March 29, 1949. W. J. URBAN 2,465,559

PALLET GRATE BAR HOLDING MEANS

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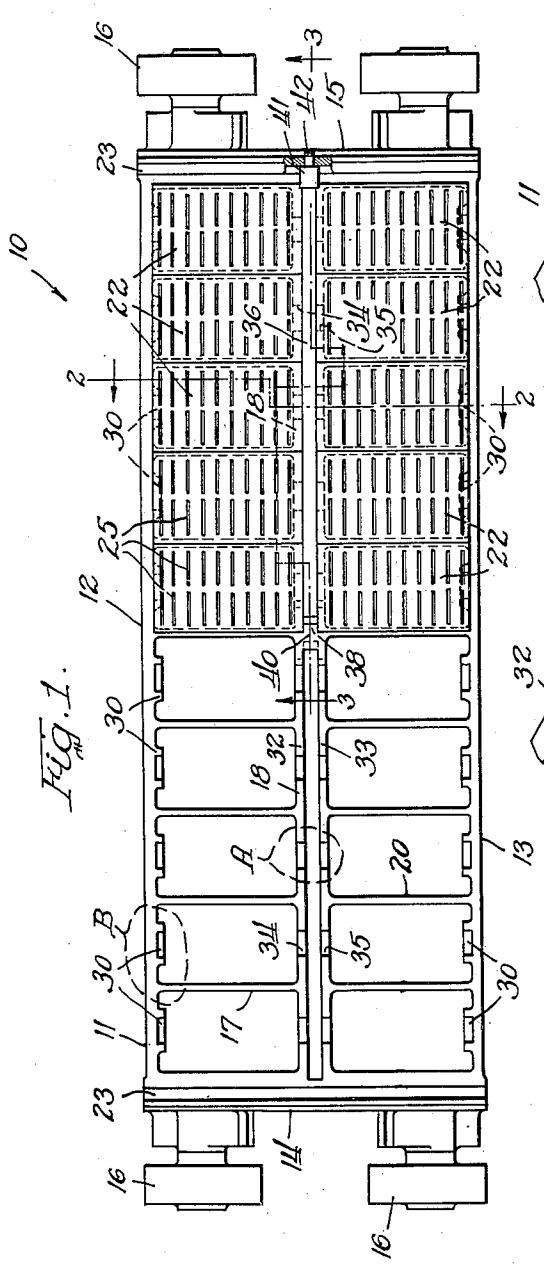

Fig. 1.

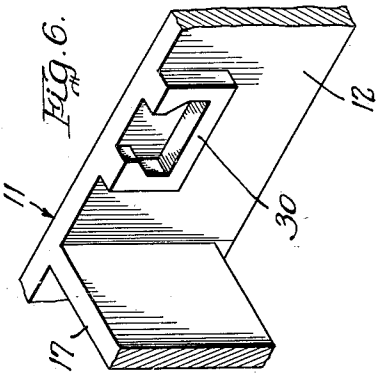

Fig. 6.

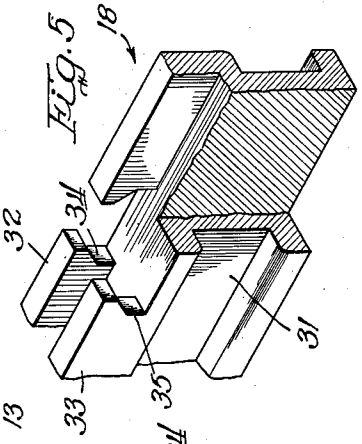

Fig. 5.

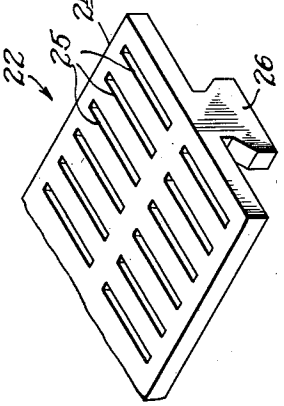

Fig. 4.

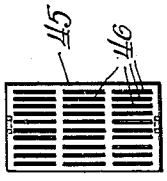

Fig. 8.

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PALLET GRATE BAR HOLDING MEANS

Filed Feb. 19, 1947 2 Sheets-Sheet 2

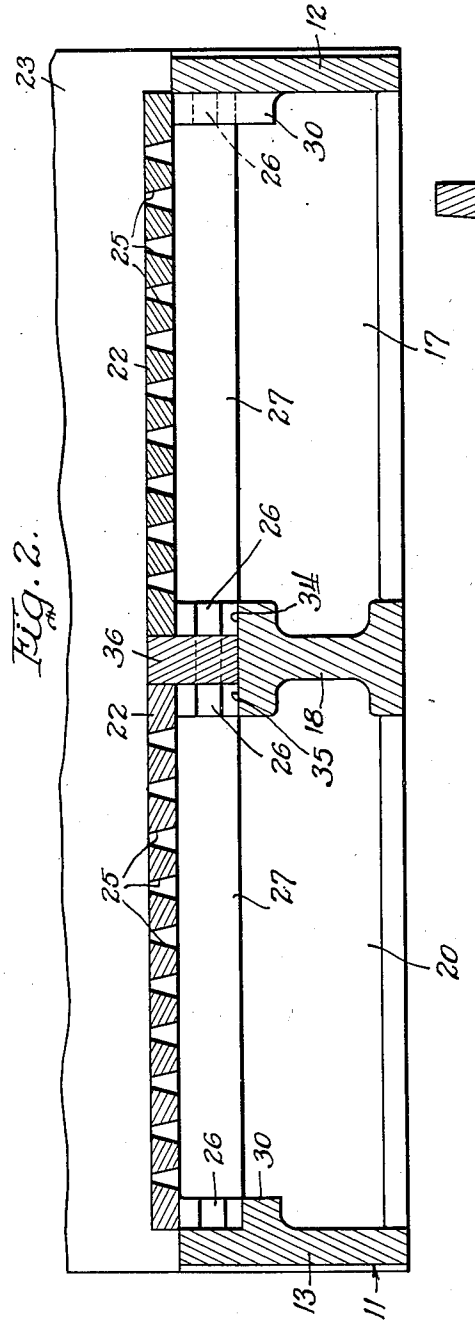

Fig. 2.

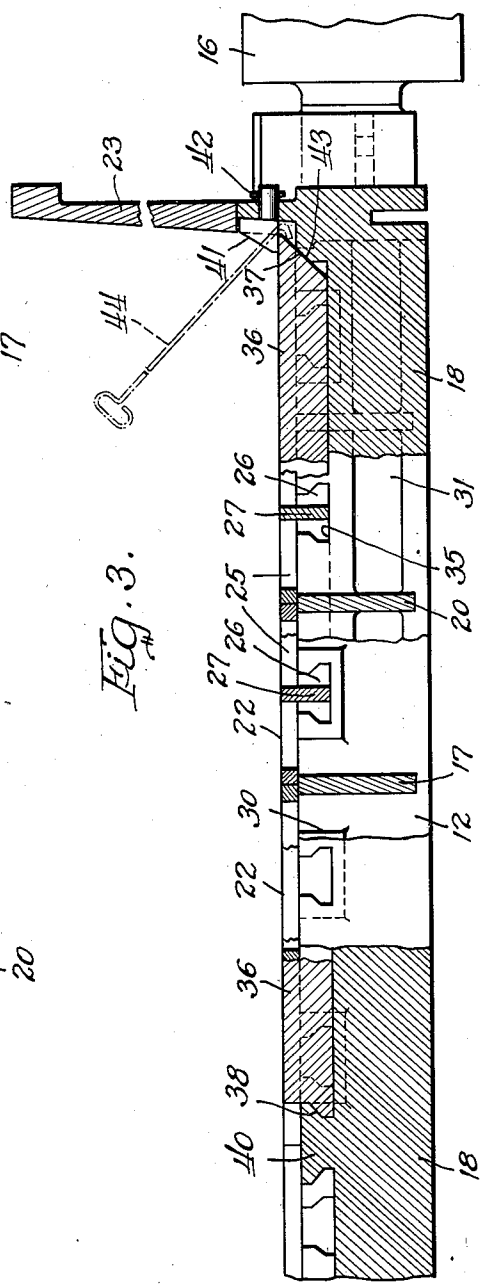

Fig. 3.

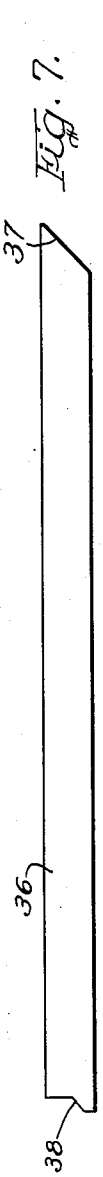

Fig. 7.

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PALLET GRATE BAR HOLDING MEANS

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9 Claims. (Cl. 266—21)

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This invention relates, generally, to grate and pallet structures adapted for use in sintering machines of the continuous type, and it has particular relation to improvements in means for locking separate grate sections to a pallet frame.

Grate and pallet structures of the general type to which the present invention relates are shown in Patents 1,756,037 and 2,245,136 to E. W. Shallock. In these structures, the material supporting area of each pallet is formed by a plurality of separate removable grate sections supported on a pallet frame.

The object of this invention, generally stated, is the provision of improved means for locking individual grate sections to a pallet frame so that a retaining bar serves to secure a number of grate sections in place.

Certain other objects of the invention will, in part, be obvious and will, in part, appear hereinafter.

For a more complete understanding of the nature and scope of this invention, reference may now be had to the following detailed description thereof, taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a partly broken away, top plan view of a pallet of the type suitable for use on a continuous sintering machine, and which embodies the presently preferred form of the present invention;

Figure 2 is an enlarged sectional view taken on line 2—2 of Figure 1;

Figure 3 is an enlarged, fragmentary, sectional view taken on line 3—3 of Figure 1;

Figure 4 is an enlarged, fragmentary, perspective view of a removable grate section adapted for use on the pallet shown in Figure 1;

Figure 5 is an enlarged, fragmentary, perspective view of the portion of the pallet frame structure indicated at A in Figure 1;

Figure 6 is an enlarged, fragmentary, perspective view of the portion of the pallet frame structure indicated at B in Figure 1;

Figure 7 is a side elevational view of one of the two retaining bars used in the structure shown in Figure 1 for retaining the individual grate sections in place; and

Figure 8 is a top plan view of a modified removable grate section.

Referring to Figure 1 of the drawings, a pallet is indicated generally at 10 of the type adapted for use on a continuous sintering machine of the Dwight & Lloyd type. The pallet 10 comprises a rectangular pallet frame 11 formed by front and back walls 12 and 13 interconnected at opposite

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ends by side walls 14 and 15. A pair of rollers or wheels 16 are provided on the opposite sides 14 and 15, so as to permit the pallet 10 to roll along the continuous track of the sintering machine. A number of the pallets 10 are pushed along the upper run of the sintering machine in a train with the wall 12 of one pallet abutting against the wall 13 of the next pallet. In this manner, a continuous supporting surface is provided by the train of pallets.

The pallet frame 11 of each pallet 10 is divided into two rows of compartments or sections 17. The two rows of sections or compartments 17 are divided by a center frame member 18, which extends from the side 14 to the opposite side 15, midway between the opposing walls 12 and 13. The details of the frame member 18 will be described in more detail below in connection with 4 of the drawings.

The present invention is primarily directed to the arrangement whereby the two rows of grate sections 22 are locked in place on the pallet frame 11.

In order to confine material to be sintered on the pallets 10, each one of them is provided with a pair of upstanding side flanges 23, which may be secured to the opposite sides 14 and 15, as more clearly shown in Figure 3 of the drawings.

Referring now to Figure 4 of the drawings, it will be seen that each of the grate sections 22 has a flat grate portion 24 provided with openings 25 therein, which are shown in cross section in Figure 2. A T head 26 depends integrally from the opposite ends of the grate portion 24, and the grate 22 is strengthened by a reenforcing section 27 extending between the T heads 26, as shown in Figures 2 and 3.

Referring particularly to Figure 6, it will be seen that each of the walls 12 and 13 is provided with a plurality of sockets 30 on the inner side thereof and intermediate each of the partitions or dividers 20. The sockets 30 are formed integrally with the walls 12 and 13 and have T-shaped socket openings of a size and shape for receiving the T heads 26 carried by the grate sections 22.

Referring now particularly to Figure 5 of the drawings, it will be seen that the center frame member 18 is in the form of an I-section 31 having upstanding flanges 32 and 33 projecting from the upper portion thereof. Each of the upstanding portions 32 and 33 is provided with T-shaped openings 34 and 35, respectively, which openings are in opposed alignment with the sockets 30 on the front and back walls 12 and 13. The space

in between the flanges 32 and 33 is at least greater than the thickness of one of the T heads 26 on the grate sections 22, so as to permit the grate sections 22 to be inserted on the pallet frame 11, as will appear more fully hereinafter.

Each of the grate sections 22 is inserted in one of the compartments 17 of the pallet frame 11 in the following manner: The grate section 22 is lifted over one of the compartments 17 and is lowered down thereon, so that the sides of the grate portion 24 rests on the partitions 17 while one of the T heads 26 lies in the channel in between the upstanding flange portions 32 and 33. The grate is then aligned so that its two T heads 26 are in alignment with the socket 30 of the particular compartment or section 17 and the opposed opening 34 or 35 in the flanges 32 or 33. When this alignment is obtained, the grate section 22 is then shoved toward one of the walls 12 or 13, as the case may be. In this manner, the outer T head 26 will engage in a socket 30, so as to prevent that end of the grate section 22 from being lifted off the pallet frame 11 and from being moved across the wall 12 or 13. At the same time, the inner T head 26 will be engaged in one of the openings 34 or 35, so that this end of the grate section cannot be lifted from the pallet frame 11. In the same manner, all of the grate sections 22 can be inserted in the compartments 17.

After the grate sections 22 are thus put in place, it is still necessary to lock them so that they cannot move toward the center of the pallet 10 in a direction parallel to the side walls 14 and 15. In order to prevent such movement and lock the grate sections 22 in place, retaining bars 36, as shown in Figure 7, are inserted in the channels between the flanges 32 and 33. In the particular construction shown in the drawings, two such retaining bars 36 are employed. This is a matter of convenience, and one such bar could be used, but because of its length, would be somewhat awkward. The two retaining bars 36 are bevelled at one end, as indicated at 37, and at the opposite end are provided with a projecting portion 38. Referring now particularly to Figures 1 and 3, it will be seen that the channel between the upstanding portions 32 and 33 does not extend unbroken all the way from one end to the other, but is closed at the center, as indicated at 40. The portion 40 is undercut at opposite sides, so as to provide pockets of the size and shape to receive the projecting ends 38 of the retaining bars 36, as shown in Figure 3.

On inserting each of the retaining bars 36 in place, the end having the projecting portion 38 is first put in place, and then the bevelled end 37 is lowered down so that it rests adjacent one of the flanges 23. The sides 14 and 15 are each provided at their middle portions with bevelled surfaces 43 against each of which the middle portion of the bevelled end 37 of a retaining bar 36 rests, as shown in Figure 3. It will be noted that the tip of each bevelled end 37 is exposed so that a hook 44 may be caught thereon, as indicated in broken line. In order to lock the retaining bar 36 in the position shown in Figure 3, a T-shaped locking member 41 is inserted through an opening provided therefor in the flanges 23 and the side walls 14 and 15, as shown in Figures 1 and 3. The head portion of the locking T 41 rests on top of the retaining bar 36 at the bevelled end, while the leg portion of the locking T extends through the flange 23 and the hole in the

side wall 14 or 15. Cotter keys 42 serve to hold the locking T 41 in place.

When it is desired to remove a retaining bar 36, the locking T 41 is removed and then a hook 44 is caught on the exposed tip of the bevelled end 37, as shown in Figure 3. The bar 36 is then lifted out of the channel between flanges 32 and 33 and removed.

In Figure 8, a modified grate section is indicated at 45, which corresponds to grate section 22 (Figure 4), except that the openings or slots 46 therein extend lengthwise of the grate rather than crosswise thereof.

It will also be obvious that certain changes may be made in the foregoing construction, and that different embodiments of the invention may be made without departing from the spirit and scope thereof. Accordingly, all matter described above, or shown in the accompanying drawings is intended to be interpreted as illustrative and not to be construed in a limiting sense.

What is claimed as new is:

1. In a grate and pallet structure wherein the load supporting area is formed by a plurality of removable grate sections supported on a pallet frame, means for locking said grate sections in place which comprises, a pallet frame member provided on one side thereof with locking means adapted to interlock with locking means provided on one end of the grate sections whereby one end of each grate section can be locked against lifting off from said pallet frame member and from passing across said pallet frame member, a second pallet frame member spaced away from said first pallet frame member a distance great enough to allow said grate sections to fit thereinbetween and provided with openings therethrough from side to side with each opening having a portion which does not extend vertically to the top of said second pallet frame member, each of said grate sections having a locking projection provided on the other end thereof adapted to interlock in one of said openings in said second pallet frame member when a grate section has its said one end interlocked with said first pallet frame member so as to prevent each grate section from being lifted off said second pallet frame member, a retaining bar arranged to fit against said second frame member and extend across said openings therein beyond but in close proximity to the ends of said grate sections, so as to prevent said grate sections from moving across said second pallet frame member, and means for holding said retaining bar in said position.

2. The grate section locking means called for in claim 1 wherein said first mentioned pallet frame member forms one of the four sides of a rectangular pallet frame.

3. The grate section locking means called for in claim 1 wherein said locking projections are in the form of T heads and said openings in said second pallet frame member are T-shaped.

4. The grate section locking means called for in claim 1 wherein said locking means provided on said first pallet frame member are in the form of sockets having T-shaped openings, wherein said openings in said second pallet frame member are T-shaped and correspond to those in said sockets, and wherein said grate sections are provided on opposite ends with T heads adapted to fit in said T-shaped socket openings and in said T-shaped openings in said second frame member.

5. A grate and pallet structure wherein the load supporting area is formed by a plurality

of removable grate sections, and comprising in combination, a rectangular pallet frame having four side walls and a pair of spaced apart frame portions extending between one pair of opposite side walls and midway between the second pair of opposite side walls, each of said second pair of side walls being provided on the inner side thereof with locking means adapted to interlock with locking means provided on one end of each of said grate sections whereby said one end of each grate section can be locked against lifting off from one of said second pair of side walls and from passing thereacross, each of said spaced apart frame portions being provided with locking openings extending therethrough from side to side with each opening having a section which does not extend vertically to the top of said frame portion, each of said grate sections having a locking projection provided on the other end thereof and adapted to interlock in one of said locking openings when a grate section has its opposite end interlocked with one of said second pair of side walls so as to prevent each grate section from being lifted off from one of said frame portions, said locking projections not having a thickness which is in excess of the space between said frame portions thereby permitting each of said grate sections to be placed on said pallet frame with its locking projection lying between said frame portions from which position each grate section can be moved into said interlocking relationships with one of said second pair of side walls and the nearest frame portion, a retaining bar arranged to fit in between said frame portions and to fit against the same so as to prevent said grate sections from moving inwardly, and means for holding said retaining bar in said position.

6. A grate and pallet structure wherein the load supporting area is formed by a plurality of removable grate sections, and comprising in combination: a rectangular pallet frame having front and back walls interconnected at opposite ends with opposing side walls, and having a center frame member extending between said side walls and positioned midway between said front and back walls, said center frame member having a pair of spaced apart vertical flange portions extending along the top thereof, said pallet frame including a plurality of partitions extending between said front and back walls and said center frame member so as to divide said pallet frame into a plurality of compartments each of which is provided with one of said removable grate sections, each of said front and back walls being provided on the inner side thereof and in between

each of said partitions with a soket having an opening adapted to receive a locking projection provided on one end of each grate section, each of said pair of vertical flange portions having a locking opening extending from side to side therethrough and in opposed alignment with one of said sockets on the adjacent front or back wall, each of said locking openings having a section which does not extend vertically to the top of the vertical flange it is in, each of said grate sections having a second locking projection on the end opposite said first locking projection, said second locking projection being interlocked in one of said locking openings when the opposite first locking projection is interlocked with one of said sockets, a retaining bar arranged to fit inbetween said vertical flanges and abut against the sides thereof so as to close said locking openings therein, and means for locking said retaining bar in place.

7. The grate and pallet structure called for in claim 6 wherein said locking projections provided on opposite ends of said grate sections are T heads of the same size and shape, and wherein said socket openings and said locking openings are T-shaped and of such size as to freely receive said T head locking projections.

8. The grate and pallet structure called for in claim 6 wherein said center frame member is in the form of an I-beam with said vertical flange portions projecting from the sides of the top portion thereof.

9. The grate and pallet structure called for in claim 6 wherein said means for holding said retaining bar in said position comprises a retaining section extending between said spaced apart vertical flange portions at a position inwardly from the opposite ends thereof and under which retaining section one end of said retaining bar is adapted to fit, and a removable locking pin adapted to extend through an opening provided therefor in one of said side walls adjacent one pair of ends of said vertical flange portions so as to fit on top of said retaining bar and prevent it from lifting.

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The following references are of record in the file of this patent:

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