April 16, 1935. N. D. LEVIN ET AL 1,997,590

MATERIAL HANDLING MECHANISM

Filed Aug. 19, 1930 4 Sheets-Sheet 1

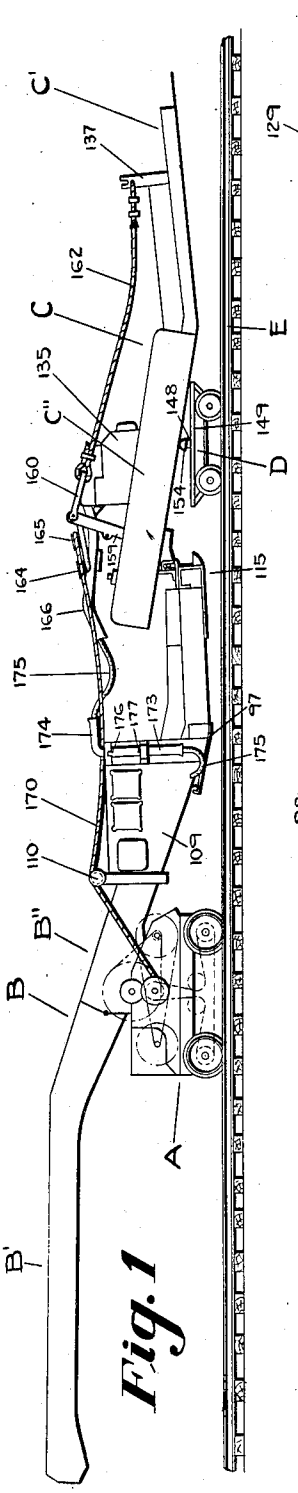


Fig. 1

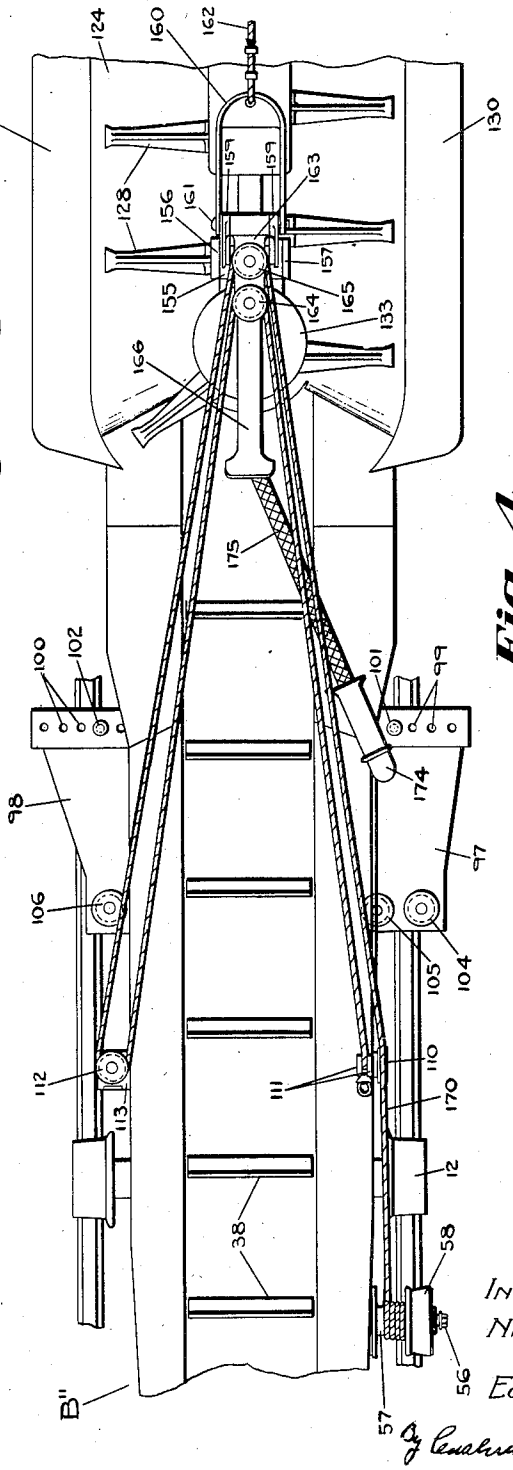


Fig. 4

INVENTORS
Nils D. Levin.
-and-
Edward G. Lewis.
By Cushman, Darby & Cushman
attys

April 16, 1935. N. D. LEVIN ET AL 1,997,590

MATERIAL HANDLING MECHANISM

Filed Aug. 19, 1930 4 Sheets-Sheet 2

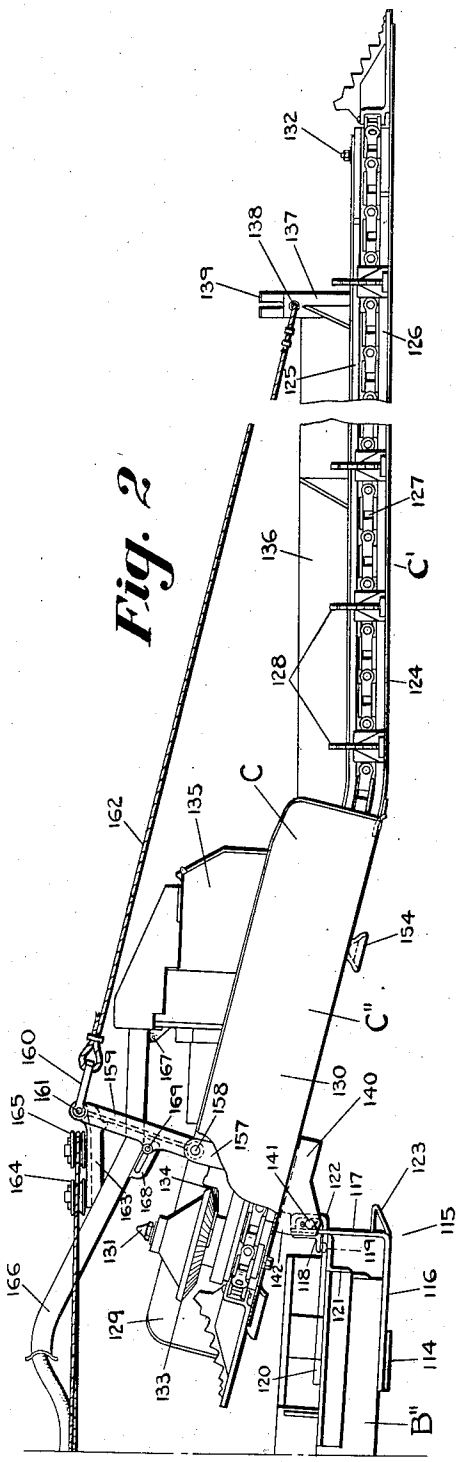


Fig. 2

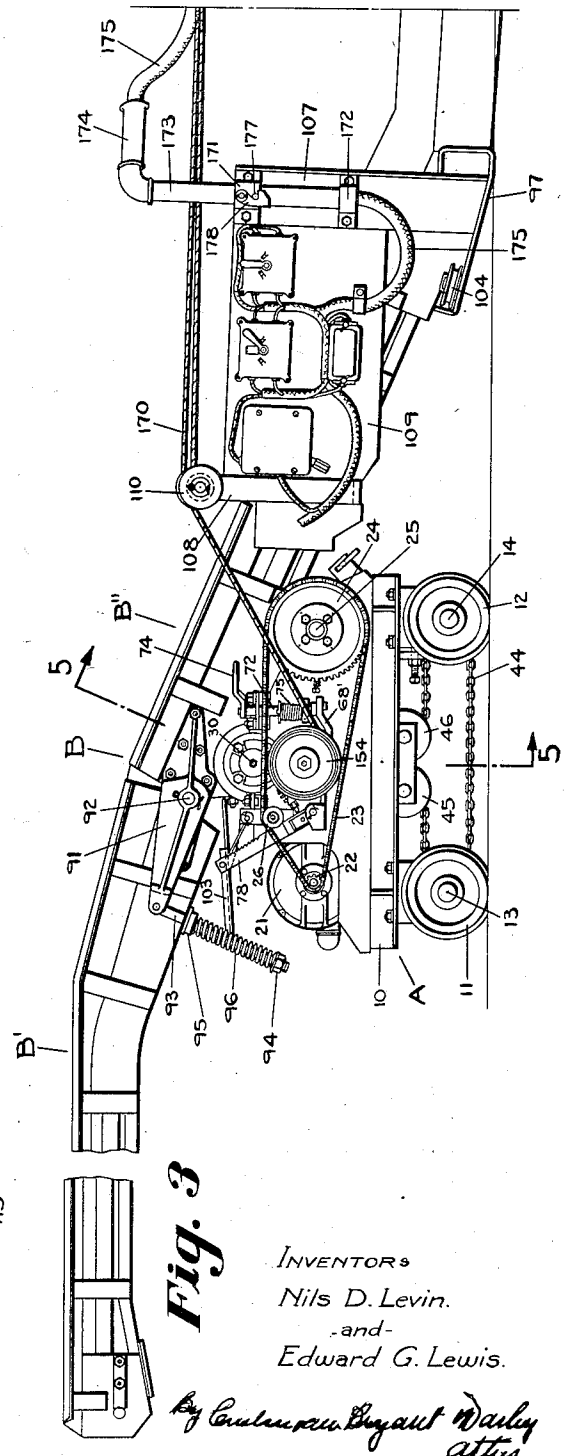


Fig. 3

INVENTORS
Nils D. Levin.
-and-
Edward G. Lewis.

By Coulman & Bryant & Darby
attys

April 16, 1935. N. D. LEVIN ET AL 1,997,590

MATERIAL HANDLING MECHANISM

Filed Aug. 19, 1930 4 Sheets-Sheet 3

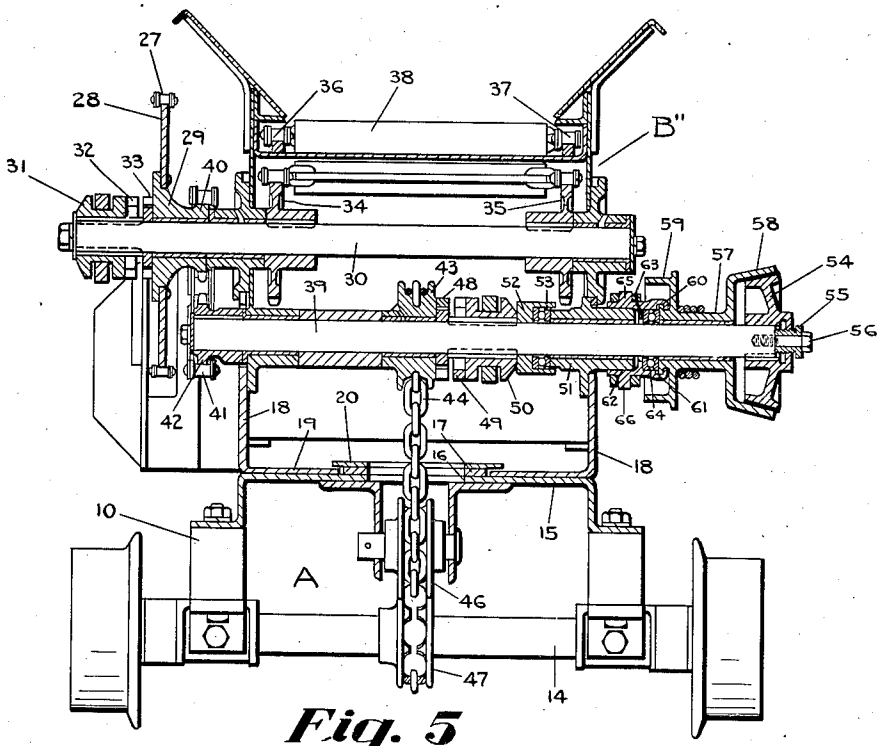


Fig. 5

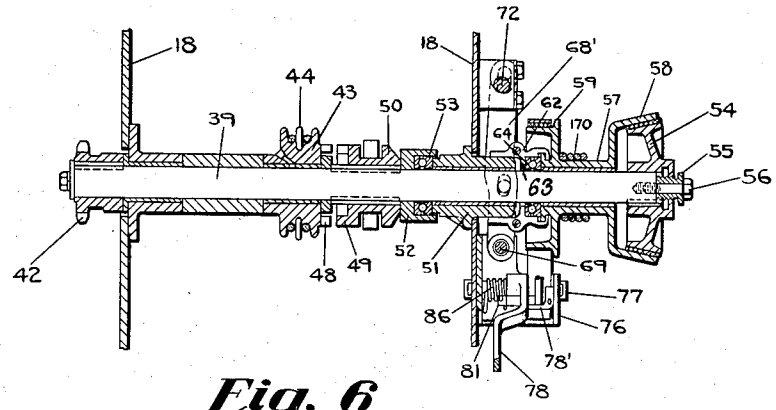


Fig. 6

INVENTORS
Nils D. Levin.
-and-
Edward G. Lewis.

By Lewis Bryant Mann & Darby
attys

April 16, 1935. N. D. LEVIN ET AL 1,997,590

MATERIAL HANDLING MECHANISM

Filed Aug. 19, 1930 4 Sheets-Sheet 4

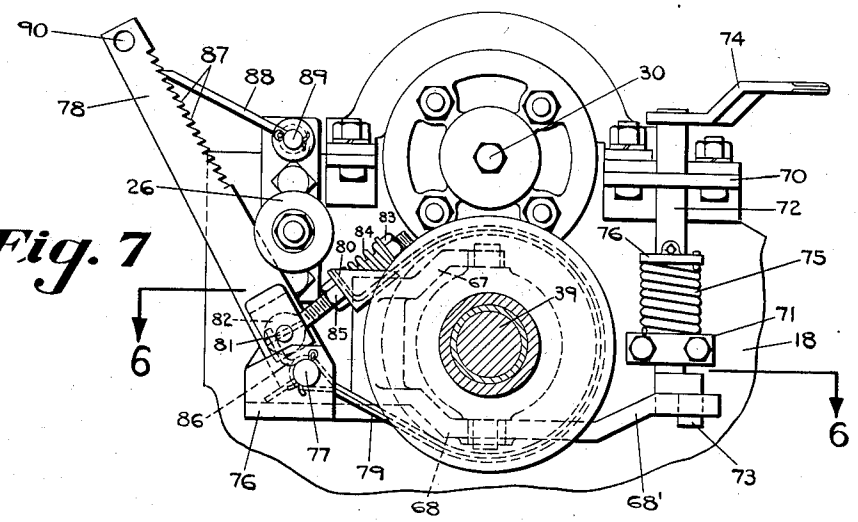


Fig. 7

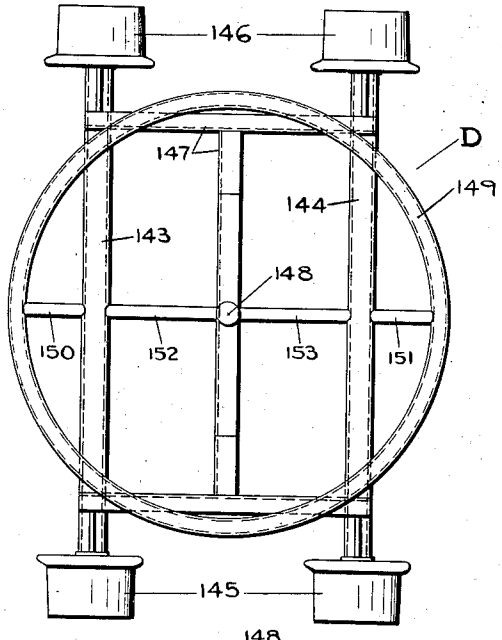


Fig. 8

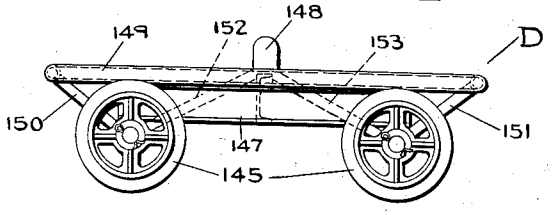


Fig. 9

INVENTORS
Nils D. Levin.
-and-
Edward G. Lewis.
By Cushman Darby & Cushman
Attys

Patented Apr. 16, 1935 1,997,590

UNITED STATES PATENT OFFICE

1,997,590

MATERIAL HANDLING MECHANISM

Nils D. Levin and Edward G. Lewis, Columbus, Ohio, assignors to The Jeffrey Manufacturing Company, Columbus, Ohio, a corporation of Ohio

Application August 19, 1930, Serial No. 476,390

8 Claims. (Cl. 198—7)

The present invention relates to a loading machine and particularly to such a machine adapted to be moved about a mine over the mine tracks and while positioned thereon, to load out material from the various workings.

The general characteristics of the new machine are the same as those described in connection with the machine covered in United States application, Ser. No. 448,626, filed April 30, 1930, the present application relating to various improvements in the design and relation of parts. A machine embodying the improvements in illustrative form is shown in the accompanying drawings wherein

Fig. 1 is a side elevation of the machine as a whole;

Fig. 2 is a side elevation of the front end of the machine on an enlarged scale;

Fig. 3 is a side elevation of the rear end of the machine on an enlarged scale;

Fig. 4 is a plan view of a medial portion of the machine;

Fig. 5 is a section on line 5—5 of Fig. 3;

Fig. 6 is a section on line 6—6 of Fig. 7;

Fig. 7 is a view of certain mechanism appearing on a smaller scale in Fig. 3;

Fig. 8 is a plan view of a pony truck forming a part of the new machine; and

Fig. 9 is a side elevation of the pony truck of Fig. 8.

Referring to the drawings and particularly to Fig. 1, A designates generally a self-propelled truck which supports a conveyor B for pivotal movement about both vertical and horizontal axes, the conveyor B being composed of two sections B' and B'' relatively adjustable about a transverse horizontal axis as will be described hereinafter. Pivotally supported at the front end of the conveyor B, which will be termed the discharge conveyor, is a gathering conveyor C which, for transportation over the mine tracks, is adapted to be supported on a pony truck D, a section of mine track being shown at E.

The discharge conveyor and its supporting truck are substantially the same as described in United States application, Ser. No. 386,647, filed August 17, 1929, in the United States Patent Office, some additions and changes having been made to accommodate the unit to its present use.

Referring particularly to Figs. 3, 4, 5, and 6, truck A comprises a frame 10 supported on wheels 11 and 12 mounted on axles 13 and 14, the wheels being designed for engagement with the mine track. Mounted on frame 10 is a platform 15 provided with an aperture 16 on whose upper margins is secured a ring 17. A frame or turn-table 18 has a bottom wall 19 provided with an aperture in which ring 17 is engaged to form a pivotal guide for the platform. A ring 20 superposed on ring 17 overlies the margins of the aperture in wall 19 to prevent any substantial upward movement of frame 18 relative to the platform 15.

A motor 21 is mounted on frame 18 with its armature shaft extending transversely thereof, the armature shaft having secured thereon a sprocket 22 which through a chain 23 drives a sprocket 24 mounted on a shaft 25 parallel to the armature shaft. The upper run of chain 23 is engaged by an idler pulley 26 as shown in Fig. 3. At its end opposite sprocket 24, shaft 25 has fixed thereto a second sprocket which engages a chain 27 (Fig. 5) to drive a sprocket 28, fixed to a hub 29, which is freely revoluble on a shaft 30 journaled in the upper portion of frame 18 in parallel relation to shaft 25. A shiftable clutch element 31 is splined on shaft 30 and is provided with teeth 32 adapted to engage teeth 33 formed on hub 29 so that the rotation of the latter may be imparted to shaft 30. Fixed on shaft 30 within and adjacent the side walls of frame 18 is a pair of sprockets 34 and 35 which are adapted to engage the lower runs of chains 36 and 37 which traverse the full length of the discharge conveyor B and are interconnected by means of material engaging flights 38.

A shaft 39 is journaled in frame 18 below shaft 30 and parallel thereto. Hub 29 has formed thereon a sprocket 40 connected by means of a chain 41 with a sprocket 42 fixed in the end of shaft 39. Freely revoluble on shaft 39 directly above aperture 16 is a sheave 43 with which is engaged a universally flexible chain 44 which is passed downwardly through aperture 16 and thence forwardly and rearwardly around sheaves 45 and 46 in engagement with sheaves as at 47 fixed to axles 13 and 14. Sheave 43 has formed thereon clutch teeth 48 adapted to be engaged by clutch teeth 49 formed on a shiftable clutch member 50 splined on shaft 39. Thus when shaft 39 is driven and clutch teeth 48 and 49 are engaged, wheels 11 and 12 will be driven through chain 44, the drive being effective throughout a considerable range of angular adjustment of frame 18 relative to the platform 15 due to the universal flexibility of the chain 44.

One end of shaft 39 is journaled in a sleeve bearing 51 fixed in frame 18. Inwardly of this bearing, shaft 39 has fixed thereon a housing 52 for a thrust bearing 53 which is interposed between the housing and the inner end of bearing

51. Splined on the end of shaft 39 outwardly of the bearing 51 is a cone-faced friction clutch member 54. Engaged co-axially in member 54 is a screw threaded nipple 55 which at its inner end is adapted to bear against the end of shaft 39. A cap screw 56 passes through nipple 55 and is threaded in a bore in the end of shaft 39 to prevent axial displacement of the nipple relative thereto. By loosening the cap screw and turning the nipple relative to shaft 39, element 54 may be adjusted longitudinally of the shaft and when the proper adjustment has been obtained, the nipple may be locked by tightening the cap screw.

Freely revoluble on shaft 39 between bearing 51 and clutch element 54 is a winding drum 57 having formed thereon a conical flange 58 adapted to cooperate with clutch element 54, a cylindrical brake flange 59 being provided at the other side of the drum. Interiorly of flange 59 is a radial flange 60 engaged with a slight lost motion in an annular groove 61 formed in a sleeve 62 revolubly mounted on the outer end of bearing sleeve 51. Engaged between an inwardly projecting radial rib 63 of sleeve 62 and the adjacent end of drum 57 is a thrust bearing 64.

Sleeve 62 is provided with diametrically opposite studs 65 and 66 engaged in the slotted ends of arms 67 and 68 of a shipper member which is pivoted on a pin 69. Mounted parallel to pin 69 in bearings 70 and 71 and on the opposite side of shaft 39 is a rocking shaft 72 having at its lower end an eccentric pin 73 engaged in the slotted end of a prolongation 68' of arm 68. A lever 74 is fixed to the upper end of shaft 72 and intermediate bearings 70 and 71, a torsion spring 75 surrounds the shaft, one end of the spring being secured to bearing 71 and the other end to a washer 76 which is fixed to the shaft. When shaft 72 is rocked in a clockwise direction, the shipper member is swung against the action of spring 75 to move the winding drum through the intermediary of thrust bearing 64 to engage the external friction clutch element 58 with the internal element 54 to cause rotation of the winding drum with shaft 39. Bearing 53 carries the thrust thus imposed on shaft 39. Upon release of lever 74, spring 75 causes the disengagement of the clutch elements due to the engagement of flange 60 in groove 61 of the shipper-controlled sleeve 62.

Journaled in a bracket 76 in parallel relation to shaft 39 is a pin 77 on which is oscillably mounted a lever 78. A brake band 79 has one of its ends secured to pin 77 and passes thence around brake flange 59 of drum 57, the other end of the band terminating in a lug 80. Lever 78 (Fig. 6) has integral therewith a bracket-like portion 78', this portion and the lever proper supporting a pin 81 in parallel spaced relation to pin 77. An eye bolt 82 is engaged by pin 81 and has its threaded shank portion passed through an aperture formed in lug 80. Between lug 80 and a nut 83 at the end of the eye bolt is interposed a compression spring 84, an abutment nut 85 being screwed on the shank of the eye bolt to the other side of lug 80 from spring 84. Adjustment of band 79 and spring 84 is obtained through adjustment of nuts 83 and 85. A torsion spring 86 surrounds pin 77 at one side of lever 78, one of its ends engaging the bottom of bracket 76 and the other engaging pin 81 as shown in Fig. 7.

Adjacent the upper end of lever 78, a number of teeth 87 are formed, these being engageable by a pawl 88 mounted on a pin 89. At its extreme upper end, lever 78 is provided with a handle 90 projecting in parallel relation to pin 77.

With pawl 88 disengaged from teeth 87, brake band 79 is released through the action of spring 86. When lever 78 is swung in a counter-clockwise direction, the band is tightened with a cushioned effect due to spring 84, it being understood that tension is applied to the band through this spring. Pawl 88 may be thrown in cooperative relation to teeth 87 to maintain the brake band taut. In any event, when lever 78 is released, spring 86 acts to loosen the band and thus release the winding drum. Inasmuch as the brake flange 59 is axially shiftable with drum 57, the flange is made of sufficient width so as to be always in full cooperative relation with band 79.

From the above description, it will be seen that motor 21 is adapted to drive the conveyor chains 36 and 37 when the clutch teeth 32 and 33 are engaged and is adapted to drive the truck wheels and the winding drum through shaft 39 when the clutches 48, 49 and 54, 58 are engaged. While all the power trains may be driven simultaneously if such operation should, by chance, become necessary, the important point is that each of the three drives may be effected entirely independently. However, simultaneous operation of the conveyor and drum drives is an essential feature in the loading operation of the machine, as will hereinafter appear, and this, of course, is effected by the engagement of clutches 32, 33 and 54, 58. Further, simultaneous drive of the truck wheels and the winding drum is desirable as when it is desired to assist the machine up an incline by means of a tension member engaged with the drum. As another importan possibility, when negotiating a decline, the motor may be shut off and, clutches 48, 49 and 54, 58 being engaged, brake band 79 may be tensioned to brake the truck wheels.

Referring to Figs. 1 and 3, it will be noted that the adjacent portions of conveyor sections B' and B'' constitute an inclined portion having at its upper end a substantially horizontal prolongation and at its lower end another substantially horizontal extension adjacent the mine track. To each side of section B'', and at its upper end is attached an arm of which one is shown at 91 (Fig. 3), the arms extending along the adjacent end of conveyor section B' and supporting a pin 92 upon which section B' is oscillably mounted. Each arm 91 has a threaded rod 93 pivoted to its extremity, each rod being provided at its end with a nut 94 and being engaged in an aperture in a bolster 95 which extends beneath section B'. Each rod 93 has a compression spring 96 mounted thereon between the bolster and nut. Section B' is thus resiliently supported on bolster 95 and its position relative to section B'' may be adjusted as desired by appropriate adjustment of nuts 94. The conveyor as a whole is supported for movement about shaft 30 so that its lower end may rest upon the track E or may be elevated for transportation. An apron 103 is so disposed as to guard the lower runs of the conveyor chains from interference with the underlying parts of the machine.

At the forward end of the inclined conveyor portion are secured plates 97 and 98 each of which has a forward horizontal portion extending transversely of the conveyor and provided with a plurality of apertures as at 99 and 100, in which may be engaged pins 101 and 102 to project below the shoes into lateral engagement with the track rails to prevent lateral displacement of the con-

veyor. At its rear end plate 97 supports a pair of sheaves 104 and 105 on substantially upright axes while plate 98 similarly supports a sheave 106.

Supported between upright arms 107 and 108 is a panel 109 upon which are arranged the various electrical control appliances. Arm 108 also revolubly supports at its upper end a sheave 110 on a horizontal axis and spaced inwardly of the sheave (Fig. 4), the arm is provided with parallel jaws 111. Directly opposite arm 108 a sheave 112 is revolubly mounted on a bracket 113 on an upright axis.

To the forward end of conveyor section B'' is pivoted on a pivot member 114 disposed on the central longitudinal line of the conveyor section, a bracket or mounting member 115 comprising angular sections 116 and 117. The bracket is capable of swinging from one side of the forward end of section B'' to the other. A horizontal angle bar 118 secured adjacent the extremity of bracket portion 117 has a depending lug 119 adapted to engage behind an arcuate rail 120 formed on a flange 121 secured to the conveyor section end, rail 120 having pivot member 114 as its center. Extending transversely of the upper end of portion 117 opposite angle bar 118 is a channel member 122, while at the lower extremity of portion 117 is fixed a shoe 123.

As may be seen most clearly from Fig. 2, the gathering conveyor C comprises a normally horizontal portion C' and an inclined portion C''. A base plate 124 extends throughout conveyor C and has disposed thereon suitable guide members as at 125 and 126 for an endless conveyor chain 127 flexible both horizontally and vertically. The conveyor chain is adapted to advance along one side of plate 124 and return along the other. Flights 128 attached to the chain at intervals are adapted to engage material and move it along the base plate and discharge it from the upper extremity of the inclined section. Flights 128 are freely exposed laterally on portion C' of conveyor, material retaining side walls 129 and 130 being provided along the inclined edges of section C''.

The conveyor head shaft 131 has a sprocket fixed thereto and engaging chain 127 to drive the latter, a foot sprocket being arranged on shaft 132. Also fixed on shaft 131 is a bevel gear 133 engaged by a drive pinion 134 which in turn is driven from the armature shaft of a motor 135 mounted on a suitable base supported on plate 124 intermediate the runs of chain 127. Extending forwardly from motor 135 and centrally of plate 125 is an upright baffle board 136 at the extremity of which is an upright post 137 provided with an aperture 138 and a bifurcated extremity 139.

Adjacent head shaft 131 plate 124 has secured thereto a bracket having spaced side walls of which one is shown at 140 (Fig. 2) projecting downwardly and adapted to receive channel 122 between them. Walls 140 are perforated to receive a removable pin 141 which is adapted to extend through channel 122 to unite the gathering conveyor C with mounting member 115, already described.

It will be evident that conveyor C may be adjusted relative to conveyor B about an axis defined by pivot member 114 and about a horizontal axis defined by pin 141. Due to the spaced relation of pin 141 to the top and bottom walls of channel 122, conveyor C may also be adjusted relative to conveyor B about a longitudinally extending axis. The upper end of conveyor C is normally supported on the upper end of bracket portion 117 on a rocking block or bolster 142.

In operation, portion C' of the gathering conveyor C assumes the position shown in Fig. 2 wherein it is adapted to rest directly on the mine floor and to be swung thereover in the manner which has been described in my application first mentioned above. When the machine is to be transported, however, the gathering conveyor is supported on the pony truck D as shown in Fig. 1.

The pony truck D, as most clearly shown in Figs. 8 and 9, comprises a pair of axles 143 and 144 upon which are mounted wheels 145 and 146, the axles being joined by means of a frame 147 composed of angle bars of sufficient width to bring their top surfaces substantially to the tops of the wheels 145 and 146. Exactly centrally of frame 147 is mounted a vertical pin 148 having a rounded extremity and concentrically with the pin is mounted a ring 149 of relatively large diameter. Struts 150 and 151 are interposed between the overhanging ring portions and axles 143 and 144, while struts 152 and 153 are interposed between the axles and the central member of frame 147. Adjacent the lower extremity of portion C'' of the gathering conveyor is fixed an inverted cup-like member 154 on the central longitudinal line of the conveyor.

When the machine is to be moved about the mine the gathering conveyor is tilted about pin 141, the pony truck placed thereunder and pin 148 engaged in cup 154. Pin 148 is of such height as would enable it to support the gathering conveyor with portion C'' thereof spaced above ring 149 in parallel relation to the plane of the latter. However, due to the disposition of cup 154 relative to the length of conveyor C the forward portion of the latter overbalances the rear portion elevating the forward end of conveyor B through the described connection and bringing the parts to the position shown in Fig. 1, plate 124, forward of cup 154, resting on ring 149. Thus in transporting the machine, the weight of conveyor C and of the forward end of conveyor B is divided between pin 148 and ring 149, this relation being maintained in all angular positions of conveyor C relative to the truck.

Inasmuch as the gathering conveyor is of considerable weight, it is desirable to provide motor operated means for elevating it into such position as to enable the pony truck to be placed thereunder. A casting 155 secured to base plate 124 forwardly of head shaft 131, has a pair of spaced upwardly projecting ears 156 and 157 which support a pin 158 which extends transversely of the plate, see Figs. 2 and 4. A member 159 comprising two parallel arms is pivoted at one end on pin 158 and at its other end has a bail 160 pivoted thereto by means of a pin 161. A guy member preferably in the form of a flexible cable 162 secured to the bail is passed forward through aperture 138 of post 137 and secured, the cable when taut permitting member 159 to take the position shown in Fig. 2. Intermediate the upper ends of the arms comprising member 159 a block 163 is mounted on pin 161, this block revolubly supporting a pair of sheaves 164 and 165. A tubular member 166 is pivoted at 167 to a casting on the motor frame and projects forwardly between the arms of member 159. Rearwardly of member 159, member 166 is provided with a downwardly projecting longitudinally slotted web 168 in the slot of which is en-

gaged a removable pin 169 extending between and supported by the arms of member 159. Abutment of pin 169 with the lower end of the slot of web 168 serves to hold member 159 in the upright position of Fig. 2 and also serves to hold member 166 in the position shown in Fig. 2, members 159 and 166 thus acting as mutual props.

Referring to Figs. 1 to 4, a rope or cable 170 is adapted to have one of its ends engaged with drum 57. Thence the cable is adapted to be trained forwardly over sheave 110, thence around sheave 165, rearwardly to and around sheave 112, again forwardly and around sheave 164, and finally rearwardly again to be anchored between jaws 111. It will be evident that upon rotation of drum 57 in the winding direction and consequent tensioning of rope 170, a substantially horizontally directed pull will be exerted on conveyor C above pivot pin 141 due to the attachment of block 163, which supports sheaves 164 and 165 to the upper end of member 159. Tensioning of cable 162 arresting any tendency of member 159 to swing about pin 158, it will be evident that the forward end of conveyor C will be swung upwardly. After the pony truck has been placed as has been above described, the tension on rope 170 may be released.

The controller for motor 135 is disposed on panel 109 and novel means are provided for supporting the electrical conductors intermediate the controller and the motor.

Vertically reciprocable in bearings 171 and 172 on upright 107 is a tubular member 173 having a horizontal projecting upper extension 174 whose extremity is outwardly flared. Conductor cable 175 is trained through the tubular housing constituted by portions 173 and 174 and thence is passed through tubular member 166 to the motor, the free extremity of member 166 being outwardly flared. During operation of the gathering conveyor it is desired that the cable portion intermediate the two tubular supports be elevated so as not to interfere with the passage of material from one conveyor to the other and such disposition is illustrated in Figs. 2 and 3, member 166 being maintained in the position shown by the means already described. Bearing 171, on the other hand, is provided with a recess 176 adapted to be engaged by a lug 177 on tubular member 173, the lug, when so positioned, being engageable by a latch 178 hung on bearing 171. It will be evident that the walls of the recess engaging the lug prevent rotation of element 173 and thereby prevent accidental disengagement of the lug from the latch, the latter serving to hold the tubular guide element in the position of upward adjustment shown in Fig. 3.

When the machine is to be transported, latch 178 is swung to release lug 177, whereupon guide member 173 drops to the position shown in Fig. 1 wherein it is arrested due to engagement of lug 177 with the bearing 172. Removal of pin 169 from the slot of web 168 permits member 159 to swing forwardly and somewhat downwardly and at the same time permits member 166 to swing downwardly, thereby considerably decreasing the height of the machine as a whole.

Guy element 162, bail 160, block 163 and cable 170 constitute together a flexible draft device connecting the winding drum with the front end of the gathering conveyor. This draft device is guided from the discharge conveyor frame substantially horizontally to the top of arm 159 and thence downwardly to post 137, arm 159 thus serving as a compression member holding the intermediate portion of the flexible draft device clear of the upper end of the delivery end of the gathering conveyor.

Various maneuvering possibilities of the machine for the purpose of gathering material have been described in the application first mentioned above and need not be repeated here. Attention may merely be called to the fact that rope 170, due to the stud mounting of sheaves 110, 112, 164, and 165, may be quickly dismounted therefrom and engaged with sheaves 104 or sheaves 105 and 106 to effect swinging of the gathering conveyor. The pony truck herein disclosed is claimed in the copending sole application of Lewis, Serial No. 606,995, filed April 22, 1932.

It will be understood that while we have described a specific embodiment of our invention, many structural modifications are possible and are contemplated under the invention. Accordingly, it will be understood that we do not limit ourselves in this respect except as stated in the following claims.

We claim:

1. In a machine of the class described, a supporting frame, a horizontally extending conveyor pivoted at its delivery end to said supporting frame for swinging adjustment relative thereto about a horizontal axis, an upright arm pivoted at its lower end to said conveyor on an axis extending transversely of the conveyor adjacent the delivery end thereof, a guy element extending between the upper end of the arm and the receiving end of the conveyor, flexible draft means in connection with the upper end of said arm, means disposed on said supporting frame operable to tension said draft means and guy element and thereby swing said arm and therewith the conveyor about said horizontal axis, and a strut pivoted at one end to the conveyor and at the other engaged with said arm through a pin and slot connection of which the slots extends longitudinally of the conveyor for retaining said arm in upright position when said draft means is untensioned.

2. In a machine of the class described, a supporting frame, a horizontally extending conveyor pivoted at its delivery end to said supporting frame for swinging adjustment relative thereto about a horizontal axis, an upright arm pivoted at its lower end to said conveyor on an axis extending transversely of the conveyor adjacent the delivery end thereof, a guy element extending between the upper end of the arm and the receiving end of the conveyor, flexible draft means in connection with the upper end of said arm, means disposed on said supporting frame operable to tension said draft means and guy element and thereby swing said arm and therewith the conveyor about said horizontal axis, and a strut pivoted at one end to the conveyor and at the other engaged with said arm through a pin and slot connection for retaining said arm in upright position when said draft means is untensioned, the pin being removable from the slot to permit said arm to swing out of its normal upright position and to permit the free end of the strut to move to a lowered position.

3. In a machine of the class described, a wheeled supporting frame adapted to be positioned on and travel over a mine track, an elongated discharge conveyor pivotally supported on said frame for adjustment about an upright axis, a gathering conveyor having its delivery end piv-

otally supported by and above the receiving end of the discharge conveyor for swinging movements relative thereto about horizontal and upright axes, a winding drum mounted in connection with said discharge conveyor on an axis fixed with respect to said discharge conveyor, an upwardly projecting member mounted on said gathering conveyor at the delivery end of the latter, a cable readily disconnectibly connected to said upwardly projecting member and having a portion windable on said drum, and means for driving said drum to tension said cable and thereby swing the gathering conveyor about its horizontal axis.

4. In a machine of the class described, a wheeled supporting frame adapted to be positioned on and travel over a mine track, an elongated discharge conveyor pivotally supported on said frame for adjustment about an upright axis, a gathering conveyor having its delivery end pivotally supported by and above the receiving end of the discharge conveyor for swinging movements relative thereto about horizontal and upright axes, a winding drum mounted in connection with said discharge conveyor on an axis fixed with respect to said discharge conveyor, an upwardly projecting member mounted on said gathering conveyor at the delivery end of the latter, a sheave mounted on an upright stud at the upper end of said upright member, a cable having a loop freely engageable with and disengageable from said sheave, one end of said cable being anchored in connection with said discharge conveyor and the other end being windable on said drum, and means for driving the drum to tension said cable and thereby swing the gathering conveyor about its horizontal axis.

5. In a machine of the class described, a wheel supporting frame adapted to be positioned on and travel over a mine track, an elongated discharge conveyor pivotally supported on said frame for adjustment about an upright axis, a gathering conveyor having its delivery end pivotally supported by and above the receiving end of the discharge conveyor for swinging movements relative thereto about horizontal and upright axes, a winding drum mounted in connection with said discharge conveyor on an axis fixed with respect to said discharge conveyor, an upwardly projecting member mounted on said gathering conveyor at the delivery end of the latter, a rearwardly extending block pivoted on the upper end of said upright member on an axis extending transversely of said gathering conveyor, a stud supported sheave on top of said block, a cable having a loop freely engageable with and disengageable from said sheave, one end of said cable being anchored in connection with said discharge conveyor and the other end being windable on said drum, and means for driving the drum to tension said cable and thereby swing the gathering conveyor about its horizontal axis, said block moving about its pivoting axis to maintain the sheave axis always substantially perpendicular to the plane of said loop portion when the cable is tensioned.

6. In a machine of the class described, a wheeled supporting frame adapted to be positioned on and travel over a mine track, an elongated discharge conveyor pivotally supported on said frame for adjustment about an upright axis, a gathering conveyor having its delivery end pivotally supported by and above the receiving end of the discharge conveyor for swinging movements relative thereto about horizontal and upright axes, a winding drum mounted in connection with said discharge conveyor on an axis fixed with respect to said discharge conveyor, an upwardly projecting member mounted on said gathering conveyor at the delivery end of the latter, said upwardly projecting member being pivotal relative to said gathering conveyor on an axis extending transversely of the latter, a guy member connecting the upper end of said upwardly projecting member and the forward end of said gathering conveyor, a cable readily disengageably connected to said upwardly projecting member and having a portion windable on said drum, and means for driving said drum to tension said cable and thereby swing the gathering conveyor about its horizontal axis.

7. In a machine of the class described, a wheeled supporting frame adapted to be positioned on and travel over a mine track, an elongated discharge conveyor pivotally supported on said frame for adjustment about an upright axis, a gathering conveyor having its delivery end pivotally supported by and above the receiving end of the discharge conveyor for swinging movements relative thereto about horizontal and upright axes, a winding drum mounted in connection with said discharge conveyor on an axis fixed with respect to said discharge conveyor, an upwardly projecting member mounted on said gathering conveyor at the delivery end of the latter, said upwardly projecting member being pivotal relative to said gathering conveyor on an axis extending transversely of the latter, a guy member connecting the upper end of said upwardly projecting member and the forward end of said gathering conveyor, a cable readily disengageably connected to said upwardly projecting member and having a portion windable on said drum, means for driving said drum to tension said cable and thereby swing the gathering conveyor about its horizontal axis, and releasible means for holding said upwardly projecting member in upright position when said cable is untensioned.

8. In a machine of the class described, a wheeled supporting frame adapted to be positioned on and travel over a mine track, an elongated discharge conveyor pivotally supported on said frame for adjustment about an upright axis, a gathering conveyor having its delivery end pivotally supported by and above the receiving end of the discharge conveyor for swinging movements relative thereto about horizontal and upright axes, a winding drum mounted in connection with said discharge conveyor at one side of the latter and on an axis fixed with respect to said discharge conveyor, an upwardly projecting member mounted on said gathering conveyor at the delivery end of the latter, a sheave supported by said upwardly projecting member at its upper end, a cable having a loop engaged with said sheave. one of the cable ends being windable on said drum and the other being anchored to said discharge conveyor on the opposite side thereof from said drum, and means for driving said drum to tension said cable and thereby swing the gathering conveyor about its horizontal axis.

NILS D. LEVIN.
EDWARD G. LEWIS.