Oct. 23, 1923. 1,471,402

R. L. LLOYD

PALLET MECHANISM FOR ORE SINTERING MACHINES

Original Filed Oct. 27, 1919 5 Sheets-Sheet 1

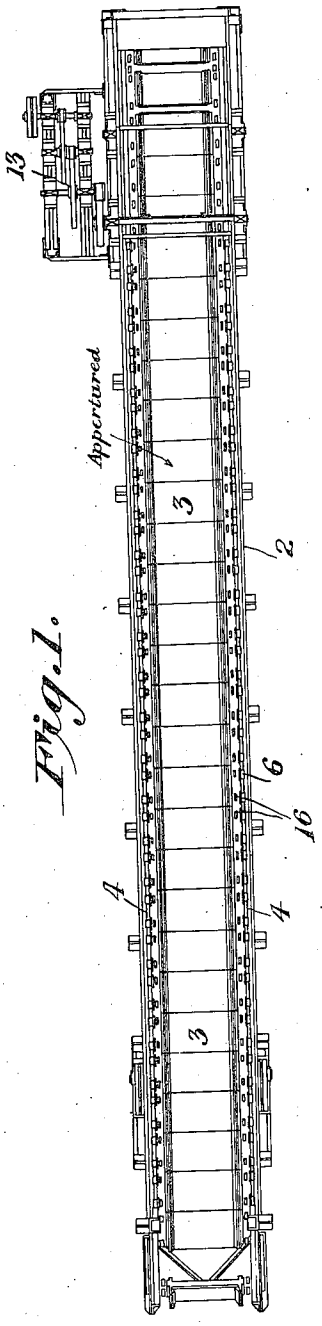

Fig. 1.

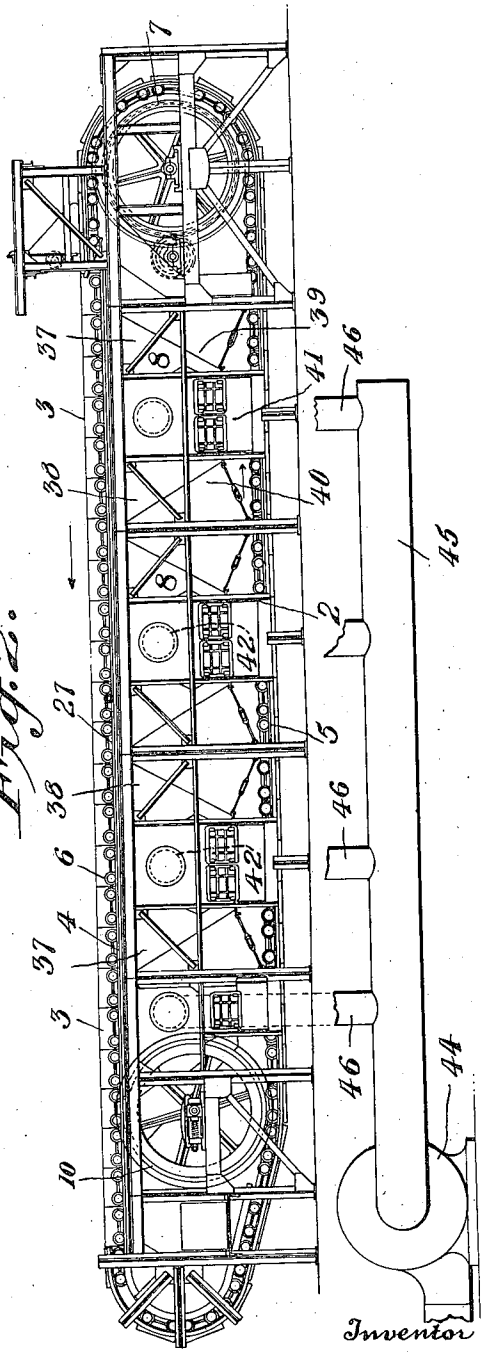

Fig. 2.

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Original Filed Oct. 27, 1919 5 Sheets-Sheet 2

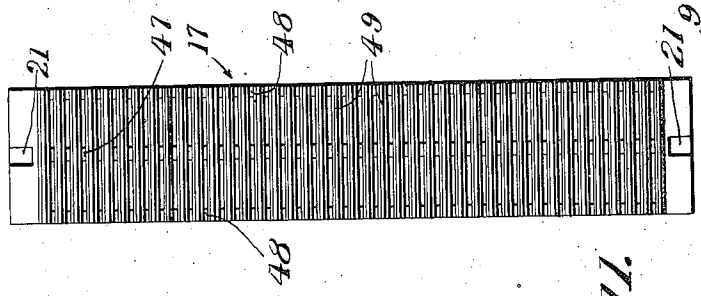


Fig. 5.

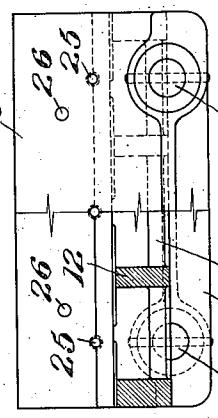


Fig. 3.

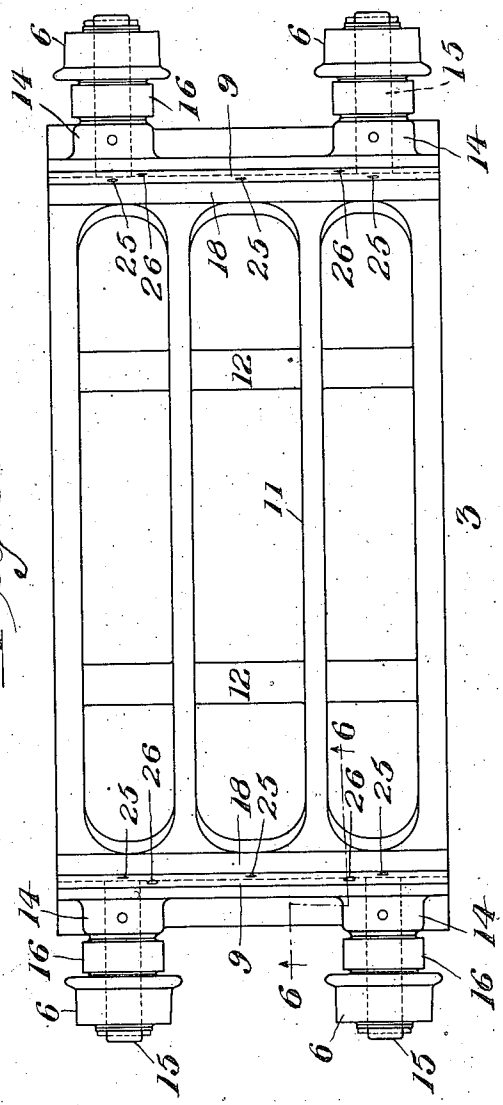
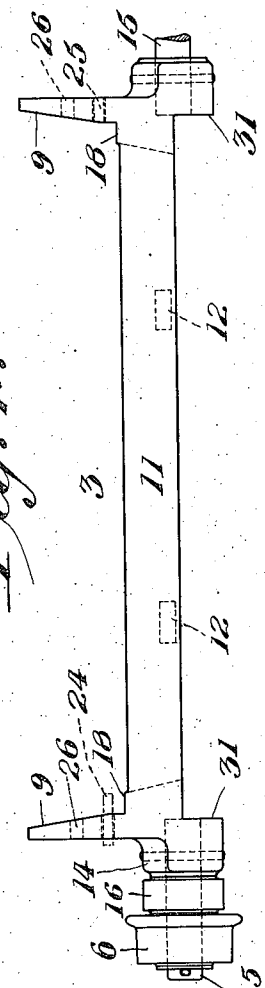


Fig. 4.



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PALLET MECHANISM FOR ORE SINTERING MACHINES

Original Filed Oct. 27, 1919 5 Sheets-Sheet 3

Fig. 8.

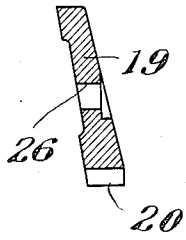


Fig. 7.

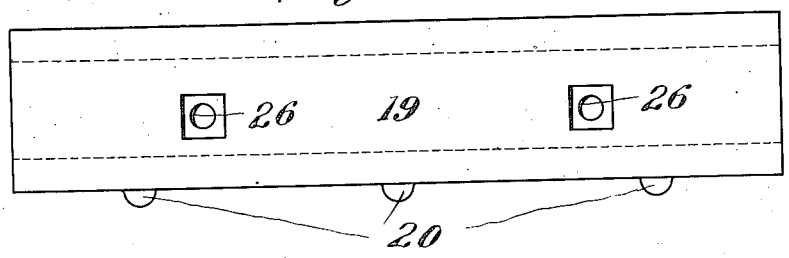
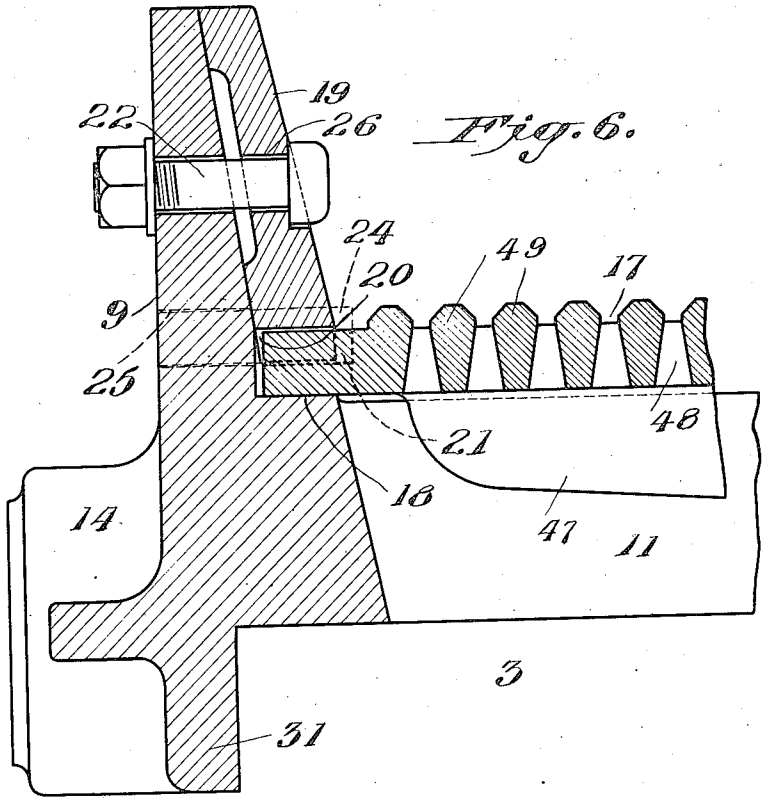


Fig. 6.



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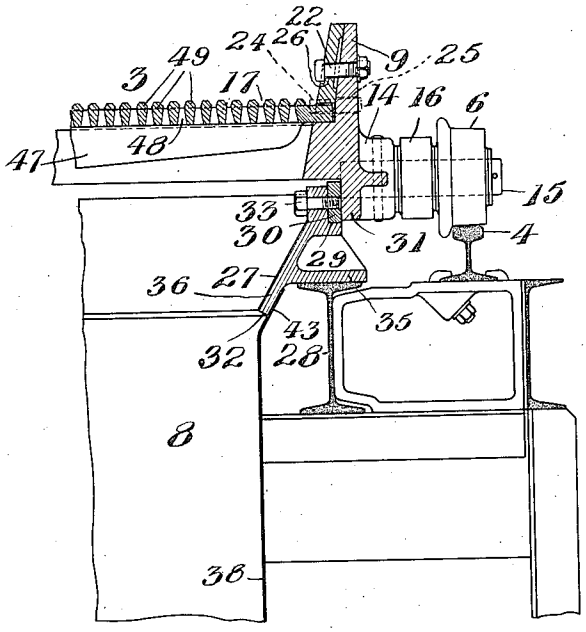
PALLET MECHANISM FOR ORE SINTERING MACHINES

Original Filed Oct. 27, 1919 5 Sheets-Sheet 4

Fig. 9.



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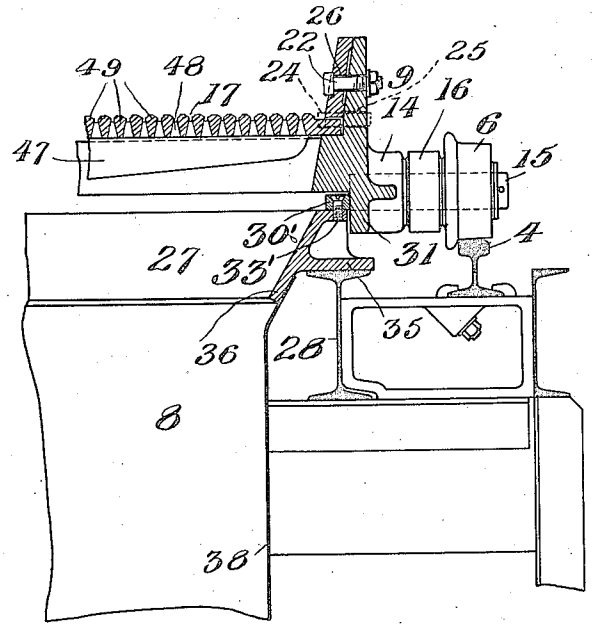
PALLET MECHANISM FOR ORE SINTERING MACHINES

Original Filed Oct. 27, 1919 5 Sheets-Sheet 5

Fig. 10.



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Patented Oct. 23, 1923. 1,471,402

UNITED STATES PATENT OFFICE.

RICHARD L. LLQYD, OF NEW YORK, N. Y., ASSIGNOR TO DWIGHT & LLOYD SINTERING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

PALLET MECHANISM FOR ORE-SINTERING MACHINES.

Application filed October 27, 1919, Serial No. 333,488. Renewed January 29, 1923.

To all whom it may concern:

Be it known that I, RICHARD L. LLOYD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Pallet Mechanism for Ore-Sintering Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in the pallets or carriers used in apparatus for roasting and sintering ore and for analogous purposes, where each pallet or carrier is a separate unit arranged to be used in connection with other similar pallets that move as a train, end to end, when in working operation.

Apparatus of the kind in connection with which the present improvements may be used is represented in Figs. 1 and 2, where Fig. 1 is a top plan view and Fig. 2 is a side elevation. Fig. 3 is a top plan view of one of the pallets or carriers detached, the bottom or grate thereof being removed. Fig. 4 is an end view of the carrier as shown in Fig. 3. Fig. 5 is a view, the left end part being in longitudinal section and the right hand part in end view, of the pallet shown in Figs. 3 and 4. Fig. 6 is a detail transverse sectional view, enlarged, parts being broken away, taken on the plane of the line VI—VI of Fig. 3, the grate bar and holder being shown in position. Fig. 7 is a detail view in elevation illustrating one of the clamping plates for holding the grate bars in position. Fig. 8 is a vertical sectional view of the bar represented in Fig. 7. Figs. 9 and 10 are transverse sectional views through the right hand end portions of a pallet, and of the parts of the apparatus adjacent thereto when the pallet is in working position, illustrating two forms of air seals located between the moving pallet and the stationary air box of the apparatus. Fig. 11 shows a plan view of one of the grate sections, detached.

In the drawings, 2 designates the framework of the apparatus, and 3, 3 independent carriers, herein termed pallets, adapted to support and carry through the apparatus the material to be treated, which it will be assumed is a fine ore carrying a combustible content. Machines of this type are well known and therefore a detailed description need not be here given. Suffice it to say the pallets, which are provided with wheels 6, 6, are supported upon rails 4, located in the upper part of the apparatus, during the working run of the pallets, and upon rails 5 in the lower part of the apparatus, during their return run. The pallets are caused to move slowly in the directions indicated by the arrows, Fig. 2, through the instrumentality of large driving sprocket wheels 7 that are rotated by power from a source not shown, through a train of speed reducing gearing 13, Fig. 1. Near the delivery end of the apparatus are arranged a pair of idler sprocket wheels 10 preferably of a size corresponding with the driving sprocket wheels 7 and engaging with the pallets in the same manner as the drive wheels. This arrangement of gearing for moving the pallets constitutes the subject-matter of another application and need not therefore be described more in detail. As the pallets move along the rails 4 the material which they carry is subject to transverse air currents induced by suitable mechanism comprising air boxes 8, 8 across the upper open ends of which the pallets are moved.

Each pallet 3 preferably consists of a small car such as represented in Figs. 3, 4 and 5, having upstanding side walls 9, 9 connected by cross bars 11, that are preferably suitably braced by the connecting bars 12. These pallets are preferably open-ended—that is without end walls—so that when arranged in a train, end to end, a continuous channel is formed bounded by the side walls 9, and the material, as for instance, fine pulverulent ore, extends in a continuous elongated sheet or layer from pallet to pallet. Alongside each pallet are the walls 31 which extend, when the pallets are in the positions indicated in Figs. 4 and 6, some distance below the plane of the bottom edges of the cross bars 11. Each pallet is provided at its sides with bearings 14, in which are mounted the axles 15 on which are mounted the supporting wheels 6. Upon the same shafts 15 and located between the wheels 6 and the bearings 14 are rollers 16, that constitute lateral contact members carried by the pallet, with which engage the sprocket teeth 23 of the wheels 7 and 10 of the apparatus.

In order to constitute a pervious support for the material being carried by the pallets they are provided with grates 17, each hav-

ing integral bars 48, 49 and web 47. These may be of any suitable construction to suit the material the pallets are intended to carry. The ends of the grate bars rest upon ledges 18 along the sides of the pallets at the bases of the side walls 9. They are held in place by clamping plates 19 secured to the side walls 9 by bolts 22 that pass through apertures 26 in the said side walls. These securing plates are provided along their lower edges with projections 20 adapted to enter recesses 21 formed in the upper faces at the ends of the grate bars, see Fig. 6, by which the latter are held from longitudinal movement in the pallets. Other means for holding the grates in position are pins 24 adapted to be seated in apertures 25 provided therefor in the side walls of the pallets and also adapted to have their inner ends rest in said recesses 21. Either the securing plates 19 or the pins 24 can be used to hold the grates. Some forms of the latter can be secured to better advantage by the use of the plates, but for others the pins are preferable. And the pallets are constructed so that either form of clamp or fastener may be used.

As each pallet in its travel along the working run of its course passes the open end of an air box 8, it is necessary that there should be maintained, between the pallet and the air box, practically air-tight connections, in order that the air that is caused to pass through the box, whether moving upwardly or downwardly, shall be forced through the material carried by the pallet, for which reason it is provided with a perforated grate such as has been described. In order to provide for these air-tight joints the following arrangement is employed:

Referring first to Fig. 9, 30 indicates a wear strip the outer face of which is adapted to bear against the inner face of the wall 31, these contacting faces being finished to fit one another accurately and to form an air-tight joint when in engagement. The strip 30 is seated in a recess or rabbet 29 formed in the flange of a frame 27, supported by longitudinal I-beams 28 and the skirt 32 of which fits the open end of an air box 8. The strip 30 is secured to the frame by bolts 33. The sealing strips, instead of being seated in recesses formed in the outer vertical faces of the frames 27, may be secured to the upper longitudinal edges of these frames as represented in Fig. 10, where the strips 30′ are represented as secured in this manner by means of the bolts 33′. The strips 30′ are of such width that they project laterally beyond the vertical upper edges of the frame 27 so as to engage in a face of the wall 31.

It will be understood that there is a series of the frames or supports 27 extending along the main frame, each being cast with the horizontal flange parts 35 resting, as aforesaid, on the main frame as at 28, and also cast with the inwardly sloping walls or flanges 36.

Independent air boxes 37, 37 are arranged in a series along the frame. Each is formed with vertical side walls 38, of sheet metal, a front wall 39 and a rear wall 40, the latter converging to a closed bottom at 41. An air forcing apparatus is connected to each air box independently of the others, such as a fan 44 and ducts 45, 46.

The upper edges of the side walls of these boxes are at 43 secured to the supports or frame elements 27.

The packing device extends continuously, in alignment, along the series of independent air boxes and the pallets are so shaped that each passes from box to box without breaking the air-tight connection, each being cast with the down extending flange walls 31 which fit tightly against the stationary, aligned packing, and also cast with supports for the wheel shafts which are so related to the packing devices that the latter are maintained tightly together as the pallet moves along the system; and each pallet is cast with transverse spaced bars integral with the side walls of the pallet so that it is held in proper relation to the packings on both sides, the transverse bars being adapted to support a series of rigidly detachable fastened grate sections.

The guideway for the pallets comprises a part along which they move when operating, a part along which they return when idle, and connecting end parts, this guideway holding them in an orbit that encloses the series of independent boxes.

What I claim is:

1. In a mechanism for desulphurizing or treating ore, the combination of the main frame, the air boxes arranged in series and supported by said frame, means for forcing air through said boxes, the guideway along the upper part of the frame, the series of pallets on the said guideway, each cast with downward projecting flange walls adapted to fit air tight with the air boxes, and cast with vertical walls and transverse bars integral with the vertical walls and with the flange walls, said transverse bars being adapted to support a series of detachable grate sections, and carrying means for holding the grate sections rigidly but detachably on the pallet bodies as they move along and around said air boxes.

2. In a mechanism for desulphurizing or treating ore, the combination of the longitudinally arranged frame, the guideway thereon, frame castings as at 27 providing a continuous longitudinal support and formed with horizontal flanges resting on the main frame and with inward sloping plates,

series of independent air boxes, each formed with a closed bottom, side walls secured to the support 27 and downward converging transverse walls, ore carrying pallets with apertured grates movable along the air boxes, each having downward projecting flange walls and laterally projecting stud shafts adapted to carry wheels fitted to said guideway, and detachable packing devices intermediate of the flange walls and the air box supports at 27.

3. In a mechanism for desulphurizing or treating ore, the combination of the longitudinally extended main frame, the guideway in the upper part of said frame, a series of cast supporting plates such as 27 supported on the main frame and formed with inward sloping walls, a series of independent air chambers each tapering inward to a closed bottom and having sheet side walls secured to the said supporting plates 27, and a series of ore carrying pallets movable along the guideway and above the air boxes, each having downward projecting flange walls and intermediate stationary air tight packing devices between said flange walls and the supporting plates.

4. In a mechanism for desulphurizing or treating ore, the combination of a longitudinally extended main frame, a guideway for supporting pallets comprising a section along which they move when in operation, a section along which they are returnable when idle and connecting sections, a series of independent air boxes surrounded by the said guideway and adapted to have air pass through them independently, and a series of pallets movable along said guideway across the air boxes successively and each pallet having down projecting flange walls fitted air tight to stationary packing devices supported at the upper edges of the air boxes.

5. In a mechanism for desulphurizing or treating ore, the combination with the main frame, the track rails, the series of independent air boxes, the packing device extending continuously in alignment along the series of air boxes, and the series of pallets mounted on wheels on said track, each cast with spaced transverse bars and with down projecting flange walls for air tight connection with the said aligned packing device, said transverse bars being adapted to support a series of grate sections with apertures communicating with said air boxes, and means for detachably securing said grate sections to the pallet bodies.

6. In a mechanism for desulphurizing or treating ore, a series of pallets each formed with a body having uprising side walls, a series of spaced transverse bars and down projecting flange walls, all cast integrally together and adapted to have a series of grate sections detachably supported on said transverse bars, and wheel supports connected to and extending laterally from the side walls and adapted to have track wheels mounted thereon, substantially as set forth.

In testimony whereof I affix my signature.

RICHARD L. LLOYD.