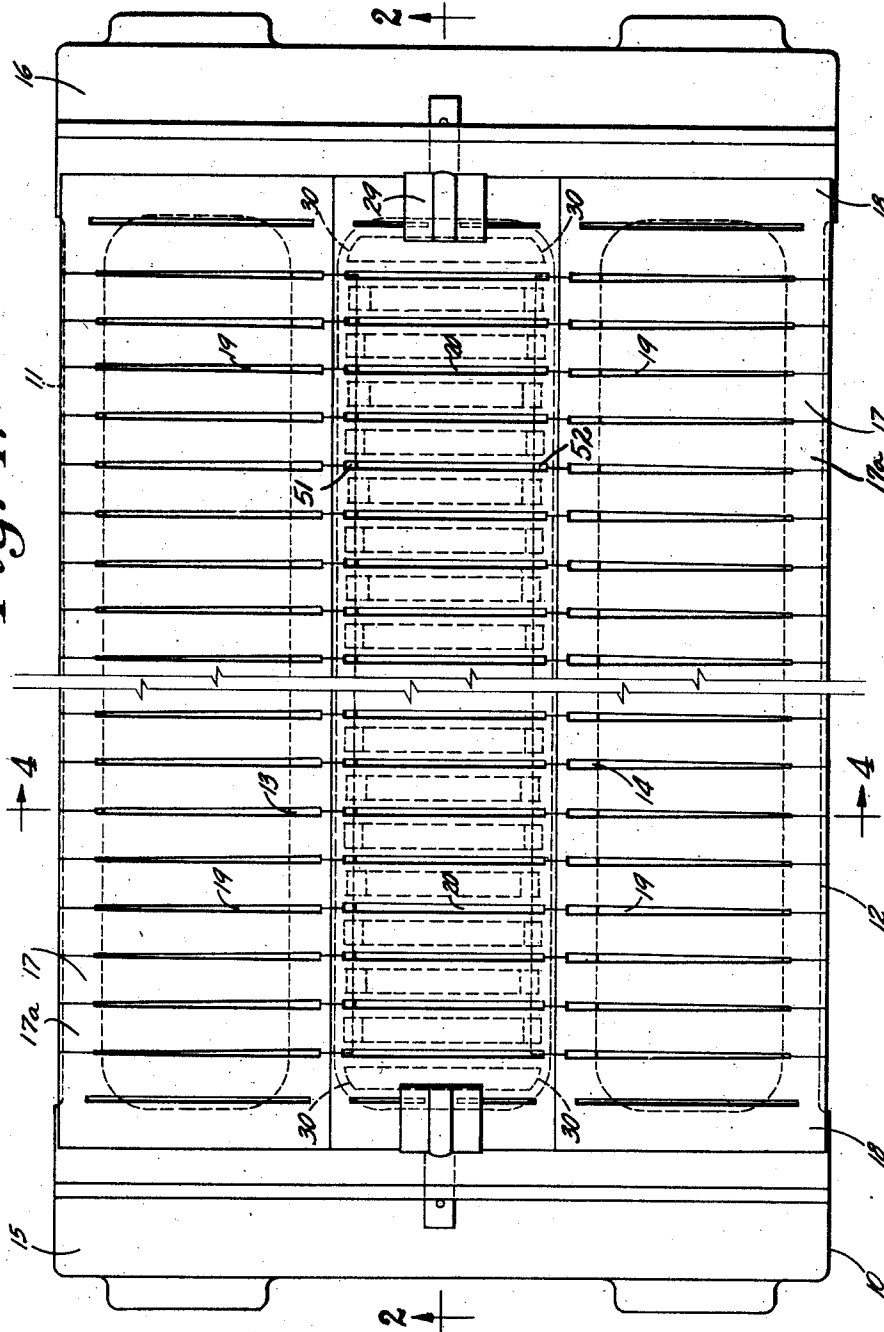
2,322,873

GRATE BAR FOR SINTERING MACHINES

Filed March 4, 1941

3 Sheets-Sheet 1

Fig. 1.



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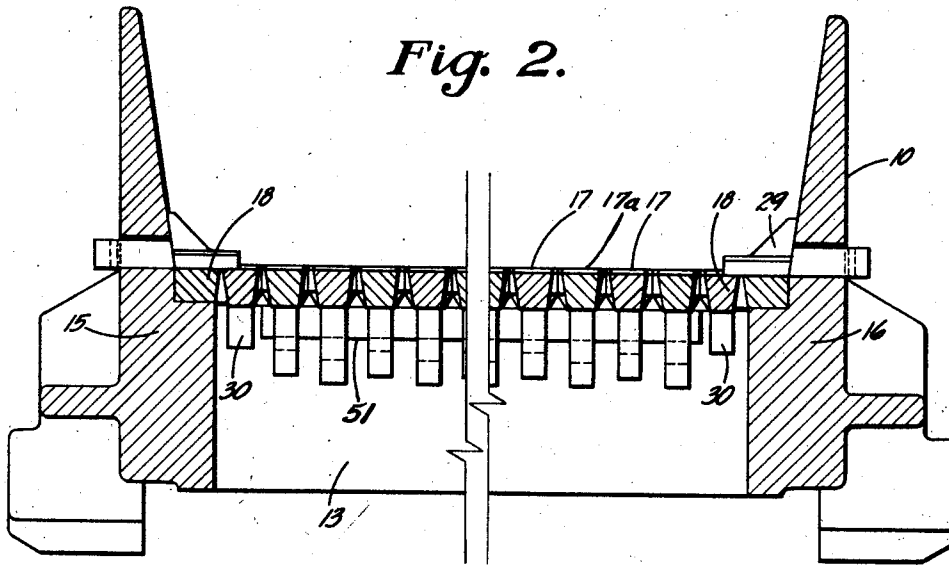
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Fig. 2.



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Fig. 3.

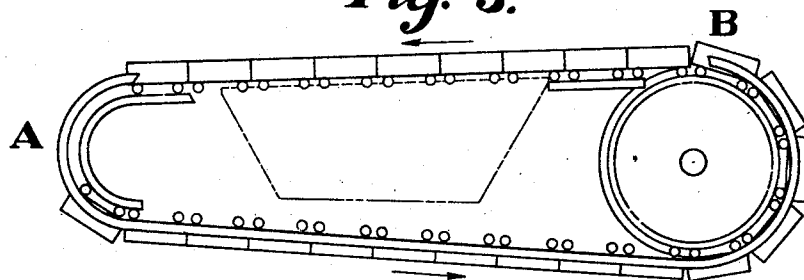


Fig. 4.

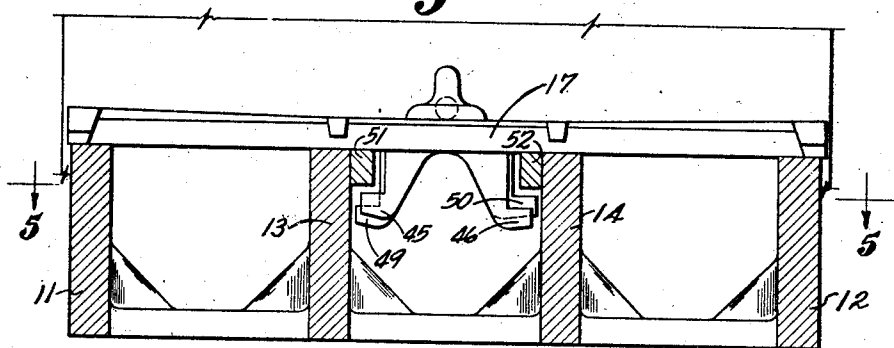
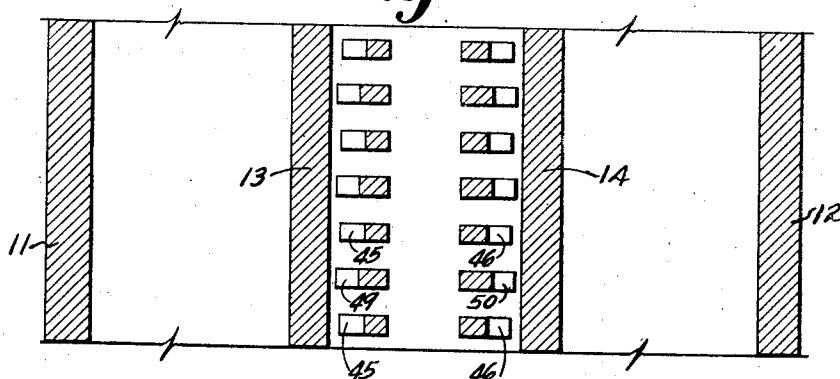


Fig. 5.



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GRATE BAR FOR SINTERING MACHINES

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1 Claim. (Cl. 263—28)

This invention relates to sintering machines and more particularly to the pallets and the grate bars therein.

In the operation of sintering machines there arises the problem of effectively discharging all of the sintered material from the pallets. Accordingly, it is the main object of my invention to provide the pallets of the machine with a grate which during the course of travel of the pallets at the discharge end of the machine will effectively loosen the sintered material from the grate. A more specific object is to provide a grate for the pallets of a sintering machine in which the grate bars thereof are adapted to be displaced different amounts and in different directions with respect to the pallet as the latter moves from upright to upside down position during the discharge operation. A more particular object is to provide a new and improved grate bar which is adapted to be mounted in the pallet in such a manner that the ends of alternate bars will drop vertically from the pallet distances different from the ends of the intermediate bars. A further object is to provide a grate bar the ends of which may drop unequal distances from the pallet, the means enabling such movement being positioned beneath the bar. A still further object is to provide a grate in which adjacent bars thereof in addition to having their adjoining ends drop unequal distances from the pallet during the discharge operation, will also drop or slide unequal amounts with respect to the pallet in a direction longitudinally of the bar.

Other objects and advantages of my invention will be apparent from the following description, taken in conjunction with the drawings, in which:

Figure 1 is a plan view of the pallet of a sintering machine with grate bars mounted thereon in accordance with my invention.

Figure 2 is a longitudinal vertical sectional view, taken on line 2—2 of Fig. 1.

Figure 3 is a diagrammatic view of a sintering machine, showing the path of travel of the pallets therein.

Figure 4 is a transverse sectional view taken on line 4—4 of Fig. 1; and

Figure 5 is a sectional view, taken along lines 5—5 of Fig. 4.

Referring to the drawings, there is shown a pallet 10 which receives and discharges the material to be sintered. This member may operate on tracks within the sintering machine in the usual manner along an endless conveyor so that at the discharge end of the machine it drops

to an upside down position and travels thus until the loading end is reached at which time it is raised to upright position to receive the charge, as is shown in Fig. 3. The pallet frame is comprised of longitudinal side members 11 and 12, longitudinal intermediate members 13 and 14 and transverse connecting members 15 and 16. Mounted on the longitudinal members are a plurality of like grate bars 17, a plurality of like grate bars 17a positioned between bars 17, and two like end bars 18. The bars are all positioned to extend in the direction of travel of the pallet, thereby permitting a shorter bar and a more flexible grate for the sintering process. The sides of the bars are recessed in a vertical direction so that when the bars are assembled on the pallet, openings 19 and 20 are formed which permit the passage of air and hot gases through the charge during sintering. The end openings 19 are tapered so as to be narrower at the ends of the bars to more evenly distribute the blast of air and hot gases over the entire grate surface.

In accordance with my invention the underside of each of bars 17 and 17a is formed with downwardly extending lugs 45 and 46, and 49 and 50 respectively. These lugs are adapted to underlie the longitudinally extending stops 51 and 52 which may be in the form of bars secured to the longitudinal members 13 and 14 or they may be cast integral with said members.

In assembling the bars 17 and 17a on the pallet each bar is lowered into the space adjacent the side of either member 15 or 16, with projections 45 and 46 or 49 and 50 between longitudinal intermediate members 13 and 14. As the ends of stops 51 and 52 do not extend to members 15 and 16 there is no interference between the stops and lugs 45 and 46 or 49 and 50 in this position of the bar. The bar may then be moved to the center of the pallet and the rest of bars 17 or 17a mounted in like manner. The assembly is completed by adding bars 18, one at each end of the pallet. These bars are held in place by means of pins 29, a limited amount of vertical movement of the bars being permitted by the looseness of the fit of the pin in the pallet. Relative movement of bars 18 in a direction longitudinally thereof is limited by projections 30 which are adapted to engage members 13 and 14. It will thus be clear that during upside down travel of the pallet all of bars are precluded from accidentally dropping out of the pallet.

As shown in Figs. 4 and 5 the stop lugs are so positioned that alternate bars are adapted to

move in both vertical and horizontal directions with respect to the pallet, amounts different from the intermediate or adjacent bars. Reference to Fig. 4 will show that lugs 45 and 46 provide for vertical displacement of bar 17 from the pallet and since lug 45 is closer to stop 51 than lug 46 is to stop 52, the two ends of grate bar 17 will move different amounts vertically of the pallet. These lugs are also spaced from walls 13 and 14 to provide movement of the bar horizontally of the pallet or in a direction longitudinally of the bar. The bar 17a immediately adjacent bar 44 is provided with lugs 49 and 50 which also permit vertical movement of the bar away from the pallet. However, these lugs are spaced a lesser amount from walls 13 and 14 than are lugs 45 and 46, and therefore the bar can not move as far horizontally with respect to the pallet as bar 44. It will be apparent that with this arrangement of lugs and stops when the pallet drops to upside down position, each end of bar 17 or 17a will drop a predetermined distance from the pallet, one end dropping further than the other. Furthermore, by arranging the bars with corresponding lugs of alternate bars 17 and 17a aligned, each end of each alternate bar will drop an amount different from the adjacent end of each intermediate bar. Thus, the corresponding ends of any two adjacent bars will be displaced unequal distances in a vertical direction from the pallet, with the surface of one bar sloping oppositely from the surface of the other in respect to the horizontal. This uneven dropping of the grate surface during the discharge operation will act to effectively loosen the sintered mass and also to break up the material into suitable sizes. It will also be observed that since the retaining lugs are located beneath the grate surface the movement of the bars away from the pallet will not be impeded by any particles of material lodging between the lugs and the stops as may happen if the lugs and stops are positioned above the grate surface. In addition, various combinations of movements of the bars are possible, such as alternating the bars in groups of twos instead of singly so that the two adjacent bars will have their lugs aligned. It will accordingly be clear that by alternating the bars as shown in Figs. 4 and 5, one set of bars at the discharge end of the machine will move both in the direction of travel of the pallet with respect thereto and away from the pallet in a vertical direction, while the intermediate set of bars will move in the same manner but in different amounts due to the positions of the lugs thereon. As the pallets move upwardly approaching the charging end B of the machine shown in Fig. 3 the bars slide rearwardly on the pallet until lugs 45, 46 and 49, 50 all engage one of walls 13 or 14, depending on the position of the pallet. As the pallet moves along its path during the

discharge operation which takes place at end A of the machine, the bars will first slide in the direction of travel of the pallet as it moves toward a vertical position until the lugs engage the opposite wall 13 or 14 as the case may be. However, since total amount of movement of adjacent bars longitudinally of the pallet is different, lugs 49 or 50 will contact the wall first and the adjacent bars having lugs 45, 46 will move still farther in order to contact the wall. Thus there will be relative movement between adjacent bars in the direction of travel of the pallet. As the pallet continues its movement toward upside down position the bars will drop away from the pallet until the lugs engage stops 51 and 52. The aforesaid relative longitudinal movement between adjacent bars will also occur as the pallet moves upwardly towards the charging end of the machine since the bars will alternately move from one of walls 13 or 14 into engagement with the other of said walls.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

What I claim is:

In a sintering machine a pallet comprising a pair of side walls extending lengthwise of the pallet and a plurality of grate supporting walls extending transversely of the pallet and joining said side walls, stop members extending along certain of said grate supporting walls and terminating short of said side walls so as to form vertical passages between the ends of said members and said side walls, a plurality of grate bars on said grate supporting walls each having depending lugs underlying said stop members, said lugs being of lesser thickness than said passages so as to pass through the latter during assembly of said bars with the pallet, said lugs having horizontal and vertical stop surfaces, the horizontal surfaces of the lugs on adjacent bars being spaced unequal distances from the under sides of said stop members and said vertical surfaces of the lugs on adjacent bars being spaced unequal distances from the sides of said stop members so as to provide for unequal movement of said bars away from and longitudinally of said pallet as the latter is inverted, other grate bars engaging said side walls for limiting movement of said plurality of grate bars toward said side walls, and means on said pallet limiting movement of said other grate bars away from said pallet when the latter is inverted.

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