Nov. 5, 1946. E. J. DOBERSTEIN 2,410,482

SHAKER CONVEYER

Filed Sept. 13, 1945 3 Sheets-Sheet 1

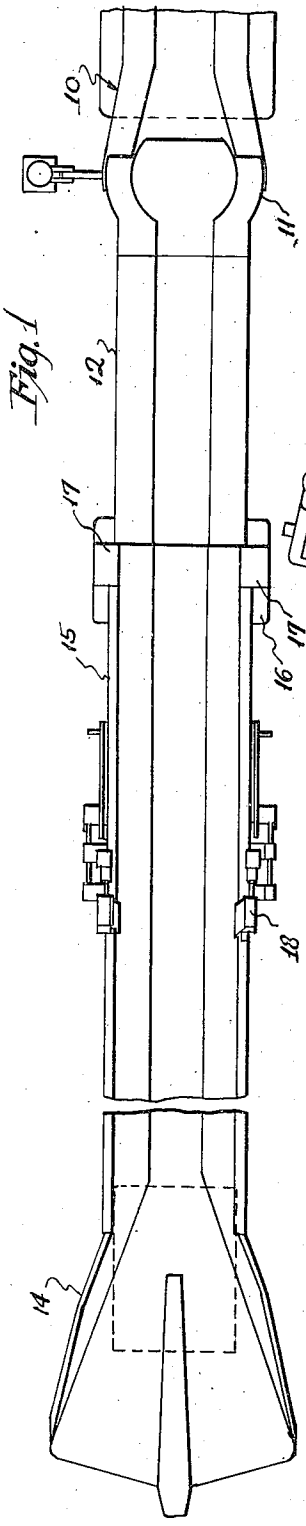


Fig. 1

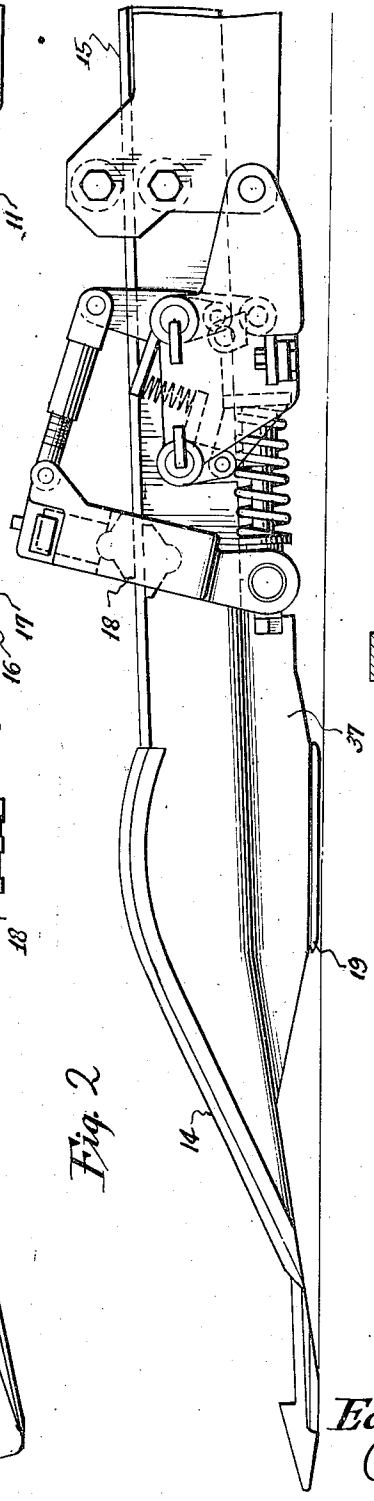


Fig. 2

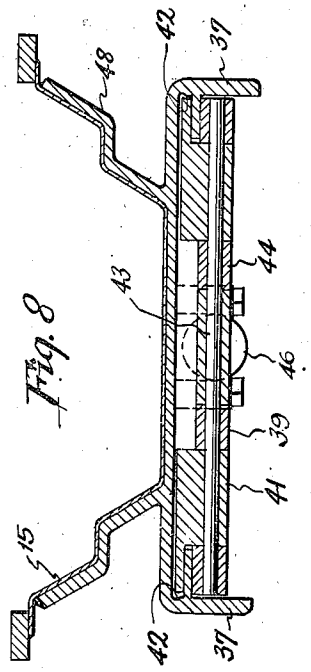


Fig. 8

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Nov. 5, 1946. E. J. DOBERSTEIN 2,410,482

SHAKER CONVEYER

Filed Sept. 13, 1945 3 Sheets-Sheet 2

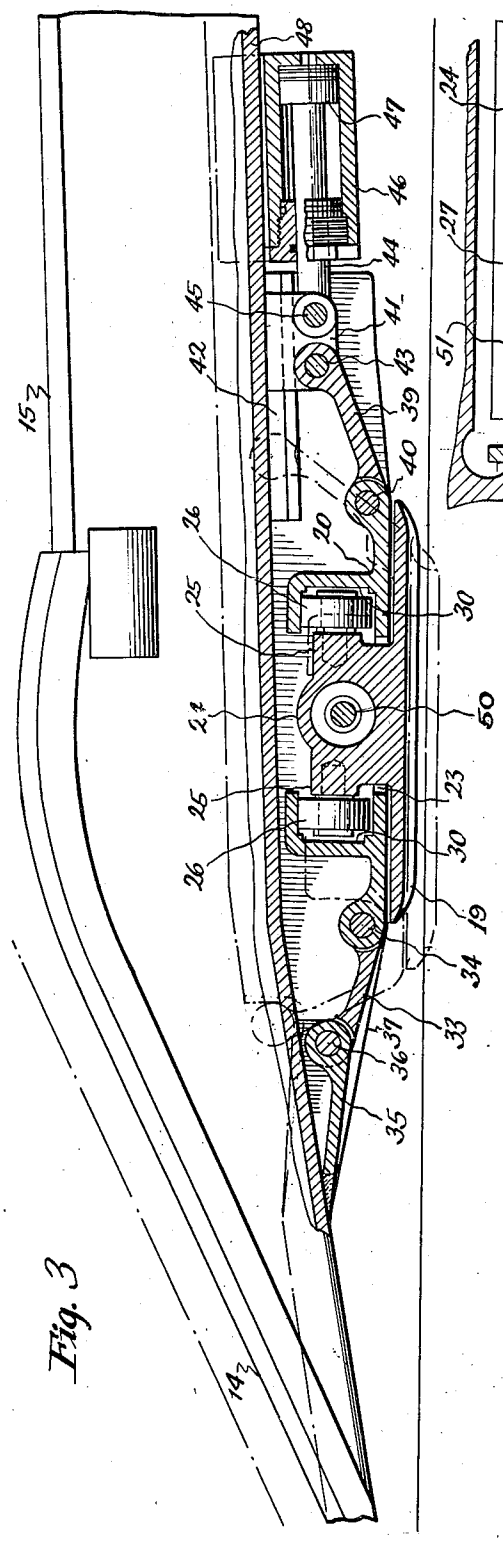


Fig. 3

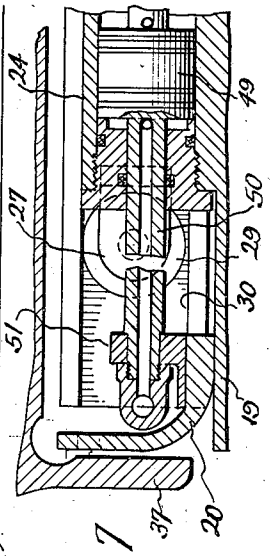


Fig. 7

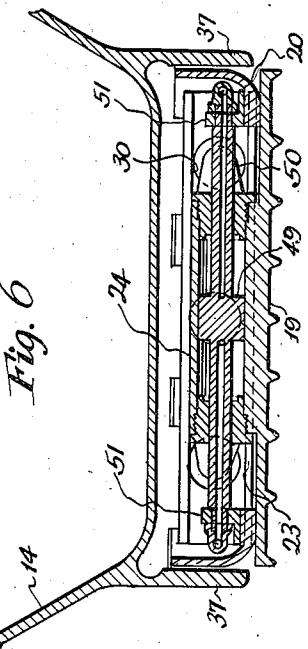


Fig. 6

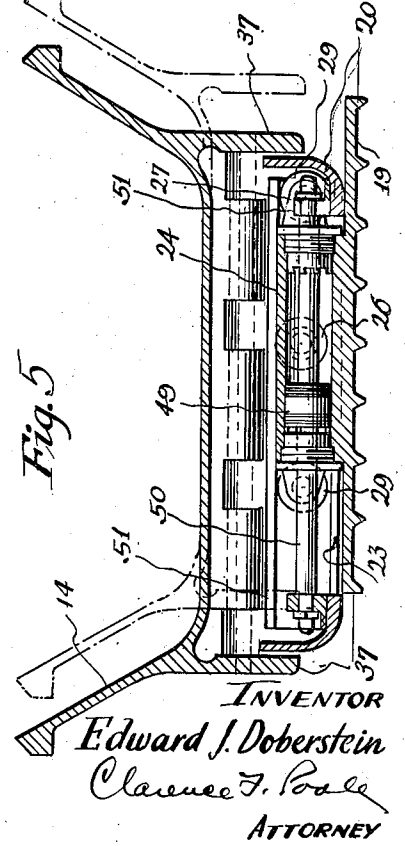


Fig. 5

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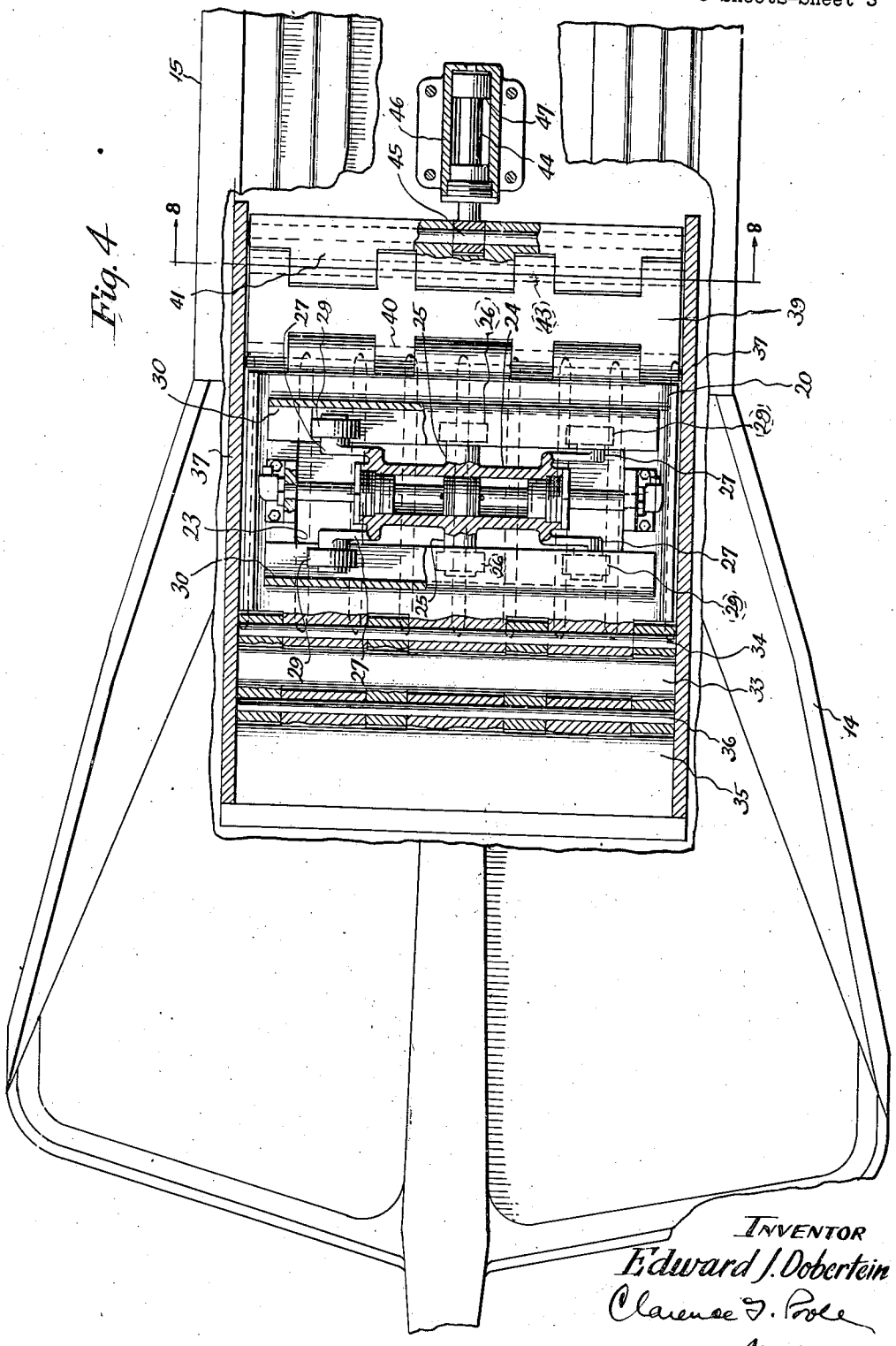
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Nov. 5, 1946. E. J. DOBERSTEIN 2,410,482

SHAKER CONVEYER

Filed Sept. 13, 1945 3 Sheets-Sheet 3

Fig. 4



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Patented Nov. 5, 1946

2,410,482

UNITED STATES PATENT OFFICE

2,410,482

SHAKER CONVEYER

Edward J. Doberstein, Blue Island, Ill., assignor to Goodman Manufacturing Company, Chicago, Ill., a corporation of Illinois

Application September 13, 1945, Serial No. 616,132

8 Claims. (Cl. 198—14)

1

This invention relates to improvements in shaker conveyers and more particularly relates to a new and improved means for laterally moving the pick-up end of a shaker conveyer.

The principal object of my invention is to provide an efficient and simplified form of self-contained means of a novel construction, which is selectively operable to positively move the pick-up end of a shaker conveyer laterally either while the conveyer is in motion or is standing still.

This and other objects of my invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

Figure 1 is a plan view of the inby end of a shaker conveyer trough line having a device constructed in accordance with my invention embodied in the inby end thereof;

Figure 2 is a view in side elevation of the inby end of the trough line shown in Figure 1 and drawn to a larger scale than Figure 1;

Figure 3 is an enlarged fragmentary view in side elevation of the inby end of the extensible trough of the trough line shown in Figures 1 and 2, with parts of the extensible trough broken away and with other parts shown in substantially longitudinal section in order to illustrate certain details of my invention;

Figure 4 is an enlarged fragmentary plan view of the inby end of the extensible trough of the shaker conveyer trough line, with certain parts of the trough broken away and certain other parts shown in substantially horizontal section in order to illustrate certain details of the device of my invention;

Figure 5 is a transverse sectional view taken substantially along line 5—5 of Figure 4, showing the pick-up member on the inby end of the extensible trough in an elevated position and in one extreme lateral position;

Figure 6 is a view somewhat similar to Figure 5 but showing the cylinder and piston in transverse section and showing the pick-up member on the inby end of the extensible trough in a lowered position and in a central position with respect to the trough line;

Figure 7 is an enlarged detail fragmentary transverse sectional view showing certain details of my invention which are not shown in Figures 5 and 6; and

Figure 8 is a transverse sectional view taken substantially along line 8—8 of Figure 4.

In the embodiment of my invention illustrated in the drawings, Figure 1 diagrammatically shows a portion of a shaker conveyer trough line

2

10. Said trough line is reciprocably driven at its outby end from a shaker conveyer drive mechanism (not shown), in a manner well known to those skilled in the art, for moving material from the inby to the outby end thereof by the reciprocable motion of said trough line. Said trough line includes a swivel trough 11 having a reciprocating trough 12 pivotally connected to its forward end for lateral movement along the ground about the axis of said swivel trough. Said swivel trough is so arranged as to permit the continuous flow of material along said reciprocating and swivel troughs to the outby end of the trough line, when the forward end of said reciprocating trough is in various positions of lateral displacement with respect to the trough line.

A pick-up member or shovel 14 forms a forward continuation of the forward end of an extensible trough 15, which extensible trough is mounted for extensible or retractible movement with respect to said reciprocating trough. Said extensible trough 15 is mounted on a ground engaging shoe 16 adjacent its rear end on legs 17, 17 extending along opposite sides of said reciprocating trough, and supporting the rear end of said extensible trough in cuttings discharge relation with respect to said reciprocating trough as it is extensibly or retractibly moved therealong. The forward end of said extensible trough is supported on the forward end of the shovel 14.

A friction grip feeding mechanism 18 mounted on the forward end of the reciprocating trough 12 and extending in advance thereof, is adapted to be moved into engagement with said extensible trough during alternate strokes of the conveyer, for extensibly or retractibly moving said extensible trough with respect to said reciprocating trough in a manner well known to those skilled in the art. Said feeding mechanism is herein shown as being of a form similar to that illustrated in the Sloane Patent No. 2,318,808, dated May 11, 1943, so need not herein be shown or described in detail.

Referring now to the means for positively moving the shovel 14 and extensible trough 15 laterally about the axis of the swivel 11, a ground engaging shoe 19 is mounted in a guide frame 20, and when engaged with the ground, forms a means for lifting said guide frame above the ground and supporting said guide frame for movement with respect to said shoe in a direction transversely of the longitudinal center of the trough line.

The guide frame 20 is herein shown as being mounted beneath the shovel 14 for vertical adjustment with respect thereto, to elevate said shovel above the ground, and as having an open central portion 23 adapted to receive a cylinder 24, herein shown as being formed integrally with and extending upwardly from the shoe 19. A plurality of aligned bosses 25, 25 project from opposite side walls of said cylinder in a direction extending longitudinally of the trough and have rollers 26, 26 rotatably mounted thereon. Arms 27, 27 extend from opposite ends of said cylinder in directions extending laterally of the shovel 14, and also forwardly and rearwardly from said cylinder, and have rollers 29, 29 rotatably mounted thereon and extending transversely of the shovel 14 in the same planes as the rollers 26, 26. Said rollers 29, 29 are similar to the rollers 26, 26, and said rollers 29, 29 and 26, 26 are guided in facing parallel spaced transversely extending channelled guides 30, 30, herein shown as extending upwardly from and as being formed integrally with said guide frame 20, on opposite sides of the open central portion thereof. Said channelled guides and rollers thus form a means for slidably supporting said shoe on said guide frame, when said shoe is out of engagement with the ground, and for slidably supporting said guide frame on said shoe when said shoe is engaged with the ground and lifts the end of the shovel 14 above the ground.

The adjustable connection between the guide frame 20 and the bottom of the shovel 14 includes a link 33 extending for substantially the full width of said guide frame and interleaving the forward portion of said guide frame and pivotally connected thereto by means of a transversely extending pivotal pin 34. The opposite end of said link interleaves the free end of a transversely extending plate 35 and is pivotally connected thereto by means of a pivotal pin 36. Said plate is secured at its forward end to the bottom of said shovel and extends in a rearward direction away from the bottom of the shovel 14 in a slightly downwardly inclined direction. Opposite sides of said plate are secured to side walls 37, 37 depending from the bottom of the shovel and extending along opposite sides of the guide frame 20, to prevent dirt from getting inside of said guide frame. Said side walls also form a guide means for said guide frame to limit lateral displacement thereof. A link 39 interleaves the end of the said guide frame, which is opposite from the link 33, and is pivotally connected thereto by means of a pivotal pin 40. The opposite end of said link interleaves a cross head 41 slidably guided at its ends in facing channelled guides 42, 42 formed integrally with the depending sides 37, 37 of the shovel 14. A pin 43 pivotally connects said link to said cross head. The opposite end of said cross head is pivotally connected to an enlarged laterally extending forward end of a piston rod 44 by means of a pivotal pin 45. Said piston rod is extensible from a cylinder 46 and extends from a piston 47 slidably movable within said cylinder. Said cylinder is secured to and depends from the bottom of a rearwardly projecting portion 48 of the shovel 14, which forms a continuation of said shovel and extends along and substantially conforms to the form of the extensible trough 15. Suitable fluid connections (not shown) may be provided to admit fluid under pressure to either the head or piston rod ends of said cylinder.

The admission of fluid under pressure to the head end of said cylinder will thus move the cross head 41 along the guides 42, 42 to move the shoe 19 downwardly into engagement with the ground through the link 39. Further movement of said cross head will cause the forward end of the shovel 14 to be elevated above the ground to the position shown by broken lines in Figure 3 and by solid lines in Figure 5. When the forward end of said shovel is spaced above the ground, the guide frame 20 will be supported on the rollers 26, 26 and 29, 29 for slidable movement along the shoe 19 in a direction extending transversely of the shovel.

The means for slidably moving the guide frame 20 with respect to said shoe in a direction transversely of the trough 15 includes a piston 49 herein shown as being formed integrally with a piston rod 50, intermediate the ends thereof. Said piston rod extends beyond opposite ends of the cylinder 24 and is mounted at its ends in upright support brackets 51, 51, secured to and extending upwardly from the bottom of said guide frame 20. Said piston rod is drilled from its opposite ends to positions adjacent opposite sides of said piston, and is cross drilled to open into said cylinder, adjacent opposite sides of said piston, to admit fluid to one end or the other of said cylinder to move the guide frame 20, extensible trough 15, and shovel 14 along said shoe on the rollers 26, 26 and 29, 29 in one direction or another about the swivel 11.

During operation of the conveyer, the shoe 19 may be lifted clear of the ground and held in an elevated position by the admission of fluid under pressure to the piston rod end of the cylinder 46. When it is desired to elevate the forward end of the shovel 14 above the ground, either to lift said shovel over a roll on the ground or to position said shovel for moving laterally, fluid under pressure may be admitted to the head end of said cylinder 46 to depress said shoe and positively raise the forward end of said trough and shovel above the ground in the hereinbefore described manner. Fluid under pressure may then be admitted to one end or the other of the cylinder 24 through the drilled piston rod 50, depending upon the direction it is desired to move the shovel, to move said guide frame and extensible trough and shovel in a transverse direction, preferably for the full length of travel of said piston.

Where it is desired that the shovel be moved laterally a distance further than the length of travel of said piston, fluid under pressure may be released from the head end of the cylinder 46 and admitted to the piston rod end thereof, to lift the shoe 19 above the ground. At the same time, the guide frame 20 may be returned to its initial position by admitting fluid under pressure to the opposite end of the cylinder 24 from which it was first admitted. Fluid under pressure may then be admitted to the head end of the cylinder 46 to again lift the shovel 14 above the ground, and at the same time fluid under pressure may be admitted to the cylinder 24 to further move said shovel in a lateral direction about the axis of the swivel 11. These operations may be repeated until the shovel is in the desired lateral position with respect to the trough line.

While I have herein shown and described one form in which my invention may be embodied, it will be understood that the construction thereof and the arrangement of the various parts may be altered without departing from the spirit and scope thereof. Furthermore, I do not wish to be construed as limiting my invention to the

specific embodiment illustrated, excepting as it may be limited in the appended claims.

I claim as my invention:

1. In a means for laterally feeding the pick-up end of a shaker conveyer, a trough on the inby end of a shaker conveyer, and means for moving the forward end of said trough laterally while the conveyer is in motion or is standing still including a shoe, means for positively engaging said shoe with the ground and elevating the forward end of said trough above the ground to cause the forward end of said trough to be wholly supported on said shoe, and other means connected between said trough and shoe and selectively operable to positively move said trough laterally with respect to said shoe.

2. In a means for laterally feeding the pick-up end of a shaker conveyer, a trough on the inby end of a shaker conveyer, and means for laterally moving the forward end of said trough while the conveyer is in motion or is standing still including a shoe, a fluid pressure cylinder and piston for moving said shoe into engagement with the ground and for elevating the forward end of said trough above the ground to cause the forward end of said trough to be wholly supported on said shoe, and another fluid pressure cylinder and piston connected between said trough and shoe for positively moving said trough laterally with respect to said shoe, when in an elevated position with respect thereto.

3. In a means for laterally feeding the inby end of a shaker conveyer, a shoe, a trough, means for positively engaging said shoe with the ground and for elevating said trough above the ground, means for mounting said trough on said shoe for slidable movement with respect thereto in a direction transversely of said trough when supported above the ground on said shoe, and means for moving said trough with respect to said shoe, to positively feed said trough in a lateral direction with respect to the conveyer.

4. In a means for laterally feeding the inby end of a shaker conveyer, a shoe, a trough, a guide frame mounted on the underside of said trough for vertical adjustment with respect thereto, a laterally movable supporting connection between said shoe and said guide frame, means connected with said guide frame for vertically moving said guide frame, to positively engage said shoe with the ground and to elevate the inby end of said trough above the ground, and means connected between said guide frame and shoe for positively moving said guide frame along said shoe, to swing said trough in a lateral direction.

5. In a means for laterally feeding the inby end of a shaker conveyer, a shoe, a trough, a guide frame mounted on the underside of said trough for vertical adjustment with respect thereto, a laterally movable supporting connection between said shoe and said guide frame, means connected with said guide frame for vertically moving said guide frame to positively engage said shoe with the ground and to elevate the inby end of said trough above the ground including a fluid pressure cylinder and piston, and another fluid pressure cylinder and piston connected between said guide frame and said shoe for positively moving said guide frame along said shoe, to swing said trough in a lateral direction.

6. In a means for laterally feeding the inby end of a shaker conveyer, a shoe, a trough, a guide frame mounted on the underside of said trough, a slidable guiding connection between said shoe and said guide frame extending transversely of said trough, a vertically adjustable supporting connection between said guide frame and said trough, a fluid pressure cylinder and piston connected between said trough and guide frame for vertically moving said guide frame with respect to said trough and for positively engaging said shoe with the ground, to support the inby end of said trough on said shoe and to elevate the inby end of said trough above the ground, and a fluid pressure cylinder and piston connected between said guide frame and said shoe for positively moving said guide frame along said shoe in reverse directions, to swing said trough laterally in one direction or another.

7. In a means for laterally feeding the inby end of a shaker conveyer, a shoe, a trough, a guide frame mounted on the underside of said trough, a slidable guiding connection between said shoe and said guide frame extending transversely of said trough, a vertically adjustable supporting connection between said guide frame and said trough including a link transversely pivoted at one of its ends to one end of said guide frame and pivoted at its opposite end to the underside of said trough, a member slidably guided on the bottom of said trough for movement in a direction extending longitudinally thereof, a link transversely pivotally connected between said member and said guide frame, and power means for moving said member longitudinally of said trough to lower said guide frame and to positively engage said shoe with the ground and elevate the inby end of said trough above the ground, and power means connected between said guide frame and shoe for positively moving said guide frame along said shoe when said trough is in an elevated position with respect to the ground, to move said trough in a lateral direction.

8. In a means for laterally feeding the inby end of a shaker conveyer, a shoe, a trough, a guide frame mounted on the underside of said trough, and a slidable guiding connection between said shoe and said guide frame extending transversely of said trough, a vertically adjustable supporting connection between said guide frame and said trough including a link transversely pivoted at one of its ends to one end of said guide frame and pivoted at its opposite end to the underside of said trough, a member slidably guided on the bottom of said trough for movement in a direction extending longitudinally thereof, a link transversely pivotally connected between said member and said guide frame, a fluid pressure cylinder and piston connected between said trough and member for moving said member longitudinally of said trough to positively engage said shoe with the ground and to elevate the inby end of said trough above the ground, and a fluid pressure cylinder and piston connected between said guide frame and shoe to positively move said guide frame along said shoe when said trough is in an elevated position with respect to the ground, to move said trough in a lateral direction.

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