No. 831,966. PATENTED SEPT. 25, 1906.

P. J. MAUGER.

DUMPING AND ELEVATING APPARATUS.

APPLICATION FILED MAR. 15, 1906.

6 SHEETS—SHEET 1.

Fig. 1.

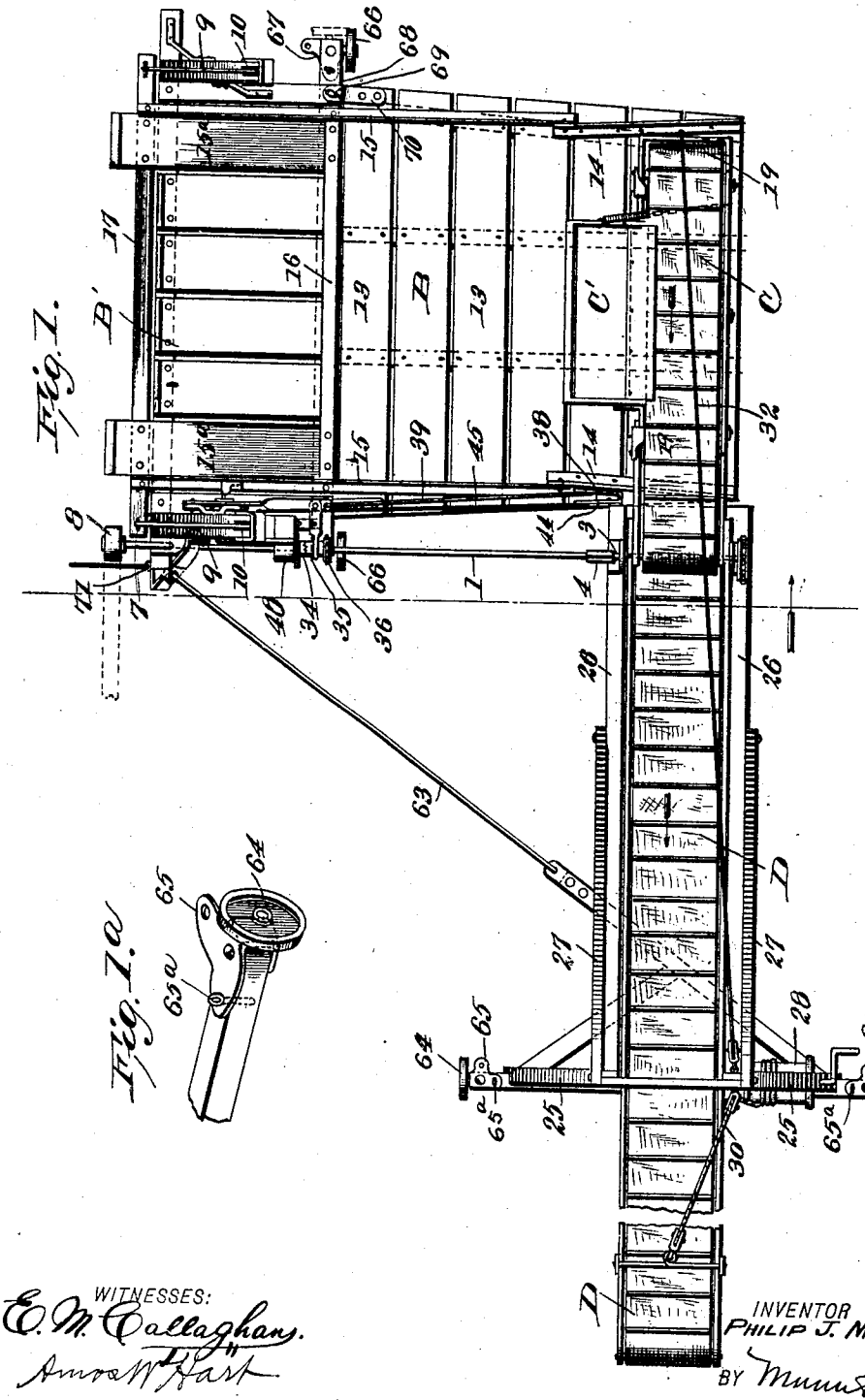


Fig. 1a.




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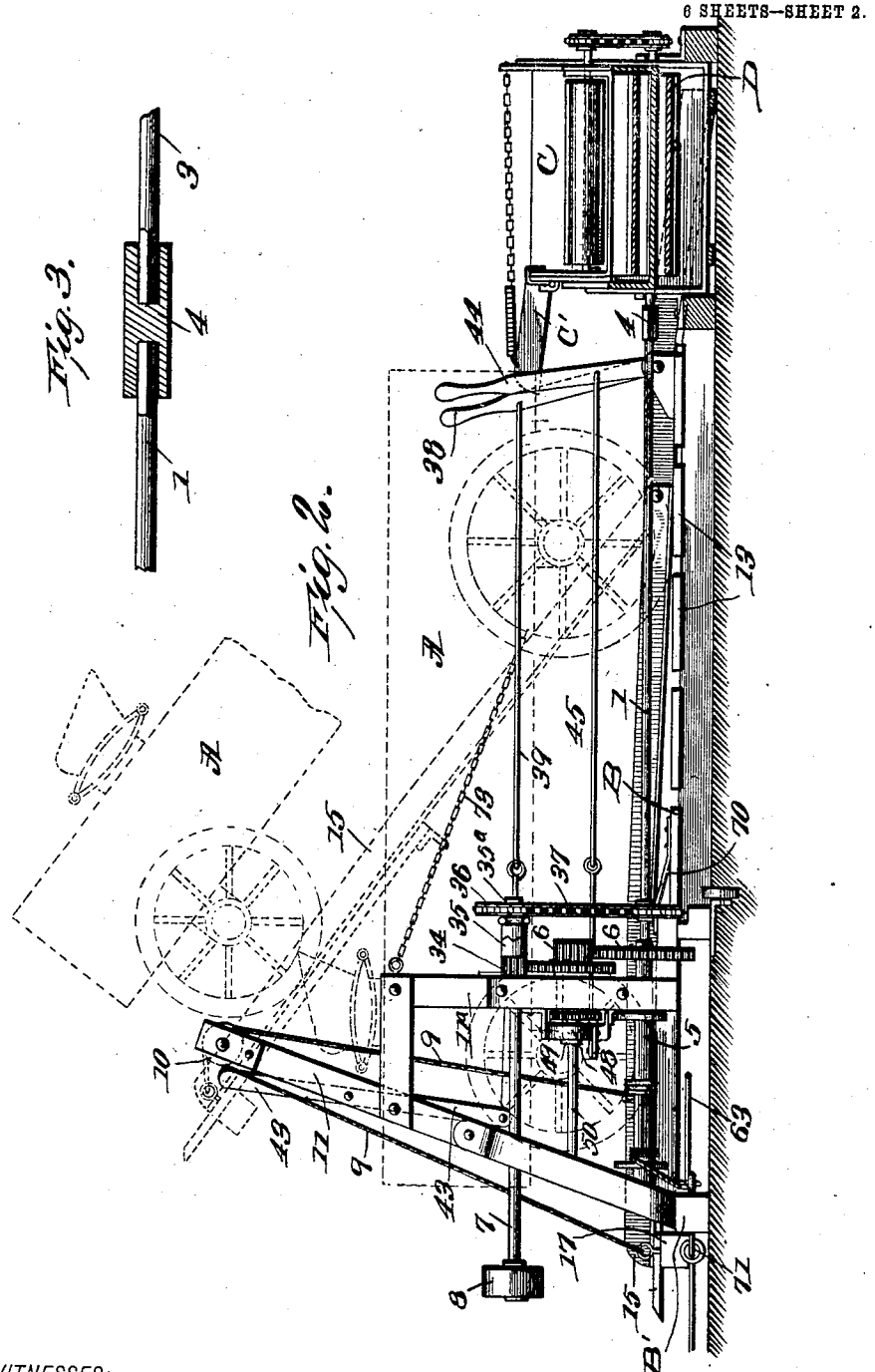
6 SHEETS—SHEET 2.

Fig. 3.




Fig. 2.

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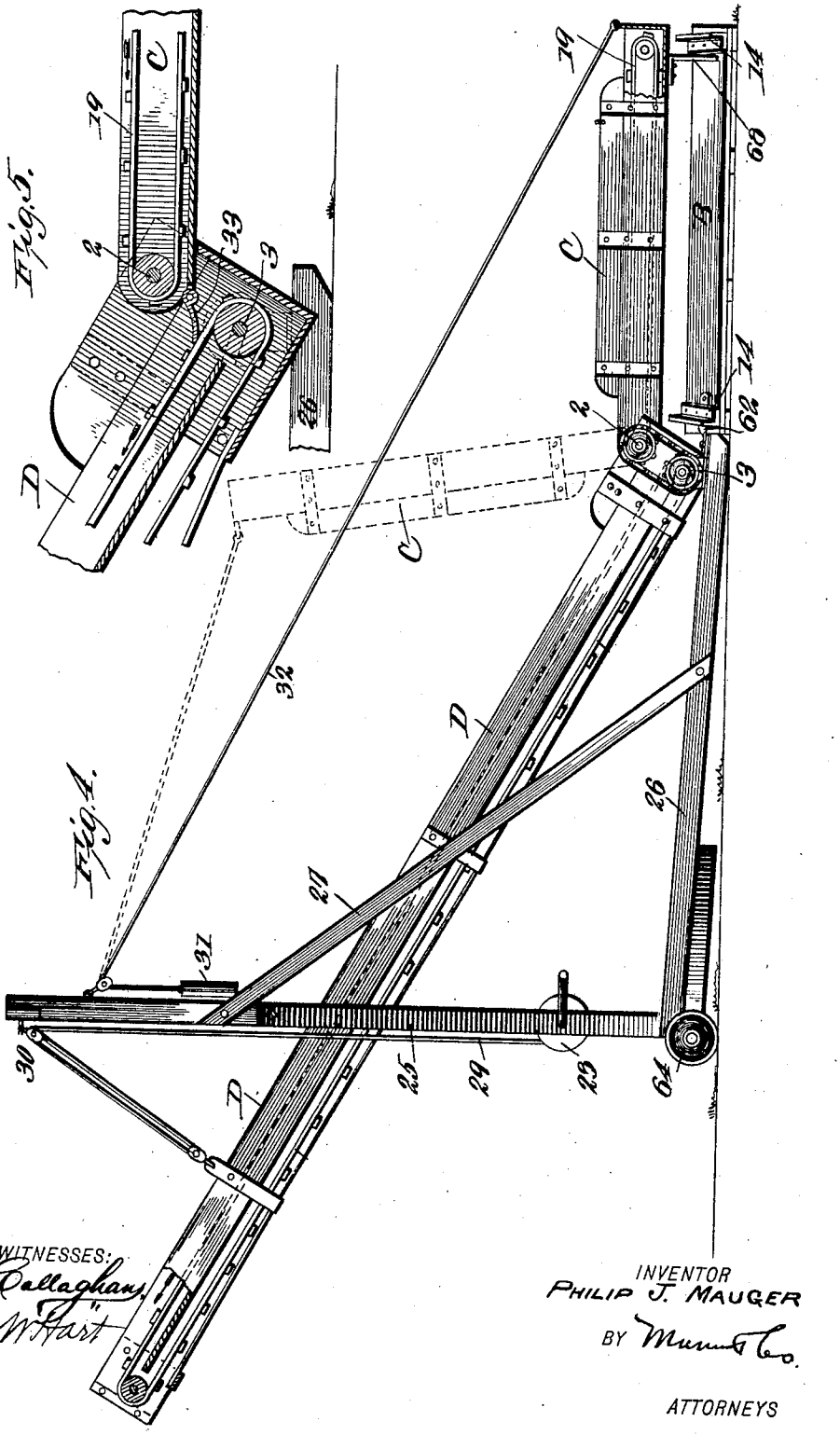
6 SHEETS—SHEET 3.

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6 SHEETS—SHEET 4.

Fig. 6.

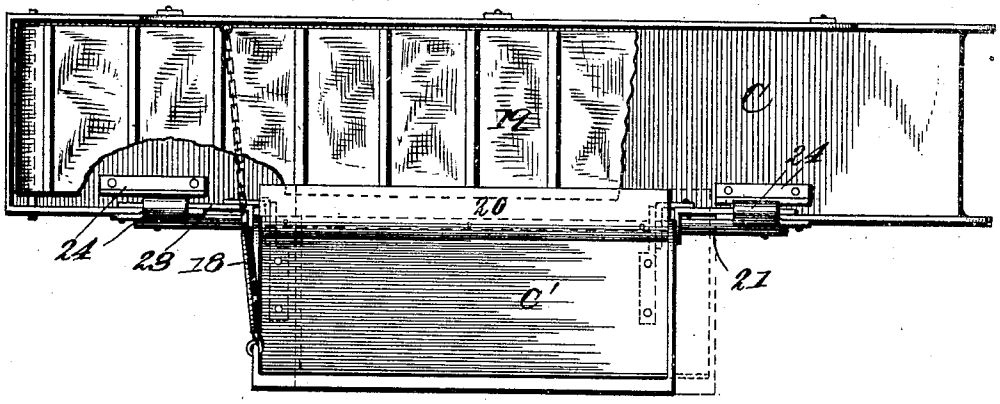
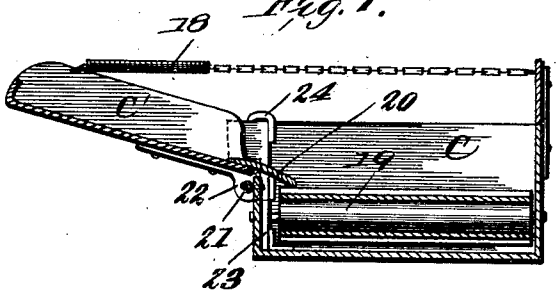



Fig. 7.

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6 SHEETS—SHEET 5.

Fig. 8.

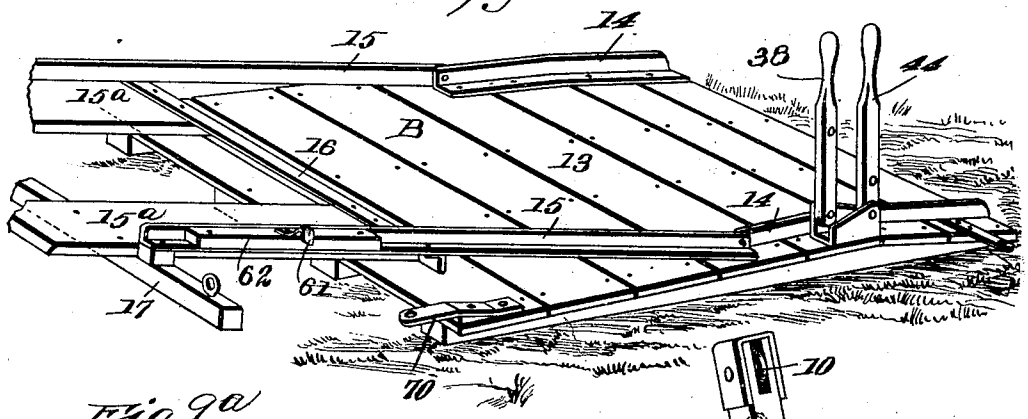



Fig. 9a.

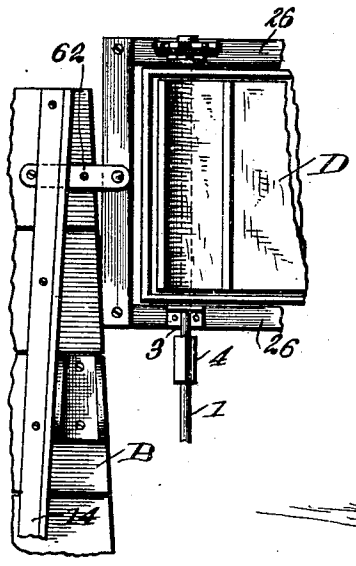
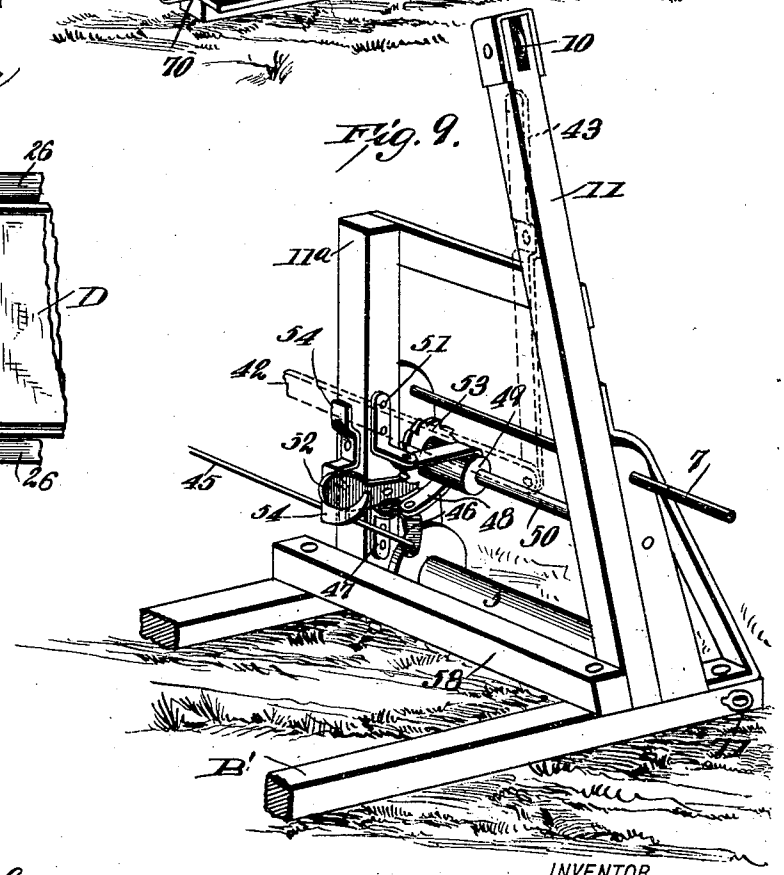



Fig. 9.

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6 SHEETS—SHEET 6.

Fig. 10.

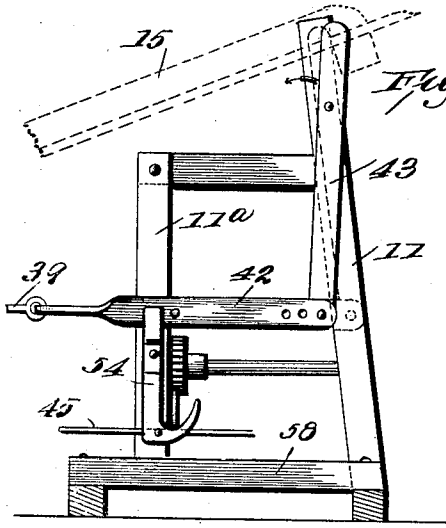



Fig. 11.

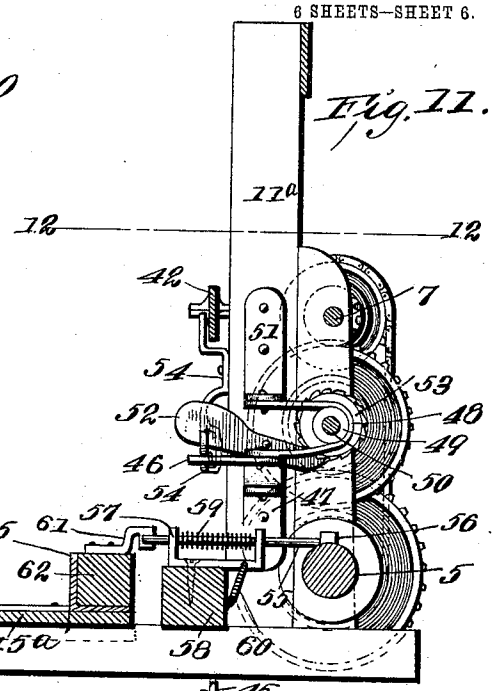
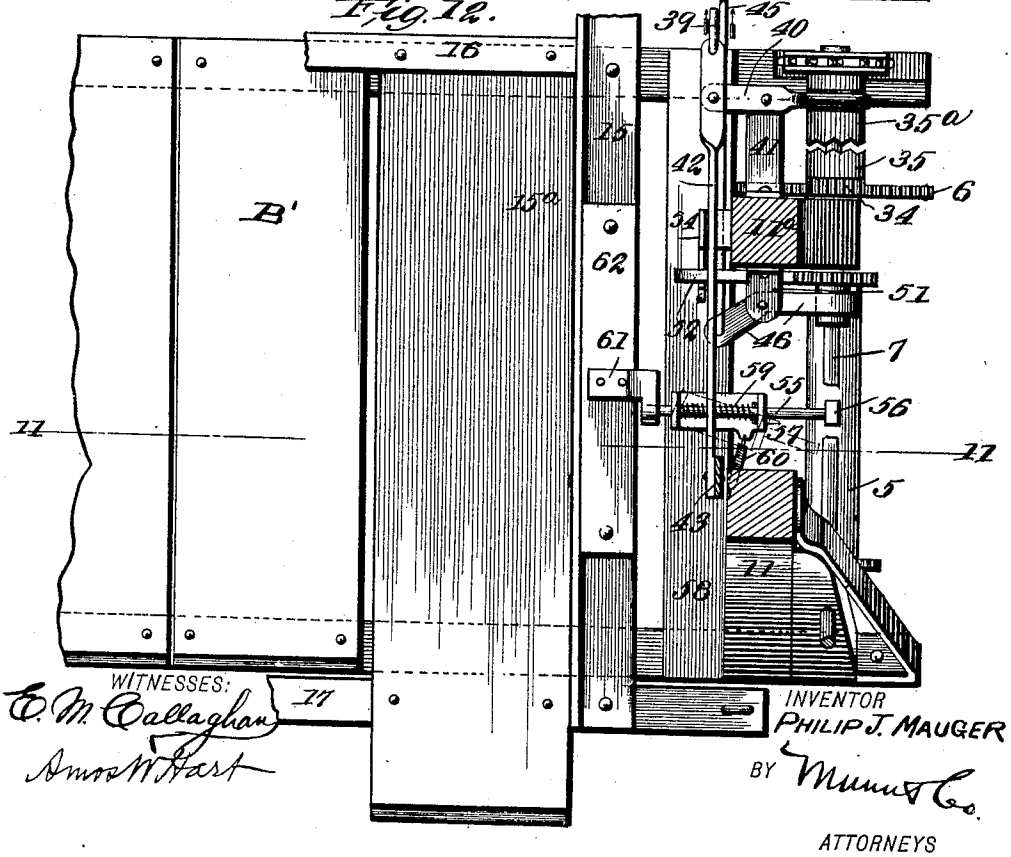



Fig. 12.

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# UNITED STATES PATENT OFFICE.

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## DUMPING AND ELEVATING APPARATUS.

No. 831,966. Specification of Letters Patent. Patented Sept. 25, 1906.

Application filed March 15, 1906. Serial No. 306,163.

*To all whom it may concern:*

Be it known that I, PHILIP JACOB MAUGER, a citizen of the United States, and a resident of Minier, in the county of Tazewell and State of Illinois, have made certain new and useful Improvements in Dumping and Elevating Apparatus, of which the following is a specification.

My invention is an improvement in apparatus for discharging or dumping grain or other articles from a wagon or cart into a conveyer by which it is delivered into a permanent storage-receptacle or into a car or boat for transportation.

It is more particularly an improvement upon the apparatus for which I have received United States Letters Patent No. 738,620. I have made various changes in and additions to the original apparatus, whereby marked advantages are obtained.

The apparatus is hereinafter described, and the novel features particularly pointed out.

In the accompanying drawings, Figure 1 is a plan view of the apparatus. Fig. 1ª is a perspective view of one of the transporting-wheels of the apparatus, including the bracket on which it is journaled. Fig. 2 is mainly a side elevation, the elevator being shown in section. Fig. 3 is a detail view illustrating a union or detachable connection between the rotatable shafts. Fig. 4 is an end elevation of the apparatus. Fig. 5 is a vertical longitudinal section of the connected ends of the conveyer and elevator. Fig. 6 is mainly a plan view of the conveyer and chute hinged thereto, portions being broken away. Fig. 7 is a cross-section of the parts shown in Fig. 6. Fig. 8 is a plan view of the main portion of the dump. Fig. 9 is a perspective view of a portion of the mechanism for elevating and lowering the dump. Fig. 9ª shows detachable connection between the conveyer and elevator. Fig. 10 is another view illustrating a portion of the mechanism shown in Fig. 9. Fig. 11 is a vertical section on the line 11 11 of Fig. 12. Fig. 12 is a horizontal section on the line 12 12 of Fig. 11.

As in my former invention, a loaded wagon A (see Fig. 2, where it is shown in dotted lines in two positions) may be driven upon a platform or dump B, (see Figs. 1 and 8,) and then the dump being elevated and a chute C′ being applied to the rear end of the wagon grain, corn, or other article may be automatically discharged by gravity upon a conveyer C, by which it is carried onto the endless traveling belt of an elevator D, the latter in turn delivering the article into a bin or storage-receptacle or into a car or boat, as the case may be. As before, the conveyer C is hinged to the base portion of the elevator D, and each being provided with an endless traveling apron having cross-slats and the same being caused to travel in the proper direction by suitable connection with a tumbling-shaft 1 it is obvious that the grain or other article will be carried in the direction indicated by the arrows in Figs. 1 and 4. The contiguous shafts 2 3 (see Fig. 4) of the conveyer C and elevator D are provided with sprocket-wheels to which a chain is applied, as shown. The lower shaft 3 is connected with the tumbling-shaft 1 by a union 4, (see Figs. 1, 2, and 3,) the adjacent and alined ends of said shafts being made square or of other polygonal form, as required. The cylindrical end of the tumbling-shaft 1 enters a socket provided in the journal of the winding-drum 5 and turns freely therein. (See Fig. 2.) The drum 5 is driven by gearing 6, (see Fig. 2,) by which it is operatively connected with a driving-shaft 7, having a band-pulley 8 keyed on its outer end. (See also Fig. 1.) Chains or ropes 9 extend from the winding-drum 5 to the free end of the dump, on the pivoted section thereof, passing intermediately over pulleys 10, journaled in uprights 11.

As shown best in Figs. 1 and 8, (see also Fig. 12,) the dump B consists of two sections, one, 13, being composed of transverse planks secured to lengthwise bars and guide-rails 14 being secured thereto and rails 15 being pivoted to the latter and extending forward to a sufficient length to duly support and elevate the front end of a wagon. When the wagon is driven on the dump B, the flanged tracks 14, which diverge from each other at their front ends, serve to guide the wheels in such manner that they will run between the pivoted rails 15, and thus pass on to the planks or boards 15ª, which are connected with the rails 15. Cross-bars 16 (see Fig. 8) rigidly connect the rails 15 and the planks 15ª. The hoisting-ropes 9 are connected with eyes fixed in the ends of the front cross-bar 17, and hence when the drum 5 is rotated for winding on the ropes 9 the free front end of the hinged portion of the dump will be elevated. In other words, the planks 15ª and the rails 15 will be raised to the angle required to effect

automatic discharge of the contents of the wagon by gravity. (See dotted lines, Fig. 2.) Means for locking the dump in the elevated position and lowering it safely will be presently described.

A chute C′ (see Figs. 1, 2, 6, and 7) is hinged to the side of the conveyer and supported by a spring and chain 18, as in my former invention, whereby its free edge may be held up in contact with the under side of the rear end of the wagon-body. When in such position, the wagon A being elevated and its end-gate raised, grain or other article will discharge by gravity from the wagon on the chute C′, and thus in turn on the endless traveling apron 19 of the conveyer C. To prevent grain escaping through the slot between the conveyer and the chute C′, I apply a hinged or elastic apron 20, (see Figs. 6 and 7,) the same being attached to the lower edge of the chute C′ and its free edge resting upon the endless traveling apron 19. I provide for shifting the chute C endwise to accommodate it to wagon-bodies of different widths or to different positions of the wagon-body. A rod 21 (see Fig. 7) is affixed to the side of the conveyer C parallel to the lower side of the same, and the chute is provided with ears or eyes 22, which are adapted to slide thereon. The side of the conveyer-frame is cut away to provide for the shifting of the chute endwise, and for closing the gaps which necessarily exist between the chute and the adjacent portions of the conveyer-frame I provide sliding pieces 23, the same working in guides 24, secured to the side of the conveyer.

In place of employing shears for supporting the elevator D, as in my former invention, it is arranged in a frame, which for convenience of description may be termed a "derrick." The frame comprises chiefly (see especially Figs. 1 and 4) uprights 25, between which the elevator D is swung, and horizontal bars 26, the two being connected by diagonal braces 27. A winding-drum 28 is applied to the lower portion of the uprights 25, and a rope 29 extends therefrom to the upper portion of the elevator D, passing intermediately through a sheave 30, pivoted to the top of the uprights. By this means the elevator may be raised and lowered as required. It is usually supported at an angle of forty-five degrees; but this may obviously be changed at will.

The conveyer C is adapted to be swung up on the shaft 2, to which it is pivoted, (see Fig. 4,) which is necessary when a wagon A has to be driven on the dump B. The chute is nearly counterbalanced by a weight 31 and rope 32, whose arrangement is obvious. Between the conveyer and the elevator I arrange a hinged apron 33 (see Fig. 5) to prevent grain sliding back into the lower portion or hood of the elevator.

The driving-shaft 7 may be constantly driven by horse-power or other form of motor. Its inner end is provided with a pinion 34, see Fig. 2,) the same being provided with a half-clutch 35, which is adapted to engage a corresponding clutch $35^a$, forming an attachment of a sprocket 36, which is slidable on a feathered portion of the shaft 7 and is operatively connected with the tumbling-shaft 1 through the medium of chain-and-sprocket mechanism 37. The pinion 34 and its half-clutch $35^a$ are loose on the shaft 7. It is apparent that when the clutch is closed, as shown in Fig. 2, the gearing 6 will be driven simultaneously with the endless aprons of the conveyer C and elevator D, as before described, and the drum 5 will also be rotated when it is required to elevate the movable or hinge section of the dump B. The clutch may be operated through the medium of a hand-lever 38, (see Fig. 2,) the same being pivoted to the front portion of the dump B and connected by a rod 39 with a horizontal lever 40, (see Fig. 12,) whose forked end engages the slidable half-clutch $35^a$. Said lever 40 is pivoted to the horizontal bar or bracket 41, which is attached to the upright 11. Thus by movement of the lever 38 the clutch may be closed or opened, as required, to operate the winding mchanism by which the dump is elevated.

From the lever 40 a bar 42 (see Fig. 12) extends and is pivoted to the lower end of a vertical lever 43. (See Figs. 2, 9, and 10.) The lever is pivoted to the frame 11, and its upper end lies in such position that when the dump is raised its front cross-bar will come in contact with it, as shown by dotted lines in Fig. 10, and thus traction will be automatically applied to the bar 42, so as to open the clutch, and thereby automatically arrest the operation of the winding-drum 5, and thereby stop the upward movement of the tilting portion of the dump. In Fig. 2 another lever 44 is pivoted to the front end of the dump B and connected by a rod 45 with a lever 46, (see Figs. 9, 11, and 12,) the same being pivoted to a bracket 47 (see Fig. 9) and pivotally attached to an elastic band 48, which passes around a short drum 49 on the shaft 50, the upper end of the band being attached to a bracket 51. As shown in Fig. 9, the position of the lever 46 is such that when traction is applied to the rod 45 through the medium of the lever 44 the band will be tightened around the drum 49, and thereby the operation of the winding mechanism or of the winding-drum 5 will be wholly or partly arrested. In other words, by this means I provide a brake by which the rotation of the drum 5 in unwinding may be regulated at will. Obviously this is only applied when the dump requires to be lowered. When the dump is elevated to the required degree, the winding mechanism, including the drum 5, is locked by weighted pawl 52, the same being

pivoted to the post 11ª (see Fig. 9) and its inner end engaging a ratchet 53, which is keyed on the shaft 50 or else fixed to the brake-drum 49. Since this pawl is normally held in engagement with the ratchet, it is obvious that when the dump is raised, the ratchet being at such time rotated, the pawl will lock the winding mechanism at whatever point of elevation the dump may be required to stop.

In order to release the pawl from the ratchet as required to allow the dump to descend, I provide a hook 54, which, as shown in Figs. 9 and 10, is pivoted to the post 11ª and connected at its lower end with the rod 45 before referred to. In other words, the hook 54 is connected with and operated by the same means as the lever 46, through which the friction-brake is applied. The curved arm of the hook 54 passes under the weighted end of the pawl 52, and when the hook is swung to the left, Fig. 10, it will obviously raise such weighted end of the pawl, and thus disengage the other end from the ratchet and unlock the latter. It is apparent that by traction on the rod 45, applied through the lever 44, such operation of the weighted pawl will be simultaneous with the application of the band-brake, and by application of due force to the lever 44 the descent of the dump may therefore be regulated as required.

I provide an auxiliary automatic stop for the winding-drum 5, the same being represented in Figs. 11 and 12. The same comprises a spring-actuated rod 55, which is adapted to engage a lug 56 on the winding-drum 5, and a support therefor consisting of a bracket 57, that is pivoted to a bar 58, constituting a part of the front section of the dump. Such bracket is provided with ears in which the rod 55 is adapted to slide, a spiral spring 59 being applied to the rod between the ears of the bracket. A spiral spring 60 serves to hold the stop in the normal position—that is to say, in the position indicated by dotted lines, Fig. 12—whereby the sliding rod 55 is out of alinement with the lug 56 on the drum 5. The spring-stop is shifted from the dotted position to that indicated in full lines by contact of its inner end with a cam 61, (see Figs. 11 and 12,) which is secured to a bar 62, arranged alongside one of the flanged rails 15. The cam is so placed that when the hinged portion of the dump descends its rounded portion comes in contact with the adjacent end of the rod 55 and throws the spring-stop into the position shown by full lines, Figs. 11 and 12, so that the rod encounters the lug 56 as the drum 5 rotates. In such case the spring 59 relieves the shock of impact, which would otherwise be too sudden and violent.

When the apparatus is in use, the several parts B C D, before described, are detachably connected in the position indicated best in Fig. 1. (See also Fig. 2.) The horizontal base-bars 26 of the derrick or frame in which the elevator D is supported are detachably connected at 62, by means of a removable pin, with the front end of the platform of the dump B. A rod 63 (see Fig. 1) extends diagonally from the base-frame of the derrick to the corner of the outer section B′ of the dump. This rod is provided with hooks which adapt it to be readily detached from its connections. The cross-bar 63, forming a part of the base-frame of the derrick and to which the parallel bars 26 are attached, is provided at its ends with small wheels 64, to provide for easy hauling of the derrick and its attachments. These wheels are journaled in brackets 65, which are pivoted to the ends of the bar 63, so that the wheels may be set parallel to the bars 26 or parallel to the bar 63. The brackets are made practically right-angular in form, and a removable pin 65ª is inserted in one or the other arm of the bracket, according to the position required. The full lines show the wheels in position required when the derrick, with the elevator, is to be hauled from one point to another, the team in such case being attached at the end of the bars 26 where the attachment is made to the dump B. When the wheels 64 are set in the alternative position, (shown by dotted lines,) the derrick may be adjusted laterally. When in use, the wheels are usually sunk in the ground in order to hold the derrick firm in the required position. The dump B is similarly provided with wheels 66 and pivoted brackets 67, (see Fig. 1,) the same being applied to the ends of the cross-bar 68, which forms a part of the detachable section B′ of the dump. The two sections B B′ are detachably connected by pins 69, that pass through straps 70 (see also Fig. 8) and enter the aforesaid bar 68. Thus the two sections may be detached and hauled separately, or they may be hauled together. In the latter case attachment is made to an eye 71 on the section B′. When the apparatus is in use, the wheels 66 are set in the position indicated by full lines, Fig. 1, and for transportation or hauling they are set in the position indicated by dotted lines.

The entire apparatus may be hauled together alongside a bin or granary when the parts are connected as indicated in Fig. 1, or when the space is too narrow—say it is required to pass through a gateway—the several main parts are detached from each other and hauled separately. This provision for detachment of one main part from another, which is effected by simply removing the pins and the rod 63, adapts the apparatus to be placed upon a wagon or car for transportation. When a loaded wagon A is run upon the dump B, the rails 14, which flare or diverge from each other, guide the wheels so

that they will run into the space between the pivoted rails 15, and the front wheels of the wagon pass onto the planks 15[a], (see Figs. 1 and 8,) which form an attachment of the rails 15, and then the wagon is secured by a chain 73, (see Fig. 2,) whose free end is hooked on the adjacent rear wheel. The next operation is to elevate the wagon by means before described, so that it assumes the required inclination, as indicated by dotted lines, Fig. 2. The conveyer C is then lowered behind the wagon in the position indicated by full lines, Figs. 1, 2, and 4, it being supported by the leg 68, (see Fig. 4,) and the chute C′ is arranged under the end of the wagon-body. The conveyer-apron and the elevator-apron being then set in operation and the end-gate of the wagon being raised, the grain or other article contained in the wagon will flow by gravity upon the chute C′ and thence on the conveyer C, by which it will be carried to the elevator, and thus delivered at the required point.

What I claim is—

1. The dump comprising a platform having at its front end guide-rails which converge from the front end of the platform inward, and a hinged section comprising rails for guiding the wheels of a wagon when run upon the dump, and supports for the front wheels of the wagon, the same being rigidly connected with the pivoted guide-rails, substantially as described.

2. The improved dumping and elevating apparatus, comprising a dump made in two sections which are detachable from each other, a derrick and an elevator supported therein, means for detachably connecting the derrick with the dump, and transporting-wheels applied to the dump and the derrick, substantially as described.

3. The improved apparatus comprising a dump having a portion adapted to be elevated, a derrick which is detachably connected with the dump, both the dump and derrick having wheels which are shiftable in position so that they may be placed at one angle or another, to facilitate transportation, substantially as described.

4. In a dumping apparatus, the combination with a derrick having a base-frame, of wheels, brackets on which the wheels are journaled, said brackets having arms at right angles to each other, and pivoted to the base-frame of the derrick, and a removable pin for holding the brackets in either of two positions, substantially as described.

5. The combination with the dump, of transporting-wheels and right-angular brackets pivoted to the frame of the dump, the same being thus adapted to be shifted, whereby the wheels may be set at one angle or the other as conditions require.

6. The combination, with the pivoted section of the dump which is adapted to be elevated for raising a wagon for unloading, of hoisting apparatus including a rotatable drum and means for operating it, the drum being provided with a peripheral lug, and an auxiliary stop comprising a spring-pressed bar, a pivoted support therefor, a spring for retracting the support, and a cam attached to the pivoted section of the dump and adapted for contact with the spring-stop when the dump descends, whereby the stop is thrown into position to engage the lug on the drum, substantially as described.

7. The combination, with the pivoted section of the dump, having a cam affixed as described, and a drum constituting a part of the elevating mechanism and provided with a lug, of a spring-stop interposed between the dump and the drum, and adapted to be thrown into operative position as the dump descends and thus arresting the rotation of the drum and the unwinding mechanism without sudden shock, substantially as described.

8. The combination with the pivoted section of the dump, and winding mechanism for raising the same, of a ratchet and a pivoted weighted pawl which engages the same and serves to lock the drum in the elevated position, a brake forming an attachment of the winding mechanism, and means adapted for manual control whereby the pawl may be thrown out of engagement with the ratchet and the brake simultaneously applied, substantially as described.

9. The combination with the pivoted section of the dump, and means for raising the same, of a ratchet forming an attachment of the winding mechanism, a pawl which normally engages the ratchet and thus serves to lock the dump in the elevated position, a brake comprising a drum and a band encircling the same, a lever connected with the free end of said band, a pull-rod connected with the said lever, whereby the brake may be applied, and means connected with the said rod for automatically throwing the pawl out of engagement with the ratchet, substantially as described.

10. The combination with the pivoted section of the dump, and winding mechanism including a ratchet and pawl for locking the dump in the elevated position, of pawl-releasing and brake mechanism, and means for operating the same simultaneously, substantially as described.

11. The combination with the pivoted section of the dump, and winding mechanism including a ratchet and pivoted weighted pawl which engages the same for holding the dump elevated, of a pull-rod and a device connected therewith and arranged to act upon the pawl whereby it may be thrown out of engagement with the ratchet to allow the dump to descend, substantially as described.

12. The combination with the pivoted

dump, and winding mechanism including a ratchet and its pawl for locking the dump in the elevated position, of a pawl-releasing device consisting of a hook pivoted to a fixed support, its curved arm projecting under the outer end of the pawl, and means for retracting the hook whereby the pawl is caused to slide over the curved arm and is thus shifted out of engagement with the ratchet.

13. The combination, with the pivoted dump, and winding mechanism connected therewith, and including a ratchet and pawl, of a brake comprising a friction-drum and band and a lever to which the free end of said band is attached, of a pawl-releasing device consisting of a pivoted hook whose curved arm is adapted to engage and shift the pawl when the hook is retracted, and means for simultaneously operating the brake-lever and the said hook, substantially as described.

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