

[54] CONVEYOR EQUIPMENT, ESPECIALLY
CARGO LOADING AND UNLOADING
EQUIPMENT FOR A VEHICLE

[75] Inventor: William H. Moser, Paris, Tex.

[73] Assignees: Giles Clegg, Jr., Dallas; J. J.
Barham, Paris, both of Tex.; part
interest to each

[22] Filed: May 24, 1973

[21] Appl. No.: 363,394

[52] U.S. Cl. 214/83.36; 198/195

[51] Int. Cl. B60p 1/38; B65g 17/10

[58] Field of Search 214/83.36; 198/195, 196,
198/197, 199, 181, 182

[56] References Cited

UNITED STATES PATENTS

1,081,697	12/1913	Renney et al.	214/83.36
1,558,164	10/1925	Haney	214/522
1,764,461	6/1930	Meem	198/196

1,945,532	2/1934	Lima	214/83.36
2,609,952	9/1952	Balzer et al.	214/83.36
3,482,717	12/1969	Moser	214/83.36
3,754,636	8/1973	Boy	198/195 X

FOREIGN PATENTS OR APPLICATIONS

441,325	5/1912	France	198/196
185,738	5/1956	Austria	198/196
798,156	7/1958	United Kingdom	198/195

Primary Examiner—Robert J. Spar

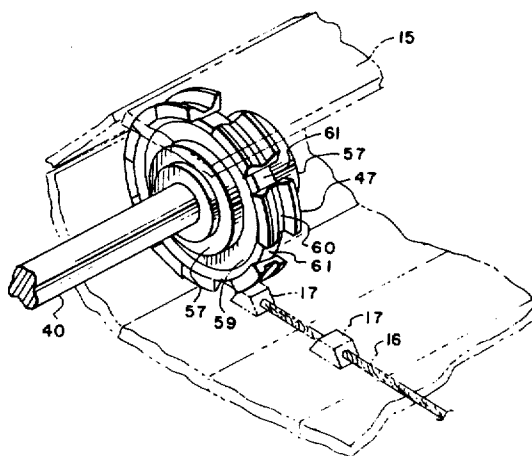
Assistant Examiner—Leslie J. Peperner

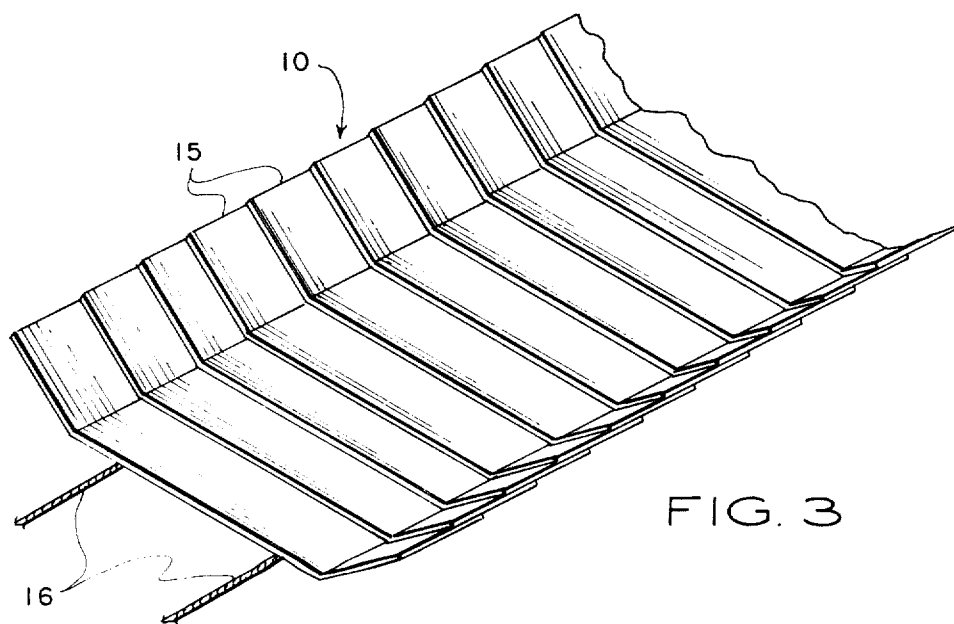
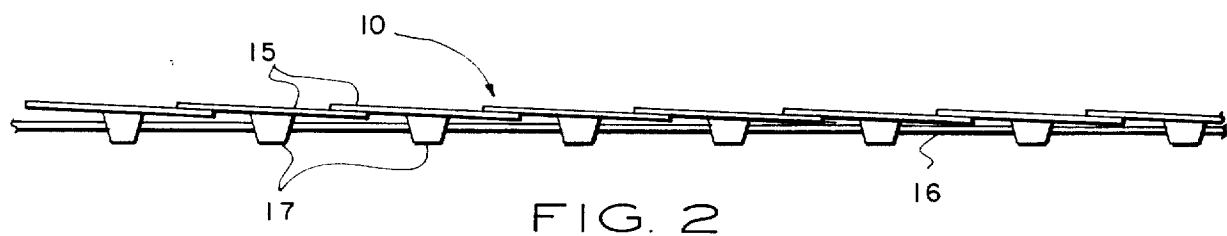
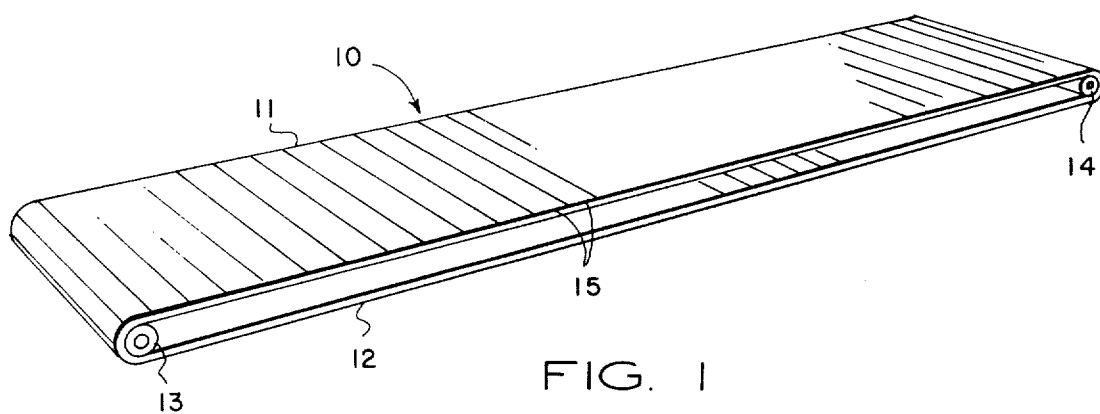
Attorney, Agent, or Firm—Clegg, Cantrell & Crisman

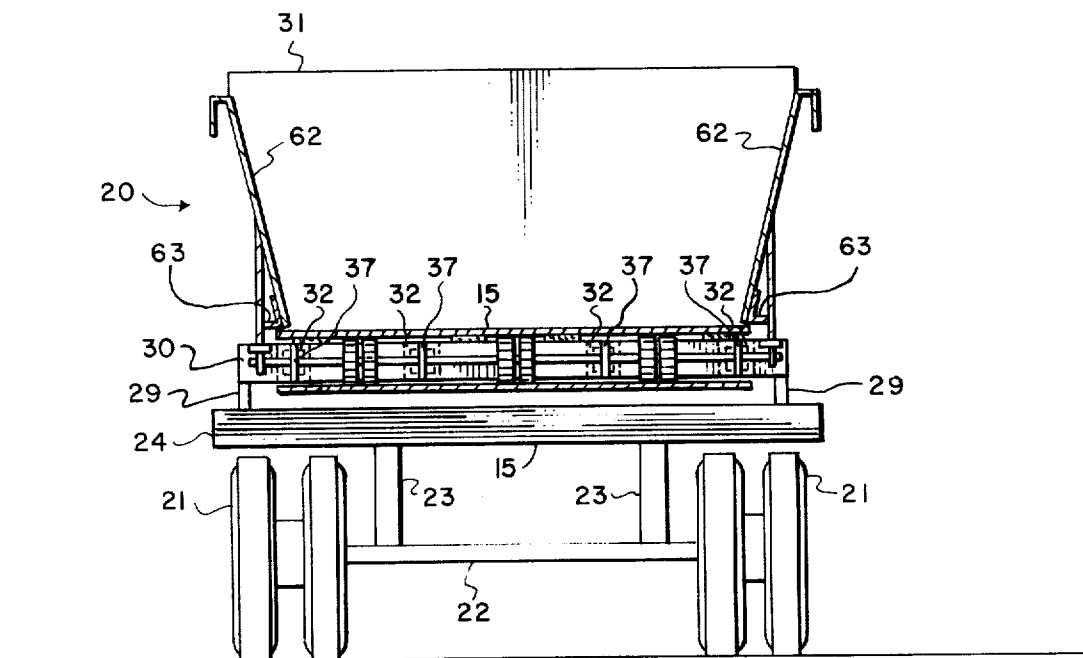
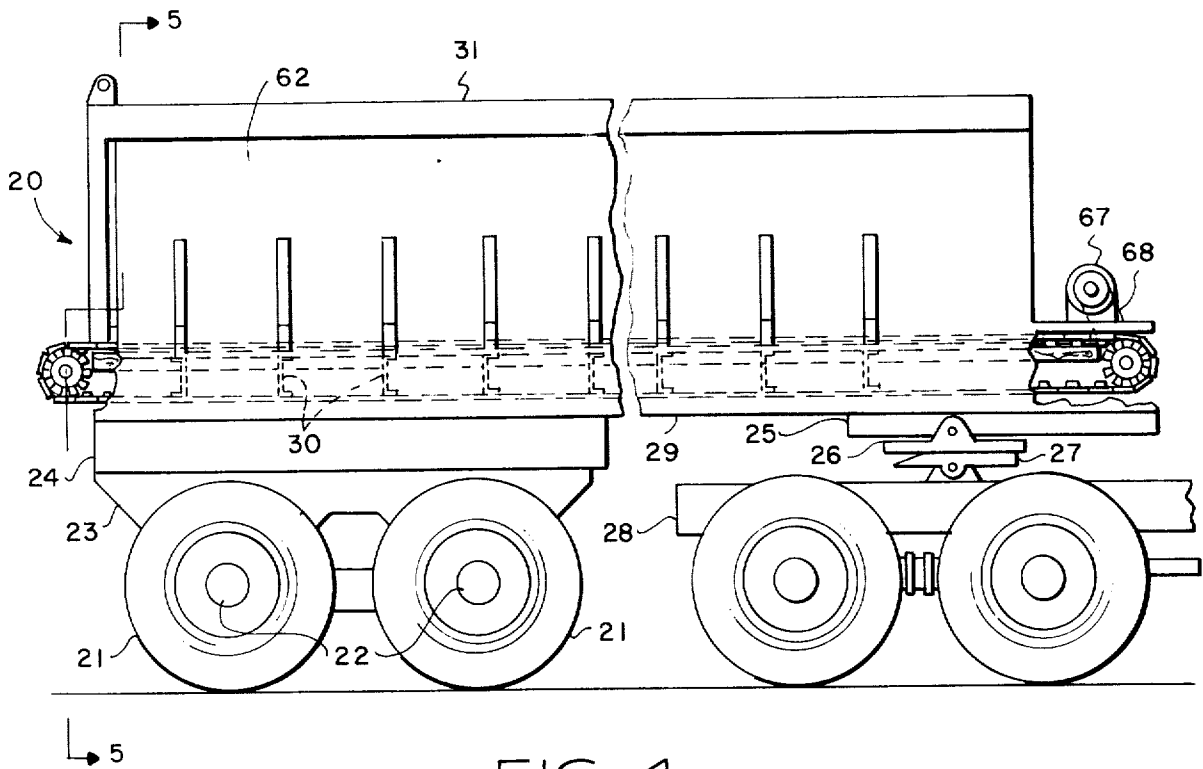
[57] ABSTRACT

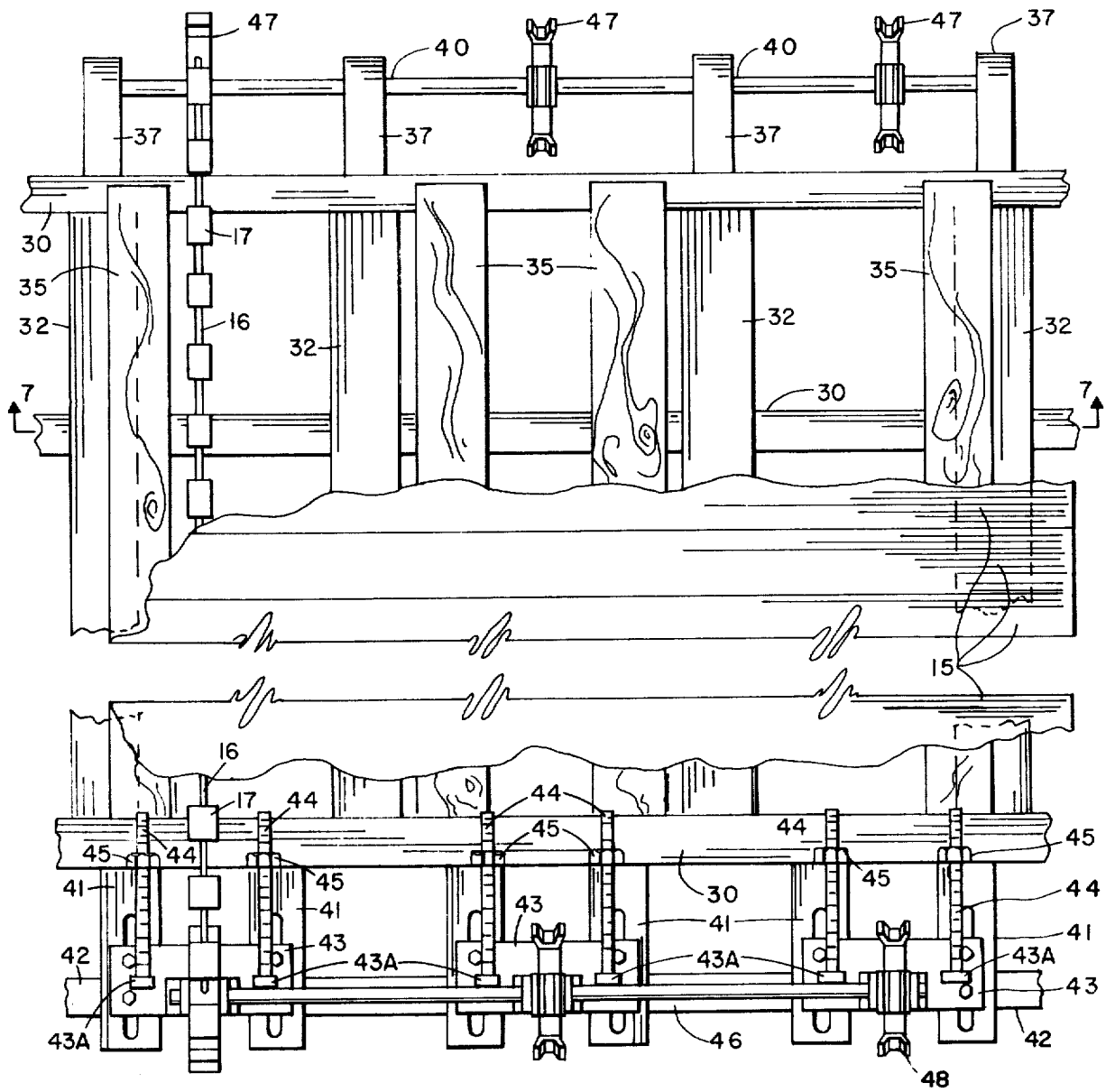
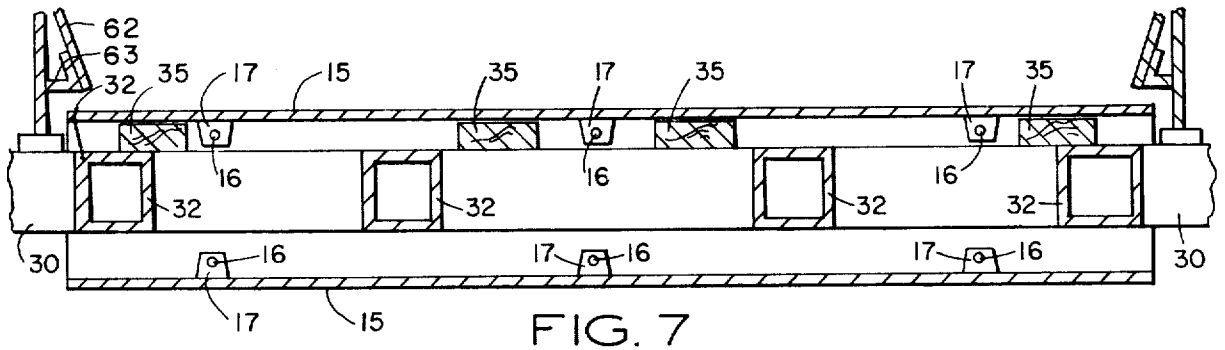
There is disclosed a conveyor device and frame suitable for use as a vehicle bed which includes a slatted floor carried on lugs that are in turn mounted on a closed loop cable. The cable is trained over and driven by notched sheaves at each end of the conveyor frame.

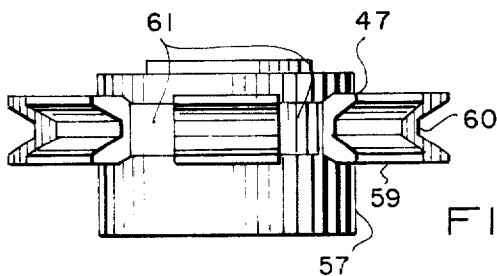
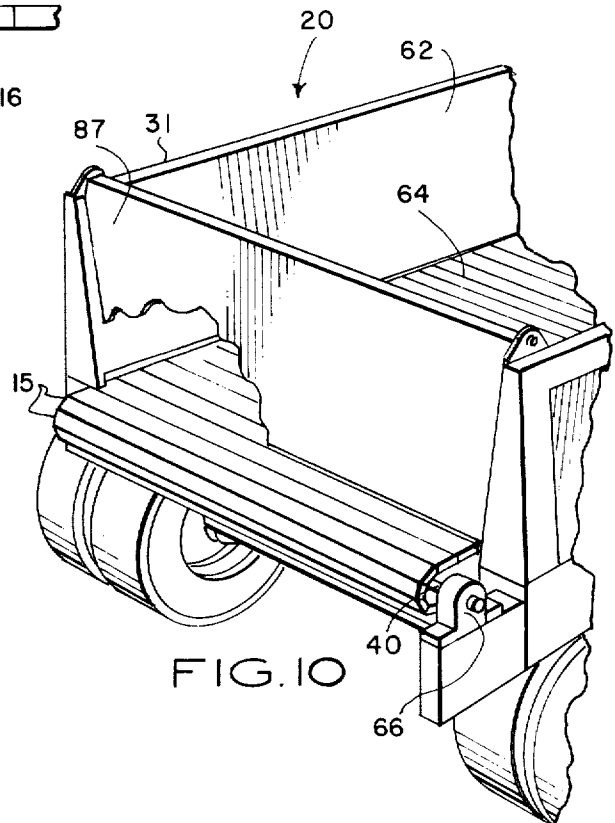
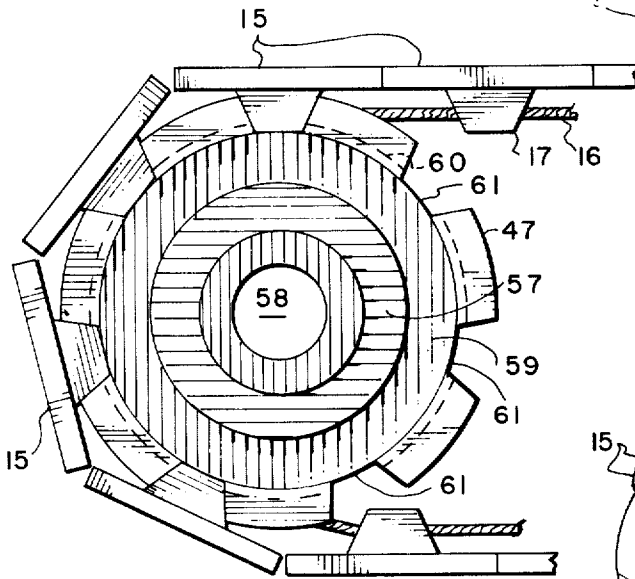
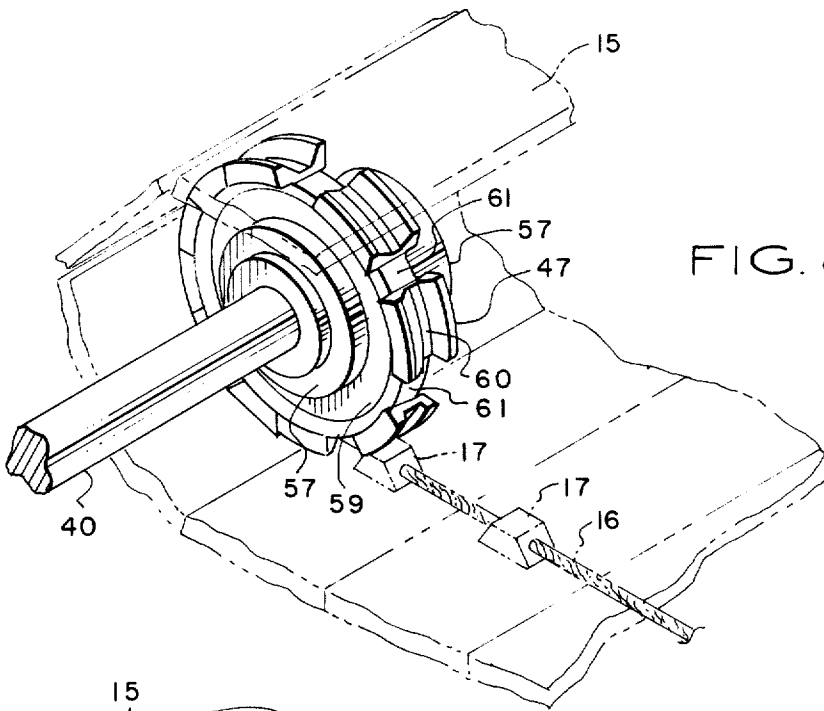
10 Claims, 23 Drawing Figures

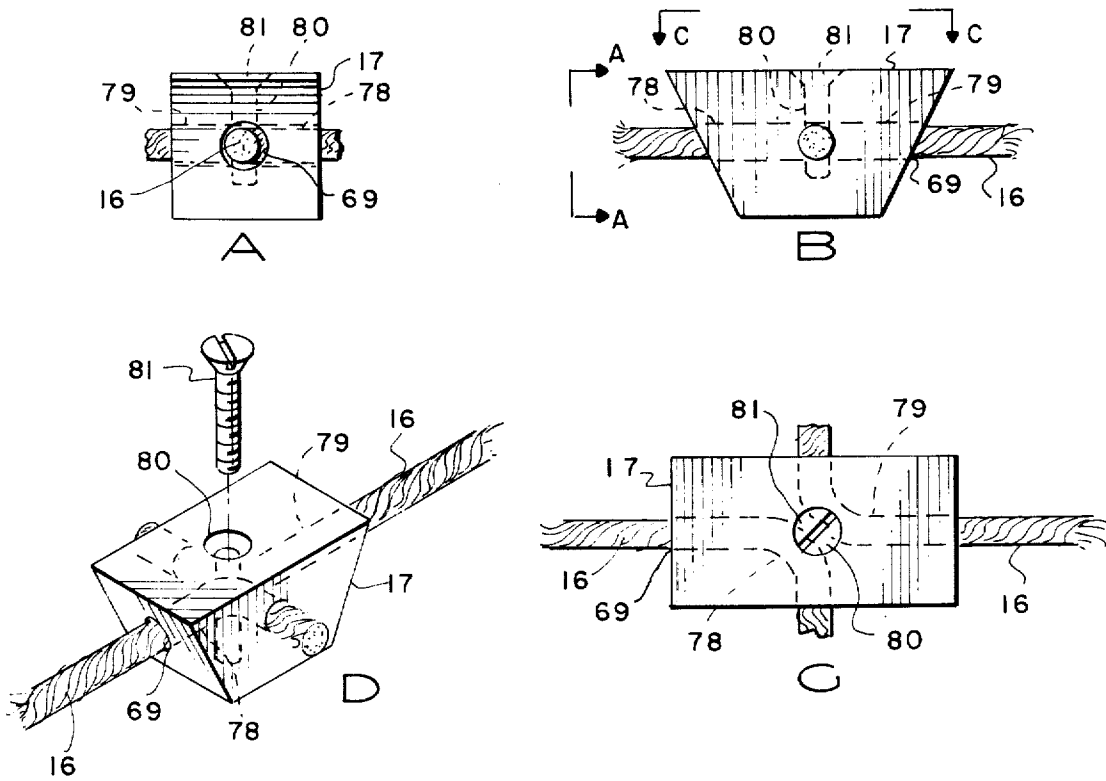
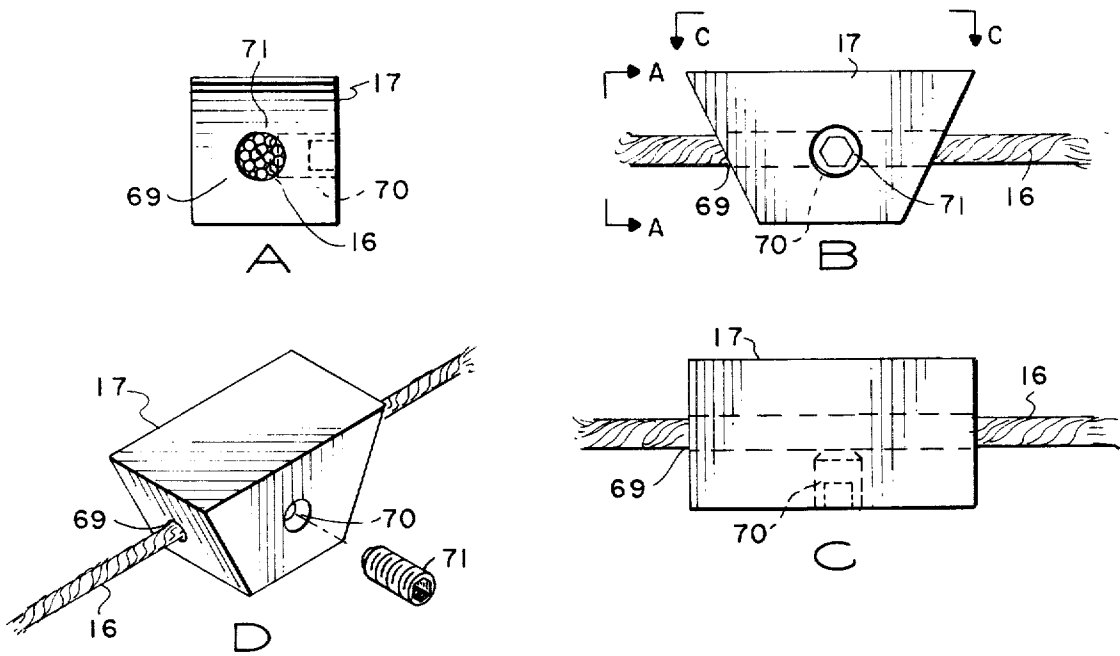












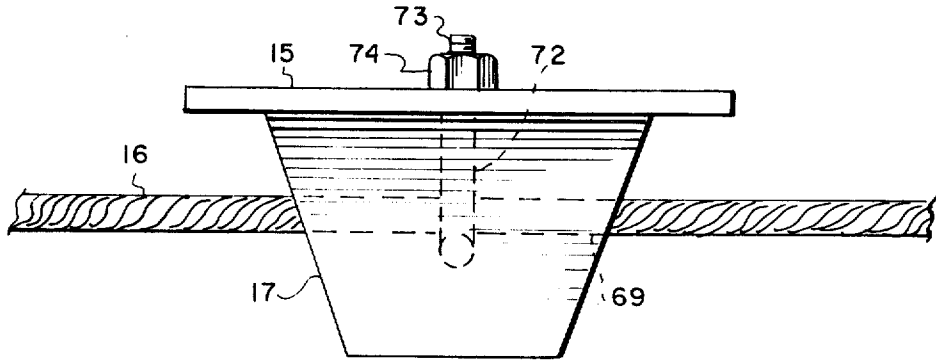


FIG. 14

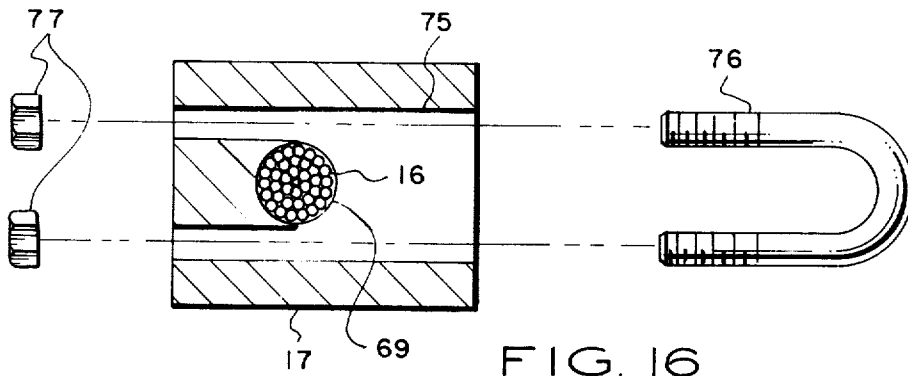


FIG. 16

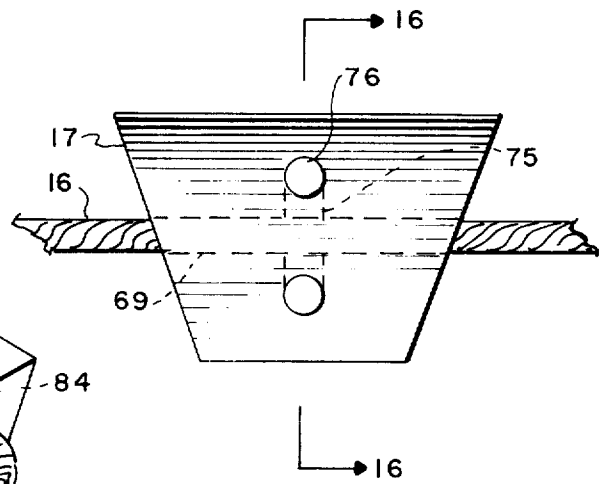


FIG. 15

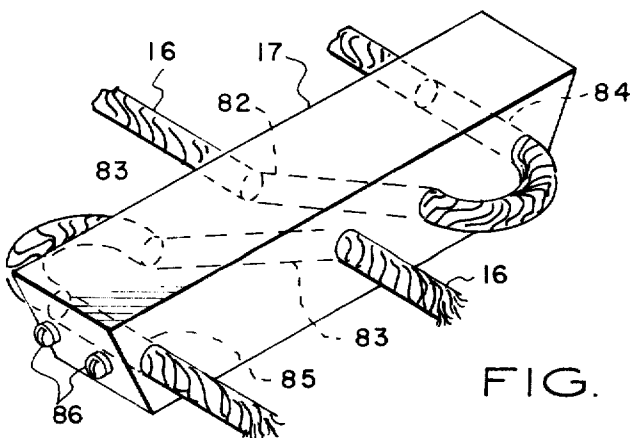


FIG. 17

CONVEYOR EQUIPMENT, ESPECIALLY CARGO LOADING AND UNLOADING EQUIPMENT FOR A VEHICLE

BACKGROUND OF THE INVENTION

This invention relates to conveyor equipment, especially conveyor equipment which is adapted for loading and unloading a vehicle. The equipment of the invention is useful in many conveyor type applications. In its more specific aspects, it is concerned with cargo carrying, and loading and unloading equipment for, or comprising part of, a transportation vehicle such as a truck or semi-trailer.

The loading and unloading of cargo vehicles has been a continuing problem impairing the efficiency of their use. For road vehicles carrying bulk cargo, the dump truck or dump trailer configuration has long been popular for unloading purposes, despite its disadvantages which include the necessity for heavy structural equipment which amounts to dead weight so far as the hauling capacity of the vehicle is concerned, a dangerous raising of the center of gravity of the vehicle during dumping operations, and difficulty in controlling the rate of discharge of the bulk material. More recently, as exemplified by my U.S. Pat. No. 3,482,717, entitled "Self-Unloading Trailer" and U.S. Pat. No. 3,247,983, to Thompson, entitled "Truck Unloading Structure", the use of bulk cargo bodies having belt conveyors forming the bed or floor of the cargo body has begun. While such constructions overcome many of the disadvantages of dump trailers or dump trucks, the relatively expensive large endless conveyor belts involved (and the relatively complex understructure involved in the Thompson-type vehicle) have limited the application of such vehicles.

Slat-type conveyor belts have been proposed in the past, both for general cargo vehicles and for bulk cargo vehicles. In this connection see U.S. Pat. Nos. 1,081,697, 1,375,535 and 1,558,164. Such slatted conveyor vehicle beds have uniformly employed chains working over sprocket wheels to carry the slats of the conveyor. Such chains are expensive, prone to breakage, sensitive to alignment with respect to the sprocket wheels, and inherently require a large amount of slackness and tolerance between slats, to accommodate the manufacturing tolerances involved in each link of chain.

The disadvantages of prior slatted conveyors utilizing chains in other applications are similar to those encountered when such conveyors have been employed in vehicle beds.

In accordance with the present invention a conveyor structure, especially suited for use as loading and unloading equipment forming the bed of a cargo vehicle, is provided which, while it is of the slatted conveyor type, has substantially none of the disadvantages of such conveyors as employed heretofore, and which, by virtue of its simple and economic construction, retains all of the advantages gained by the before-mentioned conveyor belt vehicle bed constructions, while eliminating the costly large endless conveyor belt involved in such constructions.

SUMMARY OF THE INVENTION

The conveyor structure and vehicle bed of the present invention includes a specially constructed slatted conveyor which is built upon an improved frame that

may also comprise the vehicle frame. Conveyor chains driven by sprocket wheels and their attendant disadvantages are eliminated. Sheaves are mounted for rotation on the frame and are arranged in one or more coplanar pairs, one sheave of each pair being located at each end of the frame. The sheaves are notched to accommodate and drivingly engage spaced lugs carried by a cable which is trained in a loop over coplanar sheaves. The side of each lug which faces outboard of the cable loop is attached to a conveyor slat. The frame is also desirably provided with longitudinal rails on which the slats ride and are supported when they are moving along or positioned on the upper run of the cable loop. By this construction, a slatted, but movable vehicle bed floor is obtained. In accordance with the invention, the slats may be arranged in either of two configurations; in one, the slats are closely abutting one another; in the other, the slats lap one another. Both arrangements result in the formation of a surface which is substantially impervious, and which will not leak bulk material such as gravel. Since conventional sprocket-driven conveyor chains are eliminated and replaced by a driving cable, all parts of the conveyor mechanism, including all of the slats, commence movement substantially at the same time when the conveyor mechanism is started, there being no chain slack to be taken up. The absence of chain slack, and the absence of a need to accommodate it, make it possible to have the slats forming the vehicle bed floor in continuous close abutment to one another, if that configuration of slats is employed.

In accordance with the invention, the slatted conveyor structure is superior to a conveyor belt structure in that it is more economical in construction, and because in the event of damage or heavy wear in one localized section of the conveyor it is possible to remove and replace only those slats which are in poor condition. By contrast, a damaged or locally worn conveyor belt must in most instances be completely replaced.

It is an object of the present invention to provide a slatted conveyor structure which overcomes the disadvantages of prior structures of this type, and at the same time is superior to conveyor belt structures in many respects.

It is an object of the present invention to provide an improved conveyor mechanism, and more particularly, such a mechanism which is specially adapted to serve as a vehicle bed for cargo vehicles, both of the bulk cargo type and of the general cargo type.

It is a further object of this invention to provide a conveyor structure and vehicle bed which is of simple, rugged construction, easy to maintain, and reliable to operation.

Still another object of the invention is the provision of improved transportation vehicles incorporating as part thereof the conveyor structure of the invention.

The foregoing objects, together with other objects and purposes can better be understood by consideration of the detailed description which follows together with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a simplified perspective view, with parts omitted, of a conveyor constructed in accordance with the invention;

FIG. 2 is a side elevational view of a portion of the upper run of one embodiment of the conveyor of the

present invention showing one preferred slat arrangement;

FIG. 3 is a fragmentary isometric view of a portion of the upper run of a conveyor constructed in accordance with the invention, illustrating an alternate form or shape for the conveyor slats;

FIG. 4 is a side elevational view with parts broken away and with a section broken out, of a semi-trailer constructed in accordance with and incorporating the present invention;

FIG. 5 is a rear sectional elevational view of the semi-trailer of FIG. 4, the section being taken along the line 5—5 of FIG. 4;

FIG. 6 is a plan view of an enlarged scale with parts broken away, and with a section broken out, of the conveyor structure of the semi-trailer of FIGS. 4 and 5;

FIG. 7 is a sectional elevational view of the conveyor structure of FIG. 6, the section being taken on line 7—7 of FIG. 6;

FIG. 8 is a isometric view of an enlarged scale of the sheave and cable structure forming a portion of the conveyor apparatus of the invention, with certain parts shown in ghost outline;

FIG. 9 is a fragmentary elevational view of an enlarged scale of the sheave, conveyor, and one form of slat structure of the conveyor apparatus of the invention;

FIG. 10 is a fragmentary isometric view of the rear portion of the semi-trailer of FIGS. 4 and 5;

FIG. 11 is a plan view of the sheave of FIG. 9;

FIGS. 12A, B, C and D are side, front, plan and isometric views respectively of a cable lug employed in accordance with the invention;

FIGS. 13A, B, C and D are side, front, plan and isometric views respectively of a cable splicing lug employed in accordance with the invention;

FIG. 14 is a side elevational view of an alternate form of conveyor lug employed in accordance with the invention, the view also showing a slat, and a portion of a cable;

FIG. 15 is a side elevational view of another alternate form of lug employed in accordance with the invention;

FIG. 16 is an exploded sectional view of the lug of FIG. 15, the section being taken on the line 16—16 of FIG. 15; and

FIG. 17 is a isometric view of another form of splicing lug employed in accordance with the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 a conveyor constructed in accordance with the invention is designated generally as 10. It is generally rectangular in plan view and has an upper run 11 and a lower run 12. At the ends of the conveyor the runs are trained over sheaves 13 and 14 which are shown very diagrammatically in FIG. 1 because of its scale, but which are shown in more detail in other figures discussed hereinbelow. The load carrying surface of the conveyor 10 is comprised of slats 15, which in the embodiment of FIG. 1 are flat rectangular members extending transversely across the conveyor, in closely abutting relationship to one another.

FIG. 2 shows the structure of the conveyor in greater detail, and also illustrates another arrangement of the slats. From FIG. 2 it can be seen that the conveyor 10 includes a cable 16, which is preferably constructed of steel. Mounted on the cable at evenly spaced intervals

are lugs 17, and slats 15 are attached to the lugs 17. Assuming that only a single cable is used in a given conveyor, one slat 15 is attached to each of its lugs 17, at least in the upper run. (More than one cable 16 may be employed in accordance with the invention as discussed more fully hereinbelow.)

In the embodiment of FIG. 2 the slats 15 are arranged in lapping relationship, with each slat having its left edge above its neighbor to the left and its right edge beneath its neighbor to the right. Such an arrangement is of particular advantage when the conveyor is employed to handle bulk material such as gravel or aggregate because there is less spillage of such material into the works of the conveyor at the turnaround points.

FIG. 3 illustrates a form of the conveyor of the invention in which two cables 16 are employed, each carrying lugs to which slats are attached, and in which the slats 15 are in lapping relationship as explained above in connection with FIG. 2. In addition, the ends of slats 15 are bent upwardly to provide a conveyor surface which is generally trough shaped. This configuration is particularly useful in applications of the conveyor structure where bulk material is to be handled, and no stationary side walls for the conveyor are provided or desired.

In FIGS. 4-7 and 10 a semi-trailer constructed in accordance with and incorporating the invention is designated generally as 20. FIGS. 4 and 5 show that it includes trailer wheels 21 carried on axles 22 which are journaled through axle posts 23. For the sake of simplicity the conventional spring suspension mechanism associated with axles 21 and axle posts 23 is omitted from the drawings.

Mounted above the axle posts 23 is a transverse beam structure 24 which extends substantially across the full width of the trailer. Beam structure 24 may be built up of a plurality of smaller beams, and is so proportioned as to constitute one of the principal load bearing structural members of the frame of the semi-trailer. At the front end of the semi-trailer 20, a second transverse beam structure 25 is provided. It too may be built up of a plurality of smaller beams, and is proportioned to constitute a principal load bearing portion of the trailer frame. Attached to front transverse beam structure 25 is the upper half 26 of a conventional fifth wheel unit. In operation, the upper half 26 of the fifth wheel is connected to lower half 27 which is in turn supported by frame 28 of a conventional truck tractor, only a fragment of which appears in FIG. 4.

A pair of longitudinal side beams 29 are mounted on and run between transverse beam structures 24 and 25. A plurality of cross beams 30 are transversely mounted on longitudinal beams 29. A cargo body designated 31 is mounted on the frame of the semi-trailer 20, and is supported principally by cross beams 30. In FIGS. 4 and 5 the cargo body shown is of the bulk cargo type, although the invention may also be employed to advantage for general cargo, in which case a general cargo body can be mounted upon cross beams 30 in a manner similar to the mounting of the bulk cargo body 31. It should also be noted that in some applications of the invention a flat-bed style trailer is desirable, in which case no cargo body superstructure of any kind is required.

The structure of the conveyor forming the vehicle bed of the semi-trailer 20 can best be understood by a consideration of FIGS. 6 and 7, together with some ref-

erence to FIGS. 4 and 5. As is shown in FIG. 6, the cross beams 30 are interrupted by four internal longitudinally oriented beams 32. The cross beams 30 and longitudinal beams 32, are welded together at their points of intersection to form a grid-like frame. A series of runners is formed of an inherently slippery material such as oak are mounted longitudinally on the top of said frame. Preferably the top surface of runners 35 is coated with a wear layer 36 formed of a synthetic rubber.

At the rear end of trailer 20 (at the top of FIG. 6) four pillow blocks 37, are mounted, one at the end of each of longitudinal beams 32. Journaled through the pillow blocks is an axle 40. At the front end of trailer 20 (bottom of FIG. 6), a conveyor tension adjusting structure is provided, which consists of three pairs of slotted plates 41 abutted against the frontmost cross beam 30. Slotted plates 41 are joined at their front ends by a cross member 42. Each pair of slotted plates 41 has a pillow block 43 adjustably positioned on it. Associated with each pillow block 43 in a pair of adjusting screws 44 which work against nuts 45 welded to the frontmost cross beam 30 and, abutments 43A on pillow blocks 43. A front axle 46 is journaled through pillow blocks 43 and extends across the front of the unit.

Rear axle 40 carries three rotatable sheaves 47, and front axle 46 also carries three rotatable sheaves 48. On the front axle the sheaves are positioned between the posts of the pillow blocks 43.

For purposes of the present discussion, a rear sheave 47 and a front sheave 48 are regarded as a pair when they are arranged coplanarly. In the embodiment of the invention shown in FIGS. 4-7 there are three such coplanar pairs of sheaves provided. It should be understood however that in some embodiments of the invention a single pair may suffice, while in other embodiments it may be desirable to provide two, or more than three such pairs. An example of the latter case is a trailer or other transportation vehicle designed to carry extraordinary heavy loads.

Trained around each of the pairs of sheaves is cable 16, which is preferably constructed of steel. Cable 16 is arranged in a closed loop extending longitudinally of the semi-trailer 20 and has an upper run and a lower run as a consequence of the vertical planes in which the sheave pairs are arranged.

The structure and operation of the drive system for the conveyor mechanism of the invention can best be understood by a consideration of FIGS. 8, 9 and 11, taken together with the views of the semi-trailer appearing in FIGS. 4, 5, and 10. From the enlarged views it can be seen that sheave 47 is a modified form of a conventional pulley sheave. It has a hub 57, a bore 58 to accommodate an axle 40 and a disc portion 59. Around the periphery of the disc portion 59, there is provided a relatively deep groove 60 in which cable 16 is accommodated. Groove 60 serves to restrain side-ward displacement of cable 16. Sheave 47 differs from conventional sheaves in that it is provided with a series of notches 61 around the periphery of disc 59. Notches 61 are substantially uniformly spaced, as appears most clearly in FIG. 9. Cable 16 has mounted on it in fixed position a series of lugs 17. The lugs, and their means of mounting, are more fully described hereinbelow in connection with FIGS. 12-17. As best appears in FIGS. 8, 9 and 4, lugs 17 are spaced along cable 16 at distances such that they fit into and engage the notches

61 of sheave 47 when cable 16 passes around sheave 47 in the groove thereof. It should be noted that since lugs 17 extend radially inwardly from cable 16, the notches 61 on sheave 47 are of a depth such that they extend radially inwardly from the floor of the groove 60.

Attached to each lug 17, on the radially outward side thereof is a slat 15. Slat 15 are generally board-shaped, and are positioned with respect to lugs 17 so that they extend parallel to the axle 40 which carries sheave 47. As appears best in FIG. 10, slats 15, taken together, establish a movable vehicle bed floor 64 when they are positioned in the upper run of cable 16. In the embodiment of FIGS. 4-11, the width of slats 15 is such that adjacent slats are in close abutment to one another so that the floor 64 is substantially impervious. The length of slats 15 is such that they extend substantially across the full width of the transportation vehicle; their length is at least adequate to extend across the floor of the cargo space. As can be seen in FIGS. 5 and 7, the sloping side walls 62 of cargo body 31 approach the vehicle bed floor 34 closely, and angle members 63 close the space behind the lower edges of side walls 62 to prevent packing of bulk material therein.

Spaced lugs 17 are provided throughout the length of the looped cable 16 so that lugs are always available for engagement with both the front and rear sheaves 48 and 47. In the preferred embodiment, each lug has associated with it a slat 15. However, in order to save on weight and material, in some applications of the invention half or somewhat less than half of the slats may be omitted. Stated differently, it is necessary only to provide sufficient contiguous slats to establish a floor in the upper run of cable 16. When the invention is employed in a bulk cargo vehicle, somewhat more than half of the length of cable 16 should be fitted with slats to accommodate spillback of the bulk cargo as the slatted floor is moved in an unloading operation as discussed below.

The remainder of the conveyor structure of the invention can be seen from FIGS. 4-7 where it appears clearly that cross beams 30 are so proportional that they fit between the upper and lower runs of cable 16. Cross beams 30 support above mentioned rails 35 which extend longitudinally of the frame of the trailer. They are so proportioned that their upper surfaces underlie and support slats 15 located in the upper run of cable 16. Rails 35 are preferably formed of a strong but inherently slippery material, such as oak.

As appears from FIG. 4, at the forward end of the semi-trailer, a pulley (not shown) is journaled onto an end of axle 46, and a drive motor 67 is mounted on the frame of the trailer and connected to the pulley on axle 46 by belt 68. Drive motor 67 may be a self-contained power plant such as a gasoline engine, or a power plant driven by an auxiliary system of the truck tractor, such as an air motor. Drive motor 67 is desirably reversible and of variable speed so that conveyor speed may be controlled independently of vehicle road speed, and correlated therewith in any desired manner. As is shown in FIG. 10, rear axle 40 is desirably also provided with a drive motor 66, whose operation is correlated with that of front drive motor 67.

In FIGS. 12-17 there are illustrated the two basic types of lugs 17 employed in accordance with the invention. The lugs illustrated in FIGS. 12 and 14-16 are variations of the type used for all portions of a cable 16 except the portion at the ends of the cable. The lugs il-

lustrated in FIGS. 13 and 17 are two forms of splicing lugs by which the two ends of cable 16 are joined to form it into a closed loop trained about the sheaves.

From FIG. 12B it can be seen that the standard lug 17 is generally wedge-shaped in elevation, while FIGS. 12A and 12C show that it is generally rectangular in side elevation and in plan view. (When the lapped slat configuration shown in FIGS. 2 and 3 is used, the tops of lugs 17 should preferably be angled to accommodate the lapping, as illustrated in FIG. 2.) Each lug 17 is provided with a cable hole 69 which passes through it from one side to the other. It is somewhat larger in diameter than cable 16 which is passed through hole 69. A cross hole 70 is provided in each lug and is internally threaded to accommodate a set screw 71. When the set screw is positioned in the cross hole, it compresses and distorts somewhat the cable 16, thereby effectively attaching the lug 17 to the cable tightly enough that it will not be displaced along the cable under the influence of the ordinary forces encountered in operation of the conveyor system.

The lug 17 illustrated in FIG. 14 is substantially the same in shape as that illustrated in FIG. 12, and is provided with a cable hole 69 in the same manner. However, the means of attachment to the cable, and to the slat 15, differ, in that a vertically extending slot 72 is formed in the lug, and a U-bolt 73 is fitted in slot 72. When nut 74 (a pair of such nuts are employed, one on each leg of the U-bolt) is tightened, the U-bolt 73 grips the cable 16 tightly, thus affixing the lug to the cable, and at the same time attaches the slat 15 to the lug.

The lug 17 shown in FIGS. 15 and 16 is also of the same shape as that shown in FIG. 12, and is also provided with a cable hole 69 through which cable 16 is passed. A sideward oriented slot 75, having legs at one end to accommodate the legs of a U-bolt 76 is provided in lug 17. When U-bolt 76 is inserted in slot 75, and nuts 77 are tightened on the legs of the U-bolt 76, the cable is again tightly gripped and the lug fixed on it.

A comparison of FIG. 13 with FIG. 12 reveals that in external configuration the splicing lug 17 of FIG. 13 is the same as that of the standard lug 17 illustrated in FIG. 12. A pair of curved cable holes 78 and 79 are provided in splicing lug 17. These holes enter the sides of the splicing lug, as cable hole 69 entered the sides of the standard lug. However, interiorly of the splicing lug 17 the cable holes 78 and 79 are curved substantially 90° and issue from opposite faces of the splicing lug. A vertical set screw hole 80 is provided in the splicing lug and is so positioned that it intercepts both of the curved cable holes 78 and 79. A set screw 81, when threaded into hole 80 engages and distorts the portions of cable 16 which are disposed within cable holes 78 and 79, and effectively links the two ends of the cable together to form a closed loop. The portions of the cable 16 issuing from the faces of the splicing lug may be conveniently trimmed substantially flush with the faces of the splicing wedge, although such parts are shown projecting from the faces in FIGS. 13C and 13D for clarity of illustration.

The splicing lug 17 shown in FIG. 17 has the same wedge shape as those in FIGS. 12 through 16, but it is longer than any of those lugs. A consideration of the shape of notches 61 of sheave 47 as shown in FIGS. 8, 9 and 11 will demonstrate that such greater length will not interfere with the passage of the lug of FIG. 17 around the sheave. Lug 17 of FIG. 17 is provided with

a pair of cable holes 82 and 83, which cable holes enter the lug centrally thereof and are angled to pass through the lug toward one side thereof. The ends of cable 16 are passed through cable holes 82 and 83 and are then looped back toward lug 17 to pass through clamping cable holes 84 and 85. Set screws 86 are mounted in holes in the ends of lug 17 to engage the clamp the portion of cable 16 passing through the cable holes 84 and 85. Again, the portions of the cable 16 issuing from the cable holes 84 and 85 may conveniently be trimmed substantially flush with the lug, although such parts are shown projecting in FIG. 17 for clarity of illustration.

While the conveyor system of the present invention, especially as applied to a vehicle, may be constructed of a variety of materials, it is preferred that the frame, as discussed above, be fabricated of steel for strength, with the exception of the rails 35, which are most conveniently formed of a slipper, but strong, wood such as oak. Cables 16 should also be of steel for strength. Lugs 17 may be of steel, or of another strong material. Slat 15 may be of steel, wood, or aluminum, but aluminum is preferred for its combination of strength and light weight. When slats 15 are formed of aluminum, they may be welded or brazed to the lugs 17. Alternately, the slats may be attached to the lugs by screws or bolts, one example of such attachment being illustrated in FIG. 14 discussed above.

When the invention is applied to a bulk cargo vehicle of the kind illustrated in FIGS. 4, 5 and 10, it finds its principal utility in unloading operations. The rear gate 87 (see FIG. 10) of the trailer may be opened partially and fixed in such partially open position to serve as a doctor blade. Drive motors 66 and 67 are then operated to move the upper run of the conveyor in the leftward direction as FIG. 4 is drawn. Bulk material in the cargo space of the semi-trailer is thus propelled leftwardly and out of the semi-trailer onto the ground. At the same time the vehicle may be pulled by its tractor to the right, as FIG. 4 is drawn, thus affording uniform distribution of the bulk material onto the road surface which is its point of use. When the invention is applied in a general cargo vehicle, packages and the like are placed on the lefthand end of the floor of the conveyor from a loading dock, and drive motors 66 and 67 are operated to carry them forward in the cargo space of the trailer. When it is desired to unload such packages at a point of delivery, drive motors 66 and 67 are operated in the opposite direction to move the packages from within the cargo space of the trailer to the rear of the trailer where they may be removed to a loading dock.

What is claimed is:

1. Conveyor apparatus comprising:

a generally rectangular support frame including at least two longitudinal beams extending the length of said frame, a plurality of cross beams connected between said longitudinal beams, and means for supporting said frame to permit the lower run of the conveyor to pass below the major portion of said frame;

first and second parallel spaced apart axles extending transversely thereof adjacent opposite ends of said frame;

axle support means for said axles mounted on said frame adjacent said opposite ends of said longitudinal beams;

at least one pair of coplanar notched sheaves, one of said pair being mounted on said first axle and the other of said pair being mounted on said second axle;

a conveyor cable trained over each coplanar pair of sheaves in a closed loop having upper and lower runs;

said conveyor cable being provided with lugs fixed thereon at spaced intervals, said lugs being configured to engage notches on said sheaves;

a plurality of floor slats, one of said floor slats being directly connected to each of at least a majority of said lugs on said conveyor cable, the lugs connected to floor slats being contiguous to one another, the point of connection of a floor slat to a lug being between the ends of the floor slat;

at least a pair of rails mounted on said frame and extending longitudinally thereof between said pair of axles in position to support floor slats connected to lugs located in said upper run with said slats sliding directly on said rails; and

means for driving at least one of said sheaves.

2. Apparatus in accordance with claim 1 in which said conveyor cable comprises a length of cable whose two ends are attached to a single one of said lug to form said closed loop.

3. Apparatus in accordance with claim 2 in which said single lug has a pair of divergent passageways formed therein for receiving the two ends of said length of cable, said passageways being angled to permit the ends of the cable to enter the single lug on opposite sides of the lug at opposed positions aligned with the

cable rung.

4. Apparatus in accordance with claim 1 in which one of said axle support means includes positioning means for varying the longitudinal separation of said axles.

5. Apparatus in accordance with claim 1 and further comprising a cargo body having side walls and an end wall, said side walls being supported by said longitudinal beams.

10 6. Apparatus in accordance with claim 1 in which every lug has a floor slat connected thereto.

7. Apparatus in accordance with claim 1 in which adjacent ones of said slats overlap one another.

15 8. Apparatus in accordance with claim 1 including a plurality of pairs of coplanar sheaves, the number of pairs of sheaves being n and the number of rails being at least $n + 1$ with the plane of each pair of coplanar sheaves positioned between a pair of rails.

20 9. Apparatus in accordance with claim 1 wherein said support frame includes a pair of transverse means, one positioned adjacent each end of said frame and means for supporting the longitudinal beams and cross beams above the transverse beams to define a slat in which the lower run passes.

25 10. Apparatus in accordance with claim 9 and further comprising:

means connecting one of said transverse beams to road wheels and the other of said transverse beams to a fifth wheel thereby adapting said equipment for use as a semi-trailer.

* * * * *

35

40

45

50

55

60

65