

3 Sheets—Sheet 1.

No. 532,624.

Patented Jan. 15, 1895.

Fig. 1.

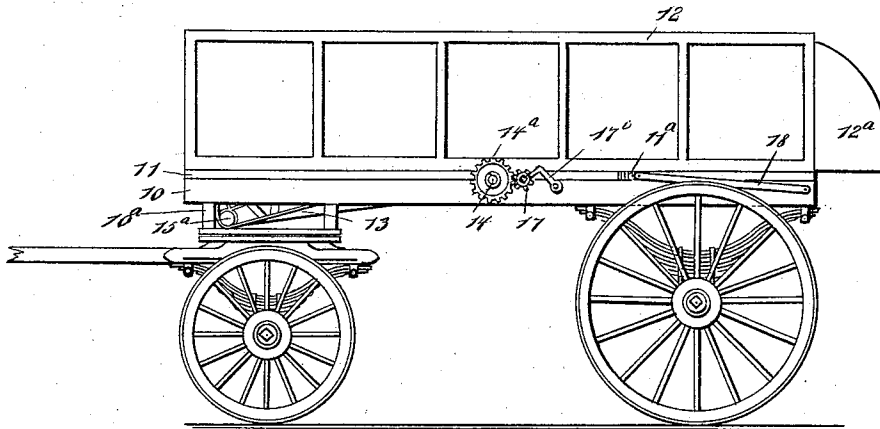
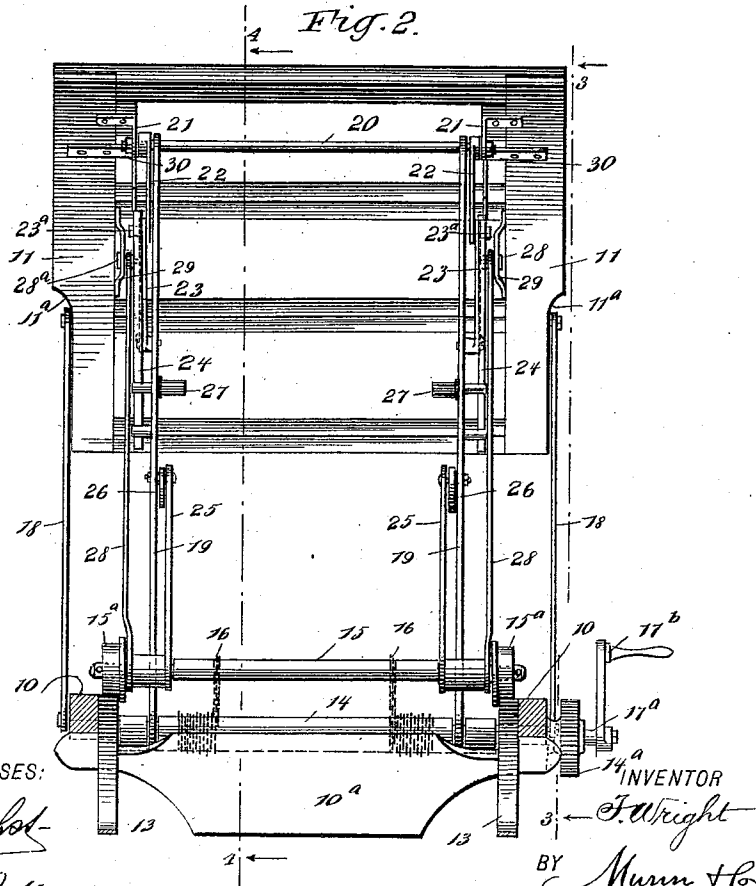


Fig. 2.



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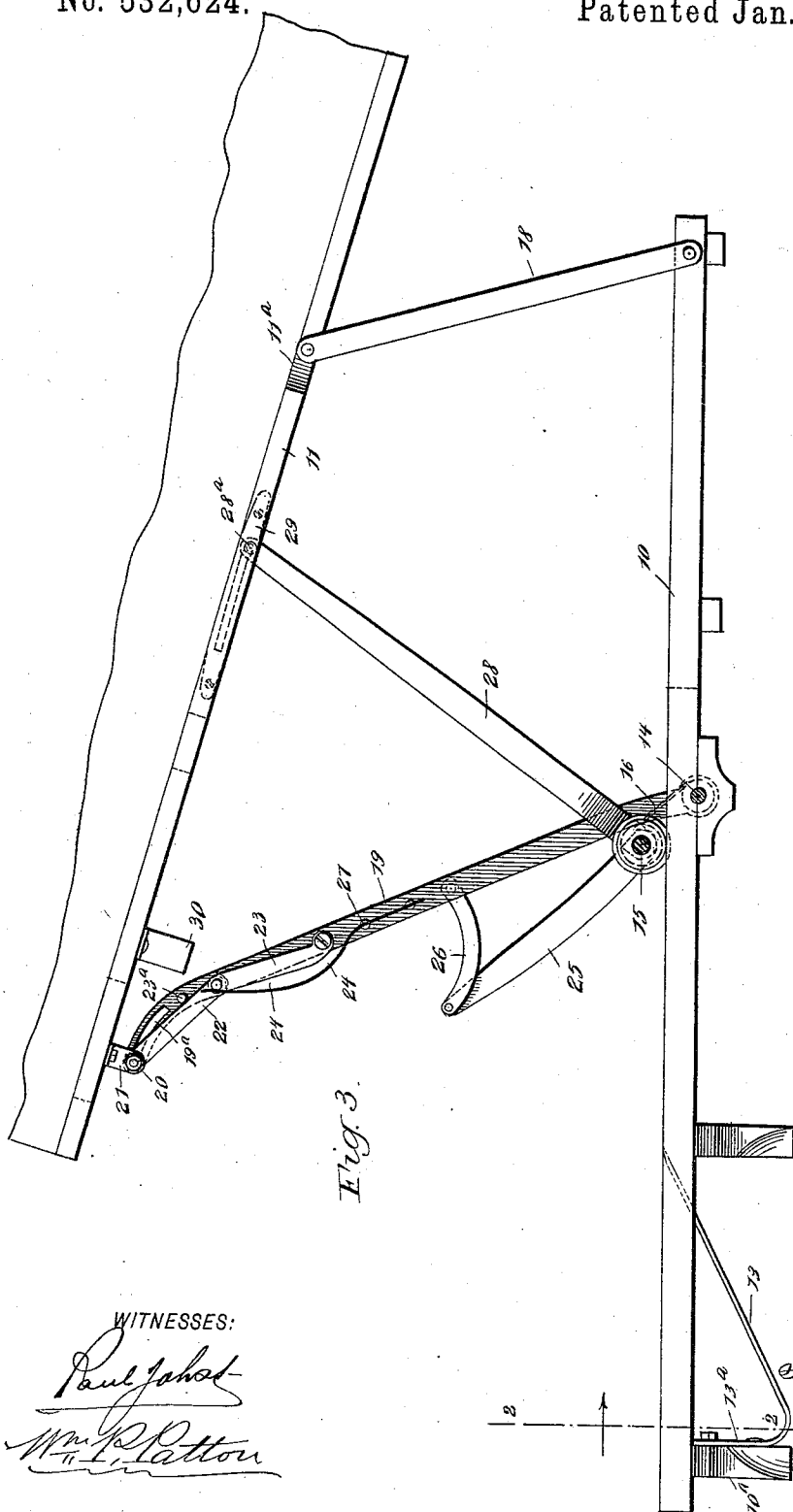
(No Model.)

3 Sheets—Sheet 2.

T. WRIGHT.
DUMPING MECHANISM.

No. 532,624.

Patented Jan. 15, 1895.



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DUMPING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 532,624, dated January 15, 1895.

Application filed August 27, 1894. Serial No. 521,455. (No model.)

To all whom it may concern:

Be it known that I, THOMAS WRIGHT, of Jersey City, in the county of Hudson and State of New Jersey, have invented new and useful
5 Improvements in Dumping Mechanism for Wagons, of which the following is a full, clear, and exact description.

My invention relates to improvements in coal or other freight wagons, having bodies adapted to dump their contents in bulk, and particularly to a style provided with mechanism to elevate the front end of the body, inclining the latter rearwardly and downwardly for a discharge of the load through an
15 opening in the rear end of the wagon body:

The object of my invention is to provide novel and effective mechanism, which in operation is self-adjusting, and that is adapted to sufficiently elevate and suitably incline the
20 wagon body from front to rear, for the quick and complete discharge of the load through a chute or aperture in the rear end of said body.

To this end my invention consists in the construction and combination of parts, as is
25 hereinafter described and indicated in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate
30 corresponding parts in all the views shown.

Figure 1 is a side view of a wagon having the improvements that are mainly concealed by the frames of the body and running gears, which are impinged to adapt the vehicle for
35 progressive movement. Fig. 2 is an enlarged transverse sectional view of the gear frame of the wagon on the line 2—2 in Fig. 3, and a rear end view of the sill frame of the body in elevated adjustment, the improved lifting or
40 dumping mechanism being shown as it appears from the rear side when completely elevated to dump a load. Fig. 3 is an enlarged partly sectional side view of the improvements shown in elevated adjustment on the
45 wagon gear frame and sill frame of the body shown in part, the section being taken on the line 3—3 in Fig. 2. Fig. 4 is a sectional side view of the sill frame, gear frame, and intervening body lifting mechanism, on the line
50 4—4 in Fig. 2, showing the improved lifting mechanism partly elevated, and Fig. 5 is a sectional side view of parts on the same line

with Fig. 4, showing the body and gear frames closely folded, and the lifting or dumping mechanism similarly adjusted.

In the drawings 10, indicates the gear frame that is mounted on the running gears of the wagon and affords a base for the sill frame 11, that is the bottom portion of the body 12, the latter being a rectangular framed structure of
60 suitable dimensions for its service as a coal transferring receptacle, the preferred use for the wagon provided with the improvements being to haul and deliver coal in bulk at a desired point.

As indicated the frames 10, 11, are elongated and rectangular, of similar form and size, each being stiffened with transverse bars.

On the gear frame 10, at the inner side edges of the same, two similar inclined track
70 bars 13 are placed and firmly secured, these pieces each consisting of a metal bar that is rectangular in cross section and of a sufficient length to afford effective service as a track support for traveler wheels that will presently be described. The track bars 13, at a
75 proper distance from the front cross-bar 10^a of the gear frame, are downwardly and forwardly inclined, terminating in similar upwardly curved foot pieces 13^a, which are at-
80 tached to the cross-bar named.

Near the longitudinal center of the gear frame 10, a winch shaft 14 is transversely journaled, one end of which is projected sufficiently outside of the frame to permit the
85 spur gear wheel 14^a to be secured on said projecting portion as shown in Figs. 1 and 2.

A movable counter shaft 15 is provided on which the two similar flanged truck wheels 15^a are journaled and loosely secured at its
90 ends, said wheels which are of comparatively small diameter being so spaced apart that their peripheries may freely roll on the track bars 13, and their flanges loosely engage the inner edges of said track bars. The wheeled
95 counter shaft 15, is flexibly connected with the winch shaft 14, by two chains 16 that have one end of each attached to the shaft 15, and opposite ends secured to the winch shaft, the chains being suitably spaced apart
100 as shown in Fig. 2. Wire ropes may be substituted for the chains if preferred. A toothed pinion 17, of considerably less diameter than that of the wheel 14^a is secured on a journaled

shaft so as to mesh its teeth with those of the spur wheel, and on the outer end of this rotatably sustained shaft 17^a a crank handle 17^b is removably secured, as is indicated in Fig. 2, a pivoted pawl 17^c on the gear frame 10, being adapted to interlock with the pinion and prevent a rotation of the winch shaft when this is necessary.

As the chains 16 are of an equal length it will be seen that a rotatable movement of the winch shaft 14, effected by the pinion and crank handle will contract the length of the chains so as to draw the counter shaft 15 toward the winch shaft and in a plane parallel with it.

The rear end of the gear frame 10, is connected with the sill frame 11, by the similar prop bars 18 which have their lower front ends pivoted to the outer surfaces of the side bars on the gear frame, and their other ends in a like manner loosely secured to the outer edges of the sill frame, the latter being cut away to allow the prop bars to fold in parallel with each other, in case the sill frame slightly exceeds the gear frame in breadth, as is shown at 11^a, in Figs. 2 and 3, the prop bars being projected forwardly so that their ends which are pivoted to the sill frame will be suitably removed from the rear end of the latter.

Two front end prop bars 19, of similar dimensions and form are furnished, these pieces each consisting of a flat metal bar having a greater width than thickness, their rear ends being laterally perforated to have a rocking engagement with the winch shaft 14, on which said perforated ends are located near the inner edges of the gear frame.

The forward ends of the bars 19, are curved edgewise and downwardly an equal degree, these curved portions being slotted as is represented in Figs. 3, 4 and 5, to afford means for their engagement by the cross brace rod 20, which rod passes loosely through the curved slots 19^a and projects sufficiently beyond the prop bars at each side of the sill frame 11 to be secured in the perforated ends of the similar depending bracket arms 21, the latter being affixed by their feet on the lower side of the sill frame near its front end.

On the outer side of each front prop bar 19, and at a correct distance from their upper ends, the mating rock arms 23, are pivoted by their lower ends, and two similar rock arms 22 are loosely mounted on the brace rod 20 between the slotted end portions of the prop bars 19, and depending bracket arms 21, the lapped ends of the paired arms 22, 23, on each side of the body frame being pivoted together.

There is a plate spring 24 affixed to each prop bar 19, on the outer side by one end, the free resilient portions of said springs that are of equal dimensions and tensional force, being imposed on the pivot joints of the paired arms 22 23, at their normally lower edges, the springs being thus adapted to press the lapped and pivoted ends of each pair of arms toward

the sill frame 11, until a stop knob 23^a, on each prop bar 19 is impinged by the arms 22.

Two supplementary lifting arms 25, are loosely mounted on the counter shaft 15, by an engagement of their perforated, unsecured lower ends with the shaft named, and two links 26, in plate form downwardly curved edgewise are pivoted by their ends, respectively to the upper end portions of the supplementary arms and to the inner sides of the front prop-bars 19. From the inner side of each prop bar 19, and near the center of length, a stud 27, is projected, these being designed to have contact with the upper edges of the links 26, at certain points of elevation given to the bars 19 and supplementary lifting arms 25, as will be further explained.

Two similar main lifting levers 28 are essential portions of the dumping mechanism, each comprising a straight bar of a length nearly equal with that of the front prop-bars 19, said levers having the one end of each pivoted on the shaft 15, between and near to the side pieces of the gear frame 10, as is clearly shown in Fig. 2. The remaining ends of the lifting levers 28, are each provided with a lateral stud bolt or headed pin 28^a, which projecting pins have a loose engagement with the longitudinally slotted bracket plates 29, which latter are affixed to the inner sides of the sill frame 11, as is plainly shown in Figs. 4 and 5, the levers being thus disposed to incline rearwardly and have a limited sliding connection with the sill frame.

Assuming that the parts are in folded adjustment, it will be noticed in Fig. 5 where such a disposition of the mechanism is illustrated, that the single pair of jointed rock arms 22 23 shown, are flexed at their pivot connection, so as to dispose them diverged at an angle of about ninety degrees, their downward projection bending the plate springs 24 correspondingly. The position of the counter shaft 15, is at the bottom of the inclined planes of the track bars 13, with the wheels 15^a near the front cross bar 10^a of the frame 10, when the sill frame 11 is imposed on the gear frame. When in complete folded adjustment, the front prop-bars 19, lie nearly horizontal, their slotted front ends having slid on the brace rod 20, so that the latter is located near the rear terminals of these curved slots in the bars mentioned, and as shown in Fig. 5, the disposition of the lifting levers 28 with regard to the sill frame 11, when the latter is completely lowered to impinge the gear frame 10, is such as will locate their connecting pins 28^a at the forward ends of the longitudinal slots in the bracket plates 29.

The supplementary lifting arms 25, and the links 26, are so proportioned in length, that when all parts of the dumping mechanism are folded to impinge the sill frame 11, on the gear frame 10, said arms and links will lie in the respective positions indicated in

Fig. 5, the links being then nearly horizontal and their upper edges in contact with the studs 27.

It is evident that to permit the described parts to assume the relative positions shown in Fig. 5, or to completely fold together, the winch shaft 14 must be allowed to rotate sufficiently to unwrap the chains 16, so that the latter may extend in a taut condition between the winch shaft and counter shaft.

The body 12, is adjusted to locate its sill frame on the gear frame 10, when the wagon is to be progressively moved, either loaded or empty, and when a load has been transported to a point where it is to be dumped, the operation is as follows: The crank handle 18, is revolved so as to rotatably move the winch shaft 14, in the direction of the curved arrow in Figs. 4 and 5, which will wrap the chains 16 on the latter and draw the counter-shaft toward the rear end of the wagon. The initial movement of the counter shaft 15, that starts it to ascend the inclines of the track bars 13, parallel with the winch shaft 14, first moves the two prop bars 19, and lifting levers 28, so that their raised ends will be relatively located as shown in Figs. 3, and 4, the brace rod 20 having then traversed the slots in the curved ends of the prop bars named, on account of the upward rocking movement of the front prop bars. In a like manner and for the same reason the pins 28^a that project from the ends of the lifting levers 28, into the slotted bracket plates 29, are rearwardly slid in said slots until they impinge their rear terminal walls, and thus adapt the levers to push upwardly on the sill frame 11. The progressive movement of the counter shaft 15, up the inclined portions of the track bars that the loose wheels 15^a facilitate, and the consequent upward rocking movement of the prop bars 19 as before mentioned, permits the plate springs 24, to press on the joints of the arms 22, 23 and move said paired arms upwardly at their points of pivotal connection, their relative adjustment when the wheels 15^a are near the top of the inclined portions of the track bars, being shown in Fig. 4. When the wagon body has been partly elevated as has been explained and as indicated in Fig. 4, the pivot bolts that loosely join the lapped ends of the paired arms 22, 23 will impinge the lower edges of the abutment limbs 30, which are oppositely and downwardly projected from the sill frame 11, at correct points for their co-action with the arms and brace rod 20, the limbs affording support so that the arms will be gradually moved toward alignment longitudinally considered, as the sill frame is given a steeper incline from front to rear. As the supplementary lifting arms 25, have been correspondingly elevated along with the prop bars 19, and the link plates 26, have their upper edges in contact with the studs 27 when the working parts are being moved to elevate the body, it will be seen that the links will be upwardly pressed as the arms 25 rock up-

wardly, and thus effectively aid the front prop bars 19 in elevating the forward end of the body 12.

It will be evident that the rocking movement of the front prop bars 19, upward and rearward, will induce a similar movement in the pair of rear prop bars 18, so that the rear portion of the wagon body will be lifted from the gear frame a proper degree, and this end of the body will be rearwardly projected beyond the gear frame as the four prop bars 18, 19 are drawn upwardly by the travel of the counter shaft 15. After the wheeled shaft 15, is sufficiently drawn toward the winch shaft 14, to locate its wheels 15^a on the level portions of the track bars 13, the levers 28 are so disposed that they lift the main portion of the load that is forward of their points of engagement with the wagon body, the prop bars 19, then serving to steady the elevated front end of the latter. A continuation of rotary movement in the winch-shaft 14, results in drawing the counter shaft 15 nearly against the front edges of the prop bars 19, as is shown in Fig. 3, and so elevates the forward end of the body 12 that the load will freely slide from it when there is an opening effected at the rear end, which may be produced by an elevation of a gate in the tail board as usual, to discharge through a chute 12^a, or the tail board may be entirely removed if preferred.

The complete elevated adjustment of parts of the improved dumping mechanism as explained, removes the abutment limbs 30, from the projecting pivot bolts of the joints between ends of the rock arms 22, 23, which allows the plate springs 24 to press the joints of these arms so as to flex them toward the limbs 30, or until they are in contact with the knobs 23^a as previously mentioned, which engagement of parts serves to stiffen the joints of the rock arms 22, 23, so that they in effect become rigid portions of the prop bars 19, preventing the body from lateral swaying movement. The supplementary lifting arms 25 and links 26 also afford effective additional support to laterally brace the elevated front end of the body.

When a load has been dumped from the body of the wagon, the weight of said body will be sufficient to enforce the folding movement of the several parts of the dumping mechanism, if the pawl 27^b is released from an engagement with the pinion 17, and as the sill frame 11, descends the abutment limbs or plates 30, will engage their lower edges with the pivot bolts which loosely join the lapped ends of the arms 22, 23, pushing the latter down so as to flex their joints downwardly, these finally assuming the position indicated in Fig. 5, when all parts of the dumping mechanism are in folded adjustment; the bearing of the studs 27 on the links 26 preventing the parts from rattling while the wagon is in transit.

It is claimed for this improvement, that the parts of the body elevating mechanism, are

automatic in their adjustment from a folded condition to a complete elevation, and also adapted to effect a sufficient inclination rearwardly for the speedy and reliable discharge of the load in bulk; and after the load is by its gravity discharged, the wagon body will quickly effect its own descent if permitted to do so, the parts being then folded and the vehicle ready for progressive movement.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a dumping device for wagons, the combination of a gear frame, a winch shaft journaled therein, means for rotating said shaft, a sill-frame arranged over said gear frame and pivotally connected at its rear part thereto, front props connecting the front end of the sill-frame to the gear-frame, a counter-shaft movably mounted parallel to the winch-shaft, flexible connections between the winch-shaft and counter-shaft and lifting arms each having one end pivotally connected to the counter-shaft and the other end connected to the central part of one of the front-props, substantially as set forth.

2. In a dumping device for wagons, the combination of a gear-frame, a winch-shaft journaled therein, means for rotating said shaft, a sill-frame arranged over the gear frame, front-props connecting the front end of the sill-frame to the gear-frame, a counter-shaft movably mounted parallel to the winch-shaft, flexible connections between the winch-shaft and counter-shaft, lifting-levers connected at their lower ends to the counter-shaft and at their upper ends to the sill-frame behind the front props, and lifting arms each pivotally connected at one end to the counter-shaft and having its other end connected to the central part of one of the front-props, substantially as set forth.

3. In a dumping device for wagons, the combination with a body having a sill frame, a gear frame, and forwardly and downwardly inclined track bars on the gear frame, of two rear prop bars pivoted to the sill frame and gear frame, a transverse journaled winch shaft, a wheeled counter shaft that is movable on the track bars, flexible connections between the winch shaft and counter shaft, forwardly inclined prop bars pivoted on the winch shaft and slidably pivoted on the sill frame and connecting mechanism adapted to transmit motion from the counter shaft to the prop bars and sill frame, substantially as described.

4. In a dumping device for wagons, the combination with a sill frame, a gear frame, track bars on the gear frame downwardly and forwardly bent, a winch shaft rotatable on the gear frame, a spur wheel on said shaft, a rotatable pinion, and a locking pawl, of a counter shaft having wheels journaled on its ends arranged to traverse the track bars,

two spaced flexible connections between the shafts, two rear prop-bars pivoted to the sill frame and gear frame and forwardly inclined, two front prop bars pivoted by ends on the winch shaft and slotted at other ends to engage a brace rod, a transverse brace rod hung by ends from the sill frame, two spring pressed lapped and pivoted arms loosely secured on each front prop bar and also on the brace-rod, and arms and levers loosely secured at ends on the counter shaft and loosely connected to the front prop bars and sill frame, substantially as described.

5. In a dumping device, the combination of a gear-frame, a sill-frame, a rotatively mounted winch-shaft, a movable counter-shaft, flexibly connected to the winch-shaft, prop bars, and lifting levers each loosely connected at one end to the counter shaft and having at its other end a slotted connection with the rear part of the sill frame, substantially as set forth.

6. In a dumping device substantially as described, the combination with the sill frame and gear frame pivotally connected at their rear ends, of two front prop bars slotted at upper ends, a transverse brace rod on the gear frame and engaging the prop bars' slots, spring pressed arms pivoted together and on the rod and front prop bars and means to elevate the prop bars.

7. In a dumping device substantially as described, the combination with a sill frame, and a gear frame, of two forward prop bars slotted at upper ends, a transverse brace rod on the sill frame engaging the slotted ends of the front prop bars, two rearwardly inclined pivoted lifting levers, arms pivoted together and on the front prop bars and brace rod, springs pressing said arms where jointed together and means to elevate the prop bars and levers.

8. In a dumping device, the combination with a sill frame, and a gear frame, of two pivoted front prop bars slotted at upper ends, a transverse brace rod on the sill frame engaging the slotted ends of the front prop bars, the lower rock arms pivoted at their lower ends to the front prop bars, the upper rock arms pivoted at their lower ends to the lower rock arms and at their upper ends to the brace rod, springs on the front prop bars pressing the pivot joints of the rock arms, stops on the prop bars which limit the flexure of the rock arms, abutments on the sill frame adapted to press the joints of the rock arms downwardly, two supplementary arms, two link plates, two lifting levers adapted to slide at ends on the sill frame, a rotatable winch shaft, and a movable wheeled counter shaft, substantially as described.

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Witnesses:

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