Feb. 11, 1936. G. E. TILEY 2,030,553

RAILWAY CAR

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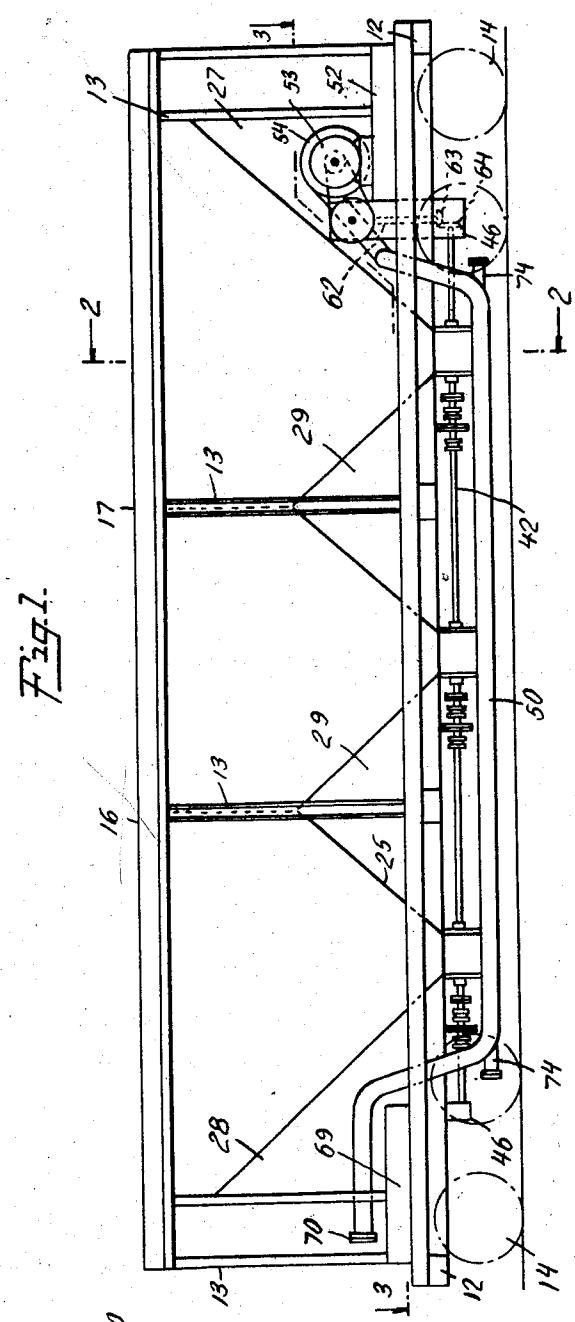


Fig. 1.

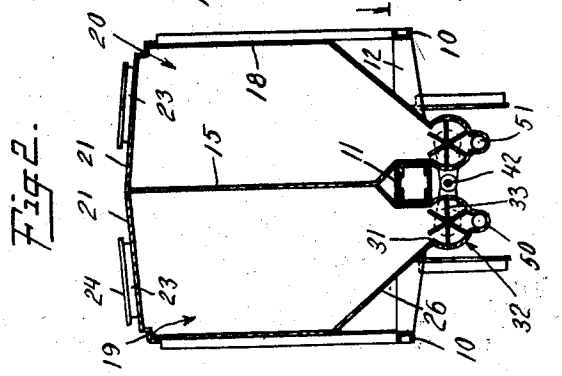


Fig. 2.

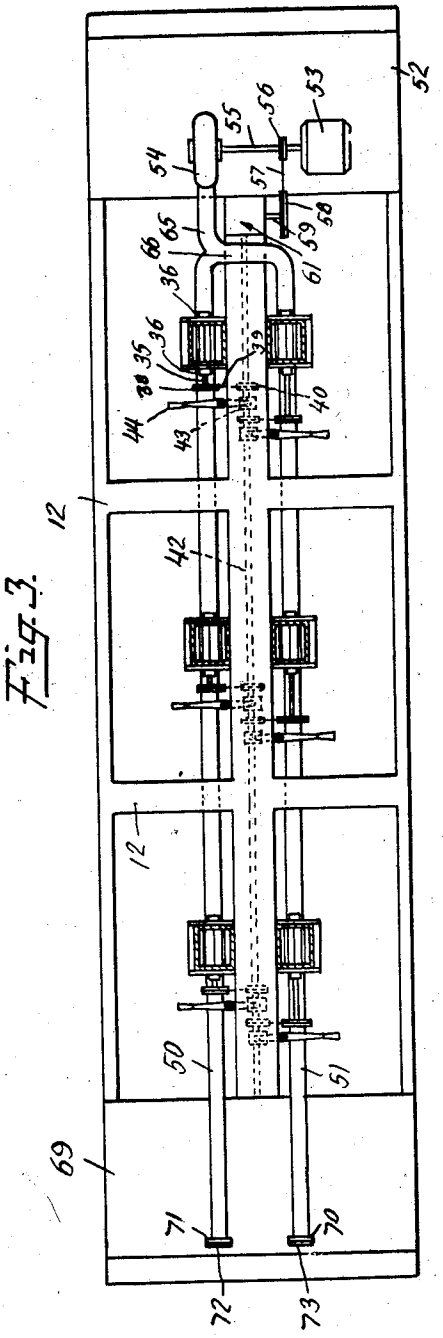


Fig. 3.

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Fig. 4.

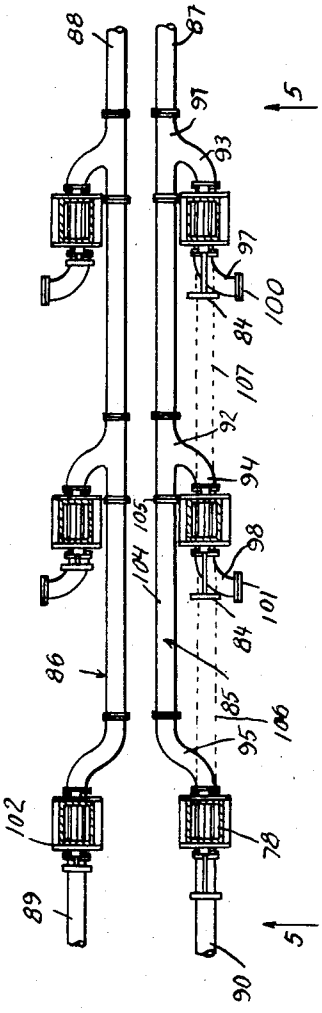
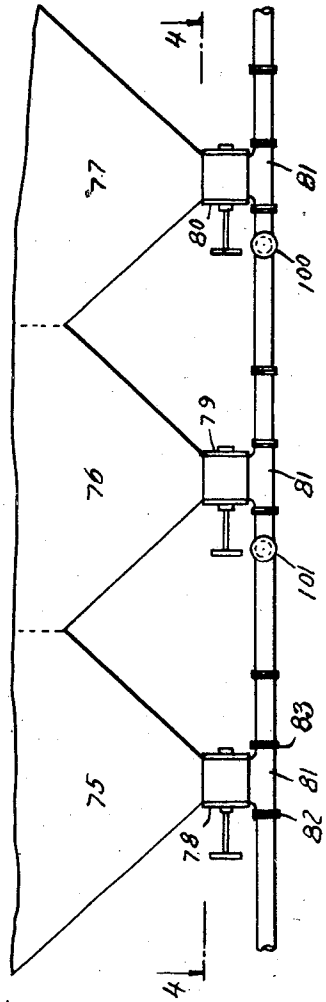


Fig. 5.



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Fig. 6.

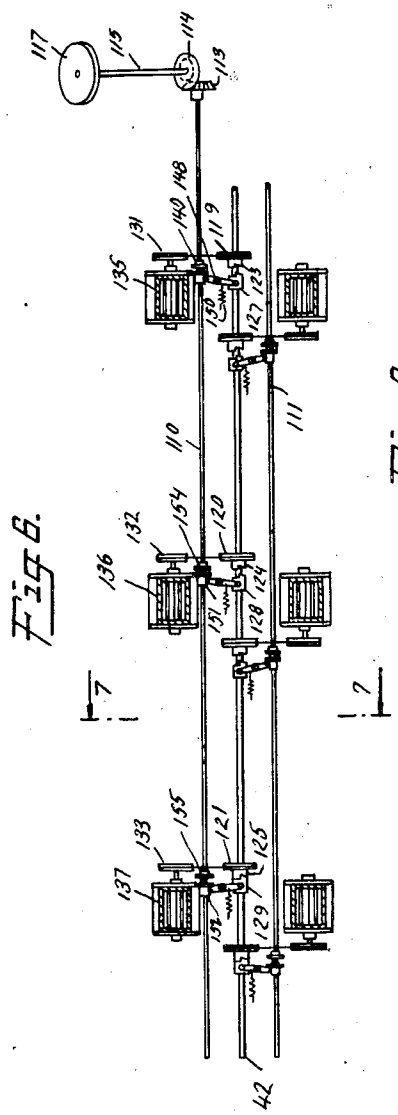


Fig. 8.

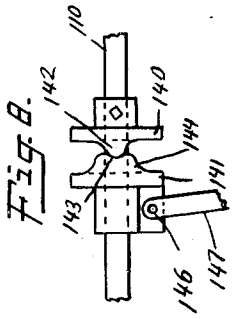


Fig. 9.

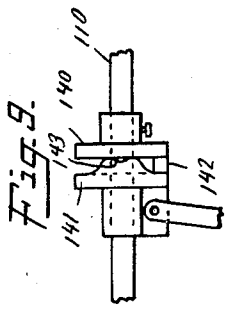
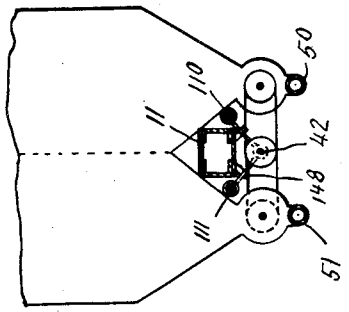


Fig. 7.



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UNITED STATES PATENT OFFICE

2,030,553

RAILWAY CAR

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Application November 14, 1932, Serial No. 642,486

10 Claims. (Cl. 214—83)

This invention relates generally to the transportation in bulk form of granular or pulverulent materials. More particularly, the invention is directed to vehicles, especially railway cars, for transporting and subsequently unloading relatively finely divided materials into bins alongside the right-of-way or more or less remote therefrom.

One of the principal objects of the invention lies in the provision of a railway car by which finely divided materials may be economically transported in bulk form, and quickly unloaded into receiving bins, at the point of destination, near to or remote from the car without manual labor, thus avoiding expense attendant upon packaging such material and manual handling of the packaged goods while loading and unloading incident to transportation. Suggestions have been made heretofore relative to the construction of self-unloading vehicles such as railway cars and the like. Prior proposals have been directed to constructions involving relatively complicated mechanical appliances and devices which in practice are found quite likely to get out of order on account of severe shocks to which railway cars are commonly subjected while in use.

The present invention aims chiefly to provide a self-unloading railway car built so as to include a minimum of movable parts in the unloading mechanism, thus avoiding delays and inconveniences arising in the use of devices of similar nature involving numerous more or less complicated mechanical elements. The invention is further directed to the provision of self-unloading cars so constructed that the few moving parts which may get out of order are of such simple nature that such parts may be readily repaired at any time by an ordinary mechanic. Additionally, a further object of the invention resides in the provision of a car constructed so that different kinds of finely divided materials may be transported in the car at the same time and separately unloaded without manual labor at the same or different points of delivery. The invention also embodies a plural hopper car in which because of the arrangement of the hoppers the rigidity of the car body is materially increased. The present improvements further comprise a car body having a plurality of material carrying compartments designed so that the car has a maximum carrying capacity and so that the unloading mechanism is located in otherwise unoccupied spaces, but yet readily accessible for manipulation.

The invention contemplates a railway car comprising preferably a plurality of hoppers or compartments for finely divided materials, and means for pneumatically unloading the materials into storage bins at the point of delivery. The invention consists further in the features of construction, combination of elements, and arrangement of parts exemplified by way of illustration in the particular embodiment of the invention hereinafter set forth. The objects and advantages of the invention may be more fully appreciated from a consideration of the following description taken in connection with the accompanying drawings, in which,—

Fig. 1 is a side elevation of the improved self-unloading car;

Fig. 2 is a transverse section on the line 2—2 of Fig. 1;

Fig. 3 is a plan view, with the hoppers removed, taken approximately on the line 3—3 of Fig. 1;

Fig. 4 is a plan view, with hoppers and car frame removed, of a modified construction;

Fig. 5 is an elevation, approximately on line 5—5 of Fig. 4, showing the hoppers and unloading connections of the modified car;

Fig. 6 is a plan view of a modified mechanism for controlling unloading of the car;

Fig. 7 is a vertical section approximately on the line 7—7 of Fig. 6, and

Figs. 8 and 9 are plan details.

Referring to the drawings, the car frame comprises sills 10, the longitudinal center beam 11, cross-beams 12, and the several vertical side and end frame members denoted by reference numerals 13. The car body is mounted on conventional trucks 14.

Disposed centrally of the car body is a vertical partition 15 which together with transverse partitions at 16 and 17 and the sheet steel plates 18, attached to the vertical frame members 13, form a plurality of material carrying compartments or hoppers on either side of the longitudinal center of the car. Two of such compartments, 19 and 20, are shown in transverse section in Fig. 2. From an inspection of the drawings, it will be apparent in the present embodiment of the invention, there are provided six separate material compartments. The tops of the hoppers are closed by the sheet steel car roof 21 sloping downwardly slightly toward the upper edges of the car body as seen in Fig. 2. Granular or other finely divided material to be shipped may be fed in bulk into the several compartments through individual openings 23 in roof 21, each opening 23 being provided with a movable closure 24.

Referring to Figs. 1 and 2, the steel sheeting forming the bottoms of the hoppers is pitched, as shown at 25 and 26, at an angle slightly greater

than the angle of repose of the material to be transported. Generally speaking, this angle may be approximately 45° and in any event is made as low as possible so as to provide in the compartments the greatest possible carrying capacity and to minimize the extent of the unoccupied spaces 27 and 28 at either end of the car body and spaces 29 between the sloping bottoms of adjacent hoppers.

As illustrated in Fig. 2, the lower end of each material compartment terminates in an opening 31 affording communication between the compartment and the chamber of a feeder indicated generally by reference numeral 32. Feeder 32 may be of more or less conventional construction, and, as shown, includes a rotary air-lock 33 comprising a plurality of radially disposed vanes carried on a shaft 35 journaled as at 36, Fig. 3, in the casing of the feeder. Keyed to one end of shaft 35 is a sprocket wheel 38 carrying a drive chain 39 passing over a sprocket 40 loosely mounted on a main drive shaft 42. At 43 is a clutch, operated by a handle 44, by means of which the sprocket 40 may be clutched to the shaft 42 to drive feeder shaft 35. Each of the six material compartments is provided with a rotary discharging air-lock which may be selectively driven as desired from shaft 42. As will be seen in Figs. 2 and 3, the shaft 42 is located beneath the center beam 11, and extends substantially the length of the car, the shaft being journaled in bearings 46 attached to the underside of beam 11.

Running longitudinally of the car beneath the material compartments are discharge conduits 50 and 51, the rotary air-locks of the hoppers on one side of the center beam 11 feeding into conduit 50 and the air-locks on the opposite side of the center beam feeding into conduit 51.

Mounted near one end of the longitudinal sills 10 and the center beam 11 and in the unloading equipment compartment 27 between hoppers 19 and 20 and the end of the car is a platform 52 carrying a motor 53 and a blower 54 for pneumatically unloading the materials carried in the several hoppers. The motor 53, preferably a gasoline motor, may be directly connected to the rotor of the blower 54 through shaft 55. Keyed to shaft 55 is a sprocket 56 driving a chain 57 which passes over a gear 58 fixed to one end of a shaft 59 connected to a set of reduction gears denoted generally by the reference character 61. As shown in Fig. 1, power is transmitted from the reduction gears through a shaft 62 and pinion 63 to gear 64 keyed to shaft 42, this arrangement affording means for driving the main shaft 42 from the motor 53. The outlet side of blower 54 communicates through a pipe 65 and cross-connection 66 with the inlet ends of conduits 50 and 51. The equipment compartment 27 may be closed in as desired to protect the unloading mechanism from the weather.

Carried by the sills and center beam at the end of the car opposite the equipment compartment is a second platform 69 in space 28. As shown in Fig. 1, the discharge ends of conduits 50 and 51 are bent upwardly and terminate horizontally above platform 69 and in the space 28. The ends of conduits 50 and 51 are formed with flanges 70 and 71 by means of which flexible hose connections may be attached to conduits 50 and 51 for conducting the material to be unloaded into bins located alongside the car, or at points more or less remote from the car. During transit, the end of conduits 50 and 51 may be closed off by blank flanges 72 and 73. The arrangement of the ends of conduits 50 and 51 in the space 28 is advantageous since it permits a workman to conveniently attach a hose connection to flanges 70 and 71 without crawling under the car. If desired, conduits 50 and 51 may converge into a single outlet so that all the material may be unloaded from the car through a single hose connected to the end of the single outlet.

In Figs. 4 and 5 there is shown in plan and in elevation a modified car construction in which different kinds of finely divided materials may be transported, and separately unloaded from the car into as many separate bins. As in Figs. 1 to 3, the car illustrated in Figs. 4 and 5 is built with six material hoppers, three of which, 75, 76 and 77, are shown in elevation in Fig. 5. The lower ends of the hoppers open respectively into the chambers of rotary feeders 78, 79 and 80, the latter in turn discharging material into an associated pipe section 81 which may conveniently be cast as an integral part of the casing of a rotary feeder. Each pipe section 81 is provided on either end with flanges 82 and 83 for connecting other pipes thereto. The rotary feeders are driven through pulleys 84 from a shaft, not shown, arranged beneath the center beam of the car, as in Figs. 1 to 3.

Beneath the sills of the car are main air conduits 85 and 86 having inlet ends 87 and 88 and outlet ends 89 and 90. It will be understood that the inlet ends 87 and 88 are connected to the outlet side of the blower in the manner shown in Fig. 2, and that the outlet ends 89 and 90 are bent upwardly and terminate above the sills of the car frame as illustrated in Fig. 1. Conduits 85 and 86 are positioned more closely together than in the construction of Figs. 1–3, and are arranged substantially underneath the center beam 11. This arrangement permits the outlets of the hoppers and the rotary feeders associated therewith to occupy approximately the same positions relative to the car frame as shown in Fig. 2.

Conduit 85 includes two T connections 91 and 92 having branches 93 and 94 connected through bolted flanges to flanges 83 on the ends of pipe sections 81 of the adjacent rotary feeders 80 and 79. Conduit 85 also includes a curved connection 95 similarly attached to feeder 78. Bolted to flanges 82 of pipe sections 81 of feeders 79 and 80 are discharge elbows 97 and 98. When in transit, the ends of discharge elbows 97 and 98 are closed off by blank flanges 100 and 101. The outlet ends 90 and 89 of conduits 85 and 86 are connected to flanges 82 of pipe sections 81 associated with feeders 78 and 102. When out of operation, it will be understood that the ends of pipes 89 and 90 are closed by blank flanges similar to flanges 100 and 101 on elbows 97 and 98.

In Figs. 6, 7, 8 and 9 there is shown a mechanism for controlling operation of the rotary discharge feeders to successively unload the material contained in the several compartments on either side of the car. This arrangement may be conveniently employed in connection with a car of the type shown in Figs. 1 and 3.

The rotary feeder operating mechanism includes a pair of parallel control shafts 110 and 111 rotatably supported on either side of the center beam 11, as indicated in Fig. 7. Each shaft has fixed to the end, adjacent the equipment compartment 27, a gear 113 meshing with pinion 114 carried on the lower end of a spindle 115 projecting upwardly into the equipment compartment 27. Spindle 115 may be operated by

a hand-wheel 117 which is readily accessible from within compartment 27. The main shaft 42, connected with a motor 53 through reduction gearing 61, is journaled in suitable bearings beneath center beam 11 as in Fig. 7.

Shaft 42 carries a plurality of loosely mounted sprockets 119, 120 and 121 each of which is provided with teeth 123, 124 and 125 adapted to engage teeth on the adjacent faces of clutch members 127, 128 and 129. The clutch members are slidable along shaft 42 and are keyed to rotate therewith. Gears 119, 120 and 121 are connected through chains with sprockets 131, 132 and 133 fixed to the ends of the shafts of feeders indicated by reference numerals 135, 136 and 137.

Clutches 127, 128 and 129 may be selectively engaged with the teeth on the faces of sprockets 119, 120 and 121 by operation of the hand-wheel 117. The cams for throwing in the clutches are shown in plan in Figs. 8 and 9 in operative and inoperative positions respectively.

Referring particularly to Fig. 8, cam 140 is keyed to shaft 110. Cam 141 is slidably mounted on shaft 110, but does not rotate therewith. As will be seen from Fig. 8, cam 140 carries a high point or knob 142 which is adapted to mesh with a notch 143 cut into the face of a high point 144 on a floating cam 141. Cams 140 and 141 are circular, looking axially of shaft 110, and knob 142 and projection 144 are formed on the peripheries thereof. Loosely pinned to cam 141 at 146 is a lever 147 pivoted at 148 to the under side of center beam 11, (Fig. 7). The opposite end of lever 147 is forked, the arms thereof lying in grooves cut in the periphery of clutch member 127. When the cams are in the position shown in Fig. 9, clutch member 127 is held out of engagement with the teeth of sprocket 119 by a spring 150, one end of which is connected to the lever and the other end to a fixed point on the car frame. The clutching mechanism associated with each feeder is similarly constructed.

Referring more particularly to Figs. 1–3, in operation, the hoppers may be loaded with relatively finely divided material through openings 23 in the roof of the car. While in transit, the unloading mechanism in equipment compartment 27 is of course out of operation, clutches 43 are thrown out as a precaution, and blank flanges 72 and 73 are bolted in place on the ends of conduits 50 and 51. The vanes in the air-locks 33 are more or less tight-fitting and little or no material falls through the air-locks into conduits 50 and 51 while the car is in motion.

The car in Figs. 1–3 is particularly adapted for transporting, in all the hoppers, material of the same kind. When it is desired to discharge all of the material in the car, blank flanges 72 and 73 are removed, and flexible hose connections are attached to flanges 70 and 71 on the outlet ends of conduits 50 and 51. The opposite ends of the hose connections are placed in the customer's bin, provided with a suitable air filter, which bin may be near the car, or at a point some distance therefrom. The motor 53 is started up, blower 54 is put in operation, and shaft 42 beneath the car is rotated through the reduction gears 61 and the connections to shaft 42 and shaft 55 of the motor 53. Clutch 43, associated with the feeder of the hopper to be unloaded, is thrown in and the feeder is driven from the main shaft 42. The ratios of the reduction gears are such that material is fed in steady streams in the desired quantities from the hoppers in conduits 50 and 51. The blower 54 is of such size and capacity to provide a sufficient air blast in conduits 50 and 51 to pneumatically discharge from the car the material fed into conduits 50 and 51 by the rotary feeders 32. Operations are preferably conducted so that only one hopper at a time is feeding into conduits 50 and 51 to avoid possible clogging of the conduits.

In practice, should a situation arise in which substantial quantities of material from the hoppers work through the air-locks and into conduits 50 and 51 during transit, if such quantities should be sufficient to prevent initial passage of air through the conduits, the latter may be cleaned out by means of a rod or other tool inserted through Y-connections 74 at either end of conduits 50 and 51. Connections 74 are provided with suitable removal closures.

The modified construction disclosed in Figs. 4 and 5 facilitates transportation and unloading of different kinds of finely divided materials. In the illustrated embodiment, the car is built with six hoppers, and it will be seen that six different kinds of materials may be transported and unloaded into separate bins at one or more points of delivery.

Assuming it is desired to unload the material contained in hopper 77, blank flange 100 is removed from the end of elbow 97, and other blank flanges such as 101 and the blank flange on the end of pipe 90 are left in place. One end of a flexible conduit is then attached to the end of elbow 97, and the opposite end of the conduit is placed in the customer's bin. With the motor and blower in operation, feeder 80 is rotated by clutching pulley 84 to the main shaft 42 as in Fig. 1. Material is then fed by feeder 80 from hopper 77 into the pipe section 81 directly beneath. The air blast passes through inlet pipe 87, branch 93, pipe section 81 and carries material therein through elbow 97 and the attached flexible conduit to the bin into which the material is to be delivered. As the ends of elbow 98 and outlet pipe 90 are blanked off, no air passes through the pipe sections 81 immediately beneath feeders 79 and 78.

Similarly, if it is desired to unload the material in hopper 76, a flexible conduit is connected to elbow 98, and the elbow 97 and outlet pipe 90 are blanked off. Material is discharged only from hopper 76. If the material from hopper 75 is to be unloaded, the flexible conduit may be attached to the outlet end of pipe 90, and elbows 97 and 98 are closed off thus preventing escape of air from the main conduit through feeders 79 and 80. The hoppers on the opposite side of the car may be unloaded in a similar manner. This construction permits unloading of material from one compartment without contamination by different material contained in another compartment. If desired, hopper 75 may be unloaded first, and hoppers 76 and 77 unloaded successively thereafter.

There may be instances in which the same kind of material is to be transported in, say, hoppers 75 and 76, and it is desired to unload these materials successively into the same bin. To provide for this situation, before the car leaves the loading terminal, curved pipe section 95 connected to feeder 78, elbow 98, and pipe section 104 may be removed, and T 92 blanked off at 105. Pipe section 104 is then inserted between feeders 78 and 79 as indicated by the dotted lines at 106 in Fig. 4. When the car arrives at destination, and the material in hoppers 75 and 76 is to

be delivered into the same bin, the blank flange on the end of outlet pipe 90 is removed and the flexible conduit connected thereto. The rotary feeders 78 and 79 are operated one at a time, and as blank flange 100 on the end of elbow 97 is in place, the air blast passes from the main conduit through branch 94, pipe section 81 beneath feeder 79, the pipe connection 104 between feeders 79 and 80, and pipe section 81 beneath feeder 78, and the material from hoppers 75 and 76 is successively carried through outlet pipe 90 and the attached flexible conduit into the storage bin. Additionally, a pipe section 107 may be placed between feeders 79 and 80, and feeders 78, 79 and 80 may be operated separately in any sequence to discharge the material in the hoppers on one side of the car through outlet 90. This construction permits conversion of the car of Figs. 4 and 5 into a car similar to that shown in Figs. 1–3, and provides interchangeable means for separately unloading material from the hoppers through individual discharge conduits associated with the hoppers, or for successively unloading the hoppers through a common conduit. A similar arrangement may be made on the opposite side of the car.

When a car such as shown in Figs. 1–3 is equipped with the rotary feed control mechanism shown in Fig. 6, the unloading operation may be carried out substantially as follows: Floating cam 141, shown in plan in Fig. 8, and similar floating cams 151 and 152 are slidable on shaft 110, and are maintained in the same position radially of the shaft by levers 147. As noted, cam 140 is fixed to shaft 110, and similarly cams 154 and 155 are likewise fixed to the shaft. However, cams 140, 154 and 155 are attached to shaft 110 so that the respective knobs 142 of the cams are positioned on the shaft radially 120° apart. When the car is loaded, shaft 110 is rotated, if necessary, by the hand-wheel 117 so that knobs 142 on cams 140, 154 and 155 are out of contact with the high points 144 of cams 141, 151 and 152. By means of springs 150, clutch members 127, 128 and 129 are drawn away from the adjacent sprockets, and cam 141, for example, is moved along shaft 110 toward cam 140 as shown in Fig. 9. With all the cams in the position shown in Fig. 9, clutches 127, 128 and 129 are disengaged, and even if shaft 42 were rotated, feeders 135, 136 and 137 would not be rotated since the connecting clutches are in the neutral position.

When the car arrives at destination and it is desired to unload the material, say from the hopper immediately above the feeder 135, handwheel 117 is rotated sufficiently to seat knob 142 on cam 140 in notch 143 of cam 141. These cams are shown in this position in Fig. 8. As knob 142 meshes with notch 143 on cam 141, cam 141 is moved along shaft 110 against spring 150, and the teeth of clutch 127 engage the teeth of sprocket 119. With motor 53 in the equipment compartment in operation and shaft 42 rotating as in the construction shown in Fig. 3, when clutch 127 is thrown into engagement with sprocket 119, the rotation of shaft 42 is transmitted through sprocket 119 and sprocket 131 to the shaft of feeder 135, and material from the hopper immediately above is continuously discharged into a longitudinal conduit 50 (Fig. 3) underneath.

During rotation of shaft 110 to throw in clutch 127, and while clutch 127 is engaged, knob 142 of cam 154 is positioned 120° beyond the knob of cam 140, and knob on cam 155 is positioned 240° beyond knob 142 on cam 140. Hence, it will be understood that clutches 128 and 129 are in the neutral position, and feeders 136 and 137 are out of operation.

When the hopper immediately above feeder 135 is empty, and it is then desired to unload the hopper above feeder 136, hand-wheel 117 is turned so that knob 142 on cam 154 is rotated approximately 120° to cause the knob to mesh with the notch 143 of cam 151. By this operation, clutch 128 is engaged, and as knob 142 of cam 140 has moved out of notch 143 of cam 141, clutch 127 has become disengaged and feeder 135 ceases to operate. When the hopper above feeder 136 is emptied, hand-wheel 117 is again turned approximately 120° so as to bring the knob on cam 155 into mesh with the notch on cam 152. By this movement of hand-wheel 117, clutch 128 is thrown out of operation, clutch 127 remains out of operation, and the teeth of clutch 129 engage the teeth on sprocket 121 thus driving the feeder 137 through sprocket 133. In Fig. 6, the parts are shown in this position. When the hopper above feeder 137 is unloaded, shaft 110 is turned far enough to disengage cams 155 and 152, and all the clutches are then inoperative.

Summarizing with reference to the unloading control mechanism of Figs. 6—9, it will be seen that when the knobs on cams 140, 154 and 155 are out of mesh with the notches 143 on cams 141, 151 and 152, the shafts of rotary feeders 135, 136 and 137 are disconnected from the main shaft 42. When it is desired to unload the hoppers on one side of the car, hand-wheel 117 may be operated so as to successively connect with the main shaft 42, first, sprocket 131 of feeder 135, then sprocket 132 of feeder 136, and finally sprocket 133 of feeder 137, thus successively and separately unloading the hoppers immediately above feeders 135, 136 and 137. The hoppers on the opposite side of the car may be operated by similar manipulation of shaft 111. This construction has the particular advantage of preventing a condition in which several hoppers are discharging at once into the outlet conduit underneath, thus avoiding possible clogging. Furthermore, since the clutches are operated from hand-wheels in compartment 27 which is closed and locked during transit, tampering with the discharge mechanism en route is prevented.

The constructions shown in the drawings may be modified to a considerable extent without departing from the scope of the invention. For example, the car of Fig. 1 may contain any number of hoppers arranged as desired with respect to the car frame. The hoppers may extend entirely across the car body instead of halfway as in the drawings and foregoing description. In such arrangement all the hoppers might be unloaded through a single discharge conduit instead of by means of two conduits as described. In this instance, the car may be provided with a double center beam so that the bottoms of the hoppers may project downwardly between the horizontally spaced longitudinal elements of the center beam, and terminate beneath the sills similarly as in Fig. 2. However, a construction having a plurality of hoppers formed by longitudinal and transverse partitions is preferred since this design adds materially to the strength and rigidity of the car body. Further, a relatively large number of hoppers is preferred since the capacity of the car is increased, and empty spaces between the sloping bottoms of the hoppers are reduced to a minimum. However the

hoppers may be arranged, the hoppers preferably terminate below the level of the sills so as to drop the center of gravity of the load as low as possible.

For shipment of some substances, the hoppers may be lined with suitable material to prevent contamination with the iron of the car body.

The motor, blower, reduction gears and associated elements may be placed elsewhere on the car frame than in the position shown. For instance, if desired the unloading equipment compartment may be located intermediate adjacent hoppers in a space 29. Because of ready accessibility, it is preferred to house the unloading equipment as shown, at one end of the car. An electric motor may be substituted for the gasoline motor 53, although the latter type motor is preferred since inconveniences involved in connecting an electric motor to a source of power are avoided.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A vehicle for transporting and unloading finely divided material which comprises a transportable frame, a plurality of material hoppers carried by the frame, a discharge conduit positioned beneath each hopper, an air-lock for feeding material from each hopper into the associated conduit, a motor carried by the frame, a blower operatively connected to the motor, a shaft driven by the motor, means for selectively connecting the air-locks to the shaft to operate the air-locks, and a connection between the blower and a discharge conduit for pneumatically discharging material from the vehicle.

2. A vehicle for transporting and unloading finely divided material which comprises a transportable frame, a material hopper carried by the frame on either side of the longitudinal center thereof, the outlets of the hoppers projecting below the frame, discharge conduits disposed longitudinally of the frame and positioned beneath each of the hoppers, the discharge ends of the conduits terminating above the base of the frame, means for feeding material from the hoppers into the associated conduit, a blower carried by the frame and connected to the conduits for discharging material pneumatically from the discharge conduits.

3. A vehicle for transporting and unloading finely divided material which comprises a transportable frame having longitudinal supporting sills, a material hopper carried by the frame and having an outlet projecting beneath the sills, a discharge conduit positioned beneath the hopper, the discharge end of the conduit terminating above the sills, a supporting member mounted above the sills, a blower carried by said member, a connection between the discharge side of the blower and the conduit, a motor for driving the blower, means for feeding material from the hopper into the conduit, and means driven by the motor for selectively operating the feeding means.

4. A vehicle for transporting and unloading finely divided material which comprises a transportable frame having longitudinal supporting sills, a material hopper carried by the frame on either side of the longitudinal center thereof, the outlets of the hoppers projecting beneath the sills, discharge conduits disposed longitudinally of the frame and positioned beneath the hoppers, the discharge ends of the conduits terminating above the sills, a supporting member mounted above the sills, a blower carried by said member, a connection between the discharge side of the blower and the conduit, a motor for driving the blower, means for feeding material from the hoppers into the associated conduit, and means driven by the motor for selectively operating the feeding means.

5. A vehicle for transporting and unloading finely divided material which comprises a transportable frame having longitudinal supporting sills, a material hopper carried by the frame on either side of the longitudinal center thereof, the outlets of the hopper projecting beneath the sills, discharge conduits disposed longitudinally of the frame and positioned beneath each of the hoppers, the discharge ends of the conduits terminating above the sills, a supporting member mounted on the sills, a blower carried by said member, a connection between the discharge side of the blower and the conduits, a motor for driving the blower, air-locks for feeding material from the hoppers into the associated conduit, a shaft rotatably supported beneath the frame, a connection between the shaft and the motor, and means for selectively connecting the air-locks to the shaft.

6. A vehicle for transporting and unloading finely divided materials which comprises a transportable frame having longitudinal supporting sills, a plurality of material hoppers carried by the frame on each side of the longitudinal center thereof, the outlets of the hoppers projecting beneath the sills, a pair of discharge conduits disposed longitudinally of the frame, each conduit being positioned beneath a plurality of material hoppers on either side of the longitudinal center of the frame, and the outlet ends of the conduits terminating above the sills at one end of the frame, a supporting member mounted above the sills at the other end of the frame, a blower carried by the supporting member, a connection between the discharge side of the blower and the inlet end of each of the conduits, a motor for driving the blower, air-locks for feeding material from the hoppers into the subjacent conduit, a longitudinally extending shaft rotatably supported on the underside of the frame and positioned centrally of the sills, reduction gears connecting the shaft and the motor, and means for selectively connecting the air-locks to the shaft.

7. In a vehicle for transporting and unloading finely divided material, a transportable frame, a plurality of material hoppers carried by the frame, a discharge conduit positioned beneath each of the hoppers, means for feeding material from a hopper into an associated discharge conduit, and unitary means for separately operating the said feeding means.

8. In a vehicle for transporting and unloading finely divided material, a transportable frame, a plurality of material hoppers carried by the frame, a rotary feeder for discharging material from each of the hoppers, a shaft, a connection including a clutch between the shaft and each of the rotary feeders for operating the feeders, and unitary means for separately engaging the clutches.

9. A vehicle for transporting and unloading finely divided material which comprises a trans-

portable frame, a material hopper carried by the frame on either side of the longitudinal center thereof, a discharge conduit positioned beneath each hopper, an air-lock for feeding material from each hopper into an associated conduit, a motor carried by the frame, a blower operatively connected to the motor, a shaft driven by the motor, means for selectively connecting the air-locks to the shaft to operate the air-locks, and a connection between the blower and a discharge conduit for pneumatically discharging material from the vehicle.

10. A vehicle for transporting and unloading finely divided material which comprises a transportable frame, a plurality of material hoppers carried by the frame, a discharge conduit positioned beneath each hopper, an air-lock for feeding material from each hopper into the associated conduit, a motor carried by the frame, a blower operatively connected to the motor, a shaft driven by the motor, means for selectively connecting the air-locks to the shaft to operate the air-locks, a connection between the blower and a discharge conduit, and interchangeable means for pneumatically separately unloading material from a hopper through an individual discharge conduit associated with such hopper or for pneumatically unloading the hoppers through a common conduit.

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