(No Model.) 5 Sheets—Sheet 1.

C. A. NELSON.

WAGON DUMP AND ELEVATOR.

No. 490,674. Patented Jan. 31, 1893.

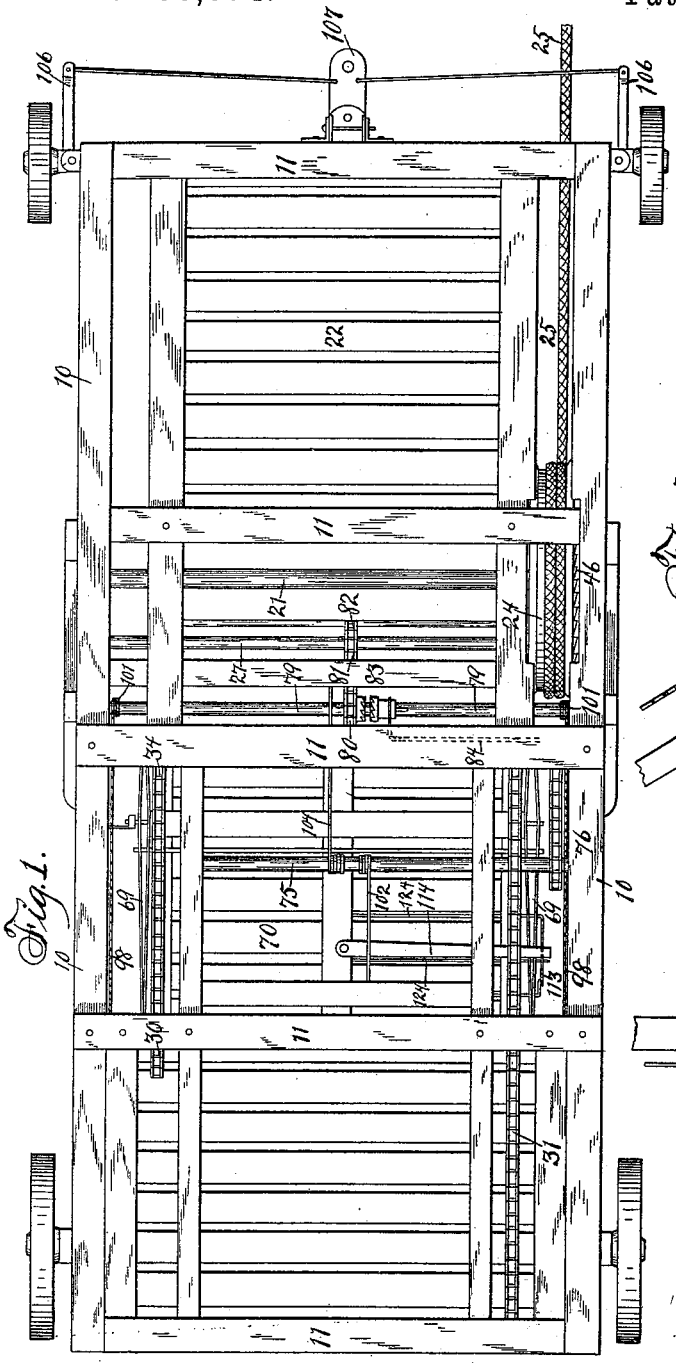

Fig. 1.

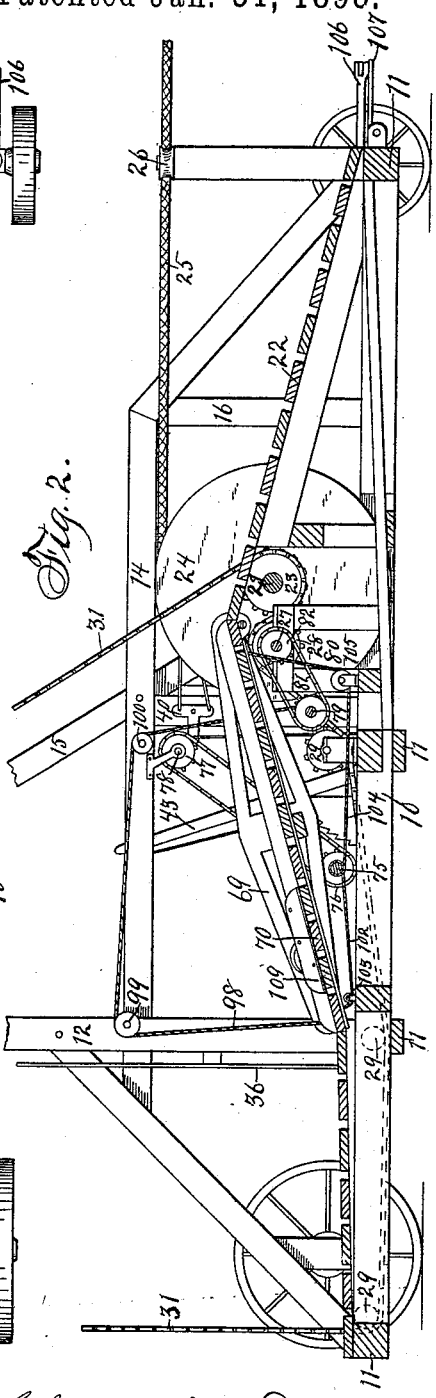

Fig. 2.

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Inventor: Charley A. Nelson,
By Thomas G. Orwig, Atty.

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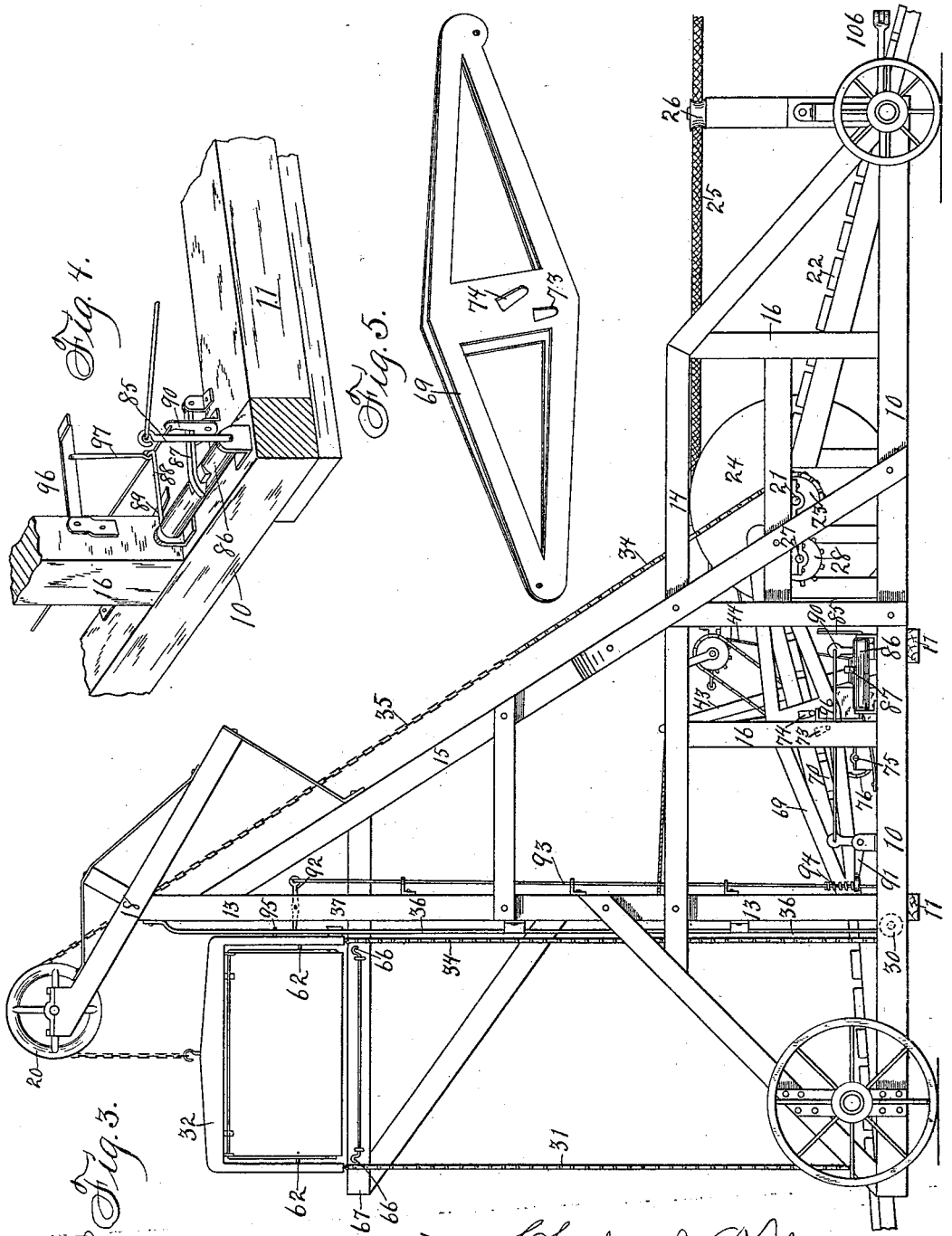

Fig. 4.

Fig. 5.

Fig. 3.

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(No Model.) 5 Sheets—Sheet 3.

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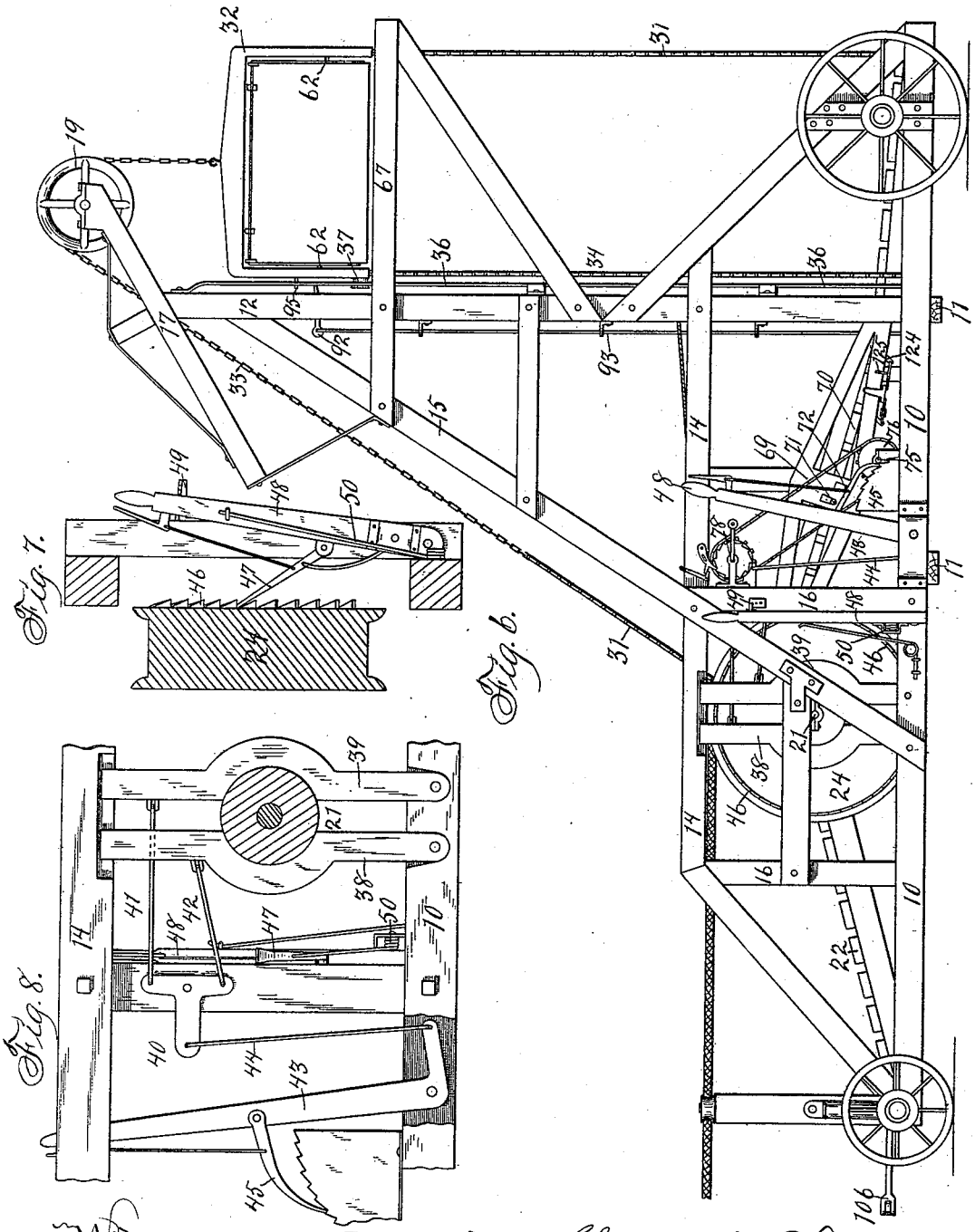

Fig. 7.

Fig. 8.

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C. A. NELSON.

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Fig. 9.

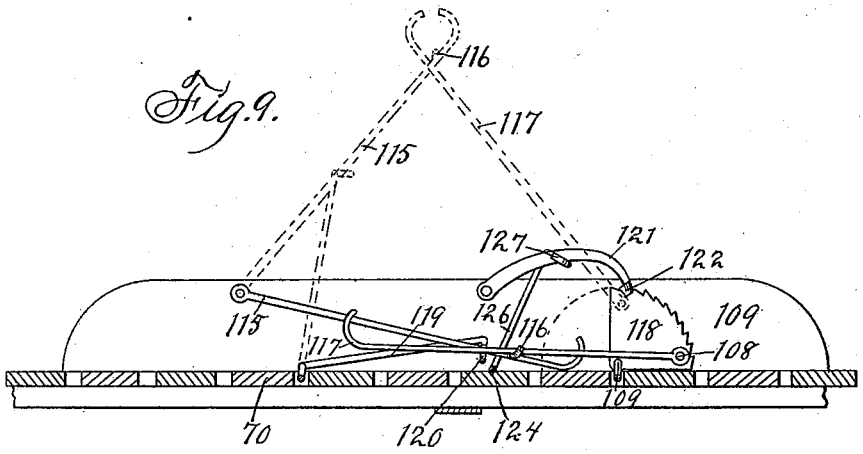


Fig. 10.

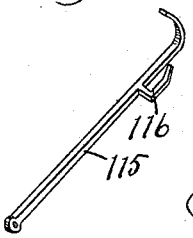


Fig. 11.

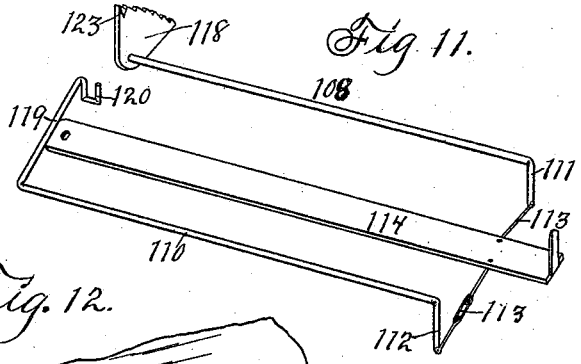


Fig. 12.

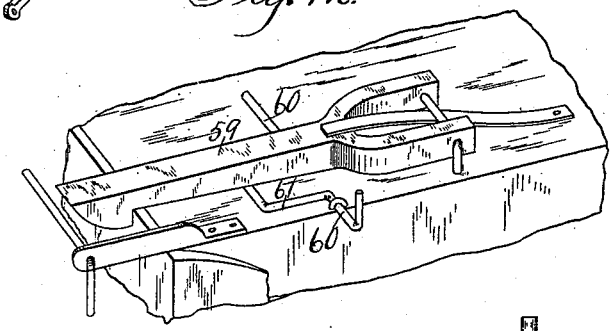
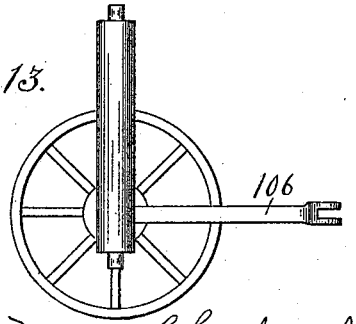


Fig. 13.



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WAGON DUMP AND ELEVATOR.

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Fig. 14.

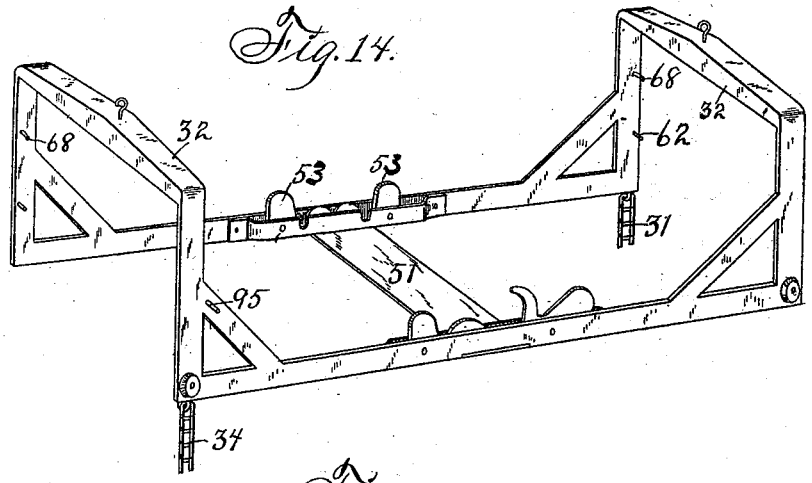


Fig. 15.

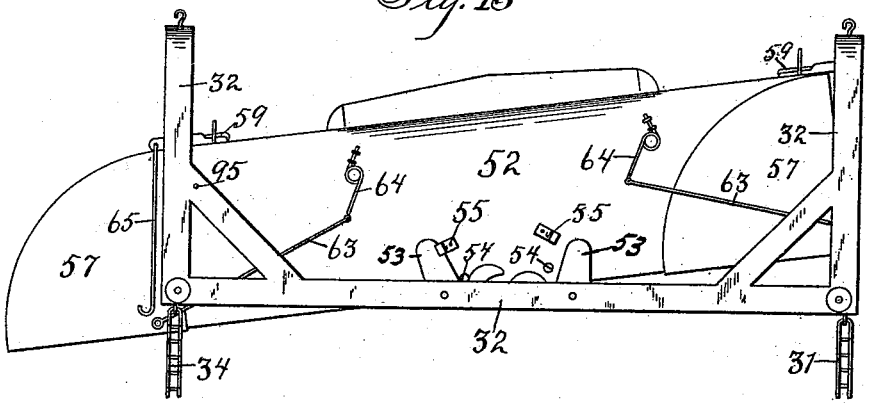
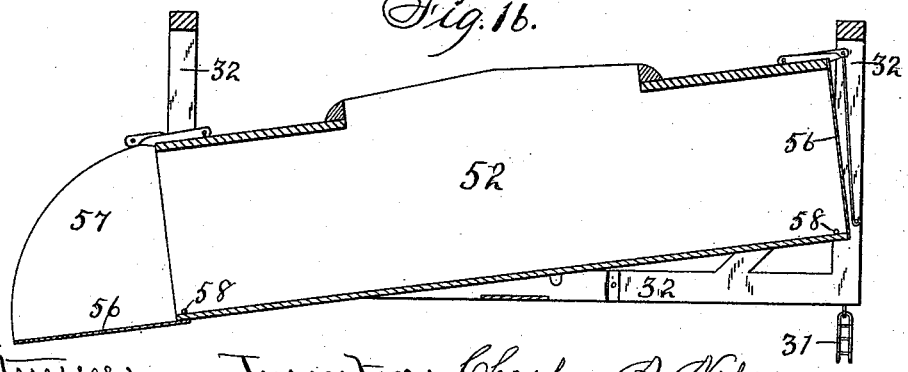


Fig. 16.



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UNITED STATES PATENT OFFICE.

CHARLEY A. NELSON, OF DES MOINES, IOWA.

WAGON DUMP AND ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 490,674, dated January 31, 1893.

Application filed March 21, 1892. Serial No. 425,842. (No model.)

To all whom it may concern:

Be it known that I, CHARLEY A. NELSON, a citizen of the United States of America, residing at Des Moines, in the county of Polk and State of Iowa, have invented a Wagon Dump and Elevator, of which the following is a specification.

The object of my invention is to provide improved means for receiving, elevating and dumping the contents of a wagon box into a crib or other containing receptacle.

A further object of my invention is to provide mechanism whereby when the elevator box is lowered the wagon and its contents is automatically elevated to a plane above the top of the said elevator box when the latter is in its lowest position.

A further object of my invention is to be found in the provision of means whereby in the elevation of the elevator box the contents thereof are automatically dumped into a crib or other repository.

My invention consists in the construction, arrangement and combination of parts, hereinafter set forth and pointed out in my claims, reference being now had to the accompanying drawings, in which:

Figure 1 is a bottom view of the complete machine. Fig. 2 is an enlarged detail longitudinal view of the lower portion of the machine. Fig. 3 is a side view of the complete machine. Fig. 4 is an enlarged detail perspective view of automatic mechanism. Fig. 5 is an enlarged perspective view of one of the truss frames which support the dumping platform. Fig. 6 is a side elevation of the complete machine opposite to Fig. 3. Fig. 7 is an enlarged detail view of the pawl and ratchet mechanism operating on the main drum. Fig. 8 is an enlarged detail view of the manually operated brake, operating on the elevating apparatus. Fig. 9 is an enlarged detail view of the wagon lock, the dotted lines showing the parts in an operative position. Fig. 10 is a detail perspective view of one of the locking arms. Fig. 11 is a detail perspective view of the mechanism controlling the wagon lock. Fig. 12 is a detail perspective view of a portion of the elevator box showing the means of locking the gates. Fig. 13 is an enlarged side view of one of the front wheels of the machine. Fig. 14 is a perspective view of the traveling frame. Fig. 15 is a side view of the traveling frame and elevator box, showing the box tilted as required to dump. Fig. 16 is a longitudinal vertical sectional view of the traveling frame and elevator box, showing the box tilted as required to dump.

In the construction of the machine as shown, the numeral 10 designates the side sills, and 11 the cross beams of the horizontal frame, which is mounted upon wheels to facilitate transportation of the machine. A superstructure comprising standards 12, 13, side beams 14, braces 15, and cross ties 16, is erected above the sills 10 and firmly bound together and stayed by ties and supplemental braces. Bifurcated mast arms 17, 18, are fixed respectively to the standards 12, 13, and support sheaves 19, 20.

A shaft 21 is mounted in bearings fixed to the sides of the superstructure and extends transversely of the machine beneath the upper end of the inclined platform 22. Sprocket wheels 23, 23, are mounted rigidly on each end portion of the shaft 21, and in alignment with the sheaves 19, 20, respectively. A drum 24, is rigidly mounted on the shaft at one end thereof, and a rope 25 is secured to and wound upon said drum, the bight of which rope is extended through and beyond the antifriction guide pulleys 26, 26, mounted on the forward end of the superstructure.

A shaft 27, carrying sprocket wheels 28, 28, is journaled in the sides of the superstructure, slightly in the rear of and below the shaft 21, and extends transversely of the machine. The sprocket wheels 28, 28, are in alignment with the sprocket wheels 23, 23.

Direction pulleys 29, 29, are rotatively mounted on bearings fixed to the face of the sill 10, in alignment with the sheave 19. Direction pulleys 30, 30, are mounted rotatably on bearings fixed to the sill 10 in alignment with the sheave 20.

A sprocket chain 31, is fixed at one end to one corner of the traveling frame 32, and extending vertically downward therefrom passes beneath and within the grooves of the direction pulleys 29, thence upward over one of the sprocket wheels 28, thence downward obliquely beneath one of the sprocket wheels 23, thence upward obliquely toward the sheave 19

to a point of attachment to one end of a cable chain 33, which latter passes over the sheave 19 and thence downward vertically to a point of attachment to the frame 32. A sprocket chain 34 is fixed at one end to the corner of the frame 32, diagonally opposite to the attachment of the chain 31, and extending downward vertically therefrom passes beneath the direction pulleys 30, thence upward over one of the sprocket wheels 28, thence downward obliquely beneath one of the sprocket wheels 23, and thence upward obliquely toward the sheave 20, to a point of attachment to one end of a cable chain 35, which latter passes over the sheave 20 and thence vertically downward to a point of attachment to the frame 32.

It will be seen that the arrangement and connection of the sprocket and cable chains provide traveling belts by means of which the frame 32 is supported and moved vertically.

Guides 36 are fixed on the rear faces of the standards 12, 13, and the frame 32 is held to said guides and directed in its vertical movement by means of the grooved rollers 37, which latter are journaled to said frame and travel on said guides.

Brake shoes 38, 39, pivoted at their lower ends to one of the sills 10, extend upward on opposite sides of the shaft 21. A double bell crank lever 40 is fulcrumed on one of the side beams 14, the upper and lower arms of said lever being respectively connected to the brake shoes 38, 39, by means of the connecting rods 41, 42. A bell crank hand lever 43, is fulcrumed on the inner face of the sill 10 adjacent to the drum 24, the short arm of said lever being connected to the rear arm of the lever 40, by the rod 44. A segmental rack is fixed to the sill 10 adjacent to the lever 43, and is acted upon by a gravity pawl 45 fixed to the lever 43 to prevent a backward movement of said lever. Manually controlled lever and rod mechanism of common form is used to disengage the pawl 45 when desired.

The drum 24 is provided with a ratchet 46 on its outer face, which ratchet is acted upon by a spring pressed pawl 47, to prevent a reverse movement of said drum. The pawl 47 is mounted upon a hand lever 48, fulcrumed on one of the vertical ties, and is manually controlled by lever and rod mechanism of common form to release the drum 24 when desired. The lever 48 is held normally stationary by means of the rack 49, being retained in engagement with said rack by the spring 50.

The traveling frame 32 is provided with a central cross piece 51, (Fig. 14) secured to the bottom thereof and is adapted to support an elevator box 52. Pivoted supporting bearings 53, 53, are centrally located on the inner faces of the sides of frame 32, and pivots 54, 54, secured to each side of the box 52, normally rest in said bearings. Clips 55 55, secured to each side of the box 52 engage with the upper arms of the bearings 53, 53, when the box is tilted. Gates 56, 56, are secured to each end of the box 52, one of which and its fastenings I will describe, both being alike. The gate 56 is provided with wings 57, 57, which latter are mounted upon rock shaft 58, extended transversely through the box. The gate 56 is normally retained in a closed position by means of the spring pressed hooks 59, 59, pivoted on the top of the box. A crank shaft 60 is journaled on the top of the box 52, and extends transversely thereof beneath the hooks 59, 59, an arm 61 being formed on said shaft directly beneath each of said hooks and extending toward the outer end thereof. A vertical arm is formed on the end of said shaft 60 adjacent to the standards of the machine and is adapted to impact with a pin 62 fixed on the inner face of the frame 32, when the box is tilted. The gate 56 is retained and supported in the plane of the bottom of the box 52, when open, by the rods 63, one end of each of which is connected to one of the wings 57, the remaining ends being secured to retractile springs 64 fixed to the outer faces of the sides of the box. Hooks 65, 65, depend from the top of the box 52, outside the ends thereof which hooks are adapted to engage hooks 66, 66, fixed to the mast arm 67, when the box is elevated. Pins 68, are fixed in and project from the frame 32, at a point above the pins 62, the purpose of which will hereinafter appear.

Truss frames 69 (shown in detail in Fig. 5) are pivoted to the superstructure on opposite sides of the dumping platform 70, which latter is suspended in the said frames by means of pivots 71, 72 which pivots are arranged in pairs on opposite sides of said platform and are normally seated in slots 73, 74, in the truss frames.

A shaft 75 is journaled in a horizontal position in the lower frame of the machine and extends transversely thereof beneath the central portion of the platform 70. A sprocket wheel 76 is rigidly mounted on a projecting end portion of said shaft 75, and is connected by means of a sprocket chain to a sprocket wheel 77, mounted on a manually operated crank shaft 78, secured in the adjacent side frame of the machine. The shaft 78 is provided with pawl and ratchet mechanism to lock the same against a reverse movement when desired.

A shaft 79 is journaled in the lower portion of the superstructure slightly below and in the rear of the shaft 27, and a sprocket wheel 80 loosely mounted on said shaft 79, is connected by means of a sprocket chain 81 to a sprocket wheel 82, rigidly mounted on the shaft 27. A clutch 83 feathered to the shaft 79 is adapted to engage a clutch on the loose sprocket wheel 80 and thus rotate the said shaft.

A clutch actuating rod 84 is suspended below the platform 70 approximately parallel to the shaft 79. One end of the rod 84 is connected to the clutch 83 and the other end of said rod is pivotally secured to an upwardly

extending crank arm 85 fixed to a rock shaft 86, which latter is journaled on the upper surface of one of the sills 10. Said rockshaft is normally held so as to retain the clutch 83 out of engagement with the sprocket wheel 80, by a detent 87. A horizontal crank arm 88 on the rock shaft 86, is acted upon by a flat spring 89 (Fig. 4) fixed to the adjacent sill 10, to rotate said rock shaft and cause the clutches to engage upon the release of the detent 87. The detent 87 is automatically released from engagement with the rock shaft 86 by the horizontal arm of a weighted bell crank lever, 90, the vertical arm of which lever is connected to the vertical arm of a bell crank lever 91 located adjacent to the standard 13. The horizontal arm of the lever 91 is connected to a rocking lever 92 fulcrumed to the standard 13 near the upper end thereof, by means of a vertical rod 93. A spiral spring 94 is mounted on the rod 93 and acts thereon to normally retain the rod 93 at its maximum elevation. An arm of the lever 92 extends rearwardly from the standard 13 and is acted upon by a pin 95, fixed to the frame 32, in the elevation of said frame. A trigger 96 is pivoted at one end to the side frame of the machine adjacent to and above the arm 88 of the rock shaft 86, and is connected to said arm by the vertical rod 97. The said trigger is acted upon by the adjacent pivot 72 on the dumping platform in the descent of said platform.

Ropes 98, 98, are fixed at one end to the free ends of the truss frames 69, 69, and extend therefrom vertically to and over direction pulleys 99, 99, pivoted to the standards 12, 13, thence rearward to and over pulleys 100, 100, journaled to the side frames of the machine, and from thence to points of attachment to drums 101, 101, formed on the opposite end portions of the shaft 79.

A rope 102 is fixed at one end to the underside of the rear end of the dumping platform near the center thereof and extended downward therefrom through a pulley 103, and forward from said pulley to a point of attachment to the shaft 75.

A rope 104 is fixed at one end to the underside of the forward end of the dumping platform near the center thereof, and extends downward therefrom through a pulley 105, and rearward from said pulley to a point of attachment to the shaft 75.

The front wheels of the machine are individually swiveled to the corners of the horizontal frame, and the swivels thereof are provided with rods 106 which are connected to the draft head 107, which latter is pivotally attached to the forward cross beam 11. A pole or thills may be secured to the draft head 107 if desired.

Removable approaches (not shown) are secured to the front and rear cross beams 11 and incline therefrom to the ground.

A wagon brake or lock is located on the dumping platform and comprises the following elements. A rock shaft 108 mounted in bearings fixed to the platform extends from one side thereof to and within the casing 109 which latter is fixed to and extends upward from the platform and provides a guard for the wagon lock. A rock shaft 110 is mounted in bearings parallel to and at a slight distance from the shaft 108. Arms 111, 112, are fixed to and project downward from the shafts 108 110, respectively, and the lower ends of said arms are connected by means of rods 113, to a hand lever 114, which latter is fulcrumed to the underside of the platform and extends horizontally outward therefrom. A hooked arm 115 (Fig. 10) is pivoted at one end to the casing 109 near the end of said casing and normally extends forward and downward therefrom. A bracket 116 is formed on and extends laterally from the arm 115, near the hook thereon, which bracket supports the outer end of a hooked arm 117, which latter is pivoted at its other end to a segmental ratchet edged plate 118 fixed to one end of the rock shaft 108. An arm 119, having a hook 120 on its outer end is formed on the inner end of the rock shaft 110 and normally rests approximately horizontally within the casing 109. Both of the hooked arms 115, 117, rest in the hook 120 of the arm 119 when in an inoperative position. A gravity pawl 121 is pivoted on the casing 109 and normally engages the ratchet teeth on the plate 118 and holds the arms 115, 117, in an inoperative position. The pawl 121 is provided with a lateral extension 122 which engages a notch 123, in the ratchet plate 118 and holds the said plate when the hooked arms 115, 117 are in an operative position. A rocking lever 124 is mounted on the under side of the dumping platform and is extended parallel with and between the rock shafts 108, 110. A hand lever 125 is formed on the outer end of the lever 124, and an arm 126 is formed on the inner end of said lever 124, which latter arm is within the casing 109 and is provided with a hook 127 adapted to act upon and lift the pawl 121 when the said locking lever is manually operated.

The operation of my machine is as follows: In the beginning the rope 25 is wound upon the drum 24 until the outer end thereof only projects beyond the pulleys 26, 26, and a horse or other motive power is secured thereto. The unwinding of the rope from the drum, by the application of power to the projecting end thereof, results in a rotation of the shaft 21 and the sprocket wheels 23, 23, engaging the sprocket chains 31 and 34, cause said chains to travel and elevate the frame 32 to the desired height to permit a loaded wagon to be driven thereunder and upon the dumping platform 70. The power applied to the rope 25 being relaxed, the frame 32 and elevator box supported thereby are retained suspended by the engagement of the locking pawl 47 with the ratchet 46 on the drum 24. The loaded wagon being in the proper position upon the plat-

form, the drum is manually released and the frame 32 and elevator box allowed to fall by gravity, the speed thereof being regulated by the manual application of power to the brake shoes 38, 39 through the medium of the lever 43, rods 41, 42, and lever 40. In the descent of the frame 32 the pin 95 thereon engages the lever 92 and depresses the same, causing an automatic release of the rock shaft 86, which latter is then acted upon by the spring 89 to throw the clutches into mutual engagement. The clutches engaging, the shaft 79 is rotated and the ropes 98, 98, are wound upon the drums 101, 101, thus elevating the rear end of the truss frames 69, the platform 70 now being supported by the pivots 72 resting in the slots 74. When the frame 32 has reached its lowest position the crank shaft 78 is manually operated to rotate the shaft 75 through the medium of the sprocket mechanism, which movement of rotation results in a winding of the rope 102 upon said shaft until the platform 70 is sufficiently tilted to cause the contents of the wagon box to be precipitated into the elevator box. This being accomplished the crank shaft 78 is reversely rotated in order to reversely rotate the shaft 75 and while unwinding the rope 102 wind up the rope 104 and tilt the platform 70 into an approximately level position. Power is then applied to lift the frame 32 and elevator box as before described, and when the said frame reaches a certain point the pin 95 engages the lever 92 and raising the same automatically disengages the clutches and permits the truss frames to resume their normal position. In the downward movement of said truss frames one of the pivots 72 engages the trigger 96 and causes the rock shaft 86 to be again locked. In a further elevation of the frame 32 and the box 52, the depending hooks 65, 65, engage the eyes 66, 66, and cause said box to tilt in the direction of said hooks 66. This tilting movement causes the vertical arm on the end of the shaft 60 to impact with the pin 62 thus rotating said shaft and releasing the mechanism which retains the gate closed. The gate being opened it is obvious that the inclined position assumed by the box 52 will precipitate the contents of said box into a crib or other repository adjacent to which my machine is operated. The frame 32 and box 52 are now again lowered and in so doing the box resumes its normal position and the gate is automatically closed as hereinbefore described.

The wagon is locked on the dumping platform in the following manner. The rocking lever 124 is operated by means of the hand lever 125, to lift and release the pawl 121 from the ratchet plate 118. The lever 114 is then moved to the right rocking the shafts 108, 110, and causing the hooked arms 115, 117, to rise into the position shown by the dotted lines in Fig. 9, the hooks on the arms 115, 117 embracing and holding the rear axle of the wagon.

Having thus described my invention what I claim as new therein, and desire to secure by Letters-Patent of the United States therefore is:

1. In a wagon dump and elevator, the combination of a portable frame and vertical guides thereon, sheaves mounted at the upper ends of said guides, chain belts run over said sheaves and fixed at one of their ends to a traveling frame which latter is adapted to be moved vertically along said guides, sprocket chains fixed at one of their ends to the remaining ends of the chain belts, the remaining ends of which sprocket chains are fixed to the lower portion of the said traveling frame, direction pulleys acting on said sprocket chains to guide the same, sprocket wheels acting on said sprocket chains, and rotating mechanism acted upon by a cable to operate said sprocket wheels, together with an elevator box mounted in said traveling frame.

2. In a wagon dump and elevator the combination with a portable frame, of a shaft located in the lower portion of said frame, sprocket wheels mounted on said shaft, a traveling frame suspended by chains engaging said sprocket wheels and supported by sheaves, an elevator box mounted in said traveling frame, hooks depending from said box and stops adapted to be engaged by said hooks to tilt said box, gates in said box and tripping mechanism automatically operated during the elevation of said box to open said gates, and a cable and drum for causing said chains to travel.

3. In a wagon dump and elevator, the combination with the portable frame and elevating mechanism of a dumping platform, comprising truss frames pivoted at one end to the portable frame, a platform pivoted at the center of its parallel sides to the truss frames, connections between said truss frames and the elevating mechanism for lifting the platform and manually operated rotating mechanism for tilting said platform.

4. In a wagon dump and elevator, the combination with a portable frame and elevating apparatus, of a dumping platform pivotally suspended within said portable frame, a main shaft of the elevating apparatus, a supplemental shaft having connection with said dumping platform, sprocket mechanism, between said shafts, and clutch mechanism on said supplemental shaft which is adapted to be automatically operated to cause the platform to be elevated by the movement of the elevating apparatus.

5. A wagon dump and elevator comprising a portable frame a dumping platform pivotally mounted on said frame, an elevator box suspended within said frame, and windlass mechanism for raising said box, rope and windlass mechanism for raising said platform, clutch mechanism interposed between the two said windlass mechanisms, tripping mechanism acted upon by the elevating mechanism to control the clutch mechanism and manu-

ally constructed rope and windlass mechanism for tilting the dumping platform.

6. In a wagon dump and elevator the combination with a dumping platform pivotally mounted within a portable frame, of a shaft mounted below the central portion of said platform and extending transversely thereof, drums mounted on said shafts, ropes fixed to said drums and extending in opposite directions therefrom to points of attachment to opposite ends of said platform, and manually operated mechanism for rotating said shaft whereby said platform is tilted.

7. In a wagon dump and elevator the combination with a dumping platform of a wagon lock comprising hooked arms, adapted to embrace the rear axle of a wagon, pivotally mounted on said platform, rock shafts located beneath said platform and having connection with said hooked arms, a manually actuated lever connected to said rock shafts and means for locking said hooked arms in different positions.

8. In a wagon dump and elevator the combination with the elevator box and means for hoisting the same, of gates hinged to said box spring pressed hooks mounted on said box and normally engaging said gates, crank shafts journaled transversely of said box beneath and in engagement with said hooks, means for tilting said box and stops adapted to engage said crank shafts and release the said hooks from engagement with said gates.

9. In a wagon dump and elevator the combination with an elevator box, a support for said box and means for hoisting the same, of hooks depending from the end of said box and stationary stops on the elevator frame adapted to be engaged by the depending hook to tilt the said box as required to dump the contents thereof.

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