

F. S. INGOLDSBY.

DUMP CAR.

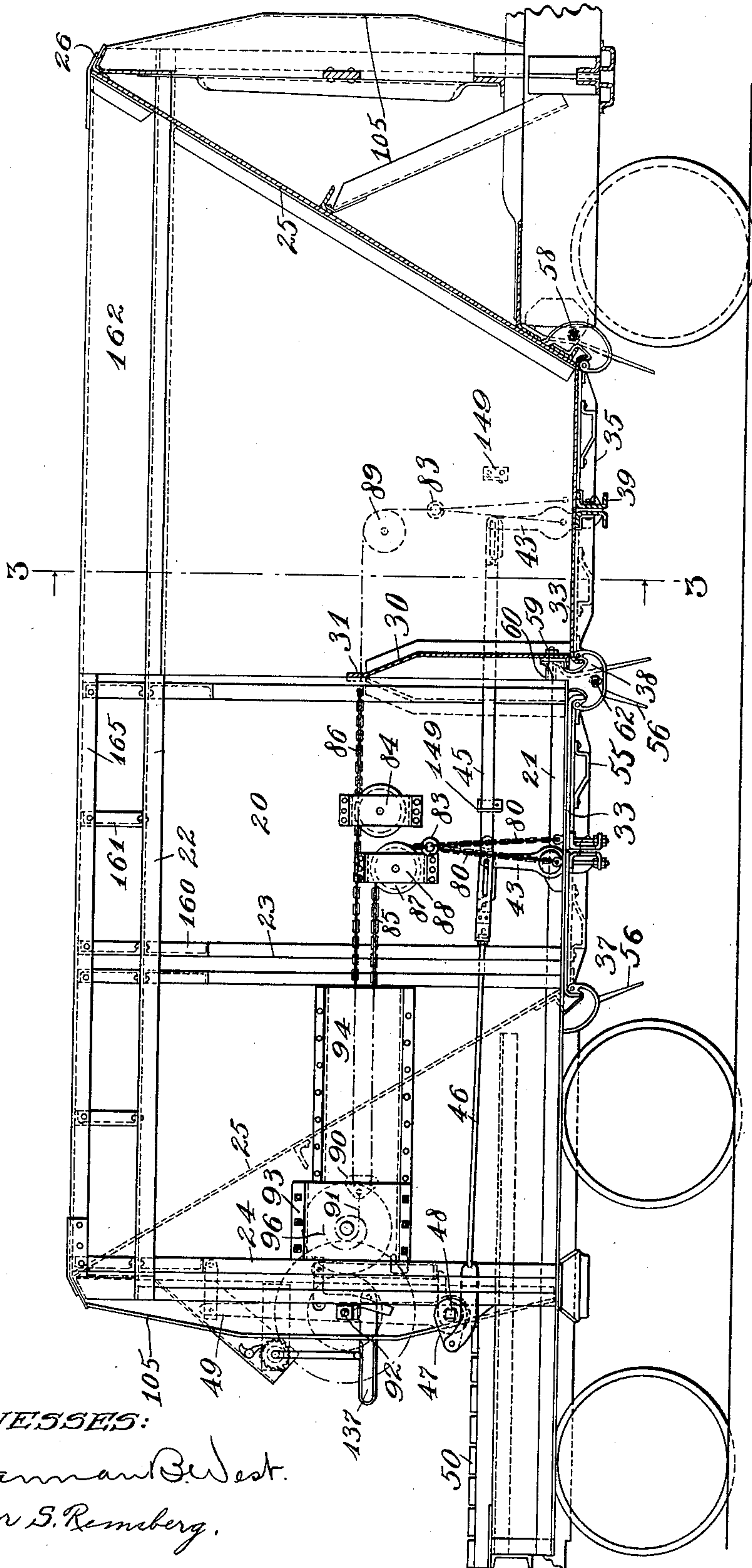
APPLICATION FILED NOV. 26, 1907.

993,450.

Patented May 30, 1911.

5 SHEETS—SHEET 1.

FIG. 1



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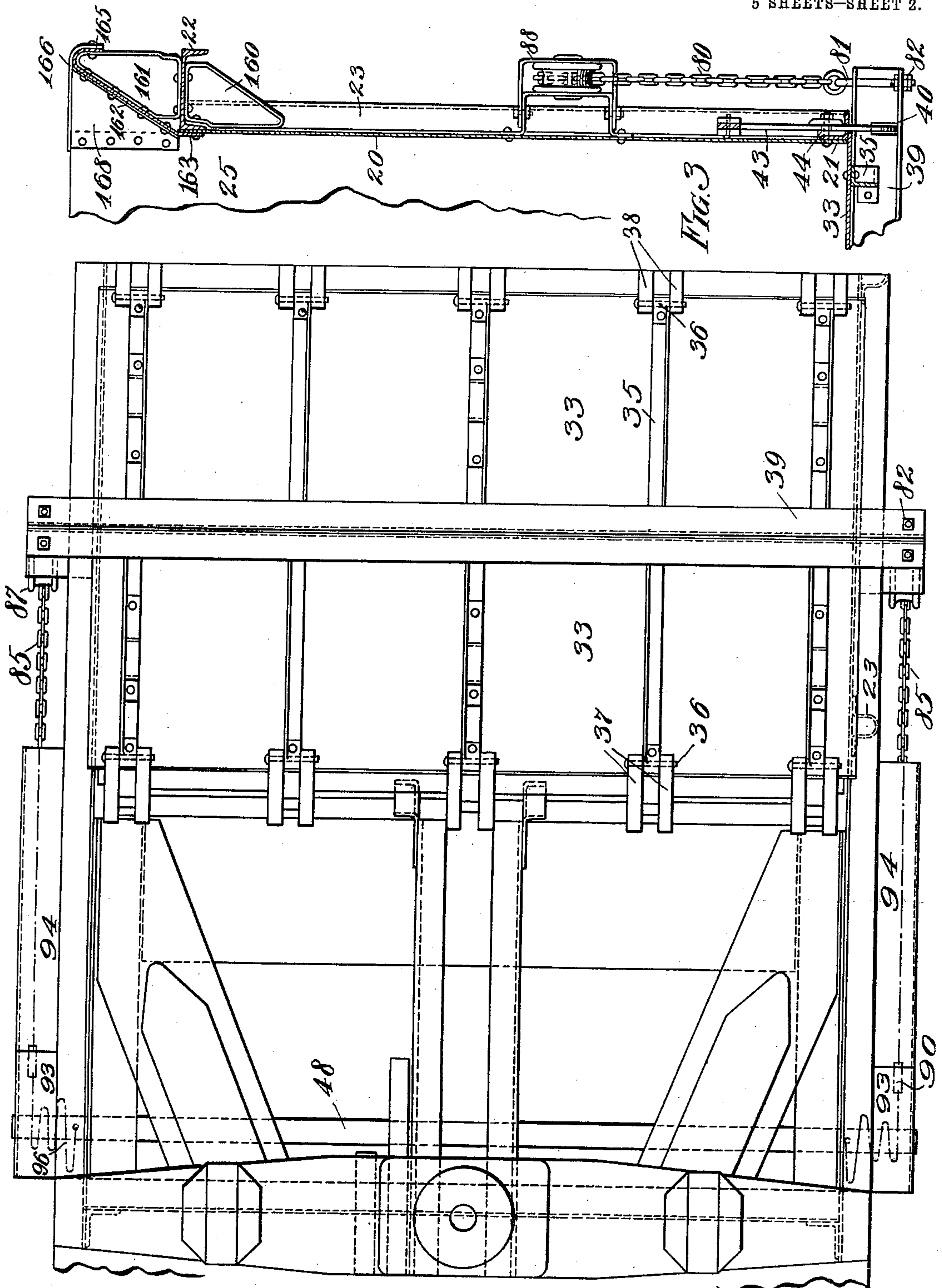
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5 SHEETS—SHEET 2.

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FIG. 2

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5 SHEETS—SHEET 3.

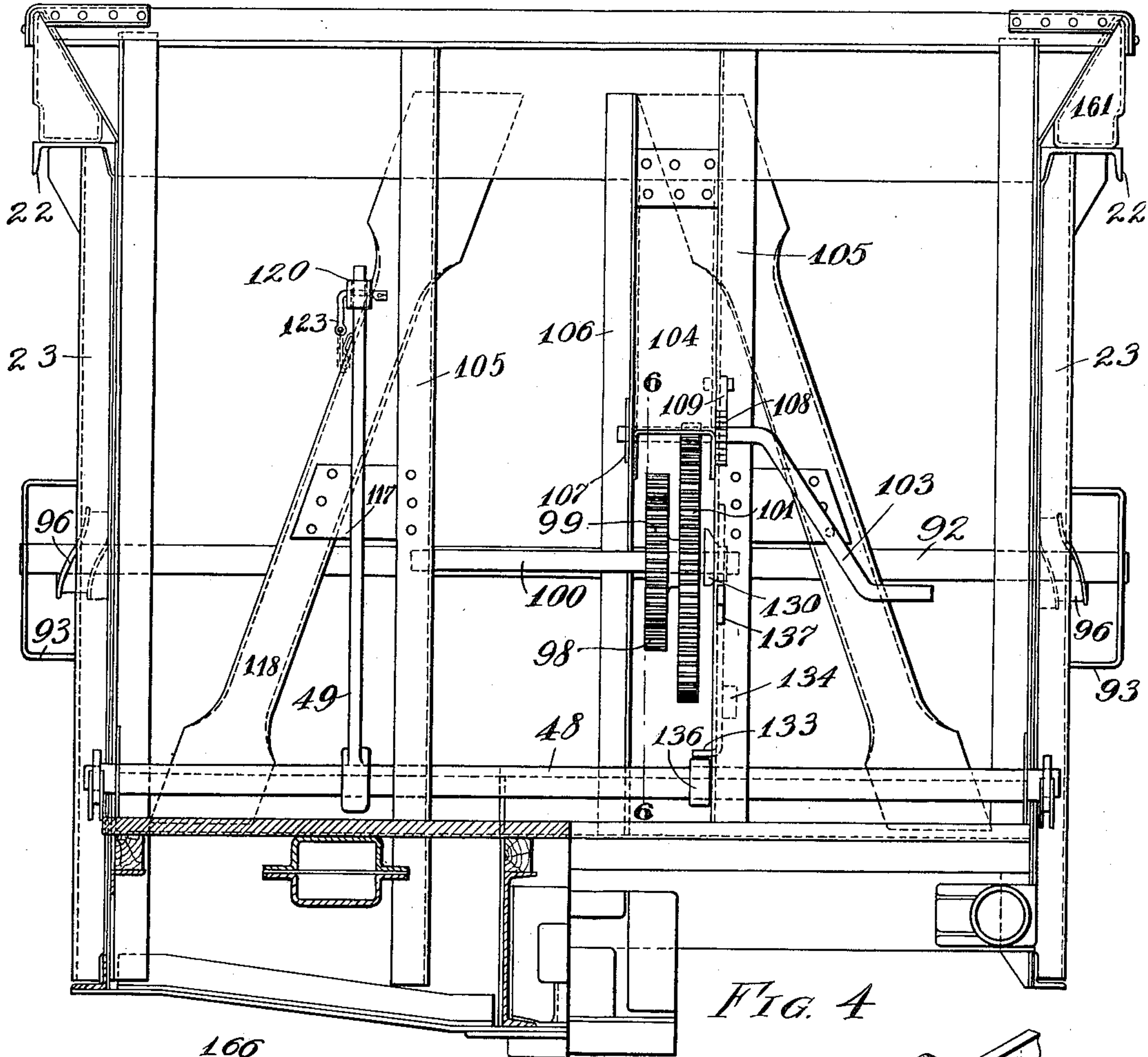


FIG. 4

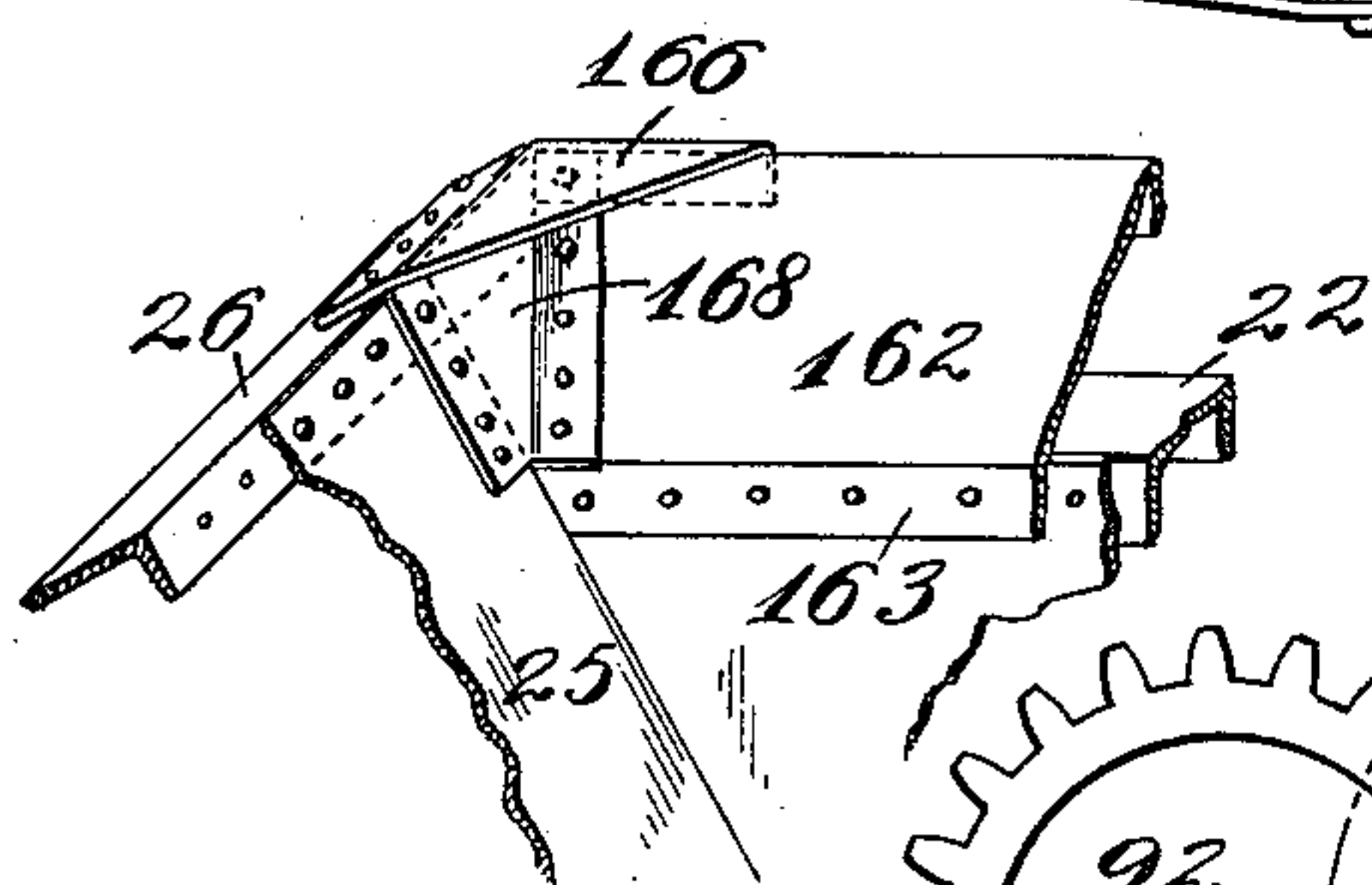


FIG. 5

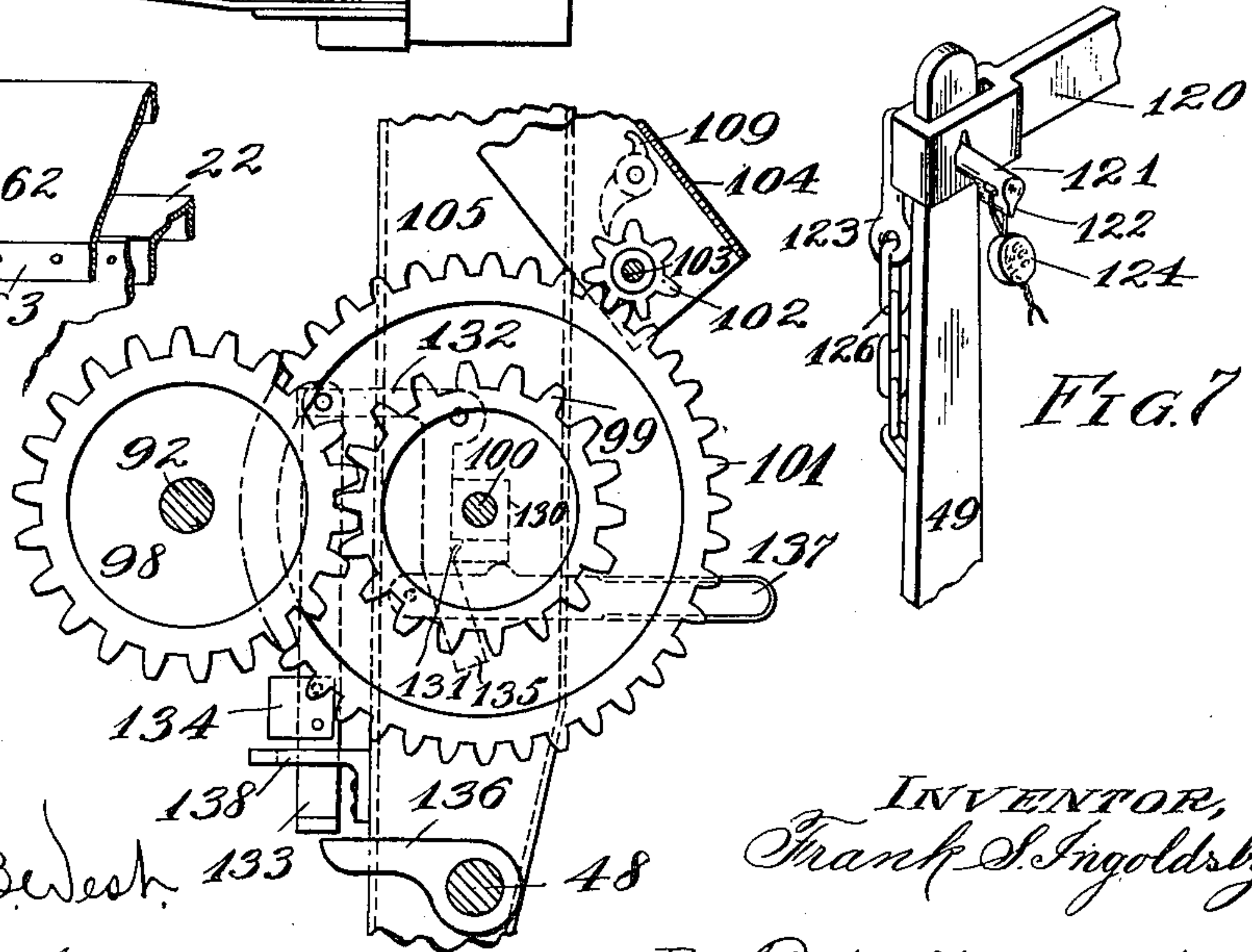


FIG. 6

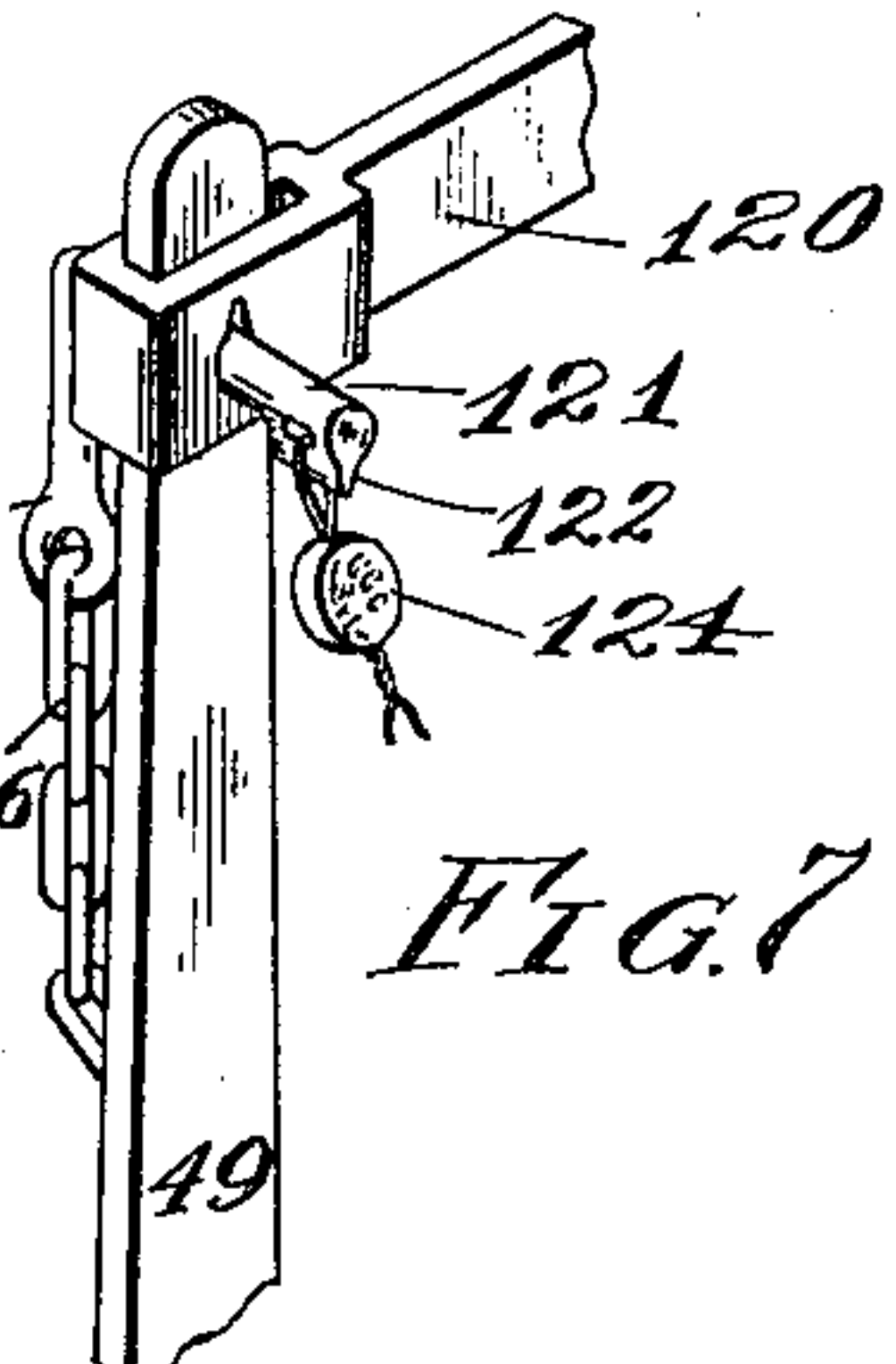


FIG. 7

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5 SHEETS—SHEET 4.

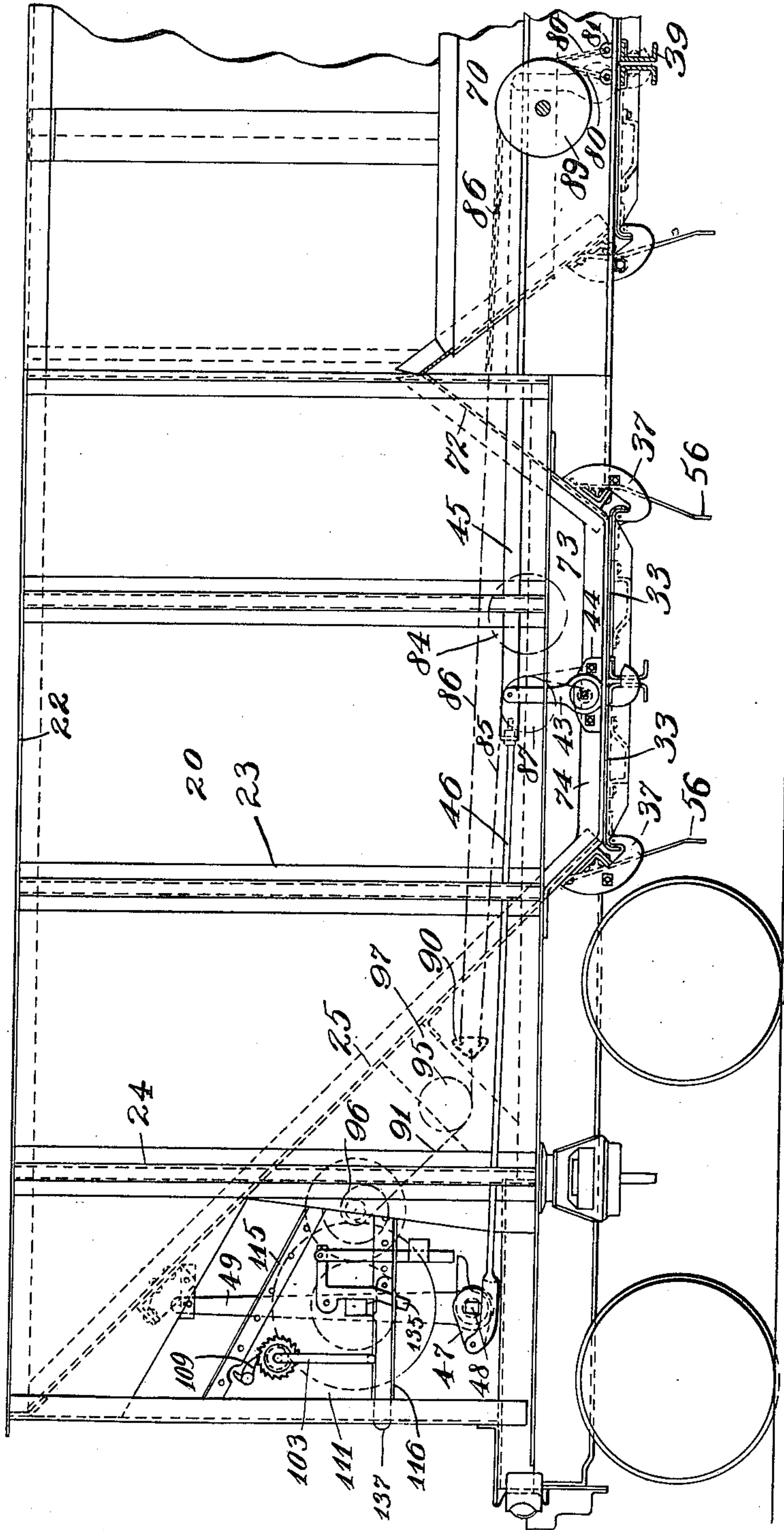


FIG. 8

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UNITED STATES PATENT OFFICE.

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DUMP-CAR.

993,450.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed November 26, 1907. Serial No. 403,919.

To all whom it may concern:

Be it known that I, FRANK S. INGOLDSBY, a citizen of the United States, residing at St. Louis and State of Missouri, have invented a certain new and useful Improvement in Dump-Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

10 The object of this invention is to provide an efficient dump car having transverse dumping doors.

In my car there is not only raising mechanism to return the dropped doors but independent locking mechanism to support the doors when raised. The movement of the locking mechanism to releasing position operates automatically to disengage the raising mechanism.

20 My invention is adapted for cars having a longitudinal center member dividing the car into hoppers each side of the center as well as to cars where such center member is omitted.

25 My invention provides efficient mechanism for raising the doors and for equalizing the raising force between two pairs of doors; it provides means whereby any of the doors may be released without others, or all the doors conjointly; it provides mechanism for disengaging the raising mechanism as the doors are being released and an efficient lock for the locking lever; it provides suitable springs carried by the car to receive the impact of the dropping doors; it provides for bracing the car at all points and for protecting the various portions of the raising mechanism; it provides a very efficient flare top for the car, increasing its carrying capacity and ease of loading and at the same time stiffening the upper chords; and it provides other features contributing to the efficiency of the car, as will be apparent from the following description.

45 The drawings illustrate my invention embodied in two forms of transverse dumping cars, one having a bottom substantially on the level of the side sills and having a transverse member dividing the car into two hoppers, and the other having a bottom depressed below the line of the side sills and having in addition to the transverse member a longitudinal center member, whereby the car is divided into four hoppers. It is

to be understood, however, that the invention is not limited to these particular number of hoppers. In short cars it might be reduced to a single hopper and in an extra long car increased over that shown. 60

Figure 1 is a side elevation of a car having no longitudinal center member but a transverse member dividing the car into two hoppers; Fig. 2 is a bottom plan of a portion of such car; Fig. 3 is a vertical section through one of the sides of such car, as indicated by the line 3—3 of Fig. 1; Fig. 4 is an end view of such car; Fig. 5 is a perspective of one of the upper corners of the car looking from the interior of the car and illustrating the flare top; Fig. 6 is a sectional elevation of the winding gear, as indicated by the line 6—6 of Fig. 4; Fig. 7 is a perspective showing the lock for the upper end of the main operating lever; Fig. 8 is a side elevation of a portion of the car having a longitudinal center member; Fig. 9 is an end view of such car; Fig. 10 is a side elevation of a pair of locking levers and their operating link adapted to be carried on the car side; Fig. 11 is a plan of such mechanism; Fig. 12 is a perspective of the mechanism at the junction of the locking lever and operating link. 75

A number of the features of the present car are shown and claimed broadly in my prior application No. 397,900, filed Oct. 17th, 1907, the present invention being an improvement on the structure shown in such prior application. 85

As shown in the various drawings, 20 represents the plate girder side of the car, which is provided with a lower chord 21, upper chord 22, and vertical stiffeners 23. Leading upward from the bolsters are vertical main struts 24, 25 indicates sloping end floors which extend diagonally downward from cross beams 26 carried by the upper ends of the car. 90

In the form of the car shown in Figs. 1 to 4 inclusive, the raising chains are on the outer sides of the car and the car body terminates at the strut rising from the bolsters; while in the construction shown in Figs. 8 and 9 the chains are housed in a longitudinal center member leading from bolster to bolster, and the car body is shown as extending beyond the bolsters. 100

I will first describe the construction of Figs. 1 to 4. In this car, as shown, there is 110

a transverse center member 30 dividing the car into two hoppers. This center member consists of two plates a short distance apart and having sides parallel for some distance from their lower ends and near their upper ends bent inwardly toward each other, the extreme upper ends being riveted together as shown at 31. This beam is of sufficient depth to make a lateral brace for the car sides, and at the same time is so narrow that it uses little valuable space in the car body. 33 represents dumping doors which extend transversely of the car body and form the bottom of it between the lower ends of the inclined floors and the transverse member 30. These dumping doors have reinforcing floor beams 35 on their undersides which carry hinge eyes 36. Extending through these eyes are hinge pintles which extend into hinge castings 37 and 38 carried respectively by the underside of the inclined end floors and by the center member 30. These castings are recessed to allow the surface of the door to curve over the pintles so as to make a tight connection with the surface of the supporting member whatever the position of the doors. The doors are arranged in pairs, as shown. At their free cooperating edges they are provided with transverse channel beams 39 onto which the floor beams 35 are flanged and riveted. The channel beams 39 extend beyond the sides of the car as shown in Figs. 2 and 3, where their webs have holes 40 which are adapted to be occupied by the hooked ends of supporting levers 43 pivoted on bosses 44 secured to the sides of the car at suitable points. As shown, these bosses are mounted on the upward flange of the lower chord 21, thus making a very strong construction. The lower ends of the supporting levers 43 are hooked and beveled so that when they engage the channel beams they draw the doors tightly up against the lower edge of the car side. In this position, the channel beams 39, by reason of their webs engaging the outer surface of the levers, form ties across the car, preventing any outward bulging. A very tight joint is thus effected. The upper ends of the levers 43 are connected by links 45 and 46 with a rock arm 47 on a shaft 48 on which is a main operating lever 49. As shown in Fig. 1, this lever is placed intermediately of the car sides at the end of the body and stands vertical when the doors are locked. When it is swung down into a more or less nearly horizontal position above the end platform 50, the levers 43 are thereby rocked to release the doors, allowing them to drop. When the released doors swing downward, bumping plates 55 on their lower sides engage bumper springs 56 carried by the car, these springs receiving the impact of the doors and preventing any injury to the raising chains. As shown, the springs are

each located between two cooperating sections of the hinge castings. The innermost springs are secured near their upper ends to the undersides of the inclined end floors and pass over and bear against filling blocks 58 separating the parts of the hinge casting 37. For this filling block I prefer to use a piece of pipe through which a bolt passes, this making it a tie as well. At the center of the car the springs may be secured at their upper ends by the same bolts 59 which secure the hinge castings 38, the springs lying between the inner faces of the webs and the tubular strut 60 surrounding the bolt. Beneath their upper ends these central springs lie on opposite sides of the strut-tie 62 and are adapted to bear against it.

The above description of doors, locking mechanism and bumper springs apply substantially also to the form of car shown in Figs. 8 and 9. There there is a longitudinal center member 70 extending from bolster to bolster. At the center of the car there extends between this member and the sides a transverse ridge 72. The surface of this ridge and the inclined end floors are extended downwardly beneath the side sills, and the car sides have extension plates 73, thus increasing the size of the hoppers. The locking levers are journaled on castings 44 bolted to the lower reinforcing member 74 of these extension plates. The upper ends of the locking levers are connected by links 45 and 46 with the rock arm 47, rock shaft 48 and main locking lever 49, as already described. The construction of the doors 33 with the floor beams, etc., is the same as that already described, and the hinge castings 37 and the bumper springs 56 are the same as those above described for the outermost doors. In Figs. 8 and 9 the construction is the same for the innermost doors, the treatment of the lower edge of the transverse ridge 72 being substantially identical with that of the lower edge of the inclined end floors. In each type of car, the employment of the bumper springs, holding the doors away from the wheels allows an increased door opening and steeper end slope.

In Figs. 1 to 4, the raising chains are on the outer sides of the car, chains 80 lead upwardly from eyes 81 extending through the flanges of the channel beams 39 and adjustably secured by nuts 82. The upper ends of these chains meet in an eye 83. Leading upward from this eye is a single chain for the two doors of the pair. Where two pairs of doors are employed, as shown in Fig. 1, there are two of these common chains as indicated by 85 and 86. They pass over pulleys 87 and 89 secured in straps 88 riveted to the sides of the car and pass toward the end of the car where they are connected with a yoke 90. An extra pulley 84 is provided to receive and support the chain 86

when it is slackened. From the midpoint of the yoke 90 a common chain 91 leads to the winding shaft. It is to be understood that this mechanism is duplicated on the two sides of the car. The winding shaft 92 (as shown in Fig. 4) extends crosswise of the car from out to out beneath its inclined end floor and has its bearings in the side plates of the car. On the outer sides of such plates this shaft is provided with tapered helical or conchoidal drums 96, which act also as collars holding the shaft against lateral movement, and outside of these drums are journaled housings 93 bolted to the car sides. Within these housings the chains run onto the respective drums. When the doors have been dropped and the winding begins, the chains run onto the largest periphery of the drums, but as the doors approach the horizontal so that the larger portion of the weight comes onto the chains, the chains ride down onto a portion of the drums having shorter radius and finally onto the shaft 92 itself. The chain, as it winds onto the drum, moves outwardly thus effectively clearing the sides of the car and preventing any rubbing when the chain is under tension. Between the housings 93 and the first vertical stiffener 23, I provide a longitudinal casing 94 riveted to the car sides and extending over the chains. These casings 93 and 94 not only protect the chains but support them when they are slackened without the doors being released. The casing 93 is preferably bolted in place to allow its convenient removal.

In the form shown in Figs. 8 and 9 the course of the winding chains is similar, except but one set thereof is employed, at the center of the car. The chains 80 are secured to eyes 81 secured to the channel beams 39 at their centers. The chains 85 and 86 leading from these pass over the pulleys 87, 89 and 84 and are connected to an equalizing yoke 90, from which a common chain 91 leads beneath a guide sheave 95 (carried by diagonal plates 97 leading from the bolster to the inclined end floor), thence the chain 91 passes onto the spiral drum 96 located in the center plane of the car and mounted on the main winding shaft 92. The construction is thus similar to that described for the other type of car.

For rotating the shaft 92 in either form of car to raise the doors, I provide the following mechanism. Mounted on this shaft is a gear 98 meshing with a gear 99 on the shaft 100. Rigid with this gear 99 is a main gear 101 with which meshes a pinion 102 on the shaft of the crank 103. In the form shown in Figs. 4 and 6 the crank shaft 103 is mounted in the side plates of a diagonally projecting trough-shaped member 104 which also forms a roof over the gearing, preventing any lodgment of material there-

on. This trough-shaped member lies on one side against the bulging end post 105 and on the other against the lighter vertical post 106. It is braced to the lighter post by the plate 107. The ratchet 108 is on the crank shaft on the outer side of the trough-like member 104 and the pawl 109 is pivoted to such member. The end posts 105 are preferably formed as shown in Fig. 1 to bulge intermediately in a longitudinal plane, thereby increasing their strength. The flanges of the end post give it strength transversely, and this transverse strength is materially increased by the gusset plate 117 which I rivet to one of these flanges and to the diagonal 118.

In the form shown, Figs. 8 and 9, the crank shaft 103 is mounted in a plate 111 which bridges from the main web plate stiffener angle 119 of the bolster to the end post 112 of the car, the extreme end of the crank shaft being journaled in a bracket 113 carried by this plate. Pawl 109 is also carried by the plate 111. This plate 111 is braced by suitable angle members 115 and 116.

In each form of construction the operation of raising the doors is substantially the same. The crank is rotated, rotating the main shaft 92 which winds in the chains to elevate the doors, and as the doors are brought home or nearly home (the pull being equalized onto the two pairs of doors by the yoke 90) the locking lever is thrown upward, causing the hooks 43 to engage the projecting channel beams of the doors and draw the doors snugly into place. It will be seen clearly from Fig. 10 that these hooks are beveled on their faces so that they may exert a considerable upward pull on the doors during this closing operation.

The closing operation is effected by raising the main operating lever 49 from approximately a horizontal position into a vertical position at the end of the car. In this position it may be securely held by a latch bar 120 pivotally carried by the car and having an eye or sleeve portion adapted to extend over the upper end of the lever, as shown in Fig. 7. When in this position, openings in the lever and sleeve align and the locking pin 121 may be passed through these openings. This pin is preferably provided with a ward 122 which allows its passage only when the handle portion 123 is turned upward. After the passage, the weight of such handle portion swings the pin into position where the ward holds it against accidental displacement. A sealing wire 124 may be passed through this pin preventing its removal without breaking the seal, whereby tampering with the load without detection is avoided. A suitable chain 126 may hold the pin to the end of the car.

It is to be noticed that the main operating

lever 49, when it is in unlocked position, stands out over the end of the platform of the car, and is thus a visible and forceful reminder of the fact that it must be put back in place, thus insuring the locking of the doors after they have been raised by the winding mechanism.

When the lever is thrown downwardly to release the doors, it is desirable that the raising mechanism be disengaged to prevent the crank being violently thrown around and doing possible damage. I accomplish this by carrying the end of the shaft 100 adjacent to the gears in a movable box 130 which is normally supported on a catch 131 on a bell crank 132, from which leads downwardly a bar 133 carrying a weight 134, which insures said bar being always in proper position above the operating member 136. Projecting from the rock shaft 48 is a rock arm 136 which extends beneath the bar 133 and raises that bar whenever the lever is swung outwardly to release the doors. This raising movement of the bar swings the bell crank to release the box 130, whereupon that end of the shaft 100 and the gears carried by it drop downward a short distance, releasing the engagement between the gear 101 and the pinion 102. After the doors have dropped, the raising gear is brought back to initial position by means of the lever 137 which may be raised by hand to raise the box 130. When the lever 49 is returned to locked position after the doors have been elevated, the arm 136 engages the front side of the bar 133 and simply swings it rearwardly until it clears the bar, a sufficient space being provided for this in the guiding clip 138. The weight 134 brings the bar 133 back into place by gravity. The lower end of the bell crank 132 projects downwardly, as shown at 135, to furnish means by which this mechanism may be pushed backward independently of the operating lever. All one has to do is to push with his foot on the lower end of the arm 132 (as shown at 135) which is bent outwardly so that it is convenient for this operation.

It is frequently desirable to be able to dump either pair of doors independently of the other. Mechanism for this purpose is shown and broadly claimed in application No. 402,181, filed Nov. 14, 1907, by Joseph R. Bowling, such application showing means whereby each locking lever may be released from the operating link and locked in stationary position. In the present invention, I provide an improvement on the mechanism shown in Mr. Bowling's application. This is shown in Figs. 1, 10, 11 and 12, and consists of a suitable dog pivotally carried by the locking hook and serving to lock that hook to the link or to a stationary abutment.

As shown, each hooked lever 43 is con-

nected at its upper end with the corresponding operating link by means of a pin 143 passing through the upper end of the lever and occupying a slot 144 in the forked end 145 of the link, the lever occupying such forked end. When the main locking lever 49 is in closed position, the links are drawn to their extreme position at the left, as shown in Figs. 1 and 10, whereupon the end of the slot 144 engaging the pin 143 absolutely holds the lever in locked position. Pivoted on the same pin 143 is the dog 147, which is adapted to swing down into the fork 145 and rest on the pin 148 extending across that fork. In this position the dog forms a distance block locking the hook to the link, so that any movement of the link toward the right also moves the locking hook to release the doors, such position of the hook being shown in dotted lines in the left hand position of Fig. 10.

When it is desired to release the lever 43 from the link and still keep that lever locked, the dog 147 is simply swung through 180 degrees, causing it to abut the stop 149 riveted to the car side, the dog in this position resting upon a projecting lip 150 of this stop, or upon the pin 152, the dog being recessed on its upper side to allow this. In this new position the hook 43 is released from the operating link, but is locked against any movement to release the doors, the floor beams of the doors preventing any movement in the opposite direction. The link 45 is suitably connected with the link 46 as by being pivoted to a projection of the fork, as shown at 152. In its normal position the lower edge of the dog extends below the fork, whereby it may be conveniently dislodged by a blow on its under side. It will be seen that this dog provides an extremely simple mechanism for positively connecting the hooks with the links, or for releasing such hooks and independently locking them. When any hook is released and locked, the operating lever may throw the other hooks as usual. The mechanism is easily operated and has no loose parts which might get lost, and this dog 147 shows at a glance whether or not it is in the position desired. When the main lever 49 is in locked position, the doors are absolutely locked by the end of the slots 144 bearing on the pins 143, so that no operation of the dog could cause the opening of the doors, and thus the one seal 124, heretofore referred to, locks the entire car.

It is to be particularly noted that in each of the two types of cars illustrated, the parts of the winding mechanism, locking mechanism, doors, supporting hinges, and springs are identical. In the flexible connection the same chain and supporting pulleys can be used, the same eye-bolts, equalizing yoke and helical drum; and the drum shaft may be of the same diameter in the two types of cars,

being simply shorter in the car having the longitudinal center member. My mechanism is thereby of practically universal application for all types of cross-dumping cars.

5 This universality and interchangeability of parts materially decreases the number of repair parts which are required to be kept on hand, where railroads, industrial concerns, or others, have cross-dumping cars
10 of more than one type in their service; and this is also exceedingly valuable to the manufacturer or builder of cross-dumping cars, as it simplifies and cheapens the work of construction, and the purchase of supplies. It is
15 to illustrate this important and valuable interchangeability that two types of cross-dumping cars are shown in this application.

I provide a flare top for the car, increasing its carrying capacity, making it easier to
20 load, preventing the lodging or spilling of material, and stiffening the upper chord. This flare top is broadly claimed in my application referred to. I show it herein in an improved form, as follows: The upper
25 chord of the car side is a channel beam 22 riveted to the side and projecting horizontally with its flanges downwardly. Beneath such channel I mount flanged bracket plates 160 which stiffen and support the outstand-
30 ing web, these brackets being preferably on the webs of each stiffener 23 and 24. Above these bracket plates and secured to the web by the same rivets are similar flanged bracket plates 161 placed above each stiffener 23 and
35 24, and also between them. These upper plates have their outer edges substantially vertical and their inner edges inclining at a suitable angle. Mounted on the inner face of the brackets are plates 162 which constitute the
40 diagonal walls of the flare top. These plates extend downwardly onto the inner side of the car at 163 and are riveted by the same rivets which secure the channel beam 22 and the bracket 160 in place. From this upper
45 edge of the car side these plates 162 extend upwardly and outwardly, being riveted to the flange of the bracket 161. At the upper edge the plate 162 is curved over the bracket and extends downwardly onto the outer side
50 a short distance, as shown at 165, and is there riveted to the outer flange of the bracket. The two brackets 160 and 161 may be of identical form for simplicity of manufacture.

55 At the corners of the car, I provide the triangular plate 166 extending over and riveted to the side of the flare top plate 162 and riveted also to the cross beam which supports the upper end of the inclined floor, this
60 cross beam being shown as an angle member. At this corner I fill in the space between the sheet 162 and the inclined end floor by a plate 168 riveted thereto. The described construction of flare top is well braced, simple
65 and effective.

It will be seen that my car has numerous advantages, among which may be mentioned very wide door openings and steep slopes, insuring free discharge of the load; door closing means which can be easily operated
70 by one man to close the whole car; positive and certain locking of the cars when closed, so that they cannot be opened partially or wholly during transit without breaking the seal; simple and efficient mechanism en-
75 abling any of the doors to be released without the release of the others, as desired; an effective cross tie by reason of the locking levers and the floor beams; efficient disengagement of the raising mechanism when
80 the doors are released, so that no one can be injured by the revolution of the crank handle; effective bumper springs to receive the impact of the doors when they drop, saving them and also the chains which raise the
85 doors; an efficient flare top, increasing the carrying capacity, increasing the ease and economy of loading, preventing lodgment of material, and stiffening the upper chords; and various other features hereinbefore de-
90 scribed.

Having thus described my invention, I claim:

1. In a dump car, the combination of a plurality of transversely extending dump-
95 ing doors arranged in pairs, flexible raising members for the different doors, a single winding mechanism, and means for equalizing the pull for the different pairs of
100 doors.

2. In a dump car, the combination of transversely extending doors arranged in pairs, two flexible raising members connected independently with two pairs of doors,
105 a yoke to which the two raising members are connected, and a single winding member connected with said yoke.

3. In a dump car, the combination of transversely extending doors arranged in pairs, flexible raising members on each side
110 of the car connected independently with two pairs of doors, two yokes to which the two members on the two sides are respectively connected, and flexible members connected with said yokes.
115

4. In a dump car, the combination of a plurality of transversely extending dump-
120 ing doors arranged in pairs, raising chains for the different doors, a single winding mechanism, and an equalizing yoke between the same and said chains equalizing the pull for the different pairs of doors.

5. In a dump car, the combination of dumping doors, a winding shaft, flexible
125 mechanism between the two, a driving pinion, gearing connecting the same with the winding shaft, and a counterweighted mechanism for holding the gearing in connection with the pinion but allowing it to
130 be disengaged therefrom.

6. In a dump car, the combination of dumping doors, a winding shaft, flexible mechanism between the two, a driving pinion, gearing connecting the same with the winding shaft, a counterweighted mechanism for holding the gearing in connection with the pinion but allowing it to be disengaged therefrom, locking mechanism for the doors, and means for automatically throwing the disengaging mechanism when the locking mechanism is thrown.

7. In a dump car, the combination of dumping doors, a winding shaft, flexible mechanism between the two, a driving pinion, gearing connecting the same with the winding shaft, a counterweighted mechanism for holding the gearing in connection with the pinion but allowing it to be disengaged therefrom, and a lever for replacing the disengaged gearing.

8. In a dump car, the combination of dumping doors, a winding shaft, flexible mechanism between the two, a driving pinion, gearing connecting the same with the winding shaft, a counterweighted mechanism for holding the gearing in connection with the pinion, but allowing it to be disengaged therefrom, means for disengaging the gearing automatically when the doors are released, and means for disengaging the gearing independently of the door release.

9. In a dump car, the combination of door closing mechanism including a pinion and gear, a bell crank sustaining the gear in engaging position, a depending bar connected with the bell crank, a weight for holding the bell crank in engaging position, and means for raising the bar.

10. In a dump car, the combination of dumping doors, mechanism on the sides of the car for holding the doors closed, a rock shaft extending crosswise of the car, arms on the ends of the rock shaft connected with said locking mechanism on the two sides of the car, and a lever on the rock shaft between its ends.

11. The combination with dumping doors, locking hooks therefor on the sides of the car, a through rock shaft extending crosswise of the car near one end, arms on the end of said rock shaft, a lever for operating said rock shaft, and links connecting the arms with the hooks, said links passing to the arms on the under side of the axis of the rock shaft.

12. In a dump car, the combination of locking mechanism, a lever for operating it, a latch for the lever, said latch and lever being provided with openings adapted to align, and a pin adapted to extend through such aligned openings, said pin and openings having cooperating features preventing the removal of the pin in normal position.

13. In a dump car, the combination of dumping doors, hinges for carrying the

same, and bumper springs carried by the car and depending between adjacent members of the hinges.

14. In a dump car, the combination of dumping doors, hinges for carrying the same, bumper springs carried by the car and depending between adjacent members of the hinges, and filling blocks carried by such members against which the spring bears below its point of securement.

15. In a dump car, the combination of a dumping door having a projecting floor beam, a hole through such beam, and a locking hook adapted to extend through such hole.

16. In a dump car, the combination of a dumping door having a projecting floor beam with a vertical web, a hole through such web, and a locking hook adapted to extend through such hole.

17. In a dump car, the combination of a transverse dumping door, a rolled beam having a vertical web secured to such door near its free edge, a hole through such web, and a locking lever pivoted on the car side and having a hooked lower end adapted to extend through such hole.

18. In a dump car, the combination with the car sides, ends, and bottom, of end posts bulging intermediately to present an extended web in the longitudinal direction of the car, dumping doors, and raising mechanism therefor mounted on one of such end posts.

19. The combination of a dumping car having flexible members on its sides, winding mechanism therefor, and readily removable casings on the outer sides of the car through which such members extend and which may support the members when slack.

20. In a car, the combination of longitudinally bulging end posts, diagonal posts and gussets connecting the same.

21. In a dump car, the combination of a locking lever, a link for operating it, and a dog pivoted to the lever and serving to lock it to the link or to a stationary abutment.

22. In a dump car, the combination of a locking lever, a slotted link, a pin carried by the lever and extending through such slot, and a dog pivoted to the lever and adapted to block the movement of the lever in the direction allowed by the slot.

23. In a dump car, the combination of a locking lever, a slotted link, a pin carried by the lever and extending through such slot and a dog pivoted on such pin and adapted to block the movement of the lever in the direction allowed by the slot.

24. In a dump car, the combination of a locking lever, a forked and slotted link embracing it, a pin occupying the lever and slot, and a dog mounted on said pin and serving to lock it in the fork of the link or to a stationary abutment.

25. In a dump car, the combination of a locking lever, an operating link, a pin on the lever occupying a slot in the link, a dog pivoted on such pin, a stationary abutment, the dog being adapted to occupy one position locking the lever to the link and another position locking the lever to the abutment.

26. The combination with a car having an upper chord with a laterally projecting portion, of a bracket above such portion, and an inclined plate secured to said bracket and providing a flare top.

27. The combination of a car side, an upper chord, similar brackets above and below it, and a plate carried by the upper bracket.

28. The combination with a car having an upper chord with a laterally projecting portion, of a bracket above such portion, an inclined plate secured to said bracket, and a bracket below the chord.

29. The combination with a car having vertical stiffeners on its sides and upper chords with laterally projecting portions, of brackets above such portion, an inclined plate secured to said brackets, and brackets below the chord and bearing against the vertical stiffeners on the car side.

30. In a dump car, the combination of an inclined end floor extending over the truck, a dumping door hinged at the lower end of the end floor and adapted to swing downwardly toward the truck, and means adapted to engage the under side of the door and limit its swing, whereby the size of the door opening may be increased and the said door when dropped not interfere with the wheels.

31. The combination of a shedding surface, a dumping door hinged thereto, and a bumper spring carried by such surface.

32. In a dump car, the combination of an inclined end floor, a transverse door, hinges for the door secured to the under side of the end floor, and a bumper spring for the door secured to and depending from the under side of the end floor.

33. In a dump car, the combination of door raising mechanism, locking mechanism for the doors when raised, a lever for operating the locking mechanism, an arm movable with said lever, and mechanism for disengaging the raising mechanism, including a member hanging by gravity over said arm.

34. In a dump car, the combination of door raising mechanism, including a pair of meshing gears, means for releasing one of said gears and allowing it to drop by gravity out of mesh, and a lever adapted to be moved

to return such dropped gear, said lever being so pivoted as not to be moved when the gear drops.

35. In a dump car, the combination with dumping doors, of flexible raising mechanism on the sides of the car, a shaft extending crosswise of the car, drums on said shaft near its ends acting as collars to prevent the lateral displacement of the shaft, the flexible raising mechanism winding onto said drums.

36. In a dump car, the combination of door raising mechanism, a crank rotating in a plane longitudinal of the car to operate the raising mechanism, and means for disengaging the raising mechanism at a point between the crank and the door.

37. In a dump car, the combination of door raising mechanism, a crank rotating in a plane longitudinal of the car to operate the raising mechanism, means for disengaging the raising mechanism at a point between the crank and the door, means for supporting the doors when raised, and means for automatically causing the said disengagement preceding the release of the doors.

38. In a dumping car, the combination of end posts bulging intermediate their ends to present an extended web in the longitudinal direction of the car, a shaft journaled in said web and means for operating the said shaft.

39. In a dumping car, the combination of end posts bulging intermediate their ends to present an extended web in the longitudinal direction of the car, a shaft journaled in said webs, and a winding mechanism operated by said shaft.

40. The combination of a girder side having stiffeners, locking mechanism extending through the stiffeners and raising mechanism extending outside the stiffeners.

41. The combination with a car side having vertical stiffeners, pivoted locking hooks supported by the side, an operating link connecting with said hooks and extending through openings in the stiffeners, pulleys carried by the car sides, and flexible raising mechanism passing over the pulleys outside of the stiffeners.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

FRANK S. INGOLDSBY.

Witnesses:

JOSEPH R. BOWLING,
EDWARD J. MEDILL.