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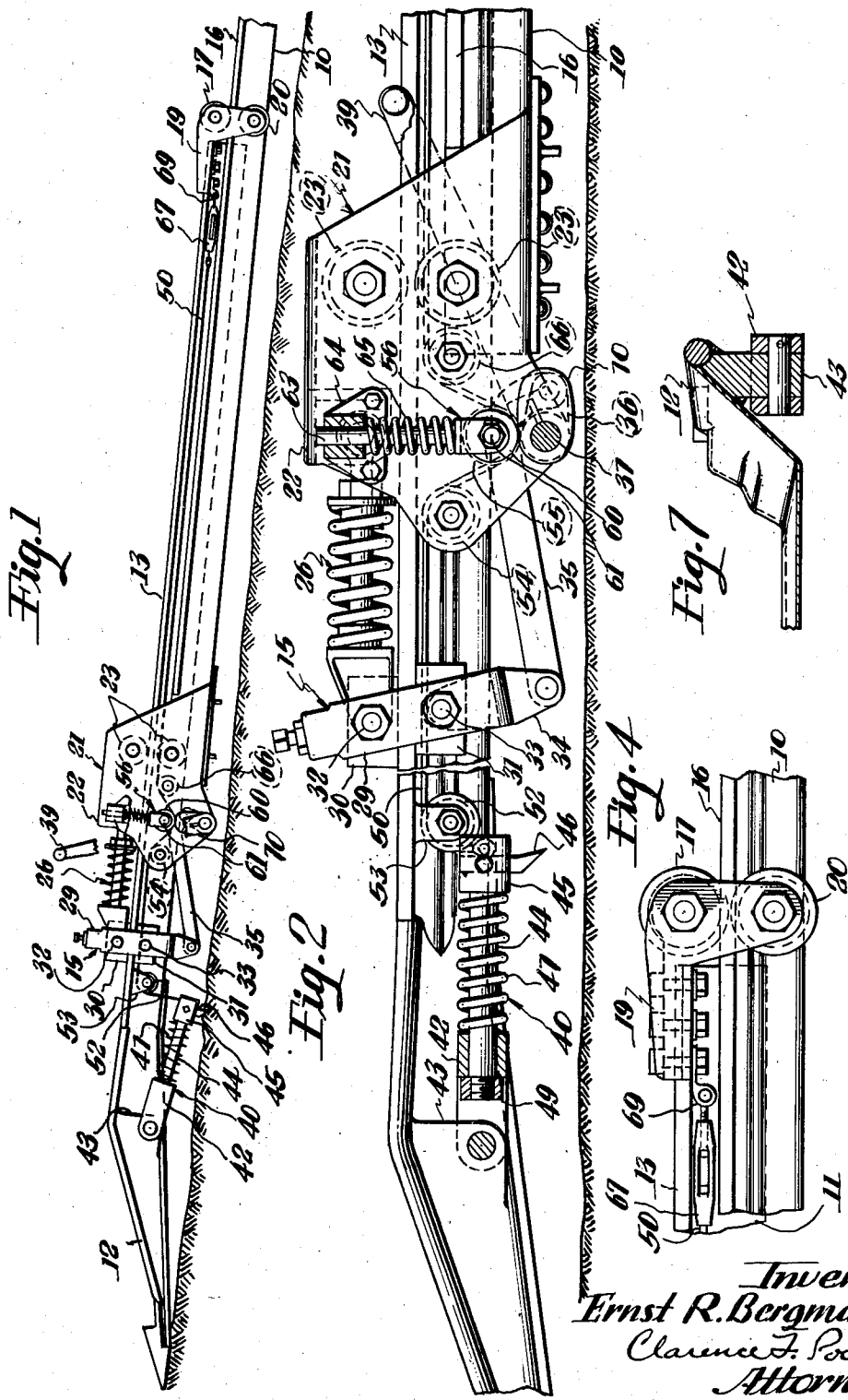
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2,161,002

FEEDING HEAD FOR RECIPROCATING OR SHAKER CONVEYERS

Filed Nov. 10, 1937

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

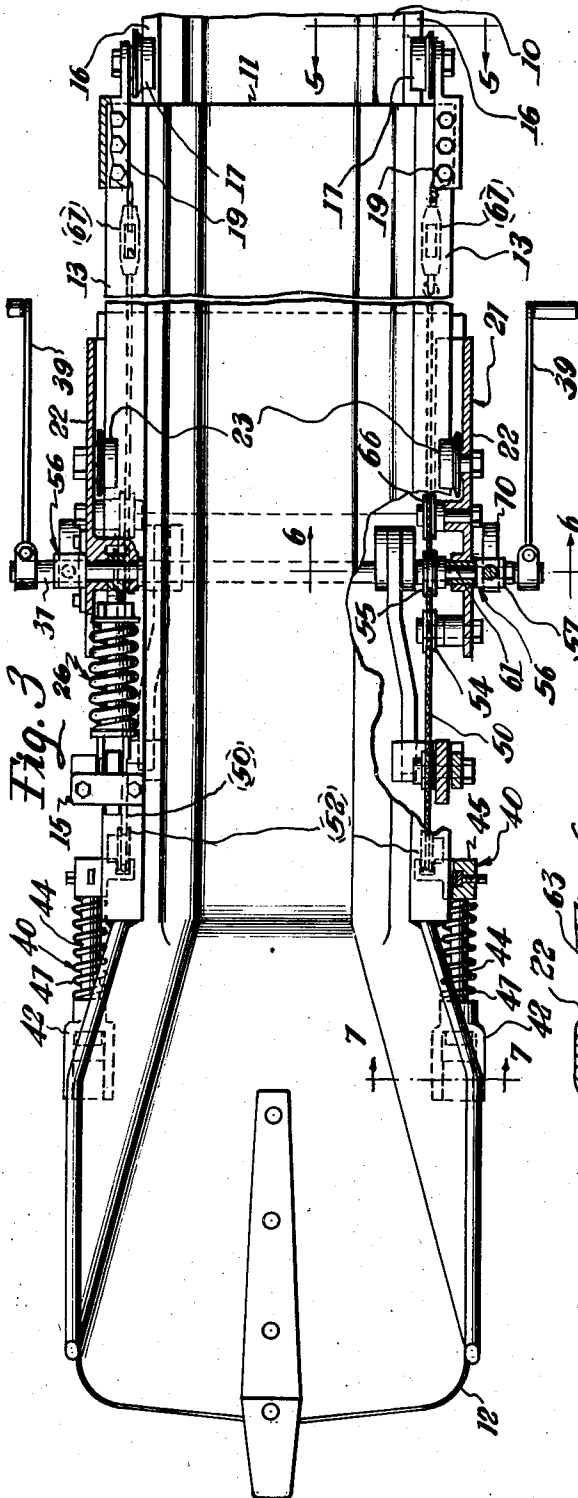


Fig. 5

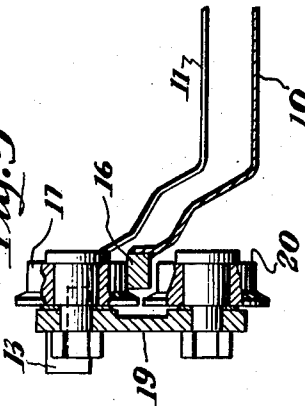
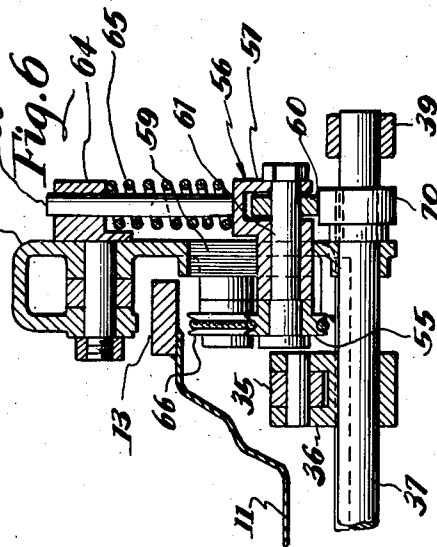


Fig. 6



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FEEDING HEAD FOR RECIPROCATING OR
SHAKER CONVEYERSErnst R. Bergmann, Chicago, Ill., assignor to
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15 Claims. (Cl. 198—220)

This invention relates to improvements in feeding heads for reciprocating or shaker conveyers of the type used for gathering and transporting loose material such as coal, rock, or the like.

5 More specifically, my invention relates to improvements in feeding heads in which the extension and retraction of a telescopic trough section is controlled through clamping means engageable with said trough section at will during
10 certain periods of the forward and return stroke of the main conveyer, and has as its objects to provide a positive means of an improved and simplified construction particularly adapted for use along grades for holding the extensible
15 trough section from backward movement when the clamping means are disengaged therefrom.

Other objects of my invention will appear from time to time as the following specification proceeds.

20 My invention may be more clearly understood with reference to the accompanying drawings wherein:

Figure 1 is a view in side elevation of a feeding mechanism attached to the forward end of
25 a reciprocating conveyer showing the apparatus positioned for loading along an upwardly inclined grade;

Figure 2 is an enlarged fragmentary view in side elevation, of the device shown in Figure 1 with the parts in a different position than in
30 Figure 1 and with certain parts broken away and in section in order to more clearly illustrate certain details of my invention;

Figure 3 is a fragmentary plan view of the device shown in Figure 1 drawn to a somewhat
35 larger scale than Figure 1 with parts broken away and in section;

Figure 4 is an enlarged detail view showing certain details of the slidable connection between
40 trough sections;

Figure 5 is an enlarged sectional view taken substantially along line 5—5 of Figure 3;

Figure 6 is an enlarged sectional view taken substantially along line 6—6 of Figure 3; and

45 Figure 7 is an enlarged sectional view taken substantially along line 7—7 of Figure 3.

Referring now in particular to the drawings, the main elements of the embodiment of my invention illustrated therein include a reciprocating trough section 10 connected to and reciprocably driven from the forward end of a reciprocating conveyer trough or pan line (not shown). Said reciprocating trough section may be connected to the forward end of the conveyer pan
50 line and supported above the ground at its rear-

ward end by means of a swivel (not shown) or any other suitable connecting means which will permit it to be spaced above the ground and be moved from side to side to readily pick up material along the entire coal face and be adjusted
5 up and down to conform to an uneven bottom. An extensible trough section or pickup member 11 having a flared gathering shovel 12 is adapted to be nested within said reciprocating trough section for telescopic extension or retraction with
10 respect thereto.

The extensible trough section or pickup member 11 is provided with a pair of laterally extending bearing plates 13, 13 secured to and extending
15 outwardly from its upper flanges. Said bearing plates are adapted to be selectively engaged by friction gripping devices generally indicated by reference character 15, which are manually controlled and are adapted to extend or retract
20 said extensible trough section with respect to said reciprocating trough section by the action of the conveyer.

The reciprocating trough section 10 is provided with laterally extending bearing plates 16, 16 which extend outwardly from the upper
25 flanges thereof and which form a track for flanged rollers 17, 17 mounted on brackets 19, 19 secured to and projecting rearwardly from the extensible trough section 11. Flanged rollers 20, 20 are likewise mounted on said bracket beneath
30 the rollers 17, 17 for engagement with the under side of said bearing plates (see Figures 1, 4, and 5).

A supporting bracket 21 is secured to the under side of the forward end of the reciprocating
35 trough section 10 and has side walls 22, 22 extending upwardly along the outer sides thereof and projecting forwardly of the forward end thereof. A pair of opposed flanged rollers 23, 23 is mounted in each side wall 22, the upper rollers
40 being adapted to ride on the bearing plates 13, 13 of the extensible trough section 11 and the lower rollers being adapted to engage the under side of said bearing plates to prevent vertical and lateral displacement of said trough sections with
45 respect to each other.

The friction gripping devices 15, 15 are disposed in advance of the bracket 21 and are pivotally connected to the side walls 22, 22 adjacent the upper sides thereof by means of spring
50 links 26, 26. Said spring links are adapted to yield when pressure is exerted thereon in a rearward direction by said clamping devices to permit said clamping devices to open and to release said extensible trough section upon pres-
55

sure on the forward end of the shovel. Said gripping devices are of a similar construction so one only will herein be described in detail.

Each gripping device 15 includes a carrier member 29 of a C-shaped formation and having the open portion thereof extending inwardly towards the center of the extensible trough 11 above and below the bearing plate 13. Said carrier member has a pair of friction blocks 30 and 31 mounted therein on opposite sides of the open portion thereof on bolts 32 and 33 respectively, the bolt 33 also forming a means for connecting said carrier member to the forward end of the spring link 26. An ear 34 depends from said carrier member and has a link 35 pivotally connected thereto which extends rearwardly therefrom and has a downwardly curved rearward end which is pivotally connected to the end of a crank arm 36. Said crank arm is in turn secured to a transversely extending shaft 37 mounted in advance of the trough section 10 in opposite side walls 22, 22 of the supporting bracket 21. An operating handle 39 is secured to each outer end of said shaft for pivoting said shaft and operating the crank arms 36, 36 and thus pivoting the carrier member 29 about its axis of connection to the spring link 26 and bringing the friction grip blocks 30, 30 and 31, 31 into and out of engagement with the bearing plates 13, 13.

When it is desired to advance the extensible trough section 11 with respect to the reciprocating trough section 10, the handle 39 is moved to the position shown in Figure 2, during the forward stroke of the conveyer, to engage the grip blocks 30 and 31 with the bearing plates 13, 13. Said handle is moved upwardly in a counterclockwise direction to the position shown in Figure 1 during the return stroke of the conveyer to permit said friction grip blocks to be disengaged from said bearing plates.

When it is desired to retract said extensible trough section within said reciprocating trough section, the friction blocks 30 and 31 are engaged with the bearing plates 13, 13 upon the return stroke of the conveyer and disengaged therefrom upon the forward stroke of the conveyer in the aforementioned manner.

With reference now in particular to the means for positively holding the extensible trough 11 from backward slipping movement with respect to the reciprocating trough 10 and several of the novel features of my invention, a pair of holding devices 40, 40 is provided which are operable when the gripping devices 15, 15 are disengaged from the bearing plates 13, 13. One of said devices is provided on each side of the shovel 12 and each of said devices is of a similar construction so one only will herein be described in detail.

The holding device 40 includes a bifurcated member 42 which is pivotally connected between the furcations thereof to a lug 43 depending from the outer side of the shovel 12, adjacent the rearward end thereof. A rod 44 slidably mounted in said member extends rearwardly therefrom. Said rod is provided with a block or bit holding member 45 on the rearward end thereof which is adapted to detachably hold a depending bit 46, which is herein shown as being an ordinary cutter bit of the type used in mining machine cutter chains. The point of said bit extends downwardly towards the ground, and is directed towards the rear of the conveyer so that it may engage the ground and hold the extensible trough section from backward slipping movement with respect to the reciprocating trough section.

A compression spring 47 encircles said rod and is interposed between the member 42 and the bit holding member 45 to permit yieldable movement of said rod in a direction towards the forward end of the shovel. A nut 49 is threaded on the end of said rod and is adapted to abut the member 42 within the furcations thereof to retain said rod on said member.

A flexible member or cable 50 is provided to actuate the holding device 40. Said flexible cable is secured to the bit holding member 45 at one of its ends, in a suitable manner, and extends upwardly therefrom and around and over a sheave 52 mounted on a bracket 53 depending from the under side of the bearing plate 13. From said sheave said cable passes rearwardly over a sheave 54 mounted on the inner side of the side wall 22 adjacent the forward end thereof. From thence it passes downwardly and under a sheave 55 on the lower end of a yieldable supporting bracket 56.

The supporting bracket 56 includes a projecting portion 57 which extends outwardly from said sheave through a slotted opening 59 in the side wall 22 (see Figure 6). The outer end of said projecting portion is provided with a slot which opens towards the lower end thereof and is adapted to receive a roller 60 mounted on a shaft 61 which shaft also forms a support for the sheave 55. A rod 63 herein shown as being formed integral with the projecting portion 57 extends upwardly therefrom and is slidably mounted in a bracket 64 secured to and projecting outwardly from the side wall 22. A compression spring 65 encircles the rod 63 and is interposed between the under side of the bracket 64 and the upper side of the projecting portion 57 to permit yieldable movement of the bracket 56 in the slotted opening 59.

From the sheave 55 the flexible cable 50 passes upwardly and over a sheave 66 mounted on the inner side of the side wall 22 and rearwardly therefrom to a turn buckle 67 to which it is connected. The opposite end of said turn buckle is connected to a connecting member 69 which is secured to the under side of the bearing plate 13 by means of one of the bolts which secures the bracket 19 to said bearing plate.

The roller 60 is adapted to be engaged by a cam shaped lever 70 on the shaft 37 so that when said shaft is pivotally moved in a counterclockwise direction by movement of the operating handle 39 from an engaged to a disengaged position the yieldable bracket 56 will be positively moved in an upward direction, which will provide slack in the flexible cable 50 and permit the bit 46 to engage the ground and hold the extensible trough section from backward movement. When said operating handle is moved in an opposite direction from a disengaged to an engaged position the roller 60 will follow the cam shaped lever 70 which will permit the sheave 55 to be depressed by the spring 65 to raise the holding device 40 to an inoperative position.

It should be noted that when the extensible trough section is being retracted within the reciprocating trough section that the holding devices 40, 40 will be raised from the ground during the return stroke of the conveyer and will engage the ground during the forward stroke of the conveyer.

It will be seen from the foregoing that a new and improved means of a simplified construction has been provided for rendering a feeding mechanism, actuated by the action of the conveyer,

practical for operation along upwardly inclined grades, which does this by holding the extensible conveyer trough from backward slipping movement during the return stroke of the conveyer, and which is positively operated by the means for operating the friction grip devices, in a simplified and efficient manner.

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

I claim as my invention:

1. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section, feeding means for extending or retracting said extensible trough section with respect to said reciprocating trough section, and other means controlled by said feeding means for positively engaging the ground and holding said extensible trough section from backward slipping movement with respect to said reciprocating trough section.

2. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section, feeding means for extending or retracting said extensible trough section with respect to said reciprocating trough section, and a holding device mounted on said extensible trough section for engagement with the ground when said feeding means is in an inoperative position for positively holding said extensible trough section from backward slipping movement with respect to said reciprocating trough section.

3. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section, feeding means for extending or retracting said extensible trough section with respect to said reciprocating trough section, and other means controlled by said feeding means for holding said extensible trough section from backward slipping movement with respect to said reciprocating trough section comprising a holding device mounted on said extensible trough section for engagement with the ground when said feeding means is in an inoperative position.

4. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section having a shovel on the forward end thereof adapted to reciprocally move along the ground, feeding means for extending or retracting said extensible trough section with respect to said reciprocating trough section, and other means controlled by said feeding means for holding said extensible trough section from backward slipping movement with respect to said reciprocating trough section comprising a pair of holding devices pivotally mounted on opposite sides of said extensible trough section for engagement with the ground when said feeding means is in an inoperative position.

5. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section, a pair of friction gripping devices for extending or retracting said extensible trough section with respect to said reciprocating trough section, and means mounted on said extensible trough section for engagement with the ground when said gripping devices are disengaged from said extensible trough section for holding said extensible trough section from back-

ward slipping movement with respect to said reciprocating trough section.

6. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section, a pair of gripping devices for extending or retracting said extensible trough section with respect to said reciprocating trough section, and means controlled by the means for actuating said gripping devices and adapted to engage the ground when said gripping devices are disengaged from said extensible trough section for holding said extensible trough section from backward slipping movement with respect to said reciprocating trough section.

7. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section having a shovel on the forward end thereof, a pair of friction gripping devices for extending or retracting said extensible trough section with respect to said reciprocating trough section, a holding device pivotally connected to said extensible trough section for engagement with the ground when said gripping devices are disengaged from said extensible trough section, and an operative connection between said holding device and gripping devices for permitting said holding device to engage the ground and hold said extensible trough section from backward slipping movement when said gripping devices are disengaged therefrom, and for positively raising said holding device above the ground when said gripping devices are engaged with said extensible trough section.

8. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section having a shovel on the forward end thereof, a pair of friction gripping devices for extending or retracting said extensible trough section with respect to said reciprocating trough section, a pair of holding devices mounted on said extensible trough section for engagement with the ground when said gripping devices are disengaged from said extensible trough section, one of said holding devices being mounted on each side of said extensible trough section adjacent said shovel, and connections between said holding devices and the means for operating said gripping devices for permitting said holding devices to engage the ground on the stroke of the conveyer when said gripping devices are disengaged from said extensible trough section and for positively disengaging said holding devices from the ground upon the stroke of the conveyer when said gripping devices are engaged with said extensible trough section.

9. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section, a pair of manually controlled gripping devices for extending or retracting said extensible trough section with respect to said reciprocating trough section, means for engaging said gripping devices with said extensible trough section, a holding device pivotally connected to said extensible trough section for engagement with the ground, and a connection between said holding device and the means for engaging said gripping devices with said extensible trough section for permitting said holding device to engage the ground when said gripping devices are disengaged from said extensible trough section and for positively raising said holding device above the ground when said gripping devices have gripping engagement with said extensible trough section.

10. In a feeding mechanism for shaker convey-

ers, a reciprocating trough section, an extensible trough section, a pair of gripping devices for extending or retracting said extensible trough section with respect to said reciprocating trough section, manually operable means for engaging said gripping devices with said extensible trough section, a holding device pivotally connected to said extensible trough section and adapted to engage the ground, and a flexible member connected between said holding device and the means for engaging said gripping devices with said extensible trough section for permitting said holding device to engage the ground when said gripping devices are disengaged from said extensible trough section and for positively raising said holding device above the ground when said gripping devices have gripping engagement with said extensible trough section.

11. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section, feeding means for extending or retracting said extensible trough section with respect to said reciprocating trough section including a pair of friction gripping devices disposed in advance of said reciprocating trough section, means for operating said gripping devices including a rocking shaft and an operative connection from said shaft to said gripping devices, means actuated by said shaft for holding said extensible trough section from backward slipping movement with respect to said reciprocating trough section including a holding device pivotally connected to said extensible trough section, and a flexible member having connection with said holding device and actuated by said shaft upon turning movement thereof for permitting said holding device to engage the ground when said gripping devices are disengaged from said extensible trough section.

12. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section, feeding means for extending or retracting said extensible trough section with respect to said reciprocating trough section including a pair of friction gripping devices disposed in advance of said reciprocating trough section, means for operating said gripping devices including a rocking shaft and an operative connection from said shaft to said gripping devices, and means actuated by said shaft for holding said extensible trough section from backward slipping movement with respect to said reciprocating trough section including a holding device pivotally connected to said extensible trough section, a sheave, a flexible member having connection with said holding device adjacent one of its ends and with said extensible trough section adjacent its opposite end and having engagement with said sheave intermediate its ends, and a connection from said shaft for bodily moving said sheave upon turning movement of said shaft and permitting said holding device to engage the ground or for positively disengaging said holding device therefrom.

13. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section, feeding means for extending or retracting said extensible trough section with respect to said reciprocating trough section including a pair of friction gripping devices disposed in advance of said reciprocating trough section, means for operating said gripping devices including a rocking shaft and a connection from said shaft to said gripping devices, and means actuated by said shaft for holding said extensible

trough section from backward slipping movement with respect to said reciprocating trough section including a holding device pivotally connected to said extensible trough section, a sheave, means interposed between said shaft and sheave for bodily moving said sheave with respect to said shaft in one direction, yieldable means for moving said sheave in an opposite direction, and a flexible cable having engagement with said sheave intermediate its ends, having connection with said holding device adjacent one of its ends and with said extensible trough section adjacent its opposite end whereby movement of said sheave in one direction will permit said holding device to engage the ground and movement of said sheave in an opposite direction will positively disengage said holding device from the ground.

14. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section, feeding means for extending or retracting said extensible trough section with respect to said reciprocating trough section including a pair of friction gripping devices disposed in advance of said reciprocating trough section, means for operating said gripping devices including a rocking shaft and an operative connection from said shaft to said gripping devices, and means actuated by said shaft for holding said extensible trough section from backward slipping movement with respect to said reciprocating trough section including a holding device pivotally connected to said extensible trough section and adapted to engage the ground, a flexible cable having connection with said holding device adjacent one of its ends and with said extensible trough section adjacent its opposite end, a sheave adapted to engage said flexible member intermediate its ends, and a lever on said shaft having operative connection with said sheave for moving said sheave in a direction to permit said holding device to engage the ground upon movement of said shaft in a direction to disengage said gripping devices from said extensible trough section.

15. In a feeding mechanism for shaker conveyers, a reciprocating trough section, an extensible trough section, feeding means for extending or retracting said extensible trough section with respect to said reciprocating trough section including a pair of friction gripping devices disposed in advance of said reciprocating trough section, means for operating said gripping devices including a rocking shaft and an operative connection from said shaft to said gripping devices, and means actuated by said shaft for holding said extensible trough section from backward slipping movement with respect to said reciprocating trough section including a holding device pivotally connected to said extensible trough section and adapted to engage the ground, a flexible cable having connection with said holding device adjacent one of its ends and with said extensible trough section adjacent its opposite end, a sheave adapted to engage said flexible member intermediate its ends, an operative connection between said sheave and shaft for bodily moving said sheave in a direction to permit said holding device to engage the ground upon movement of said shaft in a direction to disengage said gripping devices from said extensible trough section, and a yieldable member for moving said sheave in an opposite direction to positively disengage said holding device from the ground upon movement of said gripping devices to an engaged position.