

March 15, 1949.

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2,464,217

MATERIAL CONVEYER FOR VEHICLES

Filed Jan. 21, 1946

2 Sheets-Sheet 1

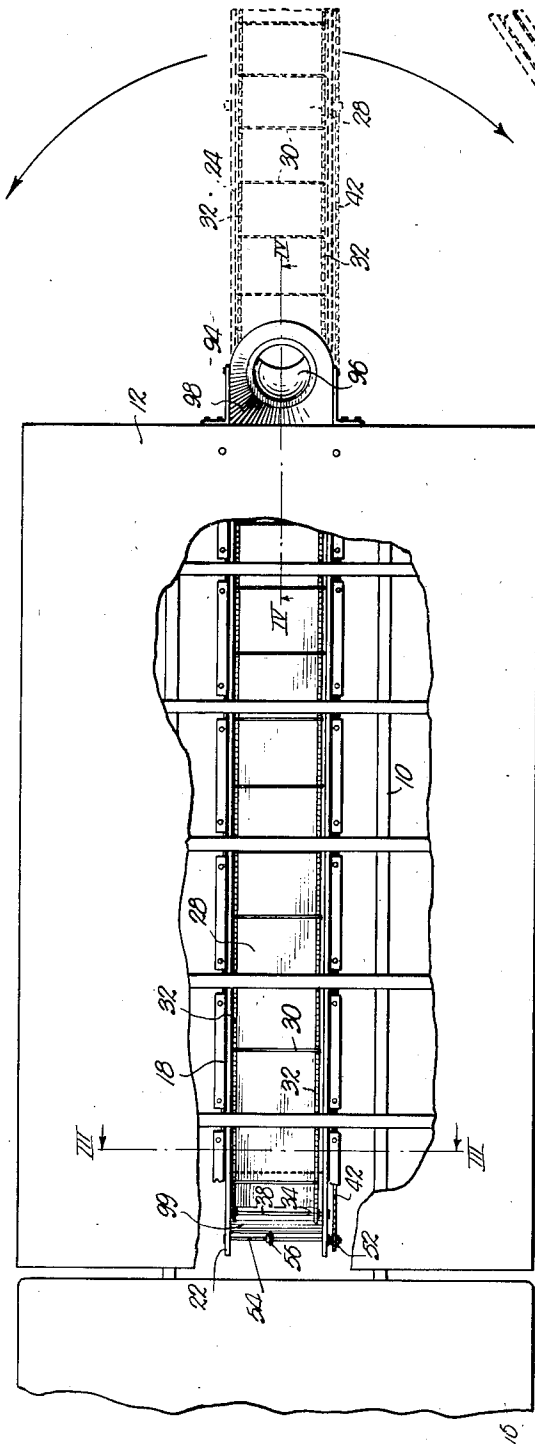


Fig. 1.

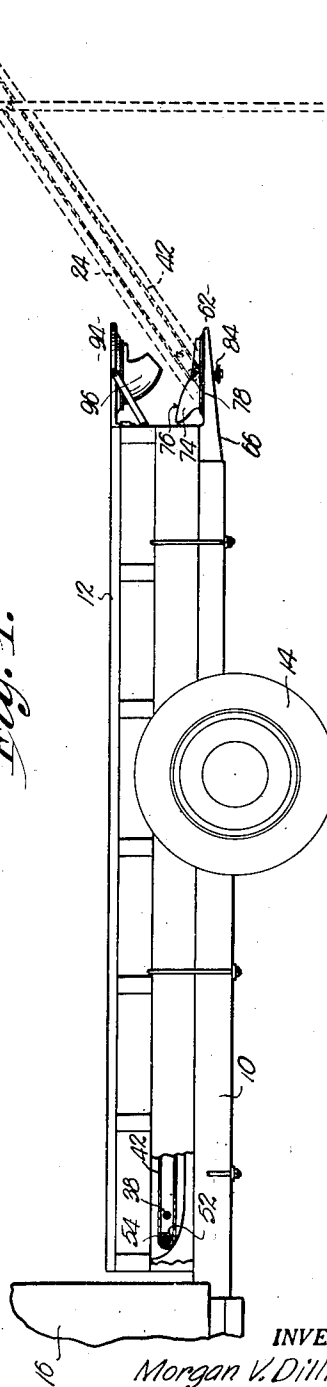


Fig. 2.

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2 Sheets-Sheet 2

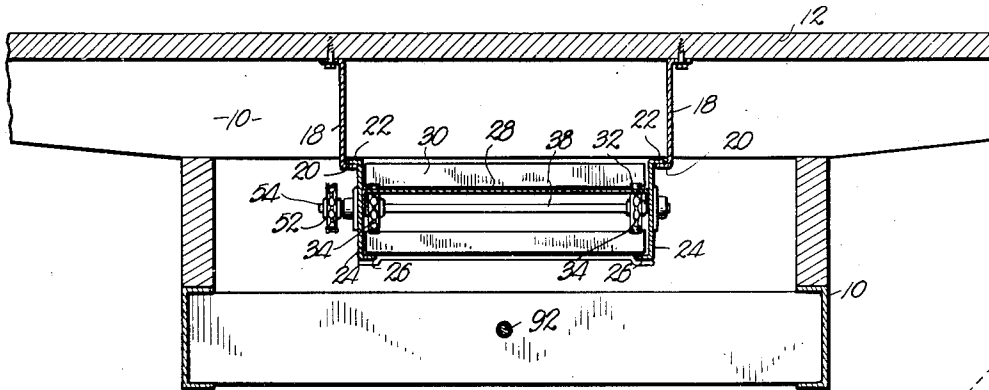


Fig. 3.

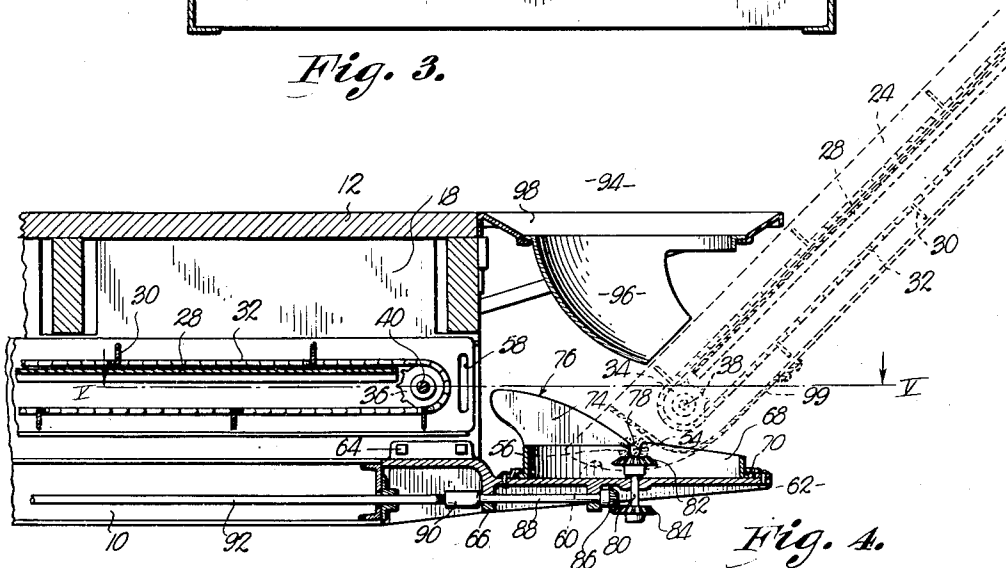


Fig. 4.

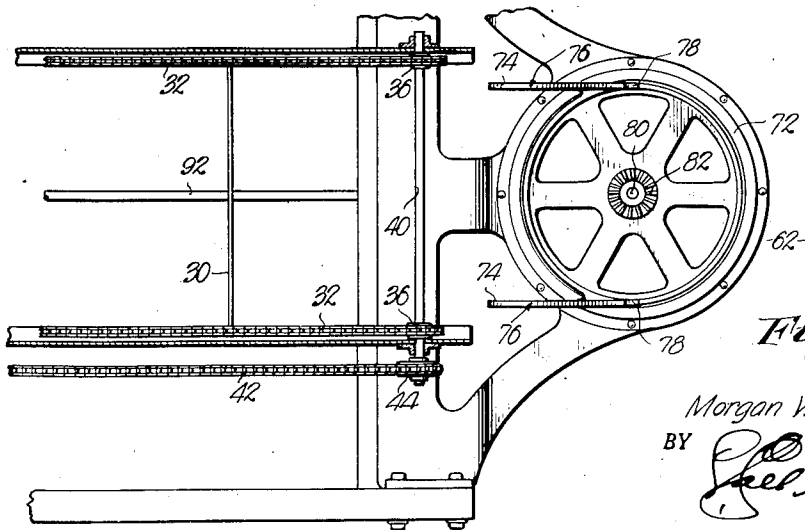


Fig. 5.

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2,464,217

MATERIAL CONVEYER FOR VEHICLES

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9 Claims. (Cl. 214—83.16)

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This invention relates to material handling equipment of a mobile nature and has for a primary aim the provision of an unitary assembly for not only transporting the material but to convey the same to a point remote from the transporting part of the assembly, all without the use of structure other than that constituting the material handling equipment.

Another important object of this invention is to provide material handling equipment that includes a vehicle, the frame or chassis whereof is formed to carry a conveyor when the latter is not in use and during the time the vehicle is transporting material that is later to be shifted from the bed of the vehicle to a point remote therefrom.

This invention has for further aims to provide material handling equipment of the aforesaid general character wherein the vehicle has means normally associated therewith for supporting one end of the conveyor when it is withdrawn from its inoperative position on the chassis of the vehicle, which supporting means has power driven means for motivating the flight structure forming a part of the conveyor; to provide suitable guide tracks on the said supporting means for the conveyor to insure a coupling of the motivating means of the flight structure and the driving means of the support as the conveyor is withdrawn from the chassis and when it reaches one end of its path of travel; to provide a supporting means or head on the vehicle for carrying one end of the conveyor as the opposite end thereof is disposed to empty the material being handled at a predetermined point remote from the supported end of the conveyor; to provide unique parts for allowing the outermost end of the conveyor to be positioned at the desired height and at any point in an arcuate path of travel thereof extending around the said head as a center; to provide a chute for the vehicle that is arranged in such relation with the head and conveyor as to allow the shifting of the conveyor through substantially 180° with the free end at a desired height without altering the position of the chute nor effecting the character and operation of the said head and to provide means for operably interconnecting the engine of the vehicle with the said head and flight structure of the conveyor.

Other aims of the invention are important,

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will become apparent to those skilled in the art after an understanding of the embodiment of the invention about to be described and will appear during the course of the following specification, referring to the accompanying drawings, wherein:

Fig. 1 is a top plan view, parts broken away of a material conveyor for vehicles made in accordance with my invention.

Fig. 2 is a side elevational view thereof, parts being broken away for clearness of illustration.

Fig. 3 is a fragmentary cross sectional view taken on line III—III of Fig. 1 and on an enlarged scale.

Fig. 4 is a fragmentary detailed longitudinal sectional view taken on line IV—IV of Fig. 1; and

Fig. 5 is a similar detailed view taken on line V—V of Fig. 4.

Much effort has been expended in trying to develop to commercial practicability material conveying means that might be continuously associated with a vehicle or other means of transporting the said material, but to date the weight, complicated mechanism, time required to shift the parts from inoperative to operative position, limitations in range of movement of the material conveyor have all been factors preventing full answers to the practical requirements of the general public.

The form of the invention chosen for illustration evidences some of the advantages emanating from the rugged, quickly adjustable and practical grouping of parts with a vehicle having a frame or chassis 10, a bed 12, wheels 14 and the well known and conventional power plant or engine (not here shown) but which is disposed adjacent to the cab 16.

Chassis 10 has a pair of spaced apart longitudinally disposed beams 18 with inturned flanges 20 along their lower edges to receive the outturned flanges 22 of a pair of side rails 24 forming a part of the conveyor unit which is shiftable as a body longitudinally along said beams 18 as will more fully hereinafter be defined. The longitudinal edges of side rails 24 opposite to the edge thereof having flange 22 thereon is inturned to provide a flange 26 and it is these said flanges 26 that preclude sagging of the flight structure. A partition 28 extending from one side rail 24 to the other is intermediate the longitudinal flanged edges thereof and forms a floor along which the

material conveyed is moved by the several transverse strips 30 mounted on endless chains 32 extending over sprockets 34 at one end of the flight structure and 36 at the opposite end thereof. These sprockets 34 and 36 are secured to transverse shafts 38 and 40 respectively and one stretch of the two opposed chains 32 will move along the surface of floor 28 as the other stretch is disposed between said floor 28 and flanges 26.

Shafts 38 and 40 are journaled in bearings carried by side rails 24, and shaft 40 extends to one side of one of the rails 24 to receive sprocket 44 over which chain 42 is passed. A driven shaft 54 is journaled in side rails 24, extends to the same side of one of the rails 24 as does shaft 40 and carries sprocket 52 over which chain 42 passes to constitute an interconnection between shaft 40 and driven shaft 54. Driven shaft 54 carries beveled gear 56, substantially at its central portion thereof but offset slightly for engagement with beveled gear 82 as hereinafter more fully described.

All of the parts just described constitute the conveyor and the flight structure thereof comprises strips 30, the supporting chains 32 and the sprockets 34 and 36.

The manner of driving the flight structure will be adequately set forth when defining the operation of the equipment. One end of side rails 24 has a grip or handle 58 and the opposite ends of side rails 24 are arcuate in form, as clearly shown at 60 in Figs. 2 and 4.

The means for supporting one end of the conveyor and for automatically coupling the driven parts of the flight structure to motivating elements is in the nature of a head, broadly designated by the numeral 62 and removably secured as at 64 to a part of the frame or chassis 10 of the vehicle. This head has a bracket 66 upon which is revolvably retained a turn table 68. This table 68 has an annular out-turned flange 70 on its annular upwardly directed wall and this flange 70 is confined within a channel formed beneath a retaining ring 72 mounted directly upon bracket 66. A pair of rectilinear spaced apart substantially parallel tracks 74 rigid to turn table 68 project toward the end of chassis 10 and terminate adjacent to beams 18, as shown in Fig. 4. The upper edges 76 of these tracks 74 are cams terminating at notches 78 formed to journal driven shaft 54 when the conveyor is in an operative position shown in dotted lines of Figs. 1, 2 and 4.

A stub shaft 80 journaled in bracket 66 has a beveled gear 82 positioned to mesh with beveled gear 56 on driven shaft 54 when one end of the conveyor is carried by head 62. Another beveled gear 84 on shaft 80 meshes with gear 86 on drive shaft 88 that is coupled as at 90 to a shaft 82 journaled in the frame 10 and extending to a power take-off at the motor of the vehicle (not here shown). Coupling 90 may be a sleeve splined to the end of shaft 92 to allow quick removal of head 62 as a unit if the same is not to be a part of the vehicle for any particular reason. Longitudinal shifting of driven shaft 54 is precluded by interengagement between side rails 24 and table 68 but when gears 56 and 82 are in mesh, the conveyor and turn table are free to rotate about the axis of stub shaft 80 even as power is imparted to the split structure. Thus—as will be later observed, the conveyor may be projected radially outwardly from the axis of rotation on shaft 80 at any desired angle within an arcuate scope of 180°. The presence of the

end of bed 12 of the vehicle is all that precludes further rotation and the range made possible through the employment of this assembly of parts is quite adequate to fulfill commercial requirements.

Because the conveyor may be elevated by swinging the same about the axis of driven shaft 54, the outer end may be disposed at practically any height.

In the illustrated form the conveyor is operable when in a position anywhere between the horizontal and a point close to a perpendicular line extended upwardly from head 62 limited only by the size and location of the chute now to be described.

The chute 94 is removably mounted on bed 12 of the vehicle and has a spout 96 rotatably supported by a hopper-like ring 98 and into which the material is dumped for guidance to the conveyor and the flight structure thereof. Plate 99 disposed between side rails 24 interconnects flanges 26 at the end of the conveyor carried by head 62, and said plate 99 is arched upwardly as illustrated in Fig. 4 to prevent the material being handled from flowing into turn table 68 and fouling the mechanism thereof.

While the operation of the apparatus specified above should be clear from what has been set down and likewise from the drawings, a better understanding might be gained by clarifying the manner in which the conveyor is easily positioned by a single operator.

It is assumed that the conveyor is in the in-operative position and hung on beams 18 and the operator is desirous of using the conveyor to elevate material from bed 12 of the vehicle.

Handles 58 are gripped and the entire conveyor assembly slides out from its confined position beneath bed 12 until shaft 54 falls upon faces 76 of the two tracks 74. These tracks will guide shaft 54 into notches 78 and cause gears 56 and 82 to mesh. The outer end of the conveyor which is being held by the manipulator will then be elevated to the desired angle and drawn to one side or the other to rotate table 68 in the step of positioning the upper and outer end of the conveyor. A suitable support such as a still or the like, shown in Fig. 2, may then be brought into play to maintain the conveyor in place or the said outer end may be otherwise moved against any means strong enough to hold the same against displacement. Spout 96 is then shifted to direct the material on to the flight structure and the entire equipment is then ready for the operator to shovel or otherwise move the material into chute 94. When the conveyor is no longer needed, its support is removed and the operator lowers the conveyor to a place where it is substantially horizontal. Further lowering the outer end will cause the lower edges of side rails 24 to engage parts of head 62 whereupon a pair of fulcrum points will be established and shaft 54 will be elevated from confinement within notches 78. Longitudinal movement of the entire conveyor is then in order and force applied to the outer end will immediately slide shaft 54 upwardly along edges 76 of tracks 74 and the out-turned flanges 22 of side rails 24 will move on to in-turned flanges 20 of beams 18. A continuation of the longitudinal movement of the conveyor will position the same in the place shown in full lines of Figs. 1 and 2. The vehicle can be driven from place to place with the conveyor so carried and but one man is therefore, needed to handle a considerable

amount of loose material even to the point of elevating the same.

The invention is capable of embodiment in structures of a different character than that illustrated and specified and therefore, it is desired to be limited only by the state of the art and scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a material handling vehicle having a chassis and bed, conveying means comprising a trough-like member carried by the vehicle beneath the bed thereof when in the inoperative position; a power driven head carried by the vehicle for supporting one end of the member when in the operative position; and flight structure on the member engageable with the head to mobilize the structure when the one end of the member is brought into said operative position, said head having tracks thereon formed to direct said structure into proper engagement with the head as the said member is withdrawn from the inoperative position, said one end of the member embracing the tracks when in said operative position.

2. In a material handling vehicle having a chassis and bed, conveying means comprising a trough-like member carried by the vehicle beneath the bed thereof, when in the inoperative position; a power driven head carried by the vehicle for supporting one end of the member when in the operative position; flight structure on the member engageable with the head to mobilize the structure when the one end of the member is brought into said operative position; and a chute to direct material to the trough-like member when the latter has its one end in the said operative position on the said head, said head being rotatable and said chute being shiftable to allow introduction of material to the said member when in any position in an arcuate path of travel of substantially 180°.

3. In a material handling vehicle having a chassis and bed, conveying means comprising a trough-like member carried by the vehicle beneath the bed thereof when in the inoperative position; a power driven head carried by the vehicle for supporting one end of the member when in the operative position; and flight structure on the member engageable with the head to mobilize the structure when the one end of the member is brought into said operative position, said head and the member having cooperating tracks and extended ends respectively for guiding the member to the operative position and to prevent accidental displacement when the conveyor is in operation with one end of the member supported by the head.

4. In a material handling vehicle having a frame, conveying means comprising a trough-like member having parts slidably engageable with portions of the frame for longitudinal movement of the member; a head mounted on the frame having tracks for supporting the member through part of its path of travel; driving means on the head; flight structure on the member; and a stop on the head to hold the member against movement when it reaches one end of its path of travel, said structure including a rotatable transverse shaft, said stop comprising notches formed in said head.

5. In a material handling vehicle having a frame, conveying means comprising a trough-like member having parts slidably engageable with

portions of the frame for longitudinal movement of the member; a head mounted on the frame having tracks for supporting the member through part of its path of travel; driving means on the head; flight structure on the member; and a stop on the head to hold the member against movement when it reaches one end of its path of travel, said flight structure having motivating means coupled with the driving means of the head when the member is held by the stop on the head, said head and the member being swingable about a vertical axis of rotation while the driving means and the motivating means are coupled, said trough-like member being separately swingable about a horizontal axis adjacent to the said head while the driving means and the motivating means are coupled.

6. In a material handling vehicle having a frame, conveying means comprising a trough-like member having parts slidably engageable with portions of the frame for longitudinal movement of the member; a head mounted on the frame having tracks for supporting the member through part of its path of travel; driving means on the head; flight structure on the member; and a stop on the head to hold the member against movement when it reaches one end of its path of travel, said flight structure having motivating means coupled with the driving means of the head when the member is held by the stop on the head, said trough-like member being separately swingable about a horizontal axis adjacent to the said head while the driving means and the motivating means are coupled.

7. In a material handling vehicle having a frame, conveying means comprising a trough-like member having parts slidably engageable with portions of the frame for longitudinal movement of the member; a head mounted on the frame having tracks for supporting the member through part of its path of travel; driving means on the head; flight structure on the member; and a stop on the head to hold the member against movement when it reaches one end of its path of travel, said flight structure having motivating means coupled with the driving means of the head when the member is held by the stop on the head, said member being shiftable with respect to the head to a position where the coupled motivating means and driving means are disengaged.

8. In a material handling vehicle having a frame, conveying means comprising a trough-like member having parts slidably engageable with portions of the frame for longitudinal movement of the member; a head mounted on the frame having tracks for supporting the member through part of its path of travel; driving means on the head; flight structure on the member; and a stop on the head to hold the member against movement when it reaches one end of its path of travel, said tracks having cam faces for directing the member toward the stop.

9. In a material handling vehicle having a frame, conveying means comprising a trough-like member having parts slidably engageable with portions of the frame for longitudinal movement of the member; a head mounted on the frame having tracks for supporting the member through part of its path of travel; driving means on the head; flight structure on the member; and a stop on the head to hold the member against movement when it reaches one end of its path of travel, said flight structure having motivating means coupled with the driving means of the head when the member is held by the stop on

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the head, said coupling being automatically accomplished by the motivating means and the driving means as the member engages the stop.
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