framework guiding tape from said spools to the unit arranging means, and moistening means on said framework for engaging the gummed tape, said moistening means comprising a first moistener adjacent to each spool adapted to initially moisten the tape, and a second moistener for each tape spaced a substantial distance along the path of movement of the tape from the first moistener and adjacent to the arranging means, and manually operable means for moving each moistener out of engagement with the tape.

8. A method of securing a plurality of envelopes, sheets, cards and like members together in overlapped relation, which comprises holding each thereof stationary while moving another thereof across the same to engage its forward edge with an abutment spaced the amount of the overlap from the forward edge of the held member, clamping said members together against relative movement, and pressing the positioned envelopes, sheets, cards and the like while so clamped against a previously moistened gummed tape and advancing them with the tape the amount of the overlap.

9. A method of securing a plurality of envelopes, sheets, cards and like members together in overlapped relation, which comprises holding each thereof stationary while moving another thereof across the same to engage its forward edge with an abutment spaced the amount of the overlap from the forward edge of the held member, clamping said members together against relative movement, moving said abutment out of the path of said clamped members, and advancing them the amount of overlap and pressing a previously moistened gummed tape to each envelope, sheet, card and the like, while held against such relative movement.

10. A method of securing a plurality of envelopes, sheets, cards and like members together in overlapped relation, which comprises holding each thereof stationary while moving another thereof across the same to engage its forward edge with an abutment spaced the amount of the overlap from the forward edge of the held member, clamping said members together against relative movement, moving said abutment out of the path of said clamped members, and advancing them the amount of overlap and pressing a previously moistened gummed tape to each envelope, sheet, card and the like, while held against such relative movement but before it is advanced.

11. A method of securing a plurality of envelopes, sheets, cards and like members together in overlapped relation, which comprises holding each thereof stationary while moving another thereof across the same to engage its forward edge with an abutment spaced the amount of the overlap from the forward edge of the held member, clamping said members together against relative movement, moving said abutment out of the path of said clamped members, and advancing them the amount of overlap and pressing a previously moistened gummed tape to each envelope, sheet, card and the like, while held against such relative movement and after it has advanced and before the next one is engaged with said abutment.

12. In a machine of the character described having means to arrange units such as envelopes, sheets, cards and the like in overlapped relation with a like portion of each unit beneath the top one exposed to receive a legend, means to secure the units together as they are so arranged, comprising a pair of members comprising part of said arranging means relatively movable to clamp said units between the same, and means for moistening a gummed tape and feeding said moistened tape between one of said members and said units to press said units and tape into engagement upon said members reaching unit clamping position.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,632,433	Christman, Jr.	June 14, 1927
2,205,433	Paulsen	June 25, 1940
2,222,983	Marchev et al.	Nov. 26, 1940
2,288,149	Williams	June 30, 1942
2,338,058	Read	Dec. 28, 1943
2,363,417	Heywood	Nov. 21, 1944

Sept. 21, 1948. J. H. HOLSTEIN 2,449,777

FEEDING MECHANISM FOR SHAKER CONVEYERS

Filed June 21, 1946 4 Sheets-Sheet 1

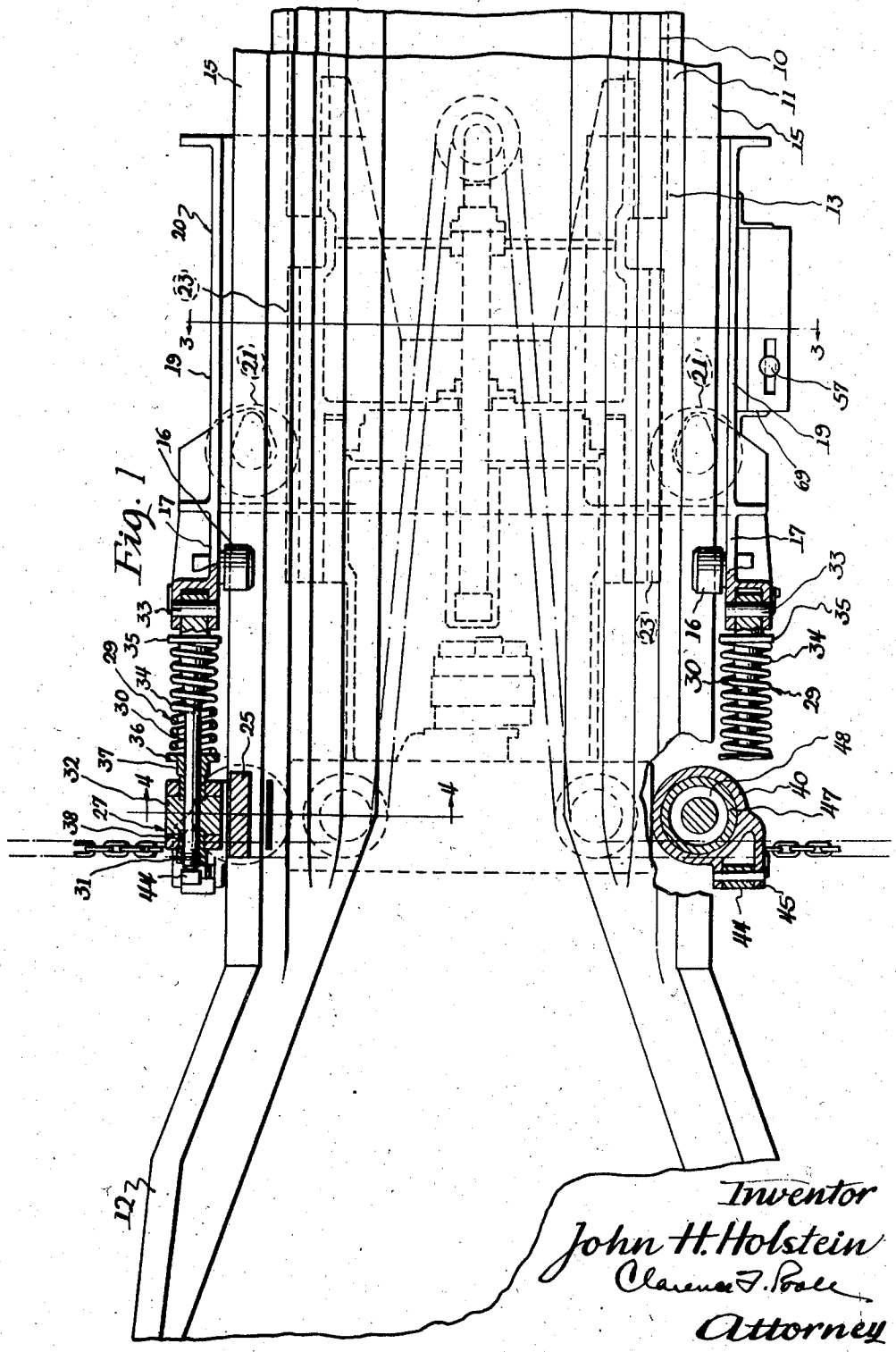


Fig. 1

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FEEDING MECHANISM FOR SHAKER CONVEYERS

Filed June 21, 1946 4 Sheets-Sheet 2

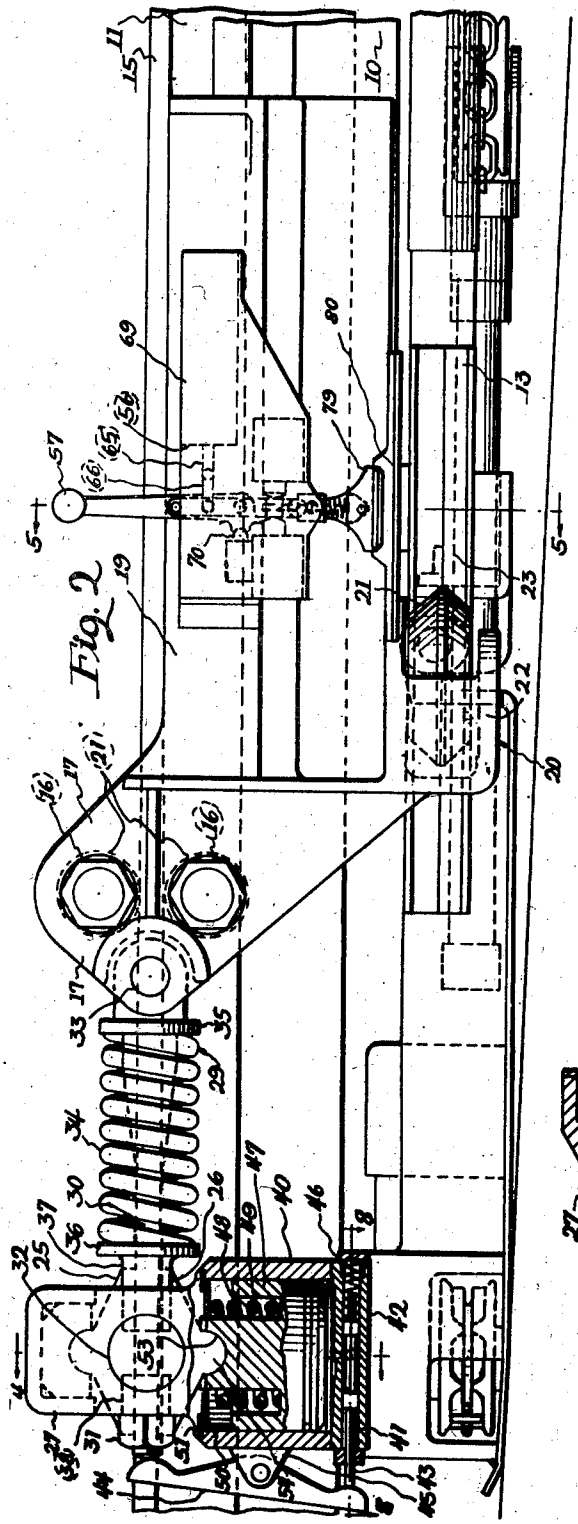


Fig. 2

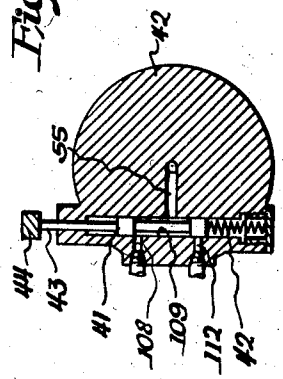


Fig. 3

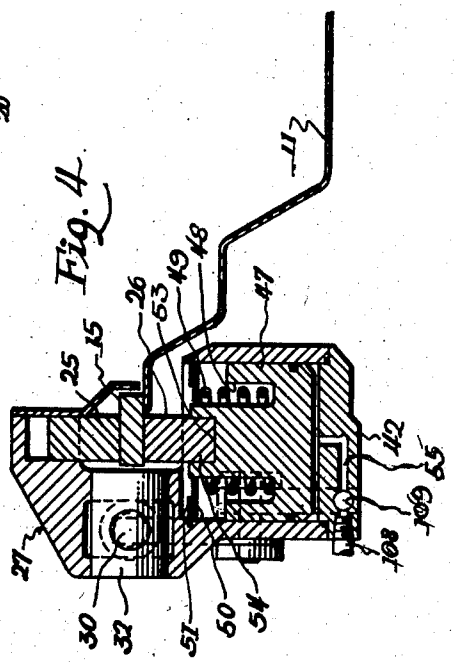


Fig. 4

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FEEDING MECHANISM FOR SHAKER CONVEYERS

Filed June 21, 1946 4 Sheets-Sheet 3

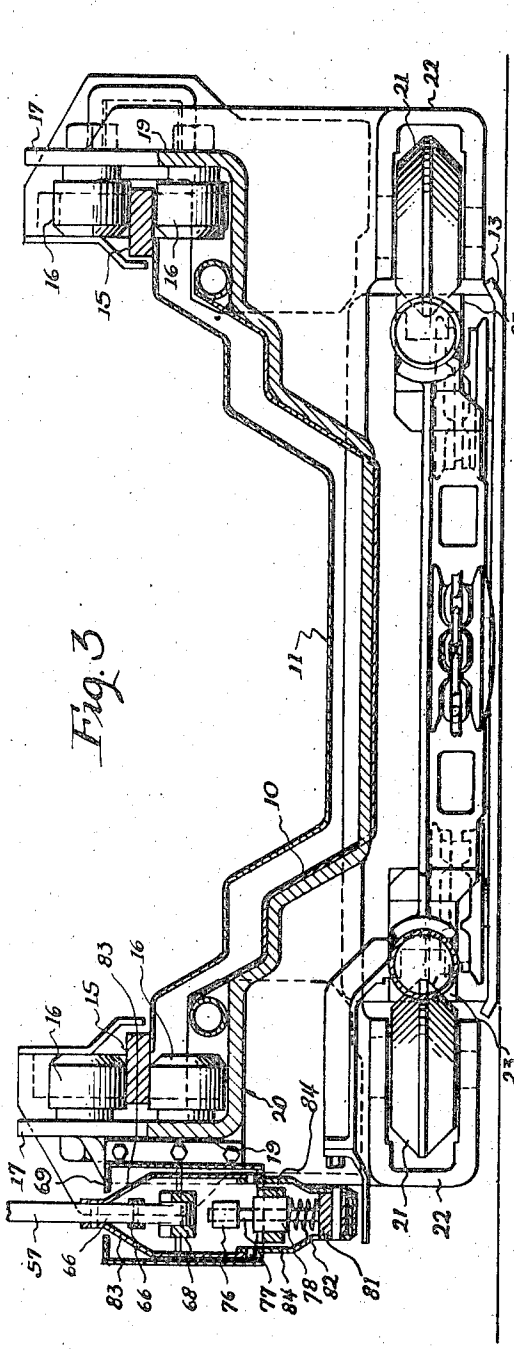


Fig. 3

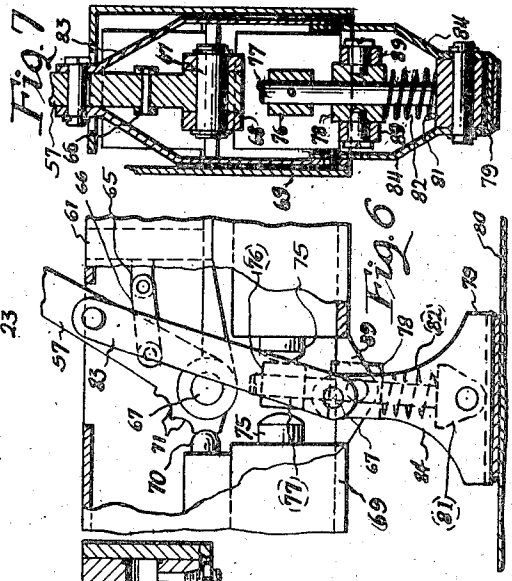


Fig. 6

Fig. 7

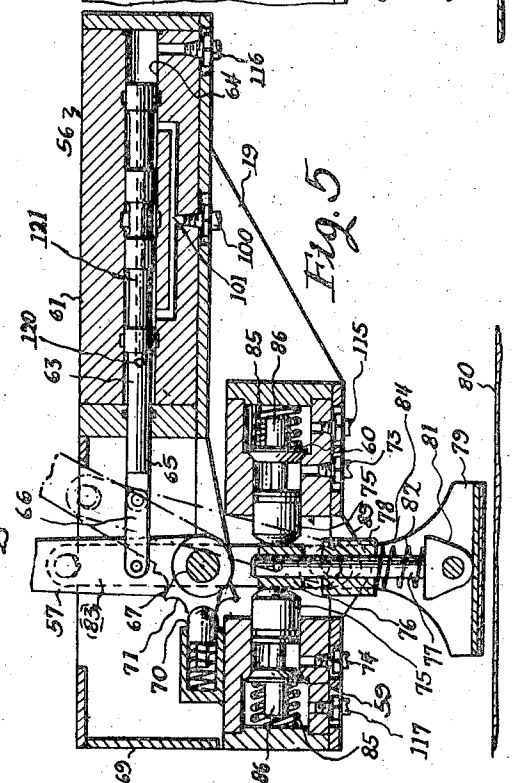


Fig. 5

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FEEDING MECHANISM FOR SHAKER CONVEYERS

Filed June 21, 1946 4 Sheets-Sheet 4

Fig. 9

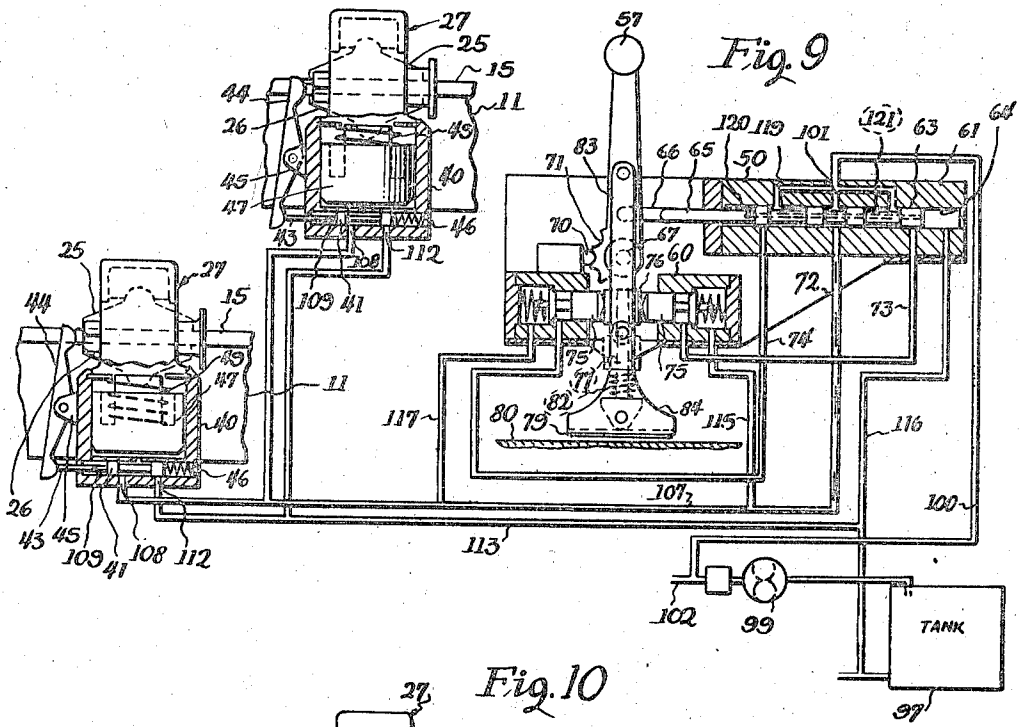
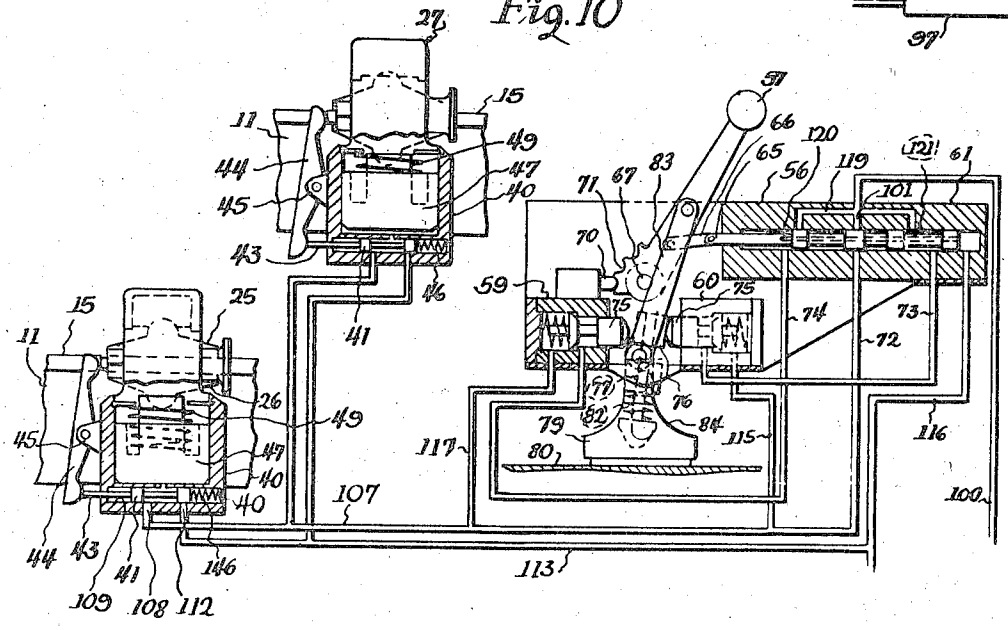


Fig. 10



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UNITED STATES PATENT OFFICE

2,449,777

FEEDING MECHANISM FOR SHAKER CONVEYERS

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Application June 21, 1946, Serial No. 678,379

18 Claims. (Cl. 198—220)

1

This invention relates to improvements in feeding mechanisms for extensibly or retractibly moving an extensible trough and shovel of a shaker conveyor, and more particularly relates to a new and improved form of fluid operated means for operating the grip blocks of the feeding mechanism.

The principal objects of my invention are to provide a novel form of friction grip feeding device for extensibly or retractibly moving an extensible trough of a shaker conveyor, including a new form of hydraulically operated means for efficiently engaging the grip blocks of the feeding device with the extensible trough during alternate strokes of the conveyor, and so arranged as to assure a uniform gripping action on each side of the extensible trough for the full stroke of the conveyor.

Another object of my invention is to provide a hydraulically operated feeding device for the extensible trough of a shaker conveyor having a novel form of release for the friction grip blocks, when the extensible trough engages an obstruction on the ground.

Still another object of my invention is to provide a feeding device for the extensible trough of a shaker conveyor including a novel form of operating and control means operated by the action of the conveyor for controlling the supply and release of fluid to and from the grip block operating mechanism.

These 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 fragmentary plan view of a feeding mechanism constructed in accordance with my invention, shown as being connected between the reciprocating and extensible troughs of a shaker conveyor, with certain parts of the extensible trough broken away and certain parts of the feeding mechanism shown in horizontal section;

Figure 2 is a view in side elevation of the feeding mechanism shown in Figure 1, with certain parts thereof shown in substantially longitudinal section;

Figure 3 is an enlarged fragmentary transverse sectional view taken substantially along line 3—3 of Figure 1;

Figure 4 is an enlarged fragmentary transverse sectional view taken substantially along line 4—4 of Figure 1;

Figure 5 is an enlarged detail longitudinal sectional view showing certain details of the valve means for supplying fluid under pressure to the

2

feeding device, during alternate strokes of the conveyor;

Figure 6 is a detail view showing the operating means for the valve means for supplying fluid under pressure to the feeding device in a different operative position than in Figure 5;

Figure 7 is an enlarged detail transverse sectional view showing certain details of the control for the valve means not shown in Figures 5 and 6;

Figure 8 is a fragmentary sectional view taken substantially along line 8—8 of Figure 2, showing certain details of the overload release valve for the feeding device;

Figure 9 is a diagrammatic view showing the fluid diagram for supplying fluid under pressure to the grip blocks to operate the feeding mechanism, with the control valves therefor in a neutral position; and

Figure 10 is a fluid diagram showing the control valves in a position to retractibly move the extensible trough of the conveyor.

In the drawings, the main elements of the invention illustrated include a reciprocating trough 10 having an extensible trough 11 mounted for extensible or retractible movement with respect thereto. Said extensible trough has a flared gathering shovel 12 at its forward end for picking up loose material from the ground. Said reciprocating trough is connected to the inby end of a shaker conveyor trough line through a swivel (not shown), to permit lateral movement of said reciprocating and extensible troughs, so as to enable the shovel to pick up loose material from the far corners of a working face of a mine, as disclosed in Patent No. 2,360,169, which issued to W. W. Sloane Oct. 10, 1944.

A frame 13 connected at its rear end to the swivel extends beneath the reciprocating and extensible troughs and serves to move said troughs laterally about said swivel on lateral movement of said frame. Said frame is shown in a companion application Serial No. 678,378, filed herewith, now Patent No. 2,435,139, issued Jan. 27, 1948, so need not herein be described further except to point out that it is non-reciprocating during reciprocable movement of the conveyor and forms a support for the drive means for laterally moving said frame and extensible and reciprocating troughs about the swivel by power.

The extensible trough 11 is supported on the ground at its forward end on the shovel 12 and is supported above the ground at its rear end on a bearing shoe (not shown) in the manner shown in the aforementioned Patent No. 2,360,169, and has a bearing plate 15 extending along each upper

outer side thereof and projecting laterally therefrom. Said bearing plates have the forward end of the reciprocating trough 10 slidably supported thereon, and extend between spaced rollers 16, 16 mounted in upwardly and forwardly extending support portions 17, 17 of side walls 19, 19 of a frame 20. Said frame is secured to the forward end of the reciprocating trough 10 and extends forwardly of said trough and across the bottom thereof and upwardly along opposite sides thereof (see Figures 1 and 2). Laterally spaced rollers 21, 21 are mounted in depending outer wall portions 22, 22 of said frame. Said rollers have V-shaped engaging surfaces and are adapted to engage guide tracks 23, 23 extending along the outer sides of the frame 13, to form a means for supporting the forward end of said frame above the ground on said reciprocating trough, as shown and described in my aforementioned companion application.

The bearing plates 15, 15 are also adapted to be engaged by friction grip blocks 25, 26 mounted in carrier members 27, 27, the grip blocks 25, 25 engaging the top faces of said bearing plates and the grip blocks 26, 26 engaging the bottom faces of said bearing plates. The carrier members and means for engaging said grip blocks with said bearing plates on each side of the extensible trough 11 are of a similar construction, so a description of said feeding mechanism for one side of said extensible trough will be sufficient for both sides thereof.

The carrier member 27 is connected with the forward end of the support 17 by means of a yieldable link 29, the longitudinal axis of which extends substantially in alignment with the central longitudinal axis of the bearing plate 15, so as to take the thrusts imparted by said extensible trough between the grip blocks 25, 26 in the plane of the longitudinal axis of said bearing plate. Said yieldable link normally acts as a solid member and includes an eyebolt 30 extending through said carrier member and slidably mounted in a pin 32 extending transversely of said carrier member. Said pin is pivotally mounted in said carrier member for movement about a transverse axis. A nut 31 is threaded on the outer end of said eyebolt and abuts a collar 38 slidably mounted on said rod and abutting said pin 32, to hold said eyebolt to said carrier member and pin (see Figure 1). The inner end of said eyebolt is pivotally connected to the support 17 by means of a pivotal pin 33. A spring 34 encircles said eyebolt and abuts a flange 35, herein shown as being formed integrally with said eyebolt and disposed adjacent the eye thereof. The opposite end of said spring abuts a flange 36 of a flanged sleeve 37, which sleeve is mounted in said carrier member at its inner end and is slidably mounted on said rod. Said spring is preloaded to act as a solid member during extension of the trough 11, and to yield when the forward end of the shovel 12 engages an obstruction on the ground. When the forward end of said shovel engages an obstruction on the ground, said spring will yield during the forward strokes of the conveyor and will allow the carrier member 27 to move rearwardly against said spring.

An overload fluid release means is provided in the lower end of said carrier member, to release fluid from a cylinder 40 herein shown as being formed integrally with the lower end of said carrier member, and to release said grip blocks from said bearing plate during the forward strokes

of the conveyor when the shovel 12 engages an obstruction on the ground. Said release means, as herein shown, includes a piston valve 41 mounted in a head 42 for said cylinder and having a stem 43 projecting forwardly from said carrier member. The end of said valve stem is adapted to be engaged by the lower end of an operating lever 44. Said lever is pivotally mounted intermediate its ends in a bifurcated support 45, which projects forwardly from said carrier member. The opposite end of said operating lever is adapted to engage the end of the eyebolt 30. Said end of said operating lever is engaged with said eyebolt 30 by means of a spring 46, mounted in the chamber for said valve 41, and engaging said valve, to hold said valve in position to admit fluid under pressure to said cylinder 40.

When overload conditions are encountered and the carrier member moves along the eyebolt 30 towards the support 17, said eyebolt engaging said lever arm at its upper end, will pivot said lever arm in a counterclockwise direction by relative movement between said carrier member and eyebolt, to move the valve 41 into position to release fluid from the cylinder 40 and to block fluid under pressure from entering said cylinder, as will hereinafter more clearly appear as this specification proceeds.

The cylinder 40 has a piston 47 slidably mounted therein. The upper portion of said piston has an annular recess 48 formed therein and opening towards the top of said piston. Said annular recess is adapted to form a seat for a spring 49. The upper end of said spring engages an annular ring 50 abutting the bottom of an annular ring 51 suitably secured to the inside of said cylinder and extending inwardly therefrom so as to move said piston in a direction to expel fluid from said cylinder when fluid pressure is released therefrom. The portion of said piston surrounded by said annular recess has an arcuate recess 53 formed therein (see Figure 2). Said recess opens towards the top of said piston and is adapted to receive an arcuate lug 54 depending from the lower grip block 26, so that when fluid under pressure is admitted to the lower end of said cylinder through a port 55 leading from the chamber of the relief valve 41, said piston will positively engage said grip blocks 25 and 26 with opposite sides of the bearing plate 15, and when fluid pressure is released from said cylinder the spring 49 will move said piston in a direction to release said grip blocks from said bearing plate.

Fluid under pressure is supplied to the cylinders 40, 40 during alternate strokes of the conveyor, by means of a piston valve 56 operated by a control lever 57 (see Figure 5). Said control valve is adapted to supply fluid under pressure to or to release fluid from either one of two alternately operable poppet valves 59 and 60. Said poppet valves are operable by reciprocable motion of the conveyor and are connected to the cylinders 40, 40 to supply fluid under pressure thereto during either the forward or return strokes of the conveyor, depending upon the direction it is desired to feed the extensible trough, and to release fluid from said cylinders during the opposite strokes of the conveyor.

The piston valve 56 includes a valve block 61, herein shown as being mounted on a side wall 19 of the frame 20. A valve piston 63 is slidably movable in a valve chamber 64 extending longitudinally of said valve block. A valve stem 65 extends from said valve piston outwardly of said valve block, and is connected to the control lever

57 by means of a link 66. Said control lever is transversely pivoted at its lower end on a pivotal pin 67 mounted at its ends in a bifurcated support 68 extending outwardly from a support frame 69, which is secured to the outer side wall 19 of the frame 20 and forms a support for the valves 59 and 60 and the operating means therefor (see Figures 3 and 7). A spring pressed detent 70 is adapted to engage either one of a plurality of depressions 71, 71 formed in the lower end of said control lever, for holding said control lever in any one of its various operating positions.

When the detent 70 is in engagement with the central depression 71, as in Figure 5, the control lever 57 and the valve 56 will be in a neutral position and fluid under pressure will pass through said valve to the cylinder 40 through a pipe 72, to engage the grip blocks 25 and 26 with the extensible trough during both the forward and return strokes of the conveyor (see Figure 9).

When the detent 70 is in engagement with the lower depression 71 as in Figures 6 and 10, the control lever 57 will be in a rearwardly inclined position and will move the piston of the valve 56 in position to supply fluid under pressure to the pressure intake side of the poppet valve 60 through a pipe 73. When said control lever is in the position shown in Figures 6 and 10, said poppet valve 60 will supply fluid under pressure to the cylinders 40, 40 during the return strokes of the conveyor, to retract said extensible trough within said reciprocating trough. In this position of said control lever fluid will be released from said cylinders during the forward strokes of the conveyor by means of the poppet valve 59.

When the detent 70 is in engagement with the upper depression 71, the control lever 57 will be in a forwardly inclined position and will move the piston of the valve 56 in position to supply fluid under pressure to the pressure inlet side of the poppet valve 59 through a pipe 74. When said control lever is in this position, said poppet valve will supply fluid under pressure to the cylinders 40, 40 during the forward strokes of the conveyor to extend said extensible trough from said reciprocating trough. In this position of said control lever fluid will be released from said cylinders during the return strokes of the conveyor by means of the poppet valve 60.

The poppet valves 59 and 60 face each other and are each of the same construction, so the same part numbers will be given to each of said valves. A plunger 75 extends from the stem of each of said valves. Said plungers face each other and are adapted to be engaged by opposite sides of a block 76, which is mounted on the upper end of a rod 77. Said rod is slidably mounted in a trunnion block 78, which is trunnioned in trunnion supports 89, 89 depending from the frame 69 (see Figure 7). A head 81 formed on the lower end of said rod is transversely pivoted to an engaging shoe 79. Said shoe is adapted to engage a bearing plate 80 secured to and extending outwardly from the non-reciprocating frame 13. A spring 82 encircles said rod 77 and is interposed between said trunnion block and said bifurcated lower end portion of said rod. Said spring urges said shoe in a direction to engage said bearing plate and serves to yieldably hold said shoe in engagement with said bearing plate.

The shoe 79 is moved into and out of engagement with the bearing plate 80, and the block 76 is moved into position to operate the valves

59 and 60 to supply fluid to the cylinders 40, 40 during either the forward or return strokes of the conveyor, by means of a pair of parallel spaced links 83, 83. Said links are pivoted adjacent their upper ends to opposite sides of the control lever 57, and are pivotally connected adjacent their lower ends to the upper ends of opposite upright sides 84, 84 of said shoe. Play is provided in the connections between said links and said control lever to permit the spring 82 to yieldably engage said shoe with said bearing plate.

Frictional resistance between the shoe 79 and bearing plate 80 during reciprocation of the conveyor, will cause the trunnion block 78 to reciprocably move and pivot said rod about its axis of pivotal connection to said shoe, to open the poppet valve 59 during the forward strokes of the conveyor and open the poppet valve 60 during the return strokes of the conveyor. Said poppet valves are both moved to closed positions by means of springs 85, 85 encircling valve stems 86, 86 projecting from the pressure outlet sides of said valves. It should here be understood that the poppet valves 59 and 60 are operated in the same order when the control lever 57 is in a forwardly extended position or a rearwardly extended position, and that the supply of fluid under pressure to the cylinders 40, 40 during either the forward or return strokes of the conveyor is controlled by the valve 56.

Referring now to Figures 9 and 10 and the fluid connections for supplying fluid to and releasing it from the cylinders 40, 40 during alternate strokes of the conveyor, a fluid storage tank 97 serves as a source of fluid supply for a pump 99. Said tank and pump may be mounted on the stationary base of the swivel (not shown). Said swivel may be connected to the rear end of the reciprocating trough 10, as in the aforementioned Sloane Patent No. 2,360,169. A pipe 100 connects said pump with a central port 101 of the piston valve 56. A pipe 102 connected with said pipe 100 serves to supply fluid under pressure to the means for swinging said extensible and reciprocating troughs laterally, as shown and described in my companion application Serial No. 678,378, now Pat. No. 2,435,139.

The pipe 72 leads from the piston valve 56 to a pipe 107 and is so connected to the chamber of said valve that it will receive fluid from the pipe 100 when said piston valve and the control lever 57 are in a neutral position. Said pipe 107 is connected with ports 108, 108 formed in the bottoms of the cylinders 40, 40. Each of said ports leads to a valve chamber 109 of the relief valve 41, for supplying fluid under pressure thereto. Said chambers are each connected to supply fluid under pressure to the cylinder 40 through the port 55. A port 112 leads from each valve chamber 109. Said ports are normally closed by the valve 41 and only open when the extensible trough engages an obstruction during the forward strokes of the conveyor. Said ports are connected with a return line 113, for returning fluid to the tank 97 upon the opening of said relief valves 41, 41.

The pipe 73 leads from the block 61 of the piston valve 56 to the pressure side of the poppet valve 60. A pipe 115 leads from the outlet side of said poppet valve and is connected to the pipe 107, to supply fluid under pressure to the cylinders 40, 40 during the return strokes of the conveyor. A pipe 116 leads from the end of the valve block 61 opposite the control lever 57, for

returning fluid to the tank 97, which is released from the cylinders 40, 40 through the poppet valves 59.

The pipe 74 leads from the opposite side of the valve block 61 from the pipe 73, and is connected with the pressure intake side of the poppet valve 59. A pipe 117 leads from the outlet side of said poppet valve to the pipe 107 for supplying fluid under pressure to the cylinders 40, 40 during the forward strokes of the conveyor.

When the control lever 57 is in the neutral position shown in Figure 9, the links 83, 83 will lift the shoe 79 out of engagement with the bearing plate 80. The valve 56 will be in a neutral position and fluid under pressure will pass through said valve and the pipe 72 to supply fluid to the two cylinders 40, 40. In this position of said control lever, fluid will be supplied to the cylinders 40, 40 during both the forward and return strokes of the conveyor, to engage the grip blocks 25, 26 with the bearing plates 15, 15 during both the forward and return strokes of the conveyor and reciprocably move the extensible trough 11 with the reciprocating trough 10.

When the control lever 57 is in the rearwardly inclined position shown in Figure 10, fluid under pressure will be supplied to the chamber of the valve 56 through a passageway 119 formed in the block of said valve, and out from said valve through the pipe 73 to the pressure side of the poppet valve 60. The shoe 79 will also be in engagement with the bearing plate 80 and relative movement between the valves 59 and 60 and said shoe and bearing plate during reciprocation of the conveyor, will cause the block 76 on the upper end of the rod 77 to depress the plunger 75 of the valve 60, during the return strokes of the conveyor, to open said valve to supply fluid under pressure to the cylinders 40, 40, to engage the grip blocks 25 and 26 with the bearing plates 15, 15 during the return strokes of the conveyor. During the forward strokes of the conveyor the block 76 will depress the plunger 75 of the valve 59, to open said valve and release fluid from the cylinders 40, 40 and permit the springs 49, 49 to move the pistons 47, 47 in a direction to release said grip blocks from said bearing plates. This will retractibly move said extensible trough with respect to said reciprocating trough. Fluid is released from said valve 59 during the return strokes of the conveyor through the pipe 74, cross drilled passageways 120 in the valve piston 63 adjacent the pipe 74, and central passageway 121 in said valve piston leading from said cross drilled passageways and opening to the right-hand end of said piston, and out of the chamber of said valve 56 to the tank 97 through the pipe 116.

When the control lever 57 is in a forwardly inclined position, to effect extension of the extensible trough 11 from the reciprocating trough 10, the valve piston 63 of the valve 56 will be moved to a position to admit fluid under pressure to the pressure intake side of the poppet valve 59 through the pipe 74. Relative movement between said valve 59 and the bearing plate 80 and shoe 79 will cause the block 76 on the upper end of said rod 77 to depress the plunger of said valve 59 during the forward strokes of the conveyor, to open said valve and supply fluid under pressure to the cylinders 40, 40, to engage the grip blocks 25, 26 with the bearing plates 15, 15 during the forward strokes of the conveyor. During the return strokes of the conveyor, said block 76 will engage and depress the plunger 75 of the poppet valve 60, to open said valve and release fluid from said cylinders and permit the springs 49, 49 to move the pistons 47, 47 in a direction to release the grip blocks 25, 26 from the bearing plates 15, 15.

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 feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and disposed on each side of the other of said troughs for engagement therewith during alternate strokes of the conveyor, fluid operated means for moving said grip blocks to a gripping position to engage said other trough, valve means for supplying fluid under pressure to and releasing fluid from said fluid operated means during alternate strokes of the conveyor, and means for operating said valve means including a shoe, a control lever for moving said shoe into position to cause relative movement between said valve means and said shoe during reciprocation of the conveyor, and an operative connection between said shoe and said valve means.

2. In a feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and disposed on each side of the other of said troughs for engagement therewith during alternate strokes of the conveyor, fluid operated means for moving said grip blocks to a gripping position to engage said other trough, valve means for supplying fluid under pressure to said fluid operated means during alternate strokes of the conveyor, a control valve for controlling the supply of fluid under pressure to and the release of fluid from said valve means, a control lever for operating said control valve, a shoe, a connection between said shoe and said control lever for moving said shoe into position to cause relative movement between said valve means and said shoe during reciprocation of the conveyor, and an operative connection between said shoe and said valve means.

3. In a feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means operated by reciprocable movement of the conveyor for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and engageable with the other of said troughs during alternate strokes of the conveyor, fluid operated means for moving said grip blocks into engagement with said other trough, two alternately operable valves for supplying fluid to and releasing fluid from said fluid operated means during alternate strokes of the conveyor, means operable by relative movement between said valves and the ground for alternately operating said valves, and a third valve operable to supply fluid to one of said two valves during one of the strokes of the conveyor and to release fluid

from the other of said two valves during the opposite strokes of the conveyor.

4. In a feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means operated by reciprocable movement of the conveyor for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and engageable with the other of said troughs during alternate strokes of the conveyor, fluid operated means for moving said grip blocks into engagement with said other trough, two alternately operable valves for supplying fluid to and releasing fluid from said fluid operated means during alternate strokes of the conveyor, a third valve, a control lever for moving said third valve into position to supply fluid to one of said two valves during the forward strokes of the conveyor and to release fluid from the other of said valves during the return strokes of the conveyor, and to supply fluid to said other valve during the return strokes of the conveyor and to release fluid from said one valve during the forward strokes of the conveyor, and means operable by movement of said control lever in position to move said third valve into position to supply fluid to either one of said two valves and by relative movement between said reciprocating trough and the ground for alternately operating said two valves.

5. In a feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means operated by reciprocable movement of the conveyor for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and engageable with the other of said troughs during alternate strokes of the conveyor, fluid operated means for moving said grip blocks into engagement with said other trough, two alternately operable valves for supplying fluid to and releasing fluid from said fluid operated means during alternate strokes of the conveyor, a third valve, a control lever for moving said third valve into position to supply fluid to one of said two valves during the forward strokes of the conveyor and to release fluid from the other of said valves during the return strokes of the conveyor, and to supply fluid to said other valve during the return strokes of the conveyor and release fluid from said one valve during the forward strokes of the conveyor, and means operable by relative movement between said reciprocating trough and the ground for alternately operating said two valves when said control lever is in position to move said third valve into position to supply fluid to either one of said two valves including a non-reciprocating bearing plate, a shoe movable into position to engage said plate upon movement of said control lever into one operative position or the other, and means connected with said shoe and operated by relative movement between said valves and shoe for alternately operating said valves upon reciprocable movement of the conveyor.

6. In a feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means operated by reciprocable movement of the conveyor for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and engageable with the other of said troughs during alternate strokes of the conveyor, fluid operated means for moving said grip blocks into engagement with said other trough, two alternately operable valves for supplying fluid to and releasing fluid from said fluid operated means during alternate strokes of the conveyor, a third valve, a control lever for moving said third valve into position to supply fluid to one of said two valves during the forward strokes of the conveyor and to release fluid from the other of said valves during the return strokes of the conveyor, and to supply fluid to said other valve during the return strokes of the conveyor and release fluid from said one valve during the forward strokes of the conveyor, and means operable by relative movement between said reciprocating trough and the ground for alternately operating said two valves when said control lever is in position to move said second valve into position to supply fluid to either one of said two valves including a non-reciprocating bearing plate, a shoe movable into position to engage said plate upon movement of said control lever into one operative position or the other, and a member having slidable connection with said reciprocating trough and pivotal connection with said shoe and having operative connection with said valves for alternately operating said valves upon relative movement between said reciprocating trough and said shoe.

7. In a feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means operated by reciprocable movement of the conveyor for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and engageable with the other of said troughs during alternate strokes of the conveyor, fluid operated means for moving said grip blocks into engagement with said other trough, two alternately operable valve means for supplying fluid to and releasing fluid from said fluid operated means during alternate strokes of the conveyor, a third valve, a control lever for moving said third valve into position to supply fluid to one of said two valves during the forward strokes of the conveyor and to release fluid from the other of said valves during the return strokes of the conveyor, and to supply fluid to said other valve during the return strokes of the conveyor and release fluid from said one valve during the forward strokes of the conveyor, and means operable by relative movement between said reciprocating trough and the ground for alternately operating said two valves when said control lever is in position to move said third valve into position to supply fluid to either one of said two valves including a non-reciprocating bearing plate, a shoe movable into position to engage said plate upon movement of said control lever into one operative position or the other, means for holding said shoe in yieldable engagement with said bearing plate when said control lever is in position to extend or retract said extensible trough, and means connected with said shoe and operated by relative movement between said reciprocating trough and shoe for alternately operating said valves.

8. In a feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means operated by reciprocable movement of the conveyor for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and engageable with the other of said troughs during alternate strokes of the conveyor, fluid operated means for moving said grip blocks into engagement with said other trough,

two longitudinally spaced facing poppet valves for supplying fluid to and releasing fluid from said fluid operated means during alternate strokes of the conveyor, a third valve, a control lever for moving said third valve into position to supply fluid to one of said poppet valves during the forward strokes of the conveyor and to release fluid from the other of said poppet valves during the return strokes of the conveyor, and for moving said third valve into position to supply fluid to the other of said poppet valves during the return strokes of the conveyor and to release fluid from said one poppet valve during the forward strokes of the conveyor, and means controllable by said control lever and operable by relative movement between said reciprocating trough and the ground for alternately operating said poppet valves when said control lever is in position to cause fluid to be supplied to either one of said poppet valves, including a reciprocably moving engaging member disposed between and having operative connection with said poppet valves.

9. In a feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means operated by reciprocable movement of the conveyor for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and engageable with the other of said troughs during alternate strokes of the conveyor, fluid operated means for moving said grip blocks into engagement with said other trough, two longitudinally spaced facing poppet valves for supplying fluid to and releasing fluid from said fluid operated means during alternate strokes of the conveyor, a third valve, a control lever for moving said third valve into position to supply fluid to one of said poppet valves during the forward strokes of the conveyor and to release fluid from the other of said poppet valves during the return strokes of the conveyor, and for moving said third valve into position to supply fluid to the other of said poppet valves during the return strokes of the conveyor and to release fluid from said one poppet valve during the forward strokes of the conveyor, and means controllable by said control lever and operable by relative movement between said reciprocating trough and the ground for alternately operating said poppet valves when said control lever is in position to cause fluid to be supplied to either one of said poppet valves, including a reciprocably moving engaging member disposed between and having operative connection with said poppet valves, a non-reciprocating bearing plate, a shoe movable into engagement with said plate when said control lever is in position to extend or retract said extensible trough, and an operative connection between said shoe and said engaging member for reciprocably moving said engaging member upon reciprocable movement of the conveyor.

10. In a feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means operated by reciprocable movement of the conveyor for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and engageable with the other of said troughs during alternate strokes of the conveyor, fluid operated means for moving said grip blocks into engagement with said other trough, two longitudinally spaced facing poppet valves for supplying fluid to and releasing fluid from said fluid operated means during alternate strokes of the conveyor, a third valve, a control lever for moving said third valve into position to supply fluid to one of said poppet valves during the forward strokes of the conveyor and to release fluid from the other of said poppet valves during the return strokes of the conveyor, and for moving said third valve into position to supply fluid to the other of said poppet valves during the return strokes of the conveyor and to release fluid from said one poppet valve during the forward strokes of the conveyor, and means controllable by said control lever and operable by relative movement between said reciprocating trough and the ground for alternately operating said poppet valves when said control lever is in position to cause fluid to be supplied to either one of said poppet valves, including a reciprocably moving engaging member disposed between and having engagement with said poppet valves, a non-reciprocating bearing plate, a shoe movable into engagement with said plate when said control lever is in position to extend or retract said extensible trough, means for yieldably holding said shoe in engagement with said bearing plate, and a member pivotally connected with said shoe and having operative connection with said engaging member for reciprocably moving said engaging member upon reciprocable movement of the conveyor.

11. In a feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and disposed on each side of the other of said troughs for engagement therewith during alternate strokes of the conveyor, a separate cylinder and piston for each set of said grip blocks for moving said grip blocks to a gripping position, a valve operable to supply fluid under pressure to said cylinders to engage said grip blocks with said other trough during the forward strokes of the conveyor, another valve operable to supply fluid under pressure to said cylinders to engage said grip blocks with said other trough during the return strokes of the conveyor, said first mentioned valve being operable to release fluid pressure from said cylinders during the forward strokes of the conveyor when said second mentioned valve is operable to supply fluid under pressure to said cylinders during the return strokes of the conveyor, to retractibly move said extensible trough, and vice versa when it is desired to extensibly move said extensible trough, a control valve operable to supply fluid under pressure to either one of said valves and at the same time connect the other of said valves to the return, a hand lever for operating said control valve, and means operable by movement of said hand lever to a position to move said control valve into position to extensibly or retractibly move said extensible trough, for alternately operating said valves to supply and release fluid under pressure from said cylinders during reciprocation of the conveyor.

12. In a feeding device for shaker conveyors, a reciprocating trough, an extensible trough, and means for moving said extensible trough relative to said reciprocating trough including two friction grip blocks reciprocably moved by one of said troughs and disposed on each side of the other of said troughs for engagement therewith during alternate strokes of the conveyor, a separate cylinder and piston for each set of said grip blocks for moving said grip blocks to a gripping position, a valve operable to supply fluid under