March 17, 1925. 1,529,875

K. DAVIS

MECHANISM AND SYSTEM FOR CONVEYING LOOSE MATERIALS

Filed Nov. 4, 1921 4 Sheets-Sheet 1

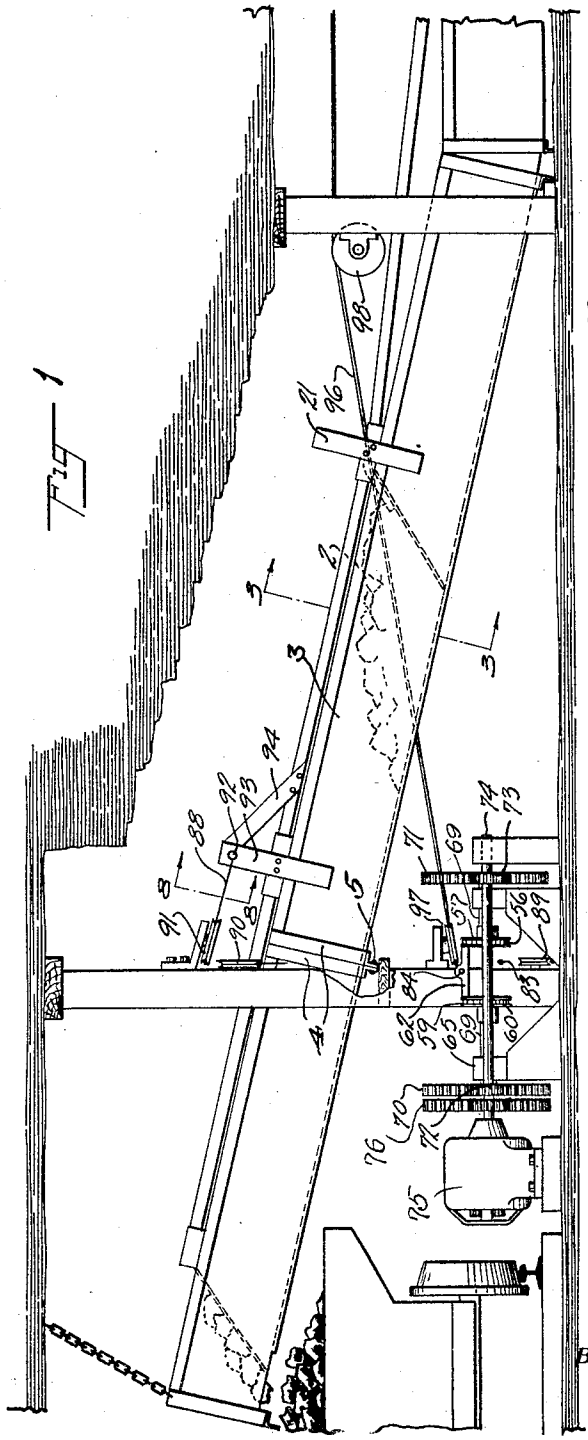

Fig. 1

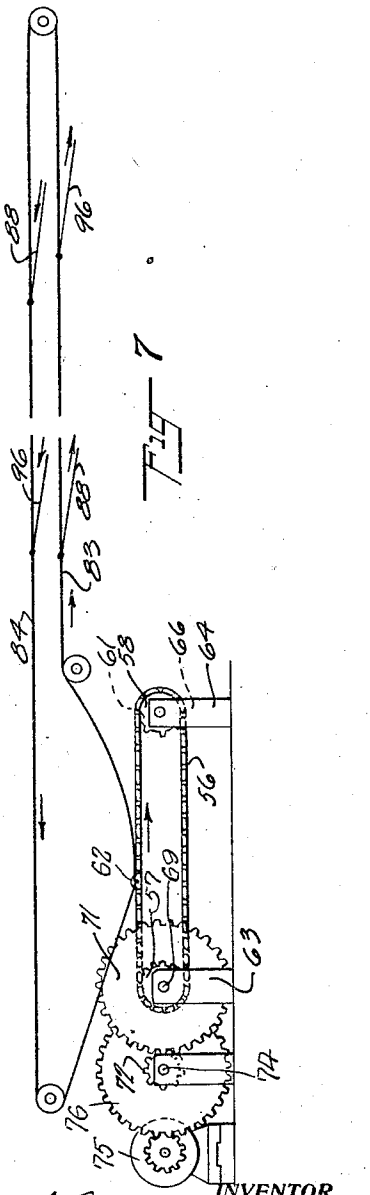

Fig. 7

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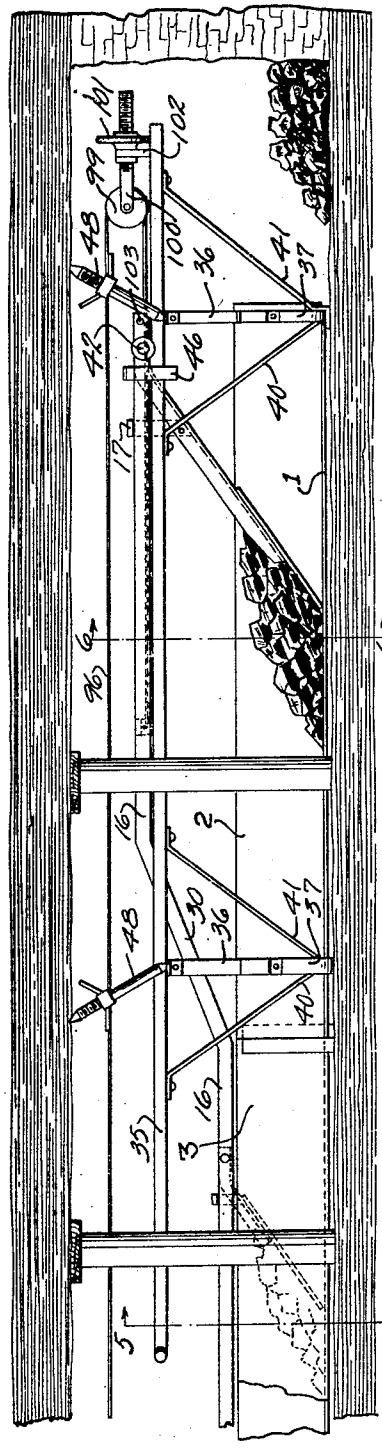

Fig. 2

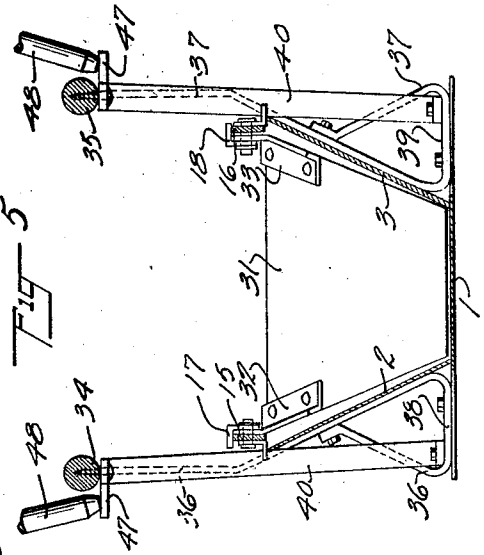

Fig. 5

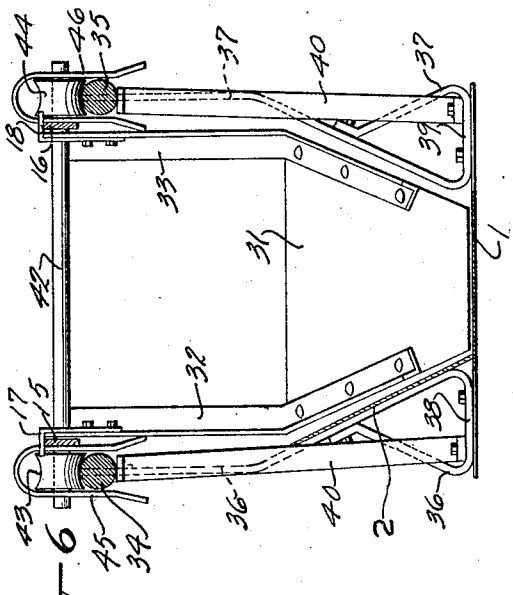

Fig. 6

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MECHANISM AND SYSTEM FOR CONVEYING LOOSE MATERIALS

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Fig 3

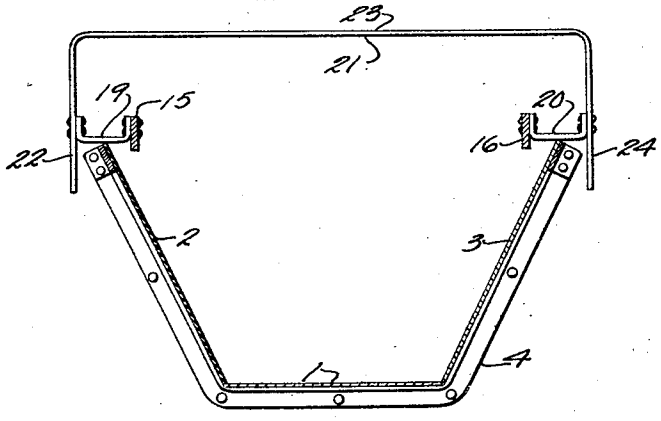


Fig 4

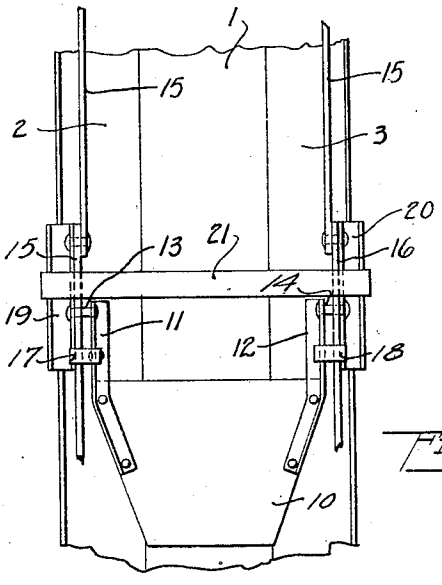


Fig 8

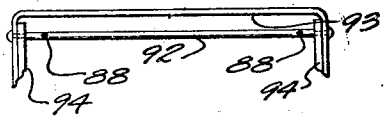
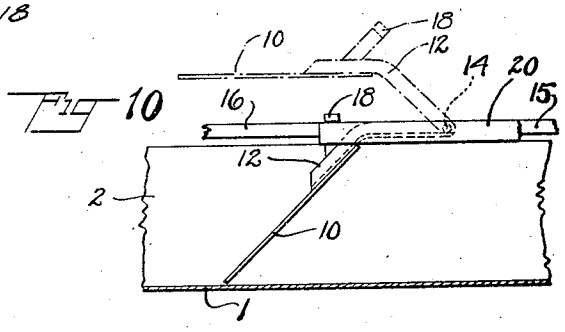


Fig 10



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MECHANISM AND SYSTEM FOR CONVEYING LOOSE MATERIALS

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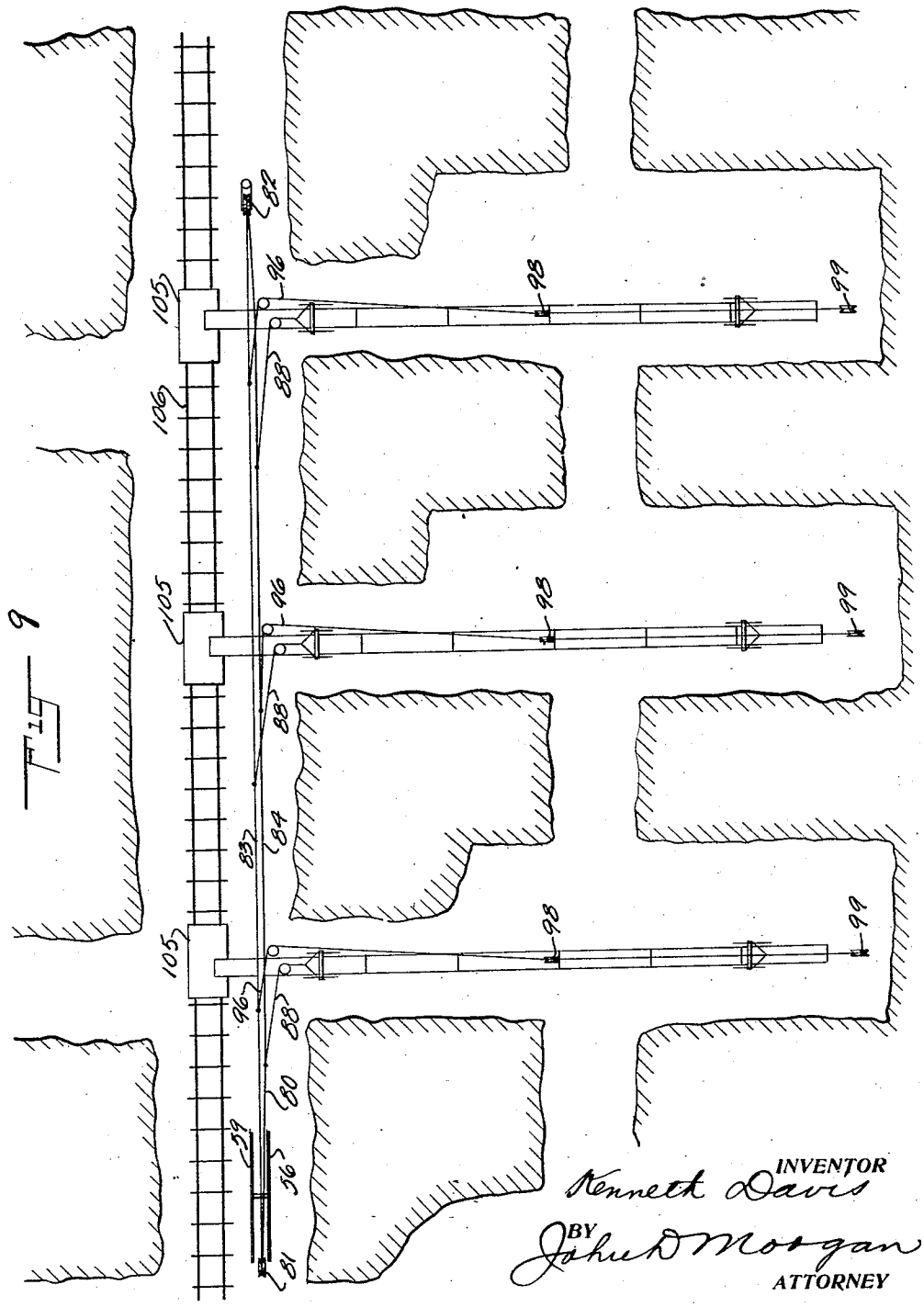

Fig. 9

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UNITED STATES PATENT OFFICE.

KENNETH DAVIS, OF ST. BENEDICT, PENNSYLVANIA, ASSIGNOR TO REMBRANDT PEALE, OF NEW YORK, N. Y.

MECHANISM AND SYSTEM FOR CONVEYING LOOSE MATERIALS.

Application filed November 4, 1921. Serial No. 512,778.

To all whom it may concern:

Be it known that I. KENNETH DAVIS, a citizen of the United States, residing at St. Benedict, in the county of Cambria and State of Pennsylvania, have made certain new and useful Improvements in Mechanism and Systems for Conveying Loose Materials, of which the following is a specification.

The invention relates to an improved form of reciprocating conveying mechanism for loose material and to a novel means for operating or driving a plurality of such conveyors.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:—

Fig. 1 is a side elevation, with certain parts shown more or less diagrammatically, of the external or discharge end of a conveyor mechanism embodying the invention, and of a part of the common driving or actuating system for a plurality of the conveyors;

Fig. 2 is a side elevation on the inner or receiving end of the conveyor shown in Fig. 1, the intervening portions of the conveyor between Figs. 1 and 2 being of varying length as desired;

Fig. 3 is a transverse vertical section taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary top plan taken over one of the pusher blade mechanisms;

Fig. 5 is a transverse vertical section taken substantially on the line 5—5 of Fig. 2;

Fig. 6 is a transverse vertical section substantially on the line 6—6 of Fig. 2;

Fig. 7 is a detached side elevation with parts omitted showing the common driving means for a plurality of the conveyors;

Fig. 8 is a vertical transverse section on line 8—8 of Fig. 1;

Fig. 9 is a diagrammatic top plan of a plurality of conveyor mechanisms operating in a series of mine rooms and driven by common driving means in the entry; and

Fig. 10 is a longitudinal section of the pusher blade mounting with the front of the conveyor trough broken away.

Referring now to the embodiment of the invention, illustrated by way of example in the accompanying drawings, the conveyor is shown applied to a mine room, and especially in a thin vein, and also as applied to a group of rooms operated together by a single driving means and source of power.

Referring primarily to the general construction of the improved form of the conveyor, the conveyor or conveyor trough is stationary and the blades within the trough reciprocate to convey the material. In accordance with one feature of the invention, the conveyor trough, the pusher blades and the actuating mechanism, are constructed in sections, or on a sectional system, of the same or corresponding dimensions, whereby the conveyor can be extended by unit lengths as the face of the working advances. The pusher blade and the actuating mechanism are constructed so that the reciprocatory travel of a blade is somewhat greater than the distance between the pusher blades to insure each blade getting completely behind its pile of material on each reciprocation.

The conveyor trough, as embodied, comprises a bottom 1, and inclined sides 2 and 3 extending upwardly therefrom, and preferably outwardly inclined. The trough members are held together in a suitable manner, as by joining and reenforcing means, such as a bent angle iron 4, 4 fitted about and riveted to the outside of the units and at the ends thereof. These reenforcing members placed at each end of each section have one flange fastened to their respective units, and may be joined together by bolts 5 passing through the other flanges which abut face against face, all as shown in Fig. 1.

The pusher blades 10 are mounted in inclined position, and are shaped to fill the interior of the trough with only working clearance about the external edges. The conveyor blades 10 are preferably mounted by means of angle pieces 11 and 12, riveted to

the blades along either side thereof, and extending upwardly and backwardly therefrom. These arms 11 and 12 at their external ends 13 and 14, respectively, are made round and are pivoted or journaled, respectively, in rods or bars 15 and 16, extending along and just above the conveyor trough. The bars 15 and 16 are preferably in unit lengths like the trough and are bolted together, using one bolt in each joint if a flexible joint is wanted and two bolts in each if a rigid joint is desired.

Means are provided for preventing the load on the pusher blades bending or swinging them too far backwardly, and from exerting too much pressure on the bottom of the conveyor. As embodied, wings 17 and 18, respectively, are fixed to the arms 11 and 12, and are bent upwardly and outwardly to rest upon the bars 15 and 16. Thus, the pusher blades 10 have two points of support at either side; on the one side, the points 13 and 17, and on the other side, the points 14 and 18, to resist undue pivoting action and also undue friction between the blades and the conveyor.

Means are provided also for unifying and stiffening the blade carrying and actuating mechanism and providing also for reciprocably supporting the same on the top edge of the conveyor trough (Fig. 3). As embodied, short pieces of channel beam 19 and 20, respectively, are fastened to the external sides of the bars 15 and 16 by one of their flanges, the bottom or web of the respective channels resting upon the top edges of the sides 2 and 3 of the conveyor trough. A connecting cross yoke or bracket 21 is formed in three right-angled reaches, one reach 22 being fastened to the outside flange of the angle 19, and the parallel reach 24 being fastened to the outside flange of the angle 20, with the intermediate uniting reach 23 extending across and above as shown in Fig. 3. The members 22 and 24 also serve as guides to prevent side lash of the pusher blade mechanism under stress of the load.

In accordance with one feature of the invention, there is provided at the inner end of the conveyor a construction especially adapted to receive the coal or other loose material at the level of the mine floor or the bottom of the conveyor in varying small or large quantities as desired. A loading machine having a shovel or carrier at the front which is normally parallel with and just above the floor, and which discharges the load from the shovel by a pusher blade is adapted to cooperate with the one-sided section of the conveyor, and can discharge comparatively large loads into the conveyor even in a very thin coal vein. Such a conveyor is shown in my copending application Ser. No. 553,252, filed April 15, 1922. Such a loader can discharge its load into the conveyor without the necessity of lifting the shovel of the loading machine to discharge the material from the loader into the conveyor. This entire arrangement is especially adapted for handling coal in large quantities in thin veins.

In the embodied form of the receiving end of the conveying mechanism, the conveyor trough is adapted to receive the loose material at the side, and the pusher blades and their actuating mechanism are adapted to this manner of loading the conveyor. The inner end of the conveyor (Figs. 2, 5 and 6) has one side, for instance, side 3, thereof omitted (Figs. 2 and 6). The side 2 in this case is removable, or shiftable from one side to the other, so that the loose material may be loaded into the conveyor from either side as desired, the side 2 serving as a stop on the opposite side to prevent the discharged material from being pushed entirely across the conveyor.

In said embodied form, the rails or bars 15 and 16 are bent upwardly as shown at 30 in Fig. 2, and then extend again horizontally at a somewhat higher level to provide greater underneath clearance. The rear pusher blade 31 is provided with supporting arms 32 and 33, like the arms 11 and 12 but of greater length. These arms are likewise pivoted in the side rails 15 and 16 in this higher section or portion thereof.

Suitable supporting means for the reciprocating conveying structure is provided, and as embodied, there is at either side, respectively, supporting and guiding rods 34 and 35, extending horizontally and longitudinally above the conveyor, and supported by suitable means, such as bar iron standards 36 and 37, respectively, formed at their bottoms into footing and reenforcing loops 38 and 39, which are fastened to the bottom of the conveyor structure and extend upwardly therefrom, and support the respective rods 34 and 35 from beneath. Reenforcing side struts 40 and 41 are fastened to the loops 38 and 39, respectively, and extend upwardly and outwardly, and are fastened to the respective rods 34 and 35.

The arms 32 and 33 are pivoted on a cross rod 42, which rod is carried in the bars 15 and 16. Journaled on the rod 42, at either side thereof, on the outside of rails 15 and 16, are curved rollers 43 and 44, which run, respectively, on the supporting and guiding rods 34 and 35. Yokes 45 and 46 are mounted at either side upon the rod 42, and extend downwardly on either side of the respective supporting and guiding rods 34 and 35. The upper part of the supports 36 are preferably bent or angled outwardly, as shown at 47 to form bearings for screw jacks 48, which also bear against the mine roof to hold the conveyor construction firmly in position.

Thus there is provided an open side to the conveyor for receiving a horizontally discharged load, with an opposite side for stopping the discharged load on the conveyor bottom. The reciprocating blade construction is sufficiently high to afford clearance beneath for the discharge or delivery of the material into the conveyor, and the blade is swung sufficiently high that it will pass easily over and come down behind any size load which may be delivered into the conveyor.

On the other hand, the entire mechanism is sufficiently simple and compact to operate in very thin coal seams, such as two foot six inch and three foot veins. The load from the loading machine can be delivered into the conveyor at any time irrespective of the position of the pusher blades. The construction also obviously provides for easy handling of the material with hand shoveling, or other means, as it obviates the necessity for lifting the material, and for the height necessary in such lifting.

In the preferred embodied form of conveyor mechanism, the blade reciprocating structure is reciprocated by means of cables and driving means therefor. Further as embodied, a common drive is provided for a plurality of cables, although each conveyor can be provided with its own individual drive, if desired. As embodied, a sprocket chain 56 runs over sprocket wheels 57 and 58, and a similar sprocket chain 59 runs over similar sprocket wheels 60 and 61 in line with the others. The space between the two sets of sprocket wheels is mechanically clear, and a cross-head 62 is connected to and extends across between the sprocket chains. To afford this clearance, the sprocket wheels are journaled in suitable bearings on the external sides thereof, such as bearings 63 and 64 and 65 and 66.

In the embodied form of drive for the sprocket chains, sprocket wheels 57 and 60 are fixed on a pair of shafts 69, on which shafts are fixed gear wheels 70 and 71, respectively. Meshing with the gear wheels 70 and 71 are pinions 72 and 73, which are fixed on shaft 74. On shaft 74 is fixed a reducing gear wheel 76, driven by the motor 75. The gear reduction may be as great as desired.

Fast to the cross-head 62 are both ends of a cable 80, which cable runs over supporting and guiding sheaves 81 and 82, so that the cable has two oppositely moving reaches 83 and 84. As the power mechanism is driven the cross-head 62 travels to and fro with the sprocket chains 56 and 59.

In Fig. 9 this driving mechanism is located in and extends along the entry, and the conveyors are located in the respective rooms, the cable extending past the mouths of the rooms. The conveyors in the rooms are actuated by branch cables attached to the main driving cable just described. As embodied (Figs. 1, 2 and 9), a branch cable 88 is connected to the lower reach 83 of the main cable, and passes over sheaves 89, 90, and 91, all suitably positioned and supported, and is fixed to a cross rod 92 fixed in a yoke 93, which otherwise may be the same or similar to the yoke 21, already described. The yoke 93 may be provided with reenforcing pieces 94 between the yoke and the rails 15 and 16, as shown in Fig. 1.

Another cable 96 is fastened to the upper reach 84 of the main cable (traveling in the opposite direction from reach 83) and passes around sheaves 97 and 98, properly mounted and positioned (Figs. 1 and 2), and extends along and over the conveyor mechanism to the inner end thereof. At the inner end thereof this cable passes over a supporting and direction reversing sheave 99, journaled in a support 100, provided with a screw adjustment 101 for taking up the slack or regulating the tension in the cable 96. The support 100 is mounted on a cross-piece 102 carried upon the inner end of the supporting and guiding rails 34 and 35. Cable 96 is fastened to a cross-rod mounted in rails 15 and 16.

In Figs. 7 and 9 the cables are shown in diagrammatic positions for the sake of clearness, but in practice the entry or other main cables are arranged so that the strain of the load will come as nearly as possible in a longitudinal direction along the sprocket chains.

The cables 88 and 96 of the different conveyor mechanisms are connected in alternate relation to the main cables 83 and 84, so as to divide the load and distribute it substantially equally, or as nearly equally as possible, on the alternate reciprocations of the main cable reaches 83 and 84. Thus the load of the first and third conveyors, and so on, will fall on the main cable traveling in one direction, and the load of the second and fourth conveyors, and so on, will fall on the main cable when traveling in the opposite direction, and the load on the drive will be substantially uniform all the time.

In Fig. 9 the room conveyors are shown discharging into mine cars 105, standing on the entry track 106. It will be understood, so far as concerns most features of the invention, a conveyor mechanism of any desired character could be used in the entry in place of the cars.

The entire system does away with the necessity of men pushing coal cars to and fro in thin veins, and also obviates the necessity of the alternative, that is, blasting and removing the top or bottom rock to make room for animals or locomotives, and at the same time provides cheap mechanical means for immediately and adequately re-

moving the dislodged coal, from its dislodgment from the vein to its conveyance out of the mine. It will be understood that the disclosure of the invention in connection with coal mining merely illustrate one very valuable use thereof, and that the invention is useful elsewhere and in other ways in conveying loose materials.

Means are provided for facilitating the passage of the pusher blades over large lumps or piles of material on the return stroke, so that the blades will not push the material backwardly or the pusher blade structure will not be lifted upwardly or be otherwise displaced or disturbed. As embodied, this is shown in Fig. 10, which shows the arms 12 extending backwardly in the direction of inclination of the blade 10 and of a length sufficient to give a relatively high lift to the blade. The length of the arms 12 will regulate the height to which the blades 10 are lifted.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:—

1. A conveying mechanism for loose materials including in combination a conveyor trough having interchangeable unit sections, pusher blades for reciprocation within the trough, connections between the pusher blades for reciprocating them together also formed in detachable and connectable units corresponding to the trough units, means for reciprocating the blades together by means of said connections, and means whereby adjoining sections may be connected together and disconnected from each other.

2. A conveying mechanism for loose materials including in combination a conveyor trough having interchangeable unit sections, pusher blades for reciprocation within the trough, connections between the pusher blades for reciprocating them together also formed in detachable and connectable units corresponding to the trough units, and means on the ends of the sections for attaching them together.

3. A conveying mechanism for loose materials including in combination a conveyor trough having interchangeable unit sections, pusher blades for reciprocation within the trough, connections between the pusher blades for reciprocating them together also formed in detachable and connectable units coresponding to the trough units, and abutting flanges on the ends of the trough sections and means for connecting said flanges together.

4. A conveying mechanism for loose materials including in combination a conveyor trough having interchangeable unit sections, pusher blades for reciprocation within the trough, connections between the pusher blades for reciprocating them together also formed in detachable and connectable units corresponding to the trough units, and abutting reenforcing members having flanges on the ends of the trough sections and means for connecting said flanges together.

5. A conveying mechanism for loose materials including in combination a trough made in portable, interchangeable sections, a material conveying device within the trough including a series of pusher blades, a series of rails connecting said pusher blades to reciprocate them together and supporting means for the blades and rails running on the edges of the trough.

6. A conveying mechanism for loose materials including in combination a trough, a material conveying device within the trough including a series of pusher blades, a series of rails connecting said pusher blades to reciprocate them together and means engageable over the outer edges of the trough for preventing side lash of the pusher blades and their connecting rails.

7. A conveying mechanism for loose materials including in combination a trough made in portable, interchangeable sections, a material conveying device within the trough including a series of pusher blades, a series of rails connecting said pusher blades to reciprocate them together and means for preventing side lash of the pusher blades and their connecting rails and for supporting the pusher blades and their connecting rails on the edges of the trough.

8. A conveying mechanism for loose materials including in combination a trough, pairs of rails extending along at either side and near the top of said trough, pusher blades fitting within and reciprocable along said trough and mounted on said rails, and supports for said rails and blades resting on the edges of said trough and permitting reciprocable movement thereof.

9. A conveying mechanism for loose materials including in combination a trough, pairs of rails extending along at either side and near the top of said trough, pusher blades fitting within and reciprocable along said trough and mounted on said rails, and supports for said rails and blades resting on the edges of said trough and permitting reciprocable movement thereof, and means for preventing side lash of said structure.

10. A conveying mechanism for loose materials including in combination a trough made in interchangeable unit sections, pairs of rails made in interchangeable unit sections corresponding to the trough sections, extending along at either side and near the top of said trough, pusher blades fitting

within and reciprocable along said trough and mounted on said rails, and supports for said rails and blades resting on the edges of said trough and permitting reciprocable movement thereof.

11. A conveying mechanism for loose materials including in combination a trough, a blade connecting structure reciprocable along the trough, cable means for reciprocating said blade connecting structure, inclined pusher blades fitting within the trough and having a pivot support on said structure and having also an additional support from said structure.

12. A conveying mechanism for loose materials including in combination a trough made in inter-changeable unit sections, a blade connecting structure reciprocable along the trough, inclined pusher blades fitting within the trough and having a pivot support on said structure and a rigid support between a pusher blade and said structure for limiting the pivotal movement of the loaded blade.

13. A conveying mechanism for loose materials including in combination a trough, made in inter-changeable unit sections, a blade connecting structure reciprocable along the trough, cable means for reciprocating said blade connecting structure, inclined pusher blades fitting within the trough and having a pivot support on said structure and means between a pusher blade and said structure for limiting the pivotal movement of the loaded blade.

14. A conveying mechanism for loose materials including in combination a series of reciprocating pusher blades, and connections therebetween for reciprocating them together, a trough within which said pusher blades reciprocate, the trough having a bottom and two sides, but at its material receiving end having only a bottom and one side interchangeable from one side to the other of the bottom.

15. A conveying mechanism for loose materials including in combination a series of reciprocating pusher blades, and connections therebetween for reciprocating them together, a trough within which said pusher blades reciprocate, the trough having a bottom and two sides, but at its material receiving end having only a bottom and one side interchangeable from one side to the other of the bottom, said connections between the blades being elevated at the receiving end to permit the supply of the loose material therebeneath onto the trough bottom.

16. A conveying mechanism for loose materials including in combination a trough, pusher blades fitting within the trough and reciprocable therealong, connections between the blades, supporting means for the pusher blades and connections resting upon and reciprocable along the trough, the trough at its material receiving end having a bottom and one side and said supporting means at said receiving end being in an elevated position above the trough and means for supporting and guiding said guiding means in said elevated position.

17. A conveying mechanism for loose materials including in combination a trough, a material conveying mechanism comprising a plurality of pusher blades fitting and reciprocable therewithin, connections between said pusher blades for reciprocating them together, and reciprocating means comprising a cable attached to said conveying mechanism near either end thereof for giving a positive pull to the conveying mechanism in both directions.

18. A conveying mechanism for loose materials including in combination a trough, a material conveying mechanism comprising a plurality of pusher blades fitting and reciprocable therewithin, connections between said pusher blades for reciprocating them together, automatically operating reciprocating means comprising a cable attached to said conveying mechanism near either end thereof, and a direction reversing pulley over which the cable runs.

19. A conveying mechanism for loose materials including in combination a trough, a material conveying mechanism comprising a plurality of pusher blades fitting and reciprocable therewithin, connections between said pusher blades for reciprocating them together, and automatically operating reciprocating means for giving a positive pull to the conveying mechanism in both directions comprising a member traveling in a longitudinal path and flexible connections therefrom to either end of said conveying mechanism.

20. A conveying mechanism for loose materials including in combination a trough, a material conveying mechanism comprising a plurality of pusher blades fitting and reciprocable therewithin, connections between said pusher blades for reciprocating them together, and automatically operating reciprocating means for giving a positive pull to the conveying mechanism in both directions comprising a member traveling in a longitudinal path and flexible connections including a direction-reversing device therefrom to either end of said conveying mechanism.

21. A conveying mechanism for loose materials including in combination a plurality of trough conveyors, each trough having a material conveying mechanism including a plurality of reciprocable pusher blades reciprocating in the trough and connections therebetween for reciprocating them together, a common actuating means for said conveying mechanisms including reciprocating means extending past all said conveyors

and connections from said reciprocating means to each of said conveying mechanisms.

22. A conveying mechanism for loose materials including in combination a plurality of trough conveyors, each trough having a material conveying mechanism including a plurality of reciprocable pusher blades reciprocating in the trough and connections therebetween for reciprocating them together, a common actuating means for said conveying mechanisms including a cable having two oppositely reciprocating reaches extending past said conveyors and cables from the conveying mechanisms of the various conveyors attached to said two cable reaches.

23. A conveying mechanism for loose materials including in combination a plurality of trough conveyors, each trough having a material conveying mechanism including a plurality of reciprocable pusher blades reciprocating in the trough and connections therebetween for reciprocating them together, a common actuating means for said conveying mechanisms including a cable having two oppositely reciprocating reaches extending past said conveyors and cables from the conveying mechanisms of the various conveyors attached in alternate relation to said two cable reaches so that the load from one conveyor will occur on the opposite reciprocation of the cable from the load from another conveyor.

24. A conveying mechanism for loose materials including in combination a trough, a blade actuating structure reciprocable along the trough, cable means for reciprocating the blade actuating structure, an inclined pusher blade within the trough and an arm on which the pusher blade is mounted and extending backwardly in the direction of inclination of the pusher blade and pivoted to said actuating structure.

25. A conveying mechanism for loose materials including in combination a trough, a blade actuating structure reciprocable along the trough, cable means for reciprocating the blade actuating structure, an inclined pusher blade within the trough and an arm on which the pusher blade is mounted and extending backwardly in the direction of inclination of the pusher blade and pivoted to said actuating structure and of sufficient length to lift the blade above said reciprocating structure.

26. A conveying mechanism for loose materials including in combination a portable and sectional trough, a blade actuating structure supported upon and reciprocable along the trough, cable means for reciprocating the blade actuating structure, an inclined pusher blade within the trough and an arm on which the pusher blade is mounted and extending backwardly in the direction of inclination of the pusher blade and pivoted to said actuating structure.

27. A conveying mechanism for loose materials including in combination a portable and sectional trough, a blade actuating structure supported upon and reciprocable along the trough, cable means for reciprocating the blade actuating structure, an inclined pusher blade within the trough and an arm on which the pusher blade is mounted and extending backwardly in the direction of inclination of the pusher blade and pivoted to said actuating structure and of sufficient length to lift the blade above said reciprocating structure.

28. A conveying mechanism for loose materials including in combination a series of conveyor sections having a bottom and two sides and a material receiving section having a bottom and only one side, whereby material may be fed in substantially at the level of the bottom, and a plurality of material advancing pusher blades reciprocable along the conveyor in both the two sided and one sided sections, and means for reciprocating the conveyor blades.

29. A conveying mechanism for loose materials including in combination a series of conveyor sections having a bottom, adapted to be positioned very close to a supporting floor, and two sides and a material receiving section having a bottom and only one side, whereby material may be fed in substantially at the level of the bottom, and a plurality of material advancing pusher blades reciprocable along the conveyor in both the two sided and one sided sections, and means for reciprocating the conveyor blades.

30. A conveying mechanism for loose materials comprising a bottom adapted to rest just above a supporting floor, a side wall, a plurality of pusher blades reciprocable along the bottom and said side wall, the other side of the conveyor being open for receiving loose material.

31. A conveying mechanism for loose materials, comprising a bottom flat throughout, and adapted to rest just above a supporting floor, and a side wall, pusher blades longitudinally reciprocable therealong, means for reciprocating the pusher blades, the other side of the conveyor being open whereby loose material may be loaded thereinto from that side.

32. A conveying mechanism for loose materials comprising a trough with a bottom and two sides, a series of material conveying pusher blades reciprocable in said trough, one of the sides being omitted at a loading point so that loose material may be loaded into the conveyor at that point into the path of the reciprocating pusher blades, and be conveyed from said loading point along the two-sided part of the conveyor.

33. A conveying mechanism for loose ma-

terials comprising a trough with a bottom, adapted to rest close to a supporting floor, and two sides, a series of pusher blades reciprocable in the trough, one of the sides at the material receiving end of the trough being omitted at a loading place for allowing the lateral loading of the loose material into the path of the reciprocating pusher blades, the series of pusher blades engaging with material at said loading point and conveying it along the two-sided part of the conveyor.

34. A conveying mechanism for loose materials comprising a trough with a bottom and two sides, one of the sides of the trough being omitted to provide an opening into which the loose material may be loaded from the side, and a plurality of pusher blades reciprocable along the two sided part of the trough and back and forth in said loading opening.

35. A mine conveyor system including in combination a series of trough conveyors located in side by side mine rooms, and each including a series of reciprocable material-conveying blades within the trough, and common actuating means for the various series of conveying blades located in the mine entry.

36. A mine conveyor system including in combination a series of trough conveyors located in side by side mine rooms, and each including a series of reciprocable material-conveying blades within the trough, and common actuating means for the various series of conveying blades located in the mine entry, the actuating means alternately operating the pusher blades in various conveyors in the material conveying direction to balance the load.

37. A mine conveyor system including in combination a series of trough conveyors located in side by side mine roms, and each including a series of reciprocable material-conveying blades within the trough, and common actuating means for the various series of conveying blades located in the mine entry, and comprising an actuating cable for each conveyor and a cable extending along the entry to which the conveyor cables are attached.

38. A mine conveyor system including in combination a series of trough conveyors located in side by side mine rooms, and each including a series of reciprocable material-conveying blades within the trough, and common actuating means for the various series of conveying blades located in the mine entry, and comprising an actuating cable for each conveyor, and a cable extending along the entry to which the conveyor cables are attached in alternative arrangement to distribute the load.

39. A conveying mechanism for loose materials including in combination a trough having an extended flat bottom and two sides, a series of material-conveying pusher blades reciprocable in a flat path along the bottom, and one side of the trough being open at a loading place, and at least one of the pusher blades being reciprocable past the open-side loading place, and means for reciprocating the blades.

40. A conveying mechanism for loose materials including in combination a trough having an extended flat bottom, adapted to lie very close to a supporting floor, and two sides, a series of material-conveying pusher blades reciprocable in a flat path along the bottom, and one side of the trough being open at a loading place, and at least one of the pusher blades being reciprocable past the open-side loading place, and means for reciprocating the blades.

In testimony whereof, I have signed my name to this specification.

KENNETH DAVIS.