A. FINKELSTEIN.

DUMPING TRUCK.

APPLICATION FILED JULY 25, 1918.

1,298,028.

Patented Mar. 25, 1919.

6 SHEETS—SHEET 1.

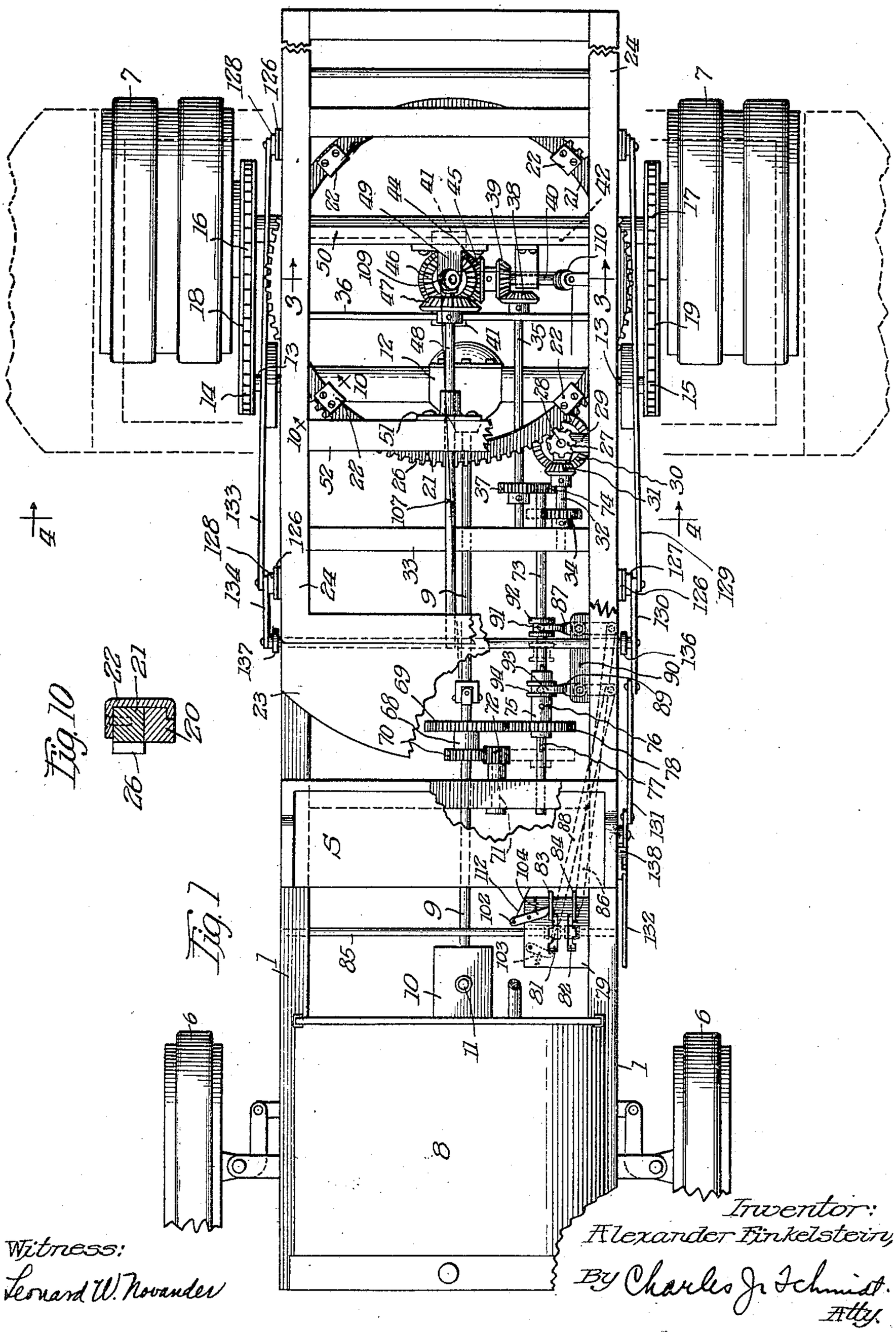

Fig. 1

Fig. 10

Witness:
Leonard W. Novander

Inventor:
Alexander Finkelstein,
By Charles J. Schmidt.
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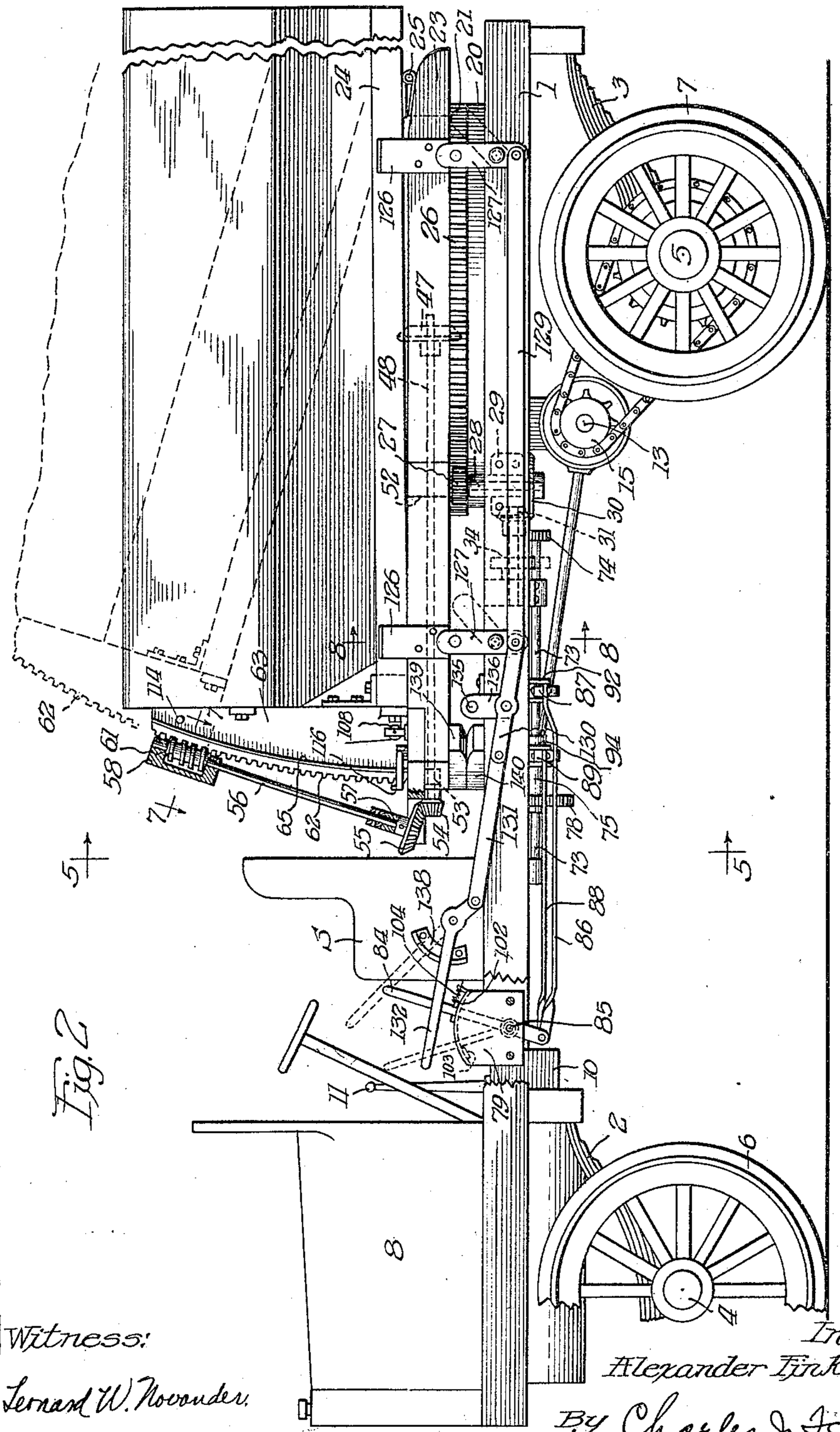

Fig. 2

Witness:

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6 SHEETS—SHEET 3.

Fig. 3

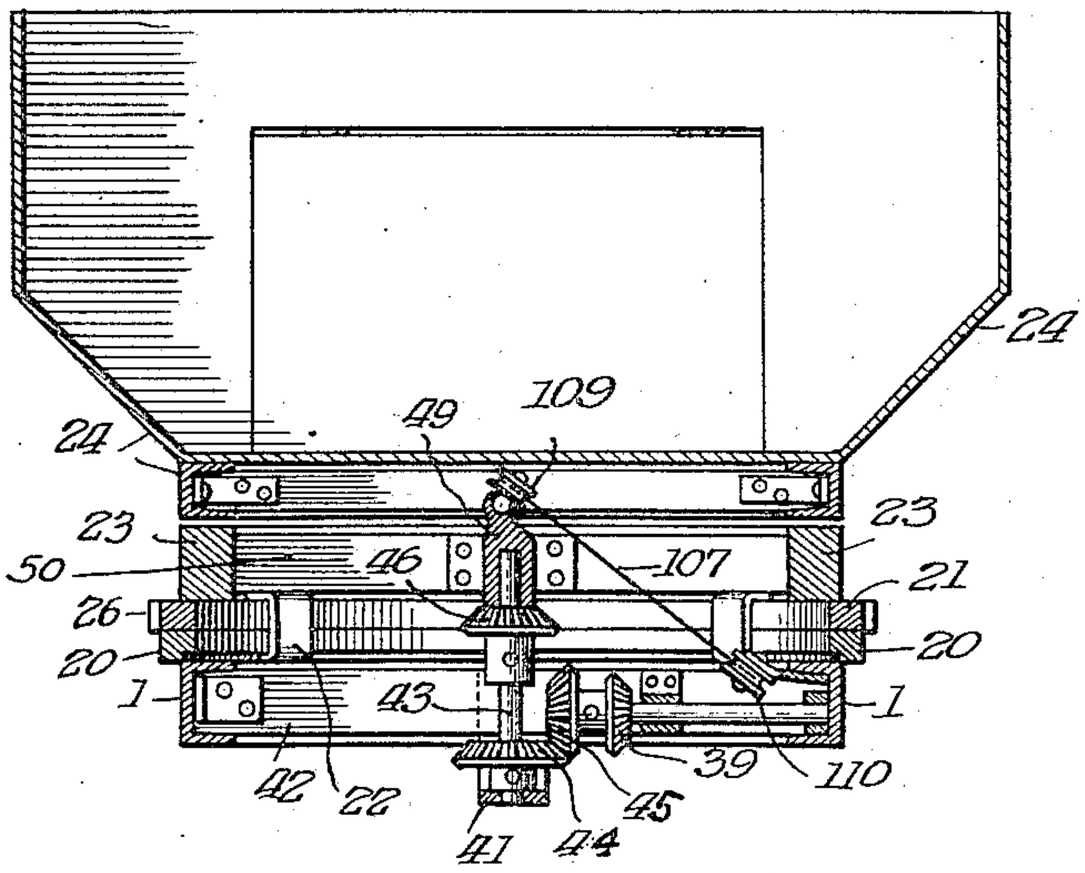
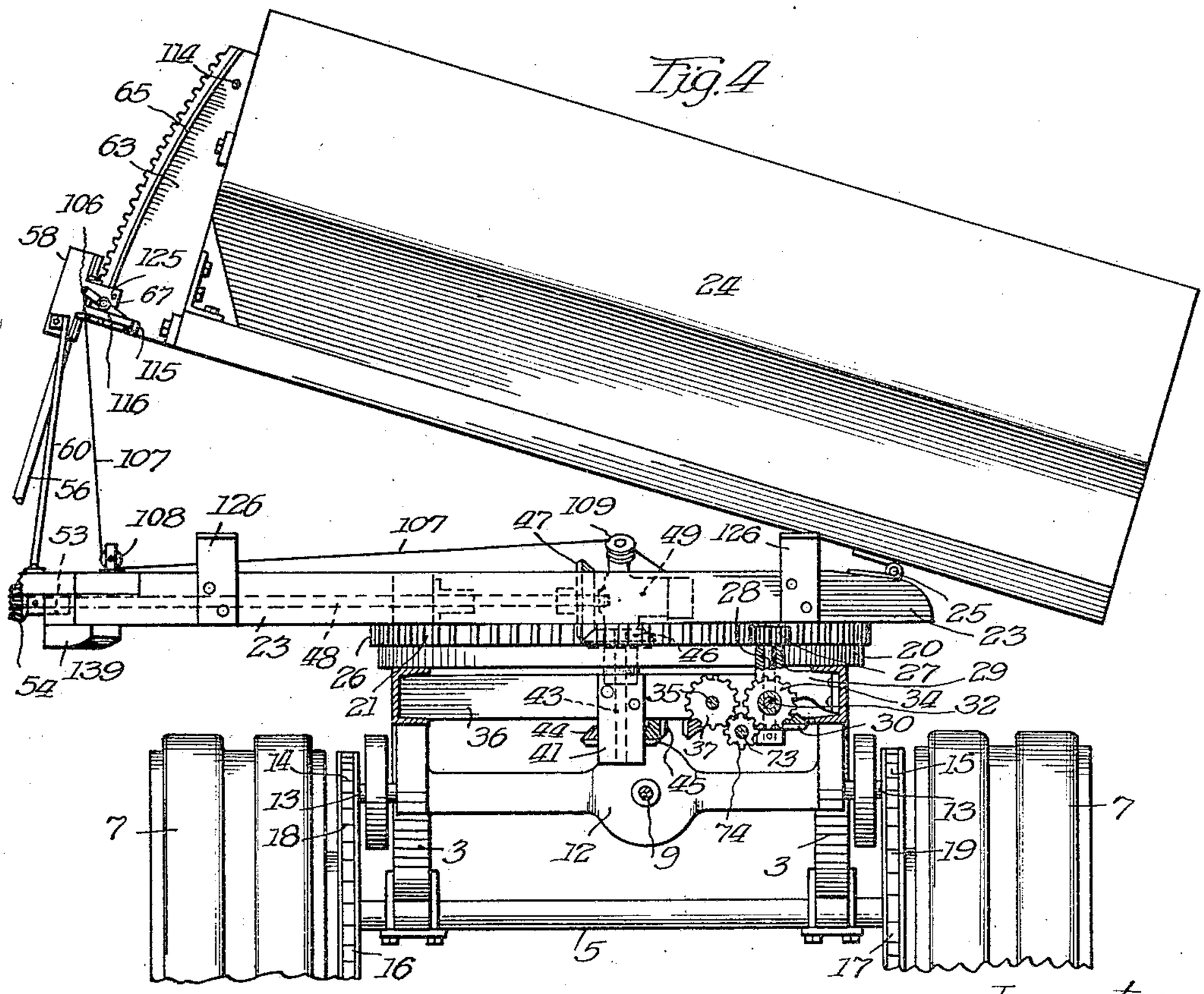


Fig. 4



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6 SHEETS—SHEET 4.

Fig. 7

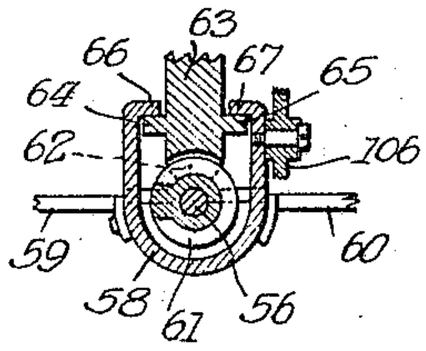


Fig. 6

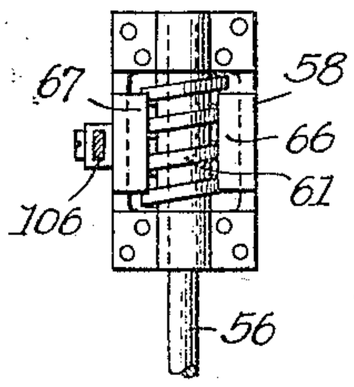


Fig. 5

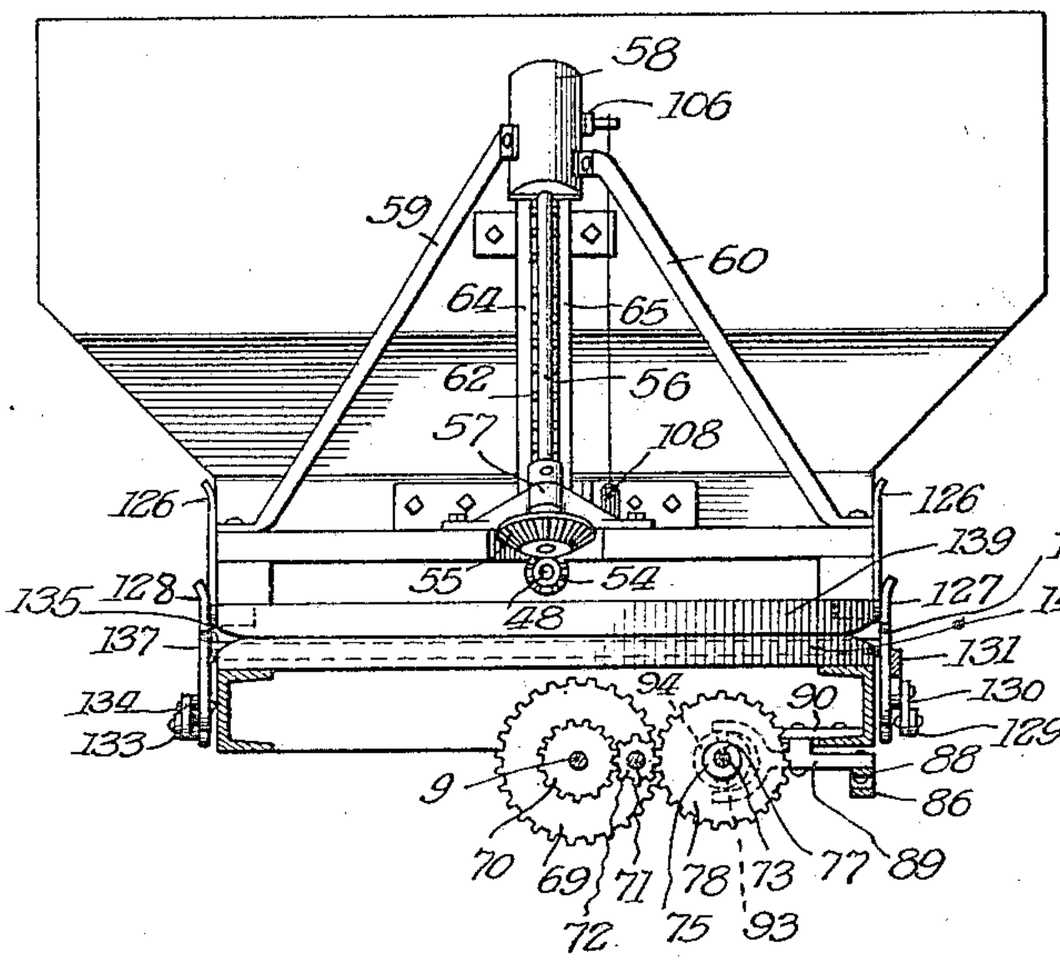
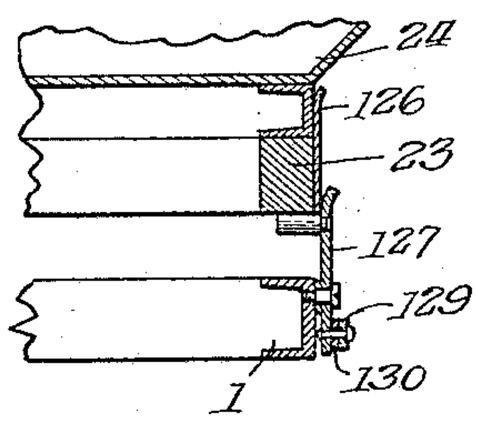


Fig. 8



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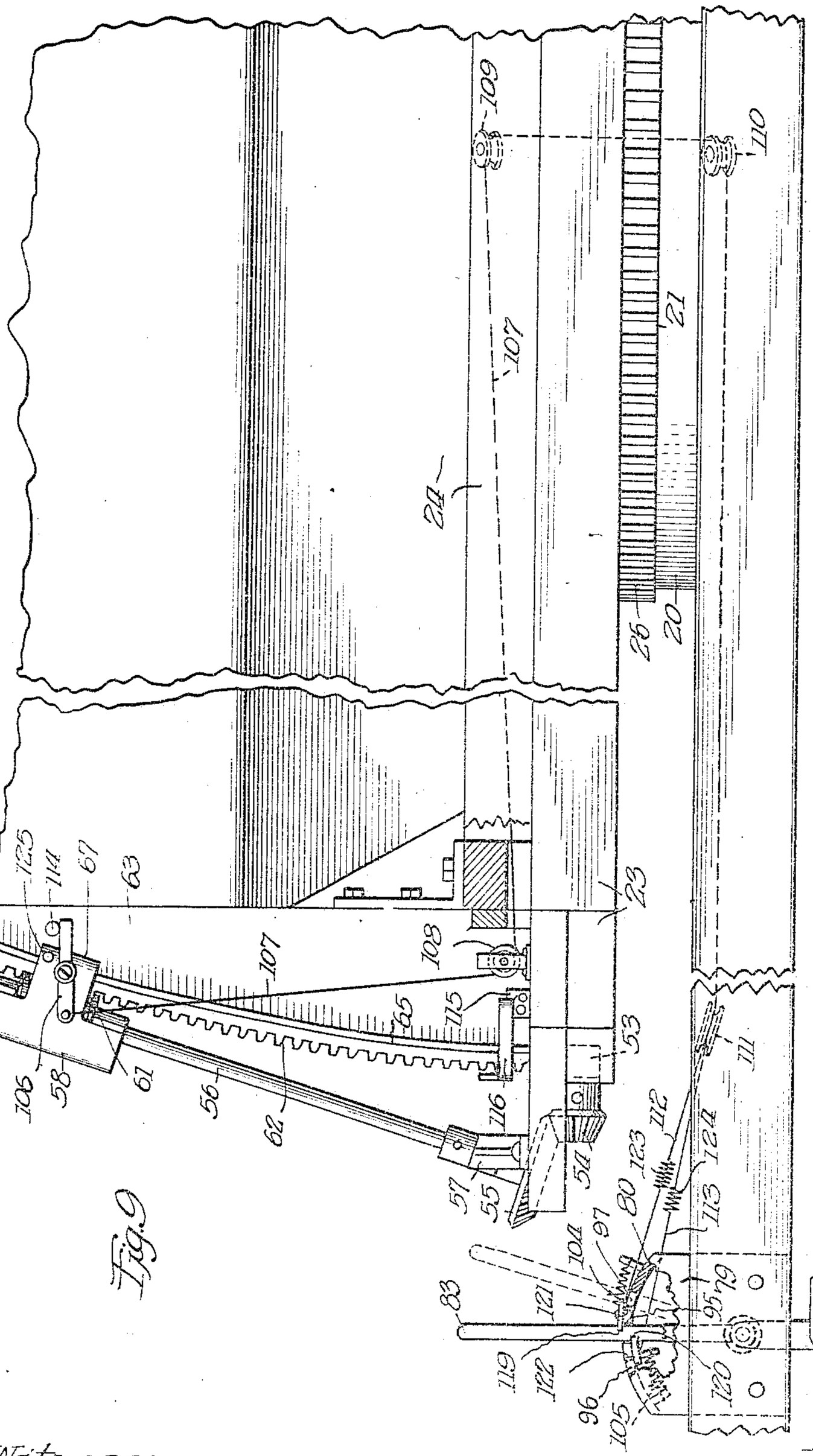

Fig. 9

Witness:
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6 SHEETS—SHEET 6.

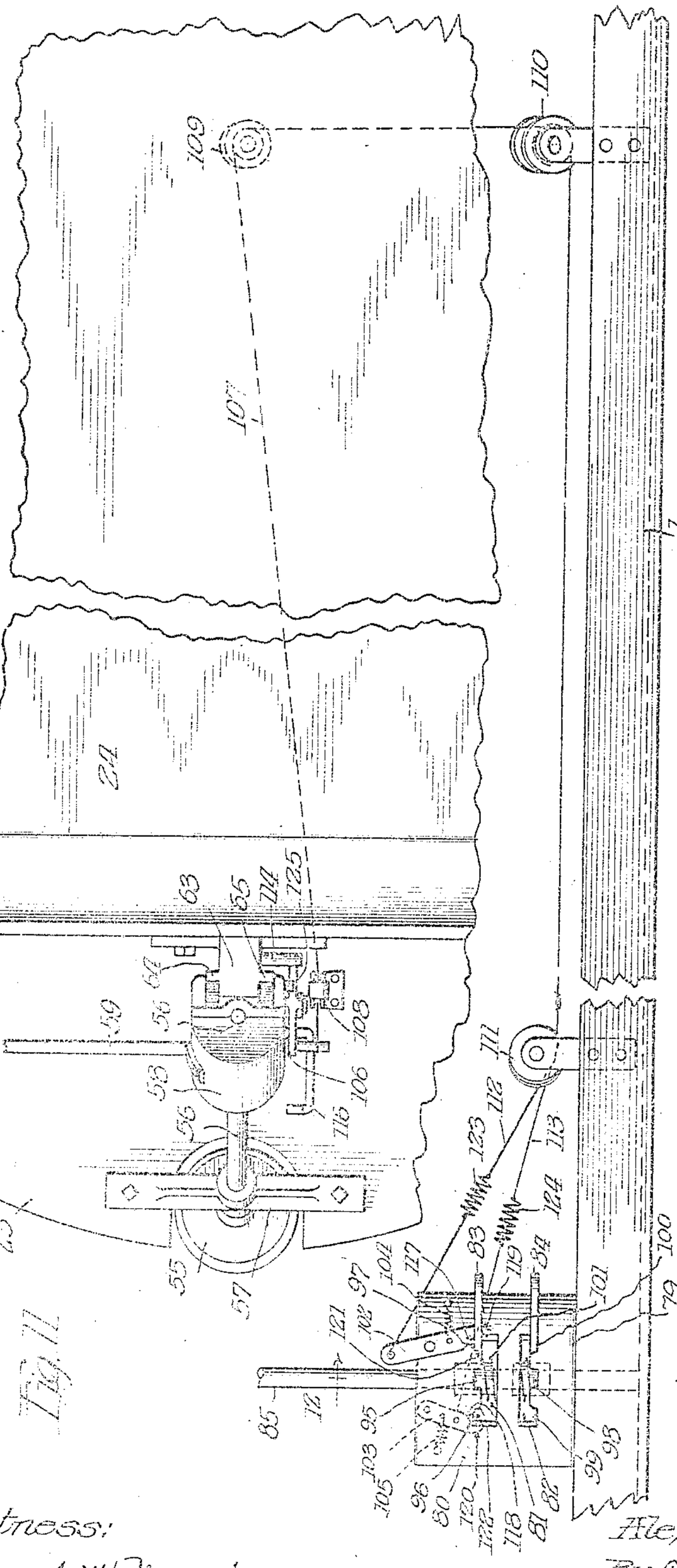

Fig. 11.

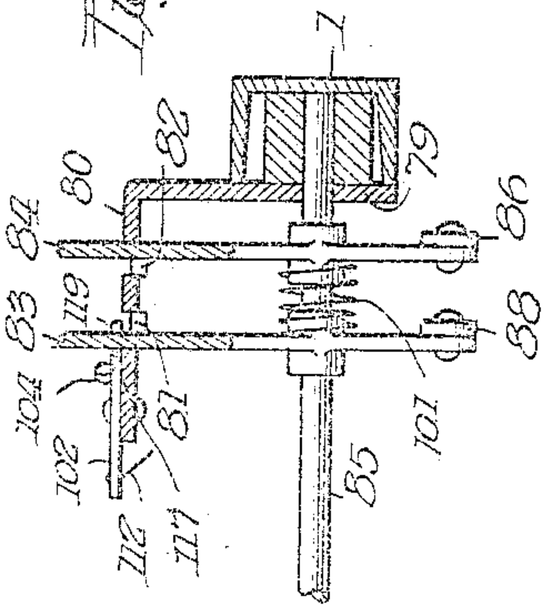

Fig. 12.

Witness:
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UNITED STATES PATENT OFFICE.

ALEXANDER FINKELSTEIN, OF CHICAGO, ILLINOIS.

DUMPING-TRUCK.

1,298,028. Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed July 25, 1918. Serial No. 246,666.

To all whom it may concern:

Be it known that I, ALEXANDER FINKELSTEIN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Dumping-Trucks, of which the following is a specification.

My invention relates to power driven dumping trucks for delivering and dumping material into manholes or other places.

The object of my invention is to provide improved and simplified driving and controlling mechanism for turning and raising the body of such vehicles and for accurately controlling the movements.

On the accompanying drawings which show a truck equipped with my improvements,

Figure 1 is a plan view of a truck with parts broken away,

Fig. 2 is a side elevational view,

Fig. 3 is a sectional view on plane 3—3, Fig. 1,

Fig. 4 is a sectional view on plane 4—4, Fig. 1,

Fig. 5 is a sectional view on plane 5—5, Fig. 2,

Fig. 6 is a rear view of a worm gear and its housing,

Fig. 7 is an enlarged sectional view on plane 7—7, Fig. 2,

Fig. 8 is a sectional view on plane 8—8, Fig. 2,

Fig. 9 is an enlarged side elevational view of the front of the body and the tilting controlling mechanism,

Fig. 10 is an enlarged sectional view on plane 10—10, Fig. 1,

Fig. 11 is a plan view of the parts shown in Fig. 9, and

Fig. 12 is a sectional view on plane 12—12, Fig. 11.

The vehicle shown comprises the chassis frame 1 mounted by means of springs 2 and 3 on the front and rear axles 4 and 5 which support the wheels 6 and 7. In the hood 8 a suitable engine is placed and connectible with the drive shaft 9 by means of transmission gearing within the case 10, 11 being the transmission controlling lever. The shaft at its rear end connects with well known differential mechanism within the housing 12 for the jack shaft 13 which at its outer ends has sprocket wheels 14 and 15 which are connected with the sprocket wheels 16 and 17 on the rear axle by chains 18 and 19.

Secured on top of the chassis at the rear end thereof is the roller ring 20, and concentric with said lower ring is an upper ring 21, this upper ring being rotatable on the lower ring but confined thereon by means of brackets 22 secured to the upper ring and deflecting around the lower ring. This upper ring is secured to the under side of a rectangular platform 23 and mounted on this platform is the vehicle load containing body 24 hinged at its rear end to the platform by suitable hinges 25. The arrangement is such that the body can swing in a vertical plane with reference to the platform and the platform with the body thereon can be turned in a horizontal plane.

The upper ring 21 is provided with gear teeth 26 and meshes with a pinion 27 secured to the upper end of the shaft 28 which is journaled in the supporting frame 29 secured to one side of the chassis. Within this frame at the lower end of the shaft a bevel gear 30 is secured and is engaged by the bevel pinion 31 on the horizontal shaft 32. The rear end of the shaft 32 has bearing in the frame 29 and its front end has bearing in a cross member 33 of the chassis, the front end of the shaft having secured thereto a gear 34. When this gear is turned the platform 23 will be swung in a horizontal plane.

A transmission shaft 35 parallel with the shaft 32 is journaled at its front end in the chassis cross member 33 and at its rear end is journaled in the chassis cross wall 36. Secured to the front end of the shaft 35 is a gear 37 which is in a plane a distance behind the plane of the gear 34. Secured to the rear end of the shaft 35 is a bevel pinion 38 which meshes with a bevel gear 39 on the cross shaft 40, this cross shaft being journaled at its ends in the side of the chassis and in the bearing frame 41 secured between the chassis cross beams 36 and 42.

Journaled in this frame is a vertical shaft 43 which within the frame has secured thereto the bevel gear 44 meshing with the bevel gear 45 secured on the shaft 40. At the upper end of the shaft 43 is secured the bevel gear 46 which meshes with the bevel gear 47 at the rear end of the shaft 48 which extends forwardly along the longitudinal center line of the platform 23. The shaft 43 above the gear 46 is journaled in the bearing 49 which is secured to the cross brace 50 of the platform 23, and in this frame the shaft 48 is journaled at its rear end, a bearing frame 51 secured to the platform cross brace 52 furnishing a journal support for the intermediate part of the shaft. At its front end the shaft 48 has bearing in the journal box 53 secured to the under side of the platform and has at its outer end the bevel pinion 54 which meshes with the bevel gear 55 at the lower end of the shaft 56 which extends upwardly and diagonally rearwardly. At its lower end this shaft is journaled in the bearing frame 57 secured to the platform and at its upper end the shaft is journaled in the housing 58 which is supported from the platform by means of posts or braces 59 and 60. Within the housing the shaft has secured thereto a worm 61 which meshes with the arcuate gear rack 62 secured to the front of a standard 63 secured to the front end of the truck body 24, as clearly shown in Fig. 4, the gear rack having its center in the line of the hinges 25 on which the truck body is to be tilted. In order to hold the worm accurately and securely in meshing engagement with the rack teeth, the rack has lateral flanges 64 and 65 around which flanges 66 and 67 on the housing 58 hook, as clearly shown in Figs. 6 and 7. When the worm is turned the rack will be raised or lowered and the truck body tilted longitudinally as indicated in Fig. 4. The shaft 43 passes through the axis of the rings 20 and 21 and therefore the gears 46 and 47 will remain in mesh during any position of lateral swing of the platform.

Power from the vehicle engine is utilized for swinging the platform with the body thereon and for raising or lowering the body on the platform. On the transmission shaft 9 is secured the hub 68 carrying the large gear 69 and the smaller gear 70. Suitably journaled on the chassis is the shaft 71 which has secured to its inner end reversing pinion 72 which meshes with the gear 70. At one side of and parallel with the transmission shaft 9 is the counter shaft 73 which is suitably journaled on the chassis and is longitudinally shiftable. At its rear end the shaft has secured thereto the clutch pinion 74 which by the shifting of the shaft may be brought into mesh with either of the gears 34 or 37 so that power will be transmitted from the shaft 73 either to the platform rotating mechanism or the body tilting mechanism. The shaft 73 may be connected with the transmission shaft for rotation in either direction. A sleeve 75 is slidable on the shaft 73 but must rotate therewith on account of the pin or key 76 extending from the sleeve into the groove 77 in the shaft. A gear 78 is secured to the sleeve which by shifting the sleeve can be brought into mesh with either the gear 69 or the reversing pinion 72 to thus connect the gear 78 and consequently the shaft 73 with the engine transmission shaft for rotation in either one direction or the other. When the gear 78 is in mesh with the gear 69 on the transmission shaft the shaft 73 will rotate faster than when the gear 78 is connected with the transmission shaft through the interposition of the reversing pinion 72.

Suitable lever controlled mechanisms are provided for bodily shifting the shaft 73 or for shifting the sleeve 75. In front of the vehicle seat S and secured to the side of the chassis is a bracket 79 which provides the top wall 80 having the two longitudinally extending slots 81 and 82 through which the hand levers 83 and 84 extend vertically. Below the wall 80 and journaled in the chassis sides is a shaft 85 on which the levers are pivoted near their lower ends. The lower end of lever 84 is connected by the rod 86 with the outer end of clutch lever 87 and the lower end of the lever 83 is connected by a rod 88 to the outer end of a clutch lever 89. These clutch levers are pivoted intermediate their ends on a bracket 90 secured to the chassis side. The lever 87 has the clutch fork 91 at its inner end receiving the clutch collar 92 secured to the shaft 73. The lever 89 has the clutch fork 93 at its inner end receiving the clutch collar 94 on the sleeve 75 which supports the gear 78. Upon swing of the levers 83 and 84 either the sleeve 75 will be shifted on the shaft 73 or the shaft 73 bodily shifted to build up the various gear transmission trains.

In the outside of the channel 81 in which lever 83 travels the plate 80 has the central notch 95 and the front and rear notches 96 and 97, these notches serving to hold the lever respectively in neutral, front or rear. In the same manner neutral, front and rear notches 98, 99 and 100 are provided in the plate 80 for the lever 84. Surrounding the shaft 85 between the hubs of the levers is a compression spring 101 which tends to force the levers apart and thereby tends to hold the levers in any of the notches in which they happen to be. With both levers in their neutral notches the gears 78 and 74 will be unmeshed from any of the transmission gears and the vehicle platform and body will therefore be disconnected from the engine transmission shaft. Normally the platform and body will be thus dis-

connected and will be held longitudinally on the vehicle chassis. If it is desired to tilt the body to dump the load, setting for such movement is first made by swinging lever 84 forwardly into its notch 99, such movement shifting the shaft 73 and bringing its driving pinion into mesh with the gear 37. The lever 83 is then swung rearwardly into its notch 97 to shift the sleeve 75 and to bring its gear 78 into mesh with the idler pinion 72 which meshes with the gear 70 on the engine transmission shaft. The worm and rack mechanism is now connected with the engine transmission shaft and the vehicle body will be slowly and powerfully raised at its front end to be tilted and to dump its contents. After the dumping operation the lever 83 is swung forwardly into notch 96 to mesh the gear 78 with the gear 69 and then the transmission train to the worm gear will be rotated in the opposite direction and the vehicle body will be lowered back into its position of rest on the platform, and then the levers are restored to their neutral notches.

If it is desired to turn the platform before a dumping operation, the lever 84 is swung rearwardly into the notch 100 which brings the pinion 74 into mesh with the gear 34, which gear forms part of the train leading to the annular gear 26 on the platform. After such setting the lever 83 is shifted rearwardly to connect the gear 78 with the idler 72 and then the platform will be rotated slowly and powerfully in one direction. To return the platform the lever 83 is swung to its front position to connect the gears 78 and 69. If after the platform has been swung away from its normal position the load is to be dumped, the lever 83 is returned to neutral position and lever 84 is swung into its front position to connect the gears 74 and 37 and then the lever 83 is swung rearwardly to mesh the gears 78 and 72. Thus for any position of the platform on the chassis the body can be tilted or lowered. Such turning of the platform with the vehicle body is a very desirable feature, particularly in cities where there are street-cars and the traffic is heavy. It is also very useful where the street or alley is not very wide and it would be impossible to back up a long vehicle against and at right angles with the curb or side of a building. With my improved construction the vehicle can be of any length and can be drawn up alongside of the curb or building and the platform then swung around to be at right angles or at any other angle with the chassis to bring the end of the body into proper position for duming the load where desired, and then upon tilting of the body the load will be accurately dumped.

Means are provided for automatically disconnecting the engine transmission shaft from the body tilting train in order to prevent breakage, should the driver fail to manipulate the controlling levers in time. As best shown in Figs. 9, 11 and 12, lever 102 is pivoted intermediate its ends on the plate 80 with its front end projecting into the path of the lever 83 when swung rearwardly. Another lever 103 is pivoted on the plate 80 with its front end projecting into the path of the lever 83 when swung forwardly. Light springs 104 and 105, respectively, tend to hold the levers outwardly with their ends at the ends of the channel 81. On the side of the housing 58 which incloses the worm 61 a lever 106 is pivoted intermediate its ends. A cable 107 is secured to the forward end of the lever and engages around the pulleys 108 and 109 supported on the vehicle platform and around the pulleys 110 and 111 supported on the vehicle chassis, the end of the cable connecting with two branch cables 112 and 113, the branch 112 connecting with the outer end of the lever 102 and the branch 113 connecting with the inner end of the lever 103. On the standard 63 which supports the rack 62 a pin 114 is provided for engaging with the rear end of the lever 106 when the dumping body reaches its normal position after a returning movement. At the base of the standard is secured the bracket 115 having the arm 116 extending forwardly therefrom in position to engage with the forward end of the lever 106 when the body reaches the upper limit of its swing or tilting movement. Whenever the lever 106 is engaged by the pin 114 or the arm 116 it will swing in clockwise direction and will pull on the cable 107 and on the branches 112 and 113 to cause the levers 102 and 103 to swing to bring their inner ends together. Ordinarily, if, when the levers 83 and 84 are set to raise or lower the vehicle body, the driver neglects to restore the lever 83 to neutral position when the body reaches either limit of swing, the worm wheel 61 will continue to be driven and the vehicle engine will be stopped or something will break somewhere along the transmission line, or the worm will strip the teeth off the rack 62. This, however, will be prevented by the levers 102 and 103 which will be swung against the setting lever 83 when the vehicle body reaches its limit of travel, and the setting lever will be shifted back into the neutral notch to disconnect the transmission train from the engine transmission shaft. In order that the levers 102 and 103 may shift the setting lever out of either the end notches 96 or 97, the levers have respectively the beveled or cam surfaces 117 and 118, these surfaces engaging first with the setting lever to shift it laterally out of the respective notch, whereafter the hooked end 119 or 120, respectively, will swing the lever into

position in front of its neutral notch, and then the spring 101 between the levers 83 and 84 will force the setting lever 83 into the neutral notch 95. To permit the setting lever to be more freely shifted out of its end notches by the levers 102 and 103 the inner sides 121 and 122 of the outer notches are beveled or rounded as best shown in Fig. 11.

When the vehicle body is either in its normal down position or in its uppermost position, the cable will be taut and the levers 102 and 103 will be held together to hold the setting lever 83 in its neutral notch. In order to permit setting of the lever 83 in either outer notch for corresponding swing of the vehicle body, springs 123 and 124, respectively, are inserted in the cable branches 112 and 113. When the lever 106 is engaged by either the pin 114 or the arm 116 the tension of the springs 123 and 124 will be sufficient to cause either the lever 102 or 103 to shift the setting lever 83 into its neutral notch, and these springs will permit manual shifting of the setting lever by the operator. However, when the lever 106 is not engaged by the pin 114 or the arm 116 the light springs 104 and 105 acting on the levers 102 and 103 will take up the slack of the cable and will hold the lever 106 against the stop pin 125 extending from the worm housing 58. Thus with my improved safety attachment, the operating train for the platform or vehicle body will be automatically disconnected from the vehicle transmission shaft to prevent injury or breakage.

In order to keep the vehicle body in longitudinal alinement with the platform when it is down, holding plates 126 are secured to the sides of the platform to extend up a distance alongside of the body, as clearly shown in Figs. 5 and 8. I also provide means for locking the platform against turning or swaying when in its normal position on the chassis, that is, during travel of the vehicle. This mechanism comprises locking plates 127 pivoted at one side of the chassis and locking plates 128 pivoted to the opposite side of the chassis. When these plates are in vertical position their upper ends project along and against the sides of the platform to hold it rigidly in alinement on the chassis. The lower ends of the plates 127 are connected by a link 129, the front end of this link being connected to a link 130 which in turn pivots to a link 131, and this last link is pivoted to the lower end of a setting lever 132 which is pivoted intermediate its ends against the side of the vehicle seat S. On the other side of the vehicle the plates 128 are connected at their lower ends by a link 133 whose front end pivots to a link 134. A transverse shaft 135 is journaled on the vehicle chassis and to its ends are secured the arms 136 and 137, the arm 136 being pivoted to the link 130 at an intermediate point thereof and the arm 137 being pivoted to the outer end of the link 134. With this arrangement when the setting lever 132 is swung the locking plates are shifted either into locking engagement with the sides of the platform or are shifted away to release the platform for swing. On the side of the vehicle seat S a notched detent sector 138 is secured for engaging with and locking the lever 132 in its various set positions. To balance the load on the platform and to take off some of the load on the turn table rings, a rail 139 is secured against the under side of the platform at the front end thereof and shoes 140 are provided on the chassis for receiving the rail during turning of the platform.

I do not of course desire to be limited to the exact construction, arrangements and operation shown and described as changes and modifications are no doubt possible which would still come within the scope of the invention.

I claim as follows:

1. The combination with a power driven vehicle comprising a chassis, running gear, driving engine and transmission shaft, of a platform pivoted on said chassis for rotation in a horizontal plane, a load supporting body hinged at its rear end to said platform whereby it may be tilted to dump its load, a counter shaft having a driving pinion thereon, a transmission gearing train connecting with said platform, a second transmission train connecting with said body, means for shifting said countershaft to bring its gear into connection with either of said trains, and means for connecting said transmission shaft in driving relation with said counter shaft.

2. The combination with a power driven vehicle comprising a chassis, running gear, driving engine and transmission shaft, of a platform pivoted on said chassis for rotation in a horizontal plane, a load supporting body hinged at its rear end to said platform whereby it may be tilted to dump its load, a countershaft having a driving pinion thereon, a transmission gearing train connecting with said platform, a second transmission train connecting with said body, means for shifting said countershaft to bring its gear into connection with either of said trains, forward and reverse driving gears connected with said transmission shaft, and a shiftable gear on said countershaft adapted for connection with either said forward or reverse driving gears.

3. The combination with the chassis, running gear, driving engine and transmission shaft of a power driven vehicle, of a platform mounted on said chassis to rotate in a horizontal plane, a load supporting body hinged to said platform to be tilted for load dumping purposes, a transmission train connecting with said platform, a second transmission train connecting with said body, a

countershaft, a driving pinion on said countershaft, a lever for shifting said countershaft to carry said pinion in driving relation with either of said transmission trains, a driving gear and a reversng gear train connected with said transmission shaft, a transmission gear shiftable on but locked to rotate with said countershaft, and a lever for shifting said transmission gear into mesh with either said forward driving gear or said reversing train.

In witness whereof I hereunto subscribe my name this 22nd day of July, A. D., 1918.

ALEXANDER FINKELSTEIN.