July 31, 1934. G. H. ERNSBARGER 1,968,249

FEEDING HEAD FOR RECIPROCATING OR JIGGING CONVEYERS

Original Filed March 21, 1931 4 Sheets-Sheet 1

Fig. 1.

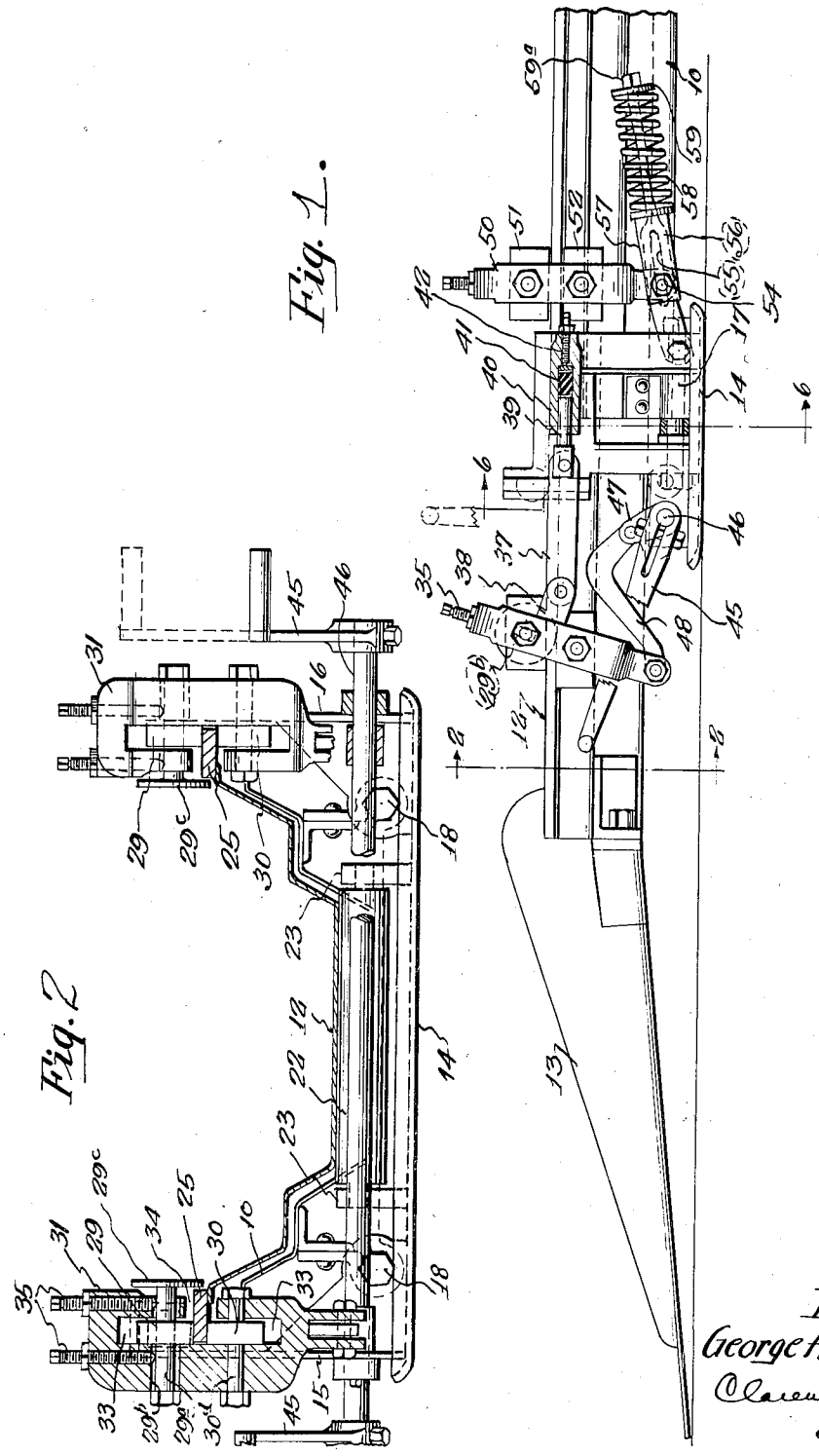


Fig. 2



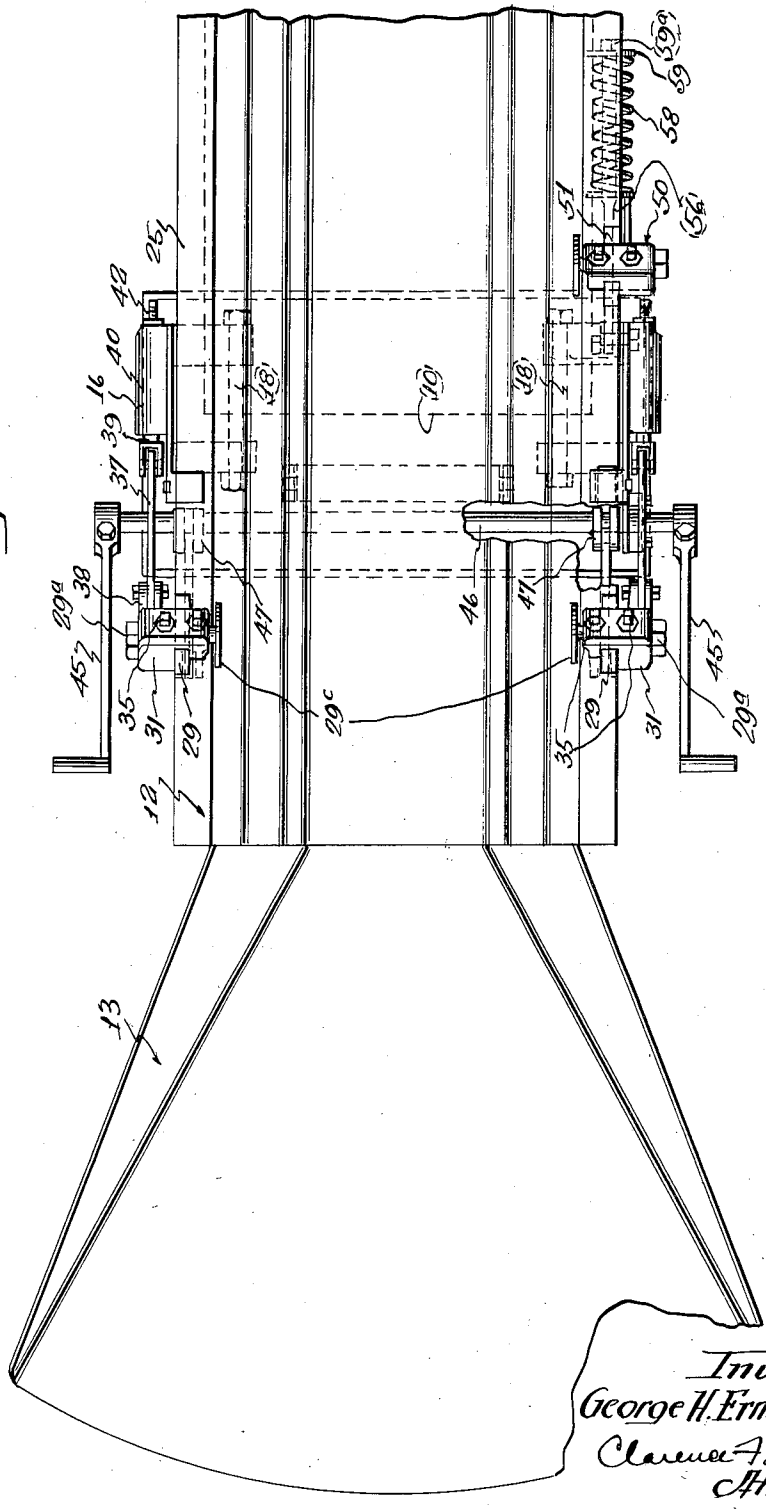
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Fig. 3




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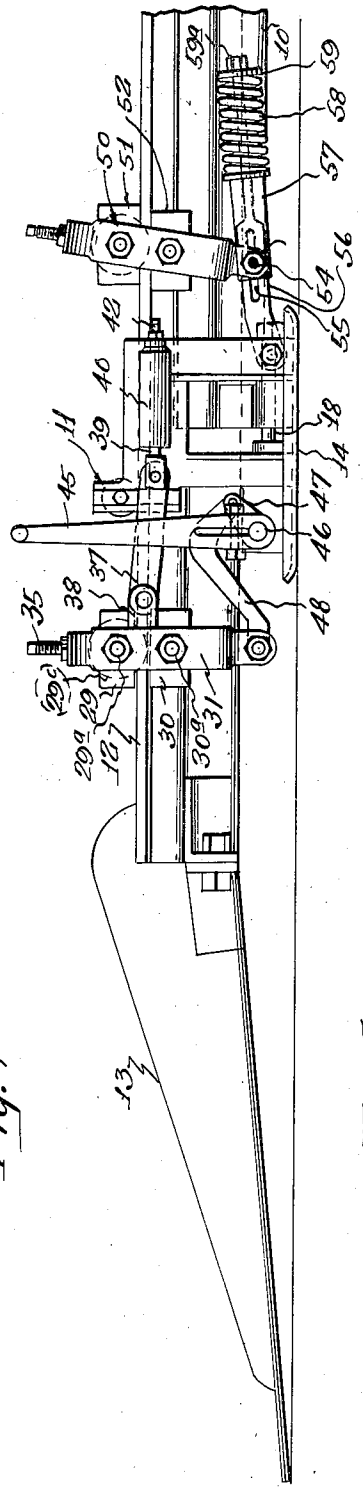


Fig. 4

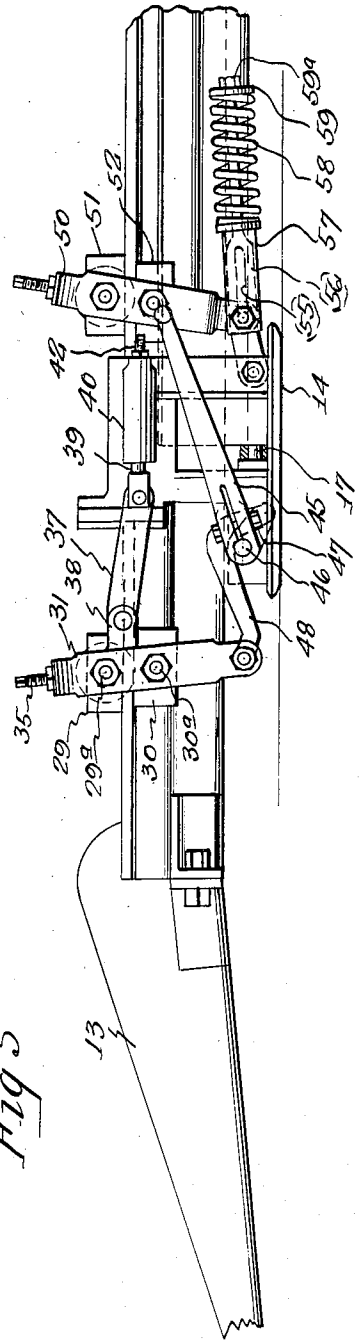


Fig 5

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Fig. 6

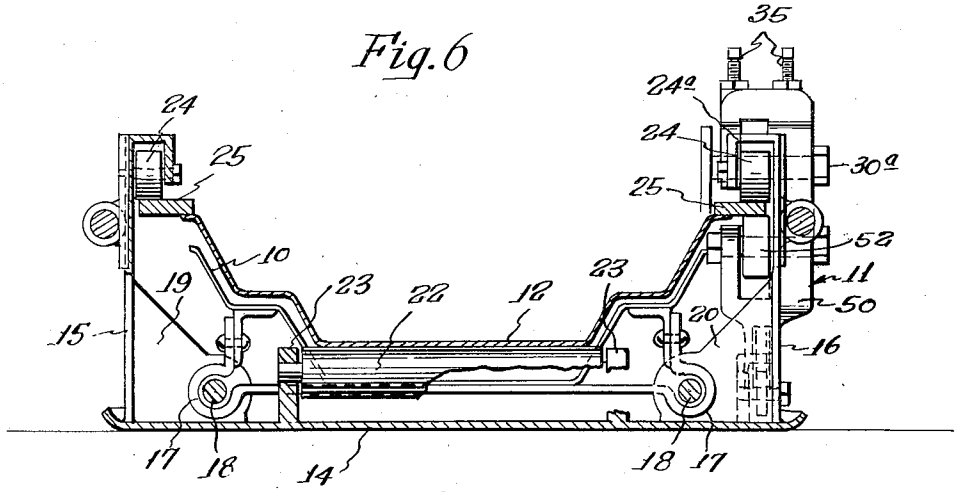
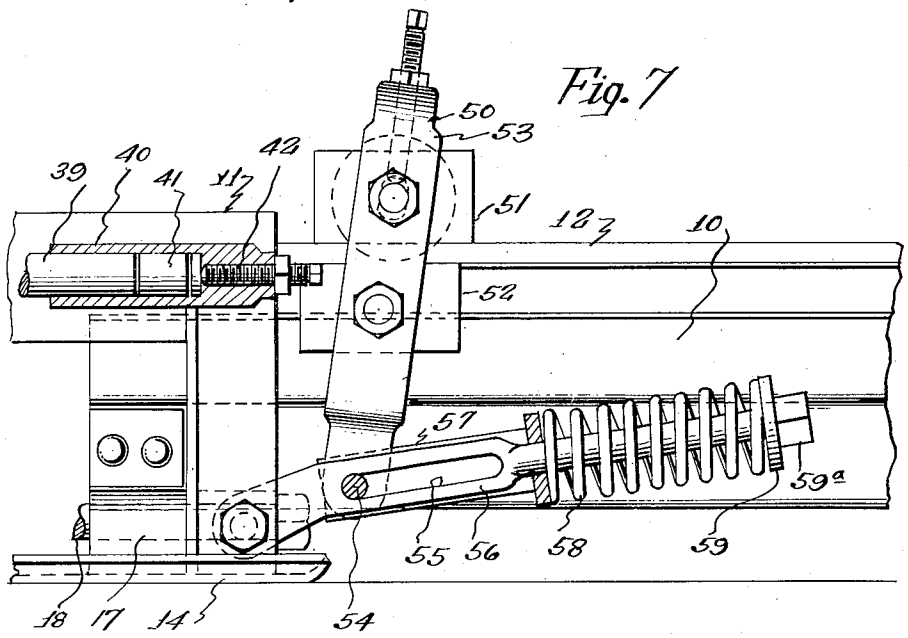



Fig. 7




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Patented July 31, 1934 1,968,249

# UNITED STATES PATENT OFFICE

1,968,249

## FEEDING HEAD FOR RECIPROCATING OR JIGGING CONVEYERS

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Application March 21, 1931, Serial No. 524,279
Renewed October 14, 1933

14 Claims. (Cl. 198—220)

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

More specifically, my invention relates to improvements in feeding heads in which the extension and retraction of the telescoping trough section is controlled through friction devices carried by the feeding head and engageable and disengageable with said trough section at will during certain periods of the forward and rearward stroke of the feeding head and main conveyer.

The object of the present invention is to provide an improved and simplified construction of feeding head especially designed for work in places having relatively low head room or vertical clearance. A further object is to provide an auxiliary friction device operable to assist the feeding movement when operating upon an up grade or incline where gravity tends to oppose normal extension of the trough section and shovel carried thereby.

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

The invention may best be understood by reference to the accompanying drawings, in which

Figure 1 is a view in side elevation of a feeding head attached to the forward end of a reciprocating conveyer, showing the extensible trough and digging shovel in retracted position and the manually controlled clamping devices in one locked position. Certain parts of the feeding head are broken away to show details of construction;

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

Figure 3 is a top plan view of the apparatus shown in Figures 1 and 2, but drawn to the same scale as Figure 1;

Figure 4 is a view similar to Figure 1, but showing the manually controlled clamping device in unlocked position;

Figure 5 is a view similar to Figure 1, but showing the manually controlled clamping device in another locked position;

Figure 6 is an enlarged section taken on line 6—6 of Figure 1; and

Figure 7 is an enlarged detail of the auxiliary clamping device, or tail blocks.

Referring now to details of construction of the embodiment of my invention illustrated in the drawings, the main elements thereof consist of a reciprocating conveyer trough section 10, a feeding head 11, and an extensible trough section 12 having a flared gathering shovel 13 integrally carried at its forward end in the usual manner.

The feeding head has a shoe 14 supported for sliding engagement on the ground or floor upon which the apparatus rests, and is provided with two upstanding side frame members 15, 16. The feeding head is suitably connected for reciprocating or jigging action with the main conveyer trough 10. As herein shown, the main conveyer trough 10 is provided on its under face with a pair of laterally spaced elongated eyes 17, 17 of the form usually employed in connecting adjacent trough sections together, but in the present instance the eyes 17, 17 are disposed between two pairs of upright flanges 19, 20 rigid with the side frames 15, 16, and the connecting bolts 18, 18 extend longitudinally through said flanges and eyes at each side of the feeder head to rigidly secure the latter to the main conveyer.

The extensible trough section 12 is partially nested within the forward end of the main conveyer trough 10, but is supported for relatively free longitudinal sliding movement relative to said conveyer and the feeding head by suitable anti-friction devices, herein comprising a horizontal roller 22 carried on upright bearing supports 23, 23 integral with the shoe 14 near the forward end of the feeding head. The extensible trough section is provided with laterally extending plates 25, 25 along each side thereof which are engaged by a pair of overhanging rollers 24, 24 mounted in brackets 24*a*, 24*a* at the forward end of the upright frames 15, 16.

The friction braking means for manually controlling the relative movement between the shovel and the feeding head comprises two sets of friction blocks, each set consisting of blocks 29, 30 mounted on a carrier 31, two of which are provided, one at each side of the extensible trough 12 and in advance of the feeding head. The construction of the carriers 31 and their respective sets of friction blocks 29, 30 being similar, a description of one will apply to both.

Each carrier has a vertically disposed slot 33 open at one side at 34 so as to be substantially C-shaped in transverse section, as shown in Figure 2. The adjacent plate 25 of the extensible trough extends into the side opening 34, and the blocks 29 and 30 are disposed within the slot 33 above and below said plate. Said blocks are pivotally mounted on horizontal pins 29*a* and 30*a*, respectively. The upper pin 29*a* is preferably mounted in a vertically disposed slot 29*b*, and has a pair of set screws 35, 35 arranged to pro-

vide adjustment between the pins 29a and 30a and thus take up wear on the blocks 29 and 30. Said upper pin 29a is also provided with an enlarged flange 29c at its inner end, which engages the inner face of the plate 25 to retain the carrier on the latter, as clearly shown in Figure 2.

The two carriers 31 are each supported in generally upright position in advance of the feeding head by a horizontally disposed link 37 pivoted at its forward end to a lug 38 integral with said carrier. The link 37 is pivoted at its rear end to the adjacent side frame, preferably by means of a rearwardly yieldable connection, herein comprising a plunger 39 which extends into a horizontally disposed cylinder 40 formed integral with the adjacent side frame 15 or 16. Said plunger engages a suitable yielding member in said cylinder; as, for instance, a rubber block 41, as shown in Figures 1 and 7. The position of the rubber block 41 may be adjusted by means of a set screw 42. The purpose of the yielding connection just described will hereinafter more fully appear.

The carriers are provided with manual control means for oscillating them into position inclined one way or the other (see Figs. 1 and 5) so as to clamp the blocks 29, 30 on their respective plates 25, or in an intermediate upright position (see Fig. 4) in which the blocks are released from their frictional engagement, to permit the extensible trough and shovel to slide freely relative to the feeding head.

The control means herein illustrated comprises a pair of handles or levers 45, 45 carried on the opposite ends of a shaft 46 extending transversely of the feeding head beneath the extensible trough, said handles being provided in duplicate so that the apparatus can be operated from either side. The shaft 46 has a pair of levers 47, 47, each of which is connected with an upwardly arched link 48 extending forwardly and pivotally connected to the lower end of the adjacent carrier 31.

The control mechanism is such, that when the levers 45 are swung forwardly, as in Figure 1, the carriers 31, 31 are inclined rearwardly into one clamping position; when the levers 45 are in upright position, as in Figure 4, the carriers are in upright, unclamped position, and when the levers are swung rearwardly, as in Figure 5, said carriers are inclined forwardly in a second clamping position.

When in operation, either clamping position shown in Figures 1 and 5 may be employed. The arrangement is such, however, that under certain conditions the position shown in Figure 5 may be preferred, due to the shape and arrangement of the arched operating links 48. It will be noted in Figure 5 that the rear pivoted end of each of said links may be drawn downwardly by lever 47 beyond a position of "dead center" on a line extending through the axis of shaft 46 and the point of pivotal connection between the carrier and the front end of said operating link, and thus produce, in effect, a toggle-action which tends to maintain the blocks in clamping position, without requiring working pressure on the handle by the operator, so long as said handle is held down with the links 48 over "dead center", as shown.

Furthermore, in the clamping position shown in Figure 5, it will be observed that the yielding supports for carriers 31, including plungers 39 and rubber blocks 41, are arranged so in the event that the shovel meets with any excessive resistance or a solid obstruction during the forward movement of the entire conveyer, the carriers 31 may be tilted rearwardly against their yielding connection so as to reduce the clamping action of the blocks, and permit the extensible trough to slip rearwardly in the feeding head, thus automatically relieving the apparatus from excessive stresses.

The manual control mechanism above described is sufficient under most conditions to provide the desired clamping action for extending or retracting the trough by alternately clamping and releasing the blocks 29, 30 at the proper periods of jigging movement of the main conveyer, in the normal manner well known to those skilled in the art.

When operating with the shovel extended along ascending grades, it has been found that the effect of gravity is often sufficient to destroy the normal feeding operation of the device, due to the tendency of the shovel to drop back with the feeding head on each return stroke of the main conveyer, even though the friction devices are released from the extensible trough at the proper part of the stroke.

In order to insure proper feeding under such conditions, I provide an auxiliary friction device or tail block at the rear of the feeding head, as indicated generally at 50, and including a pair of friction blocks 51, 52 mounted on a carrier 53 similar in construction to the carriers 31, 31 at the front of the head. The carrier 53, however, is pivotally mounted at its lower end on a pin 54, which is slidable longitudinally in slot 55 formed in arm 56. Said arm is pivoted to the lower part of the side frame 16, and extends rearwardly therefrom in position below the overhanging flanges of the troughs 10 and 12. The pin 54 is also fixed to a bracket 57 which extends rearwardly along said arm. A coil spring 58 is mounted on the rear end of said arm and is interposed between the rear end of bracket 57 and a stop 59 carried on the extreme end of said arm. The tension of spring 58 may be adjusted by nut 59a threaded on the end of said arm and serving to retain stop 59 thereon.

Referring now to the operation of the auxiliary friction device or tail block 50, it will be understood that it works more or less automatically in conjunction with the manually operated carriers 31, 31 to produce a positive forward feeding action of the shovel even when working on ascending grades.

It will be seen by reference to Figure 1 that the carrier 53 will normally be free to oscillate rearwardly on its pivot pin 54 supported on arm 56. If during the beginning of the forward stroke the hand operated blocks 29, 30 are moved into released position, the shovel is permitted to move rearwardly a short distance relative to the feeding head, but while so doing, the carrier 53 is tilted rearwardly by friction of the blocks 51 and 52, and becomes fully clamped on the plate or bar 25, as indicated in Figure 4. After becoming so clamped, further forward movement of the feeding head causes rearward bodily movement of the carrier 53, pin 54, and bracket 57 against the tension of spring 58. As soon as the spring is compressed sufficiently, the shovel is carried forward in unison with the feeding head and main conveyer through the remainder of the forward stroke, but with the spring 58 under considerable compression. In order to insure the forward movement of the shovel after the spring has been compressed, the front blocks 29, 30 may also be clamped on the plates 25 by operating one of the handles 45.

When the conveyer reaches the end of its for-

ward stroke, the clamping blocks 29, 30 are released, and as soon as the conveyer starts its reverse or rearward stroke, the spring 58 tends to give a forward impulse to the shovel to move it forward positively, relative to the feeding head, a distance substantially the same as the amount of compression of the spring. This is made possible because the resistance of loose material and inertia of the shovel which are effective on the shovel during forward stroke of the conveyer, is relieved as soon as the conveyer starts on its rearward stroke and the tension of the spring 58 cooperates with the natural inertia of the shovel to extend the latter.

When the pin 54 reaches the forward end of the slot 55, the carrier 53 is thrown forwardly into substantially upright position so as to release the shovel and permit it to continue its extending movement initiated by the spring as described.

When it is desired to retract the shovel, or feed it forwardly in the normal manner, by sole use of the forward carriers 31, 31, the rear carrier 53 may be held in upright inoperative position by the operator.

It will now be understood that the auxiliary friction device just described co-operates to insure positive forward extension of the shovel in conjunction with the manually operated friction blocks 29, 30, when the apparatus is working upon such an up grade that gravity might otherwise make it impossible to feed the shovel forwardly.

In fact, it will be seen that if the forward blocks 29, 30 are held in inoperative position throughout the forward and reverse strokes, the auxiliary friction device will feed the shovel automatically forward on each stroke. However, the amount of forward extension of the shovel, when produced automatically by the tail blocks as described, is usually somewhat less than the amount of feeding that can be produced in the normal manner, by operation of the manually controlled blocks 29, 30 alone.

Consequently, the tail blocks are necessary only when conditions require a more positive feed, and under more favorable conditions, the entire friction device 50 may be removed from the feeding head, at the option of the operator.

Although 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 in the drawings, excepting as it may be limited by the appended claims.

I claim as my invention:

1. In a feeding head for a jigging conveyer and in combination with an extensible trough, a clamping device carried by said head, manually controlled means for moving said clamping device into and out of clamping position relative to said extensible trough, and a second clamping device pivotally mounted on said head and automatically oscillatable into clamping position on said trough due to initial rearward movement of said trough in said head, and tension means interposed between said second clamping device and said head arranged to be compressed during the advance stroke of said head.

2. In a feeding head for a jigging conveyer and in combination with an extensible trough, a clamping device pivotally mounted on said head and automatically oscillatable into clamping position on said trough due to initial rearward movement of said trough in said head, and tension means interposed between said clamping device and said head arranged to be compressed during the advance stroke of said head.

3. In a feeding head for a jigging conveyer and in combination with an extensible trough, a clamping device comprising a carrier in advance of said head having a pair of opposed friction blocks disposed above and below a portion of said extensible trough, a horizontally disposed link pivotally connected between said carrier and said head, and manually controlled devices connected to the lower end of said carrier for rocking said carrier, with said link acting as a floating fulcrum, into and out of inclined clamping position relative to said extensible trough.

4. In a feeding head for a jigging conveyer and in combination with an extensible trough, a clamping device comprising a carrier in advance of said head having a pair of opposed friction blocks disposed above and below a portion of said extensible trough, a horizontally disposed link pivotally connected between said head and an intermediate part of said carrier adjacent said blocks, and manually controlled devices connected to said carrier for rocking the latter, with said link acting as a floating fulcrum, into and out of inclined clamping position relative to said extensible trough.

5. In a feeding head for a jigging conveyer and in combination with an extensible trough, a gripping device comprising a carrier in advance of said head having a pair of opposed friction blocks disposed above and below a portion of said extensible trough, a horizontally disposed link pivotally connecting said head and said carrier at a point adjacent said blocks and means for rocking said carrier into and out of inclined clamping position relative to said extensible trough, including a link extending between the lower end of said carrier and a rocking member pivoted on said feeding head adjacent the bottom thereof, and manual control means for said rocking member.

6. In a feeding head for a jigging conveyer and in combination with an extensible trough, a gripping device comprising a carrier in advance of said head, having a pair of opposed friction blocks disposed above and below a portion of said extensible trough, a horizontally disposed link pivotally connecting said head and said carrier at a point adjacent said blocks, a shaft extending transversely of said head below said extensible trough, operating levers on said shaft at opposite sides of said head, an arm on said shaft, and a link connecting said arm and the lower end of said carrier, for rocking the latter into and out of inclined clamping position relative to said trough.

7. In a feeding head for a jigging conveyer and in combination with an extensible trough, a clamping device comprising a carrier in advance of said feeding head having a pair of opposed friction blocks pivotally connected thereto and disposed above and below a portion of said extensible trough, a horizontally disposed link pivotally connected to said carrier intermediate the pivotal connections of said friction blocks, longitudinally yielding means connecting the rear end of said link to said head, and manually controlled devices for rocking said carrier, with said link acting as a floating fulcrum, into and out of inclined clamping position relative to said extensible trough.

8. In a feeding head for a jigging conveyer and in combination with an extensible trough, a clamping device comprising a carrier in advance of said feeding head having a pair of opposed friction blocks pivotally connected thereto and disposed above and below a portion of said extensible trough, a horizontally disposed link pivotally connected to said carrier intermediate the pivotal connections of said friction blocks, longitudinally yielding means connecting the rear end of said link to said feeding head, and manually controlled devices for rocking said carrier into and out of inclined clamping position relative to said extensible trough including a link extending between the lower end of said carrier and a rocking member pivoted on said feeding head adjacent the bottom thereof, and manual control means for said rocking member.

9. In a feeding head for a jigging conveyer and in combination with an extensible trough, a clamping device comprising a carrier in advance of said feeding head having a pair of opposed friction blocks pivotally connected thereto and disposed above and below a portion of said extensible trough, a horizontally disposed link pivotally connected to said carrier adjacent said friction blocks, compression means interposed between the rear end of said link and said head, and manually controlled devices disposed beneath said link and connected to the lower portion of said carrier for rocking said carrier with said link acting as a floating fulcrum, into and out of inclined clamping position relative to said extensible trough.

10. In a feeding head for a jigging conveyer and in combination with an extensible trough, a clamping device comprising a carrier in advance of said feeding head having a pair of opposed friction blocks pivotally connected thereto and disposed above and below a portion of said extensible trough, a horizontally disposed link pivotally connected to said carrier adjacent said friction blocks, compression means interposed between the rear end of said link and said feeding head, and manually controlled devices for rocking said carrier into and out of inclined clamping position relative to said extensible trough including a link extending between the lower end of said carrier and a rocking member pivoted on said feeding head adjacent the bottom thereof, and manual control means for rocking said rocking member.

11. In a feeding head for a jigging conveyer and in combination with an extensible trough, a clamping device comprising a carrier in advance of said feeding head having a pair of opposed friction blocks pivotally connected thereto and disposed above and below a portion of said extensible trough, a horizontally disposed rearwardly extending link pivotally connected to said carrier, a connection between said link and the upper end of said head including a compression member, and manually controlled devices for rocking said carrier, with said link acting as a floating fulcrum, into and out of inclined clamping position relative to said extensible trough including a link connected to said carrier adjacent the lower end thereof and extending rearwardly therefrom, a rocking member pivoted on said feeding member adjacent the bottom thereof, a connection between said rocking member and link, and manual control means for said rocking member.

12. In a feeding device for a jigging conveyer and in combination with an extensible trough, a clamping device comprising a carrier in advance of said feeding head having a pair of opposed friction blocks pivotally connected thereto and disposed above and below a portion of said extensible trough, manually operated devices for rocking said carrier into and out of inclined clamping position relative to said extensible trough including a link connected to said carrier adjacent the lower end thereof and extending rearwardly therefrom, a rocking member pivoted on said feeding member adjacent the bottom thereof and a connection between said rocking member and link, and means for automatically releasing said blocks from said trough upon overload thereof on forward movement of said conveyer comprising a horizontally disposed link pivotally connected to said carrier adjacent said blocks and above said first mentioned link and compression means interposed between the rear end of said link and said head.

13. In a feeding head for a jigging conveyer and in combination with an extensible trough, a pair of gripping devices comprising a pair of carriers in advance of said head and on opposite sides thereof, each of said carriers having a pair of opposed friction blocks disposed above and below a portion of said extensible trough, a pair of horizontally disposed links pivotally connecting said head and said carrier at a point adjacent said blocks, a shaft extending transversely of said head below said extensible trough, operating levers on said shaft at opposite sides of said head, arms on said shaft at opposite sides of said head, and forwardly extending links connecting said arms with the lower portion of said carrier for rocking the latter into and out of inclined position relative to said trough.

14. In a feeding device for a jigging conveyer and in combination with an extensible trough, a pair of clamping devices comprising a pair of carriers in advance of said feeding head adjacent opposite sides thereof, each of said clamping devices having a pair of opposed friction blocks pivotally connected thereto and disposed above and below a portion of said extensible trough, manually controlled devices for rocking said carriers into and out of inclined clamping position relative to said extensible trough including a link extending between the lower end of each of said carriers and a rocking member pivoted on said feeding head beneath said conveyer trough, and means for releasing said blocks from said trough upon overload thereof on forward movement of said conveyer comprising a horizontally disposed link pivotally connected to each of said carriers adjacent said blocks and above said first mentioned links and compression means interposed between the rear end of said links and said head.

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