

No. 684,039.

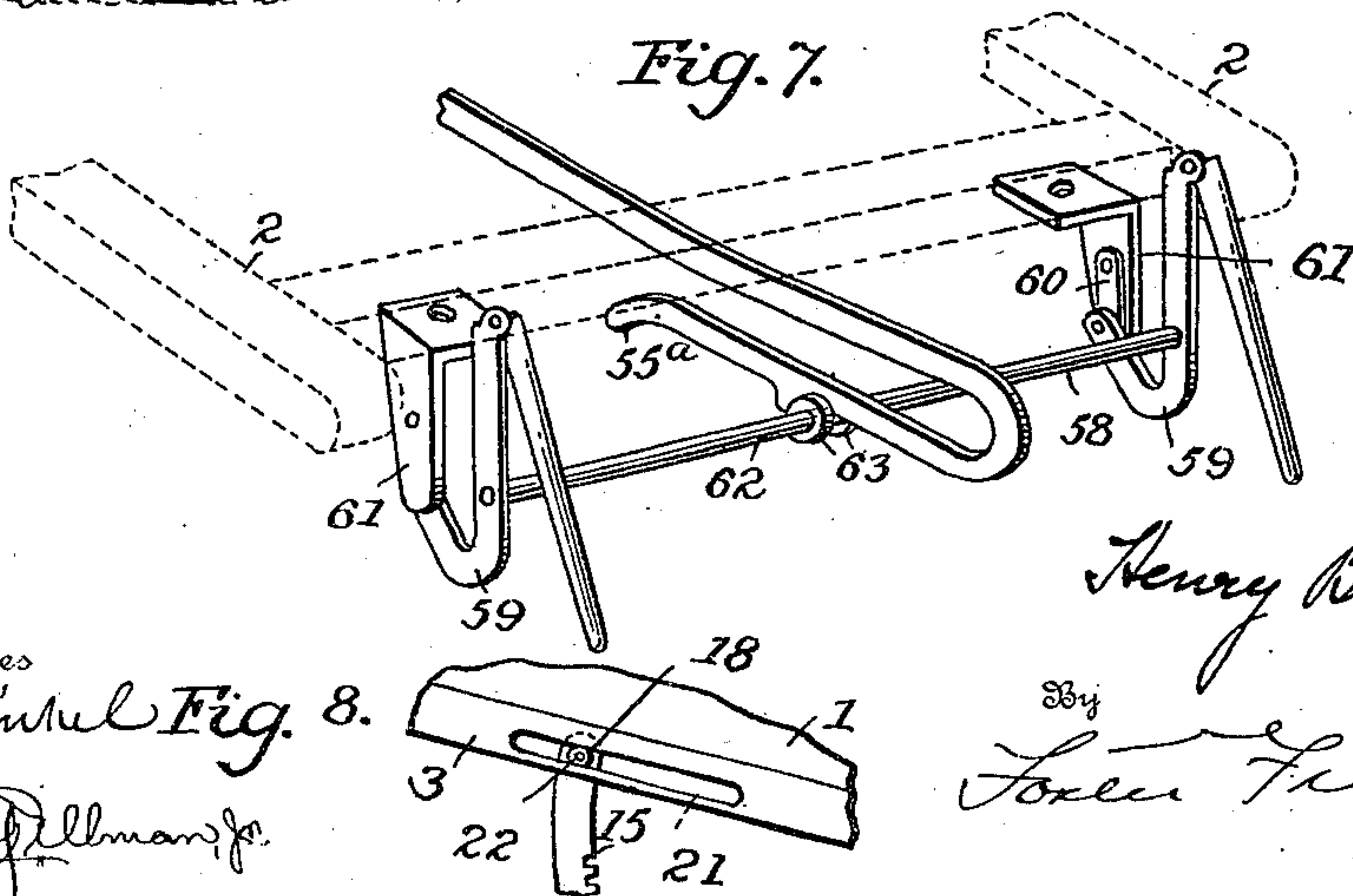
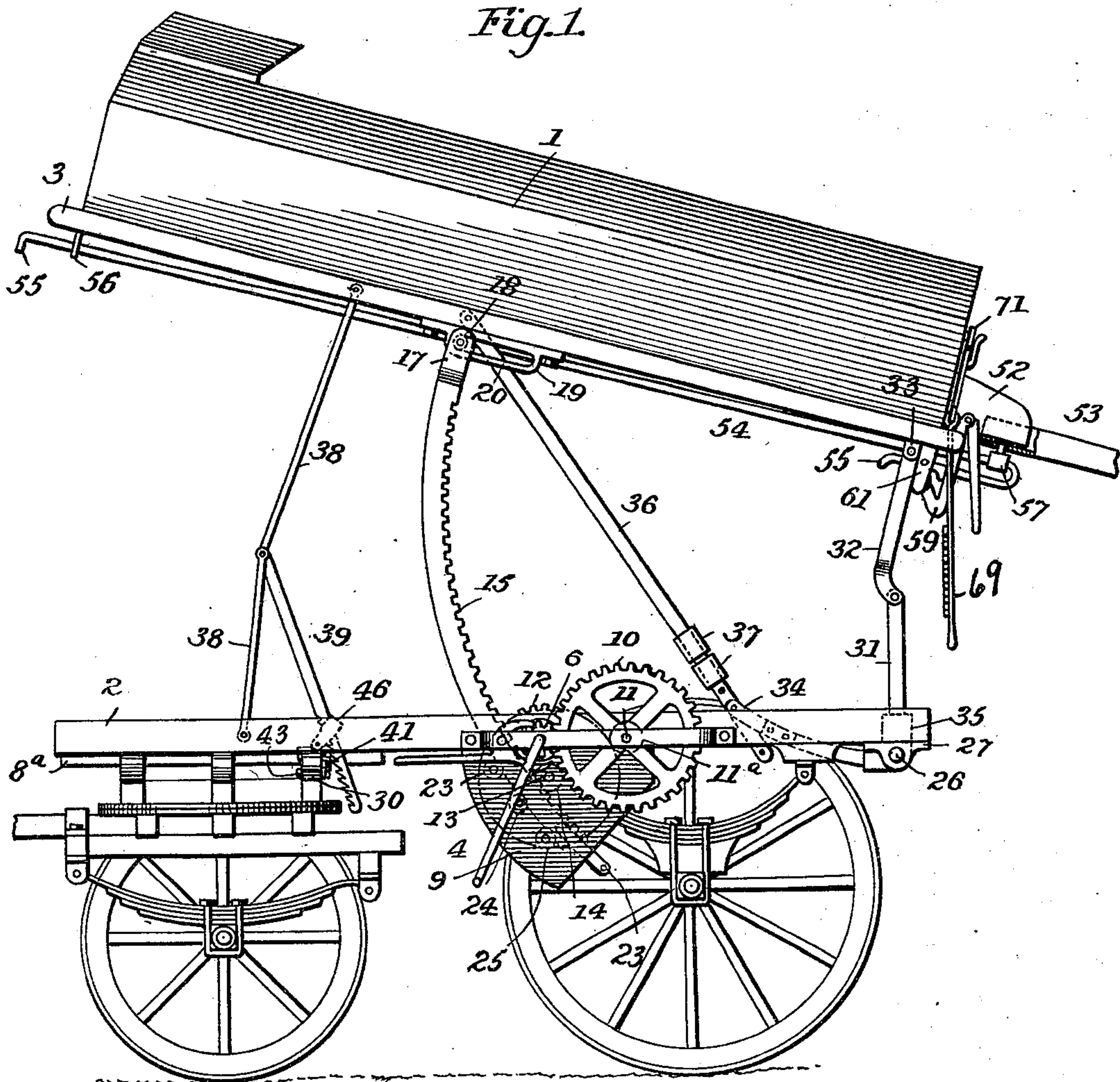
Patented Oct. 8, 1901.

H. BITNER, SR.  
DUMPING WAGON.

(Application filed Jan. 7, 1901.)

(No Model.)

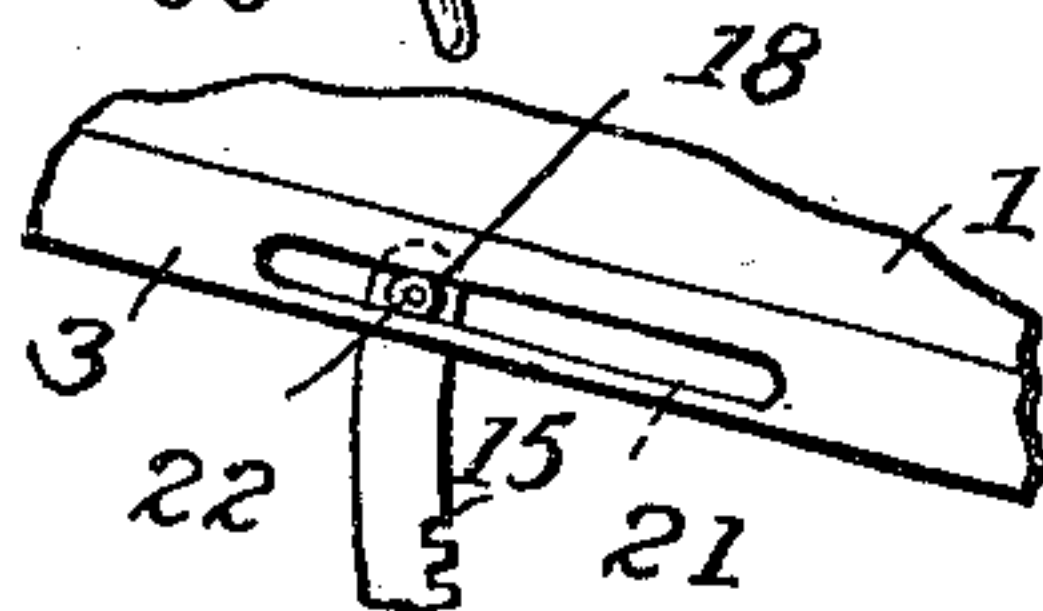
3 Sheets—Sheet 1.



Witnesses

*J. H. Tuttle* *Fig. 8.*

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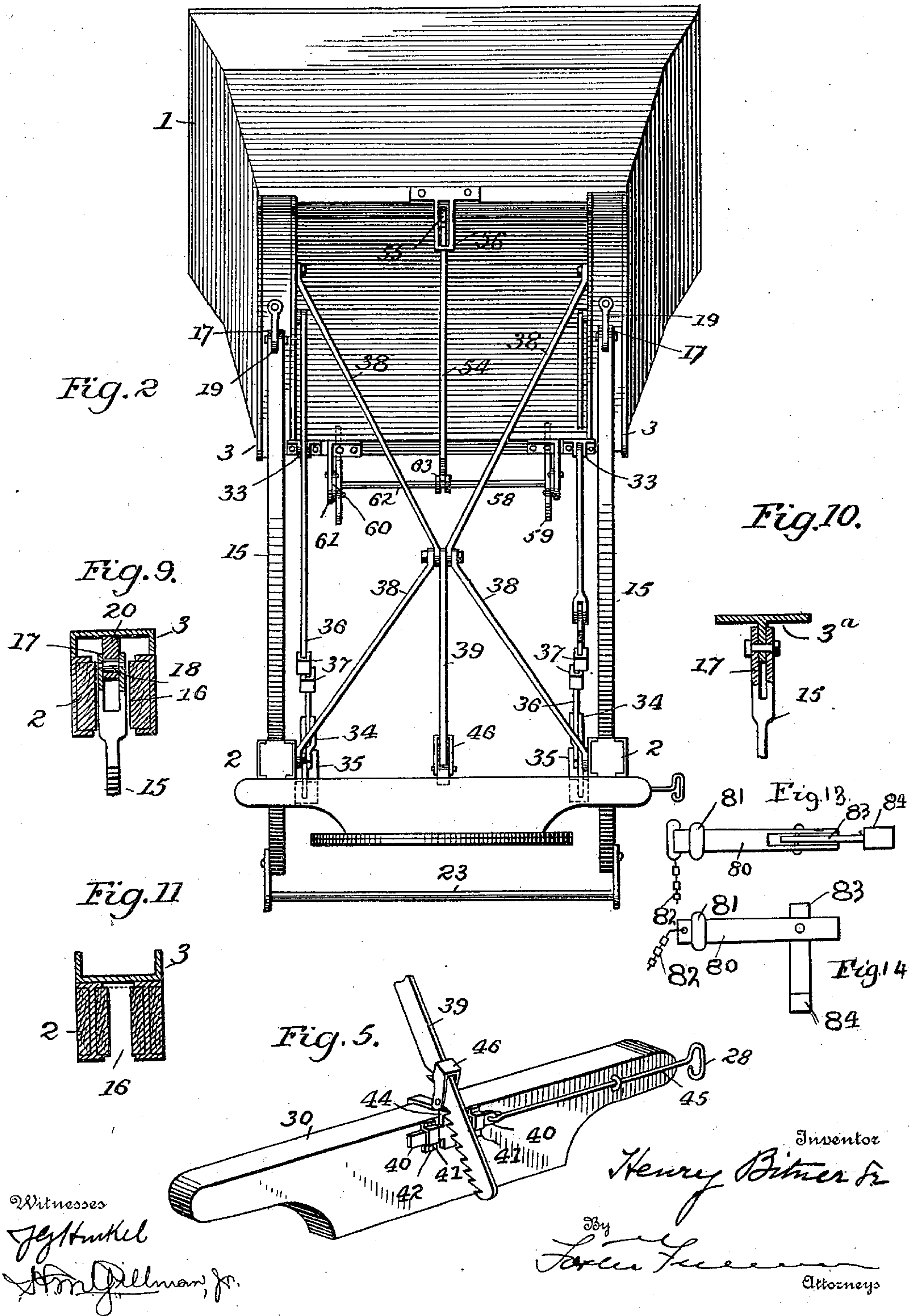
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3 Sheets—Sheet 3.

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Fig. 3.

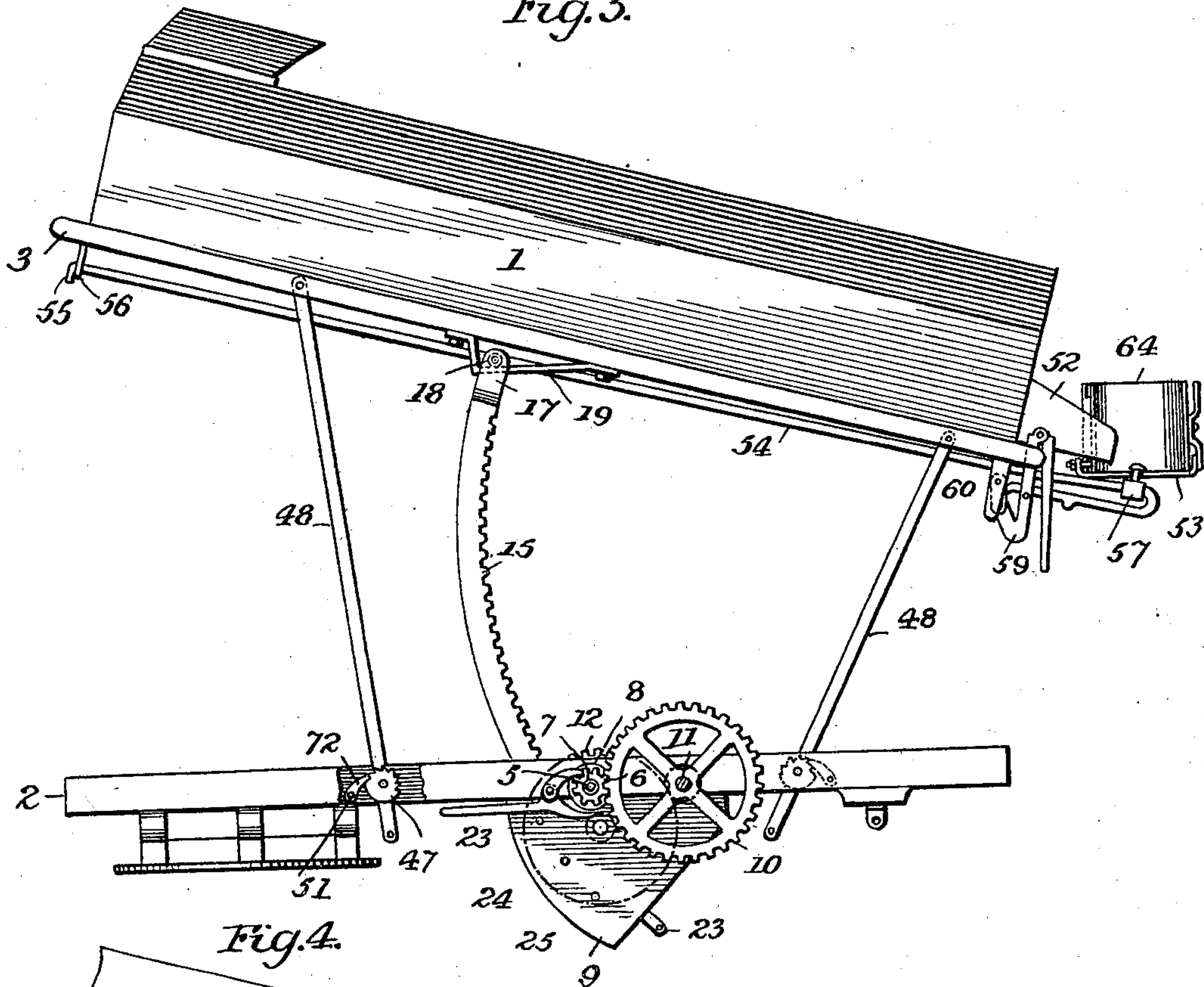


Fig. 4.

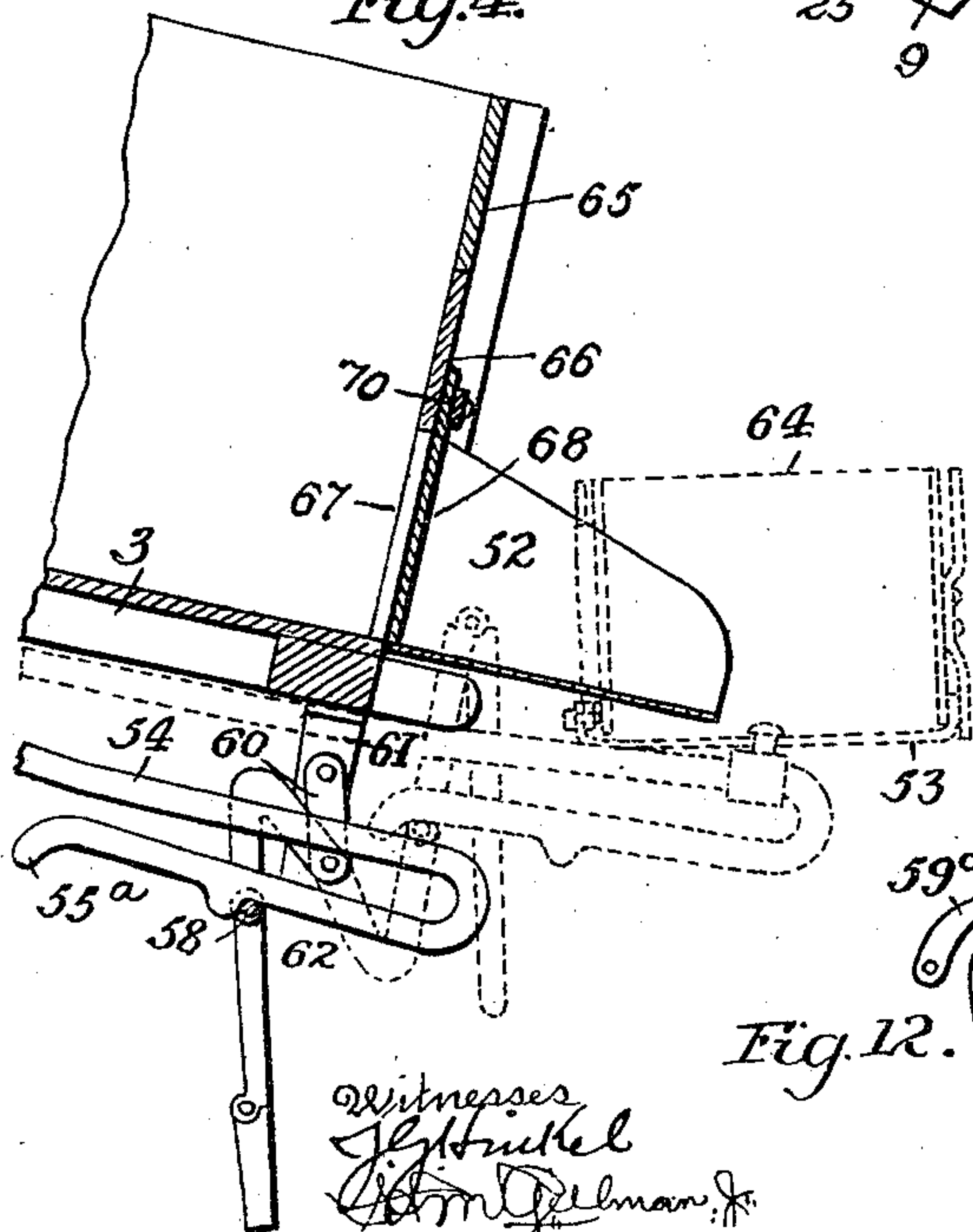


Fig. 6.

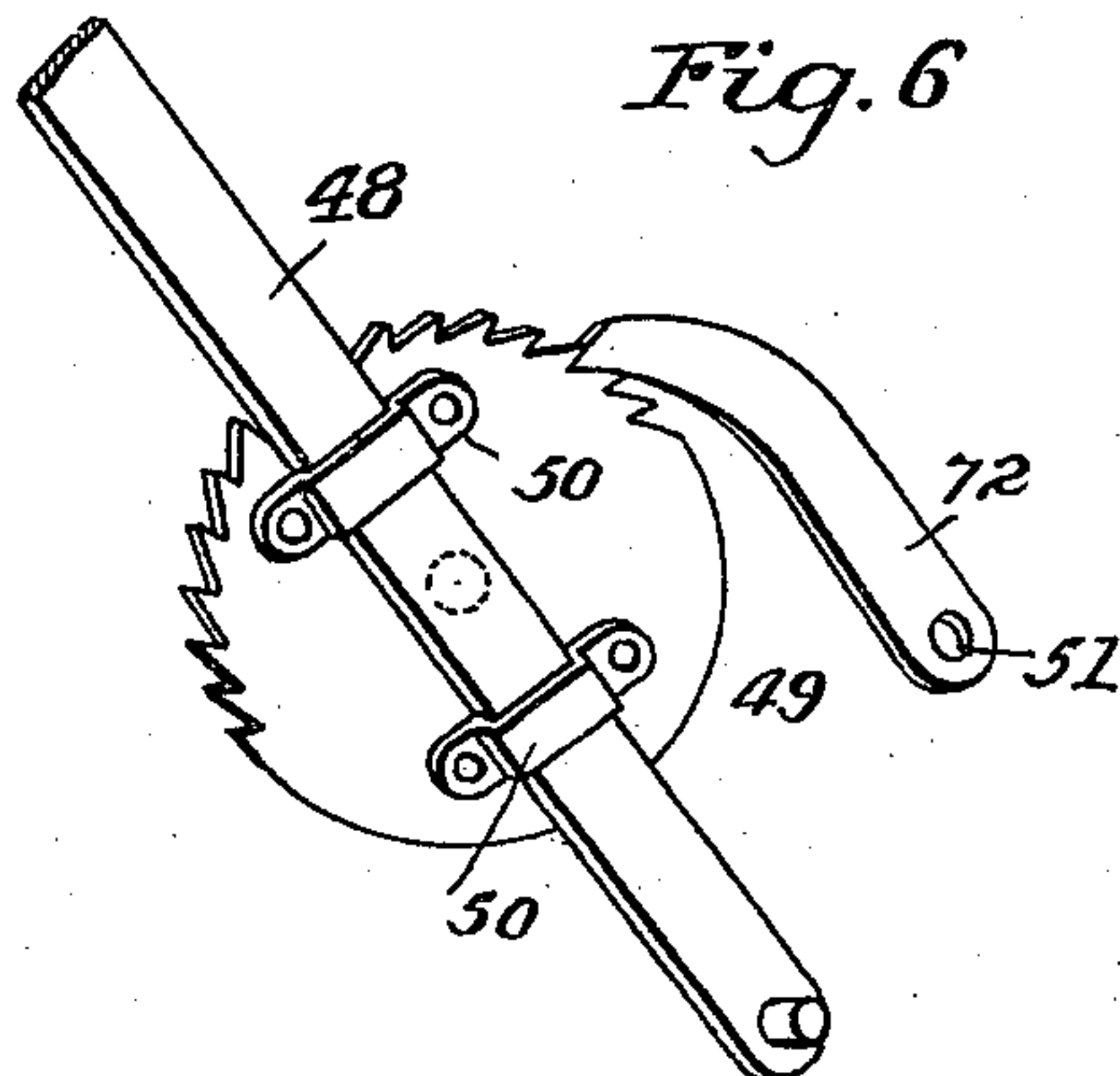
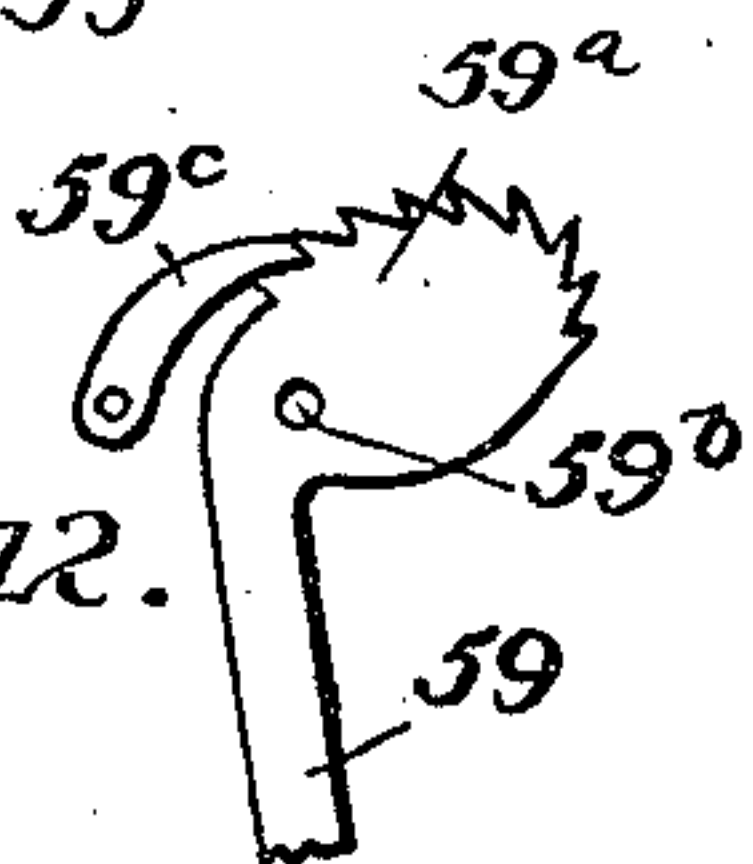


Fig. 12.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## DUMPING-WAGON.

SPECIFICATION forming part of Letters Patent No. 684,039, dated October 8, 1901.

Application filed January 7, 1901. Serial No. 42,415. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY BITNER, Sr., a citizen of the United States, residing at Harrisburg, county of Dauphin, State of Pennsylvania, have invented certain new and useful Improvements in Dumping-Wagons, of which the following is a specification.

This invention relates to certain new and useful improvements in dumping-wagons, having for its objects to secure an improved and expeditious means for the ready transportation and unloading of coal, sand, broken stone, and other loose material and the deposit of the same at the desired place of unloading more or less distant from the wagon, as the case may be, with the saving of time and labor.

With these objects in view the invention consists of an improved mechanism for the elevation of both the front and rear ends of the body of the wagon or for elevating the front end only, if desired, said mechanism being actuated at will by means of a crank and a system of gearing from a common point of initial movement and by a continuous motion.

In the accompanying drawings, forming a part of this specification, and in which like numerals of reference indicate corresponding parts, Figure 1 is a side elevation of the improved dumping-wagon, the body being elevated in position for dumping and the wheels upon one side being removed. Fig. 2 is a transverse sectional rear view of the rear-end-lifting mechanism with pull-rods attached, showing more in detail the relative arrangement of said mechanism and truck-rails, parts being broken away. Fig. 3 is a side elevation of the wagon-body, truck-rail, and lifting devices. Fig. 4 is a detail view. Fig. 5 is a detail view showing the operation of the ratchet-bar to obstruct the descent of the body at will. Fig. 6 is a modification of Fig. 5. Fig. 7 is a view showing the details of the chute-rod support. Fig. 8 is a modification of Fig. 9. Fig. 9 is a detail view showing the upper end of a lifting-arc. Fig. 10 is a modification in the mode of connecting the upper end of a lifting-arc. Fig. 11 shows the orifice in the truck-rail through which a lifting-arc passes. Fig. 12 is a modification in the

construction of part of the chute-rod support. Fig. 13 is a plan view of a drop-bolt ready to be inserted in position; and Fig. 14 is a side view of the drop-bolt, showing the tongue dropped down for holding the bolt in position.

Referring more particularly to the drawings, 1 designates the wagon-body, which may be made of any suitable material or combination of materials and is preferably made somewhat deepest at the rear end.

The framework upon which the body 1 is supported consists, primarily, of four rails or beams of either wood or steel, or both, or of any other material suitable to sustain the weight and resist the shocks or concussion to which the structure is subjected in the performance of the functions for which the invention is devised. The two lower beams 2 2, which will hereinafter be designated as "truck-rails," and the upper beams 3 3, hereinafter referred to as "body-sills," may be of any suitable construction; but preferably the beams are formed of metal channel-plates, which I attach most usually in the case of the body to the body-sills, so that the flanges extend vertically downward, and in the case of the truck-rails to the latter, so that the flanges of the latter extend vertically upward, an arrangement by which when the body rests upon the truck-rails the flanges of the channels of the body engage by contact longitudinally with those of the truck-rails each to each. When, however, the weight to be transported and elevated to a greater or less altitude is excessive, the said channels are arranged in a different manner—that is to say, each truck-rail is constituted of two channel-plates or of one or two I-beams arranged to lie parallel in the same horizontal plane, (in the case in which I use two channel-plates with their flanges extending horizontally and their webs erected vertically.) In the case in which I use an I-beam for each truck-rail I prefer to extend the flanges of the channels attached to the body-sills upward, said sills resting between the said channel-flanges. By this arrangement the horizontal or transverse upper surfaces of the truck I-beams engage with the lower flat surface of the webs of the body-channels when the body is not in process of elevation. By this arrangement



of the channel-plates or I beam or beams a greater strength of resistance to a superimposed load is attained than would be possible if but one truck channel-plate were on each side of the wagon with their webs in a horizontal extension. In the further completion of the said parallel channel-plates or I beam or beams the channels thereof are preferably filled with some suitable material lighter than that of which the plates are made, preferably wood. When I use the channels 3 3, as above described, Fig. 4, with their webs in a vertical position, the other actuating parts in connection therewith are as hereinafter described.

It is seen that the power used to elevate the body 1 to the desired position in dumping is applied to the crank 4, attached to the hub 5 of the pinion 6, which is securely fastened to the short shaft 7, as is also the brake-wheel 8, contiguous to the said pinion 6, (the beam 8<sup>a</sup> or horizontal support upon which the channels 2 rest,) and the downwardly-projecting plates 9 9, which are also securely fastened to the said outer and inner vertical webs of said channels 2 and keyed or otherwise secured in place that the pinion 6 and brake-wheel 8 may perform in turn their required functions. By further reference to said figures it is seen that the pinion 6 meshes into the cogged periphery of the wheel 10, fitted upon the short shaft 11, also attached to the said plates 9 9, and terminating in the pinion 11<sup>a</sup> in close proximity to the said inner plate 9. The said wheel 10 by its revolutions transmits its motion to the said pinion 11<sup>a</sup>, which in turn meshes into the cogged periphery of the wheel 12, and thence by the revolution of the long shaft 13 and the terminal pinions 14 thereof (located in vertical lines centrally between the said channels 2 upon opposite sides of the wagon-bed) the motion is further communicated by the meshing of the cogs of said pinions 14 into the cogged concaves (or in the equivalent case of cogged convexes, should I prefer to use cogged convexes instead of concaves) of the lifting-arcs 15, said shaft 13 being journaled through the bearing-plates 9 9 and their coordinates also located similarly to the vertical flat surfaces of the channels 2 upon the opposite side of the wagon-bed. By the said meshing of the said pinions 14 under the applied power the said lifting-arcs 15 are enforced upward in a vertical plane through the orifices 16, piercing the wood fillings of the channels 2, so located as to freely admit thereof. The upper ends of said arc-lifters 15 are bifurcated into jaws 17 for the reception therein of the rollers 18, so as to form guards 19, that in turn act as bearing-surfaces between which the frictional guides 20 are received, and thereby confine the said rollers 18 upon the bearing-surfaces of said guides in their forward or retrograde movement when the body 1 is being elevated or lowered against lateral displacement of the said rollers 18 in the sphere of their function.

In the event that I wish to secure a less expensive mode of guide and guard action than is attainable by the use of the said appliances I prefer to pierce the contiguous flanges of the channels 2 with longitudinal slots 21 of such length of orifice as will equal more or less that of the said guides, as shown in Fig. 8, that I may register therewith and pierce the said orifices by the terminal prolongations of the axles 22, upon which the said rollers 18 revolve in the performance of their said functions. In order also that the said axles 22 may perform the double function of guards and guides, I upset or otherwise enlarge the extremities of the said axles to prevent any longitudinal movement of the same when in use, while owing to the fact also that the bearing ends of the axles are thus confined in the forward or backward travel within the said slots there is no liability of the said rollers 18 being forced by an average accident away from their bearing-contact with the flat engaging surfaces of the body-channels 3, and thus fail to support the body during elevation or when in position for dumping, and therefore in the event of this contingency operate to increase the liability of breakage of the elevating or other mechanism of the wagon by the displacement of the said rollers from their normal sphere of support when in use. It is also sometimes preferable, both in point of economy, safety, and simplicity of construction, to use a modified form of guide 19, (shown in Fig. 1,) in which a longitudinal slot 20 is so wrought in the guide 19 that in the substitution thereof I am enabled to dispense with the use of the rollers 18 altogether, if desirable, and in lieu thereof use the said axles 22 directly as bearing surfaces or supports by fitting the same loosely in the said slots 20 of the guides 19, so as to admit of their free movement therein to the entire lengths of the said slots 20 or over such a portion thereof as the requirements of elevation may demand, while at the same time all the advantages of guard and guide in action are secured, as in the case of the slotted channel-flanges shown in Fig. 1, and at a minimum of expense, from the fact that the said slots 20 in the guides 19 may be cast therein, as in the case of cast-steel, which is the preferable material for the same. In the construction of my guides 19, as shown in Fig. 1, I prefer the use of a bar of iron or steel of general T shape some two and a half inches broad transversely, one-half or three-fourths of an inch thick vertically, and some eighteen or twenty inches long for the reception of said longitudinal slot and flattened at both ends transversely to such an extent as may be sufficient to afford bearings through which I pass bolts, said bolts being extended through the bottoms of the channels 3 and the superimposed sills of the body 1 and securely fastened thereto by the use of nuts. By a further examination of the lifting-arcs 15 it is seen that in general form they con-



stitute the arcs of a circle of greater or less curvature and length, according to the weight to be lifted and the height of elevation required. As to shape in cross-section I prefer the general form of an I-beam, as combining strength with lightness of weight. In practice I prefer also to have the same cogged upon the concave edge, as and for the purpose hereinbefore set forth, although I do not limit myself to this specific location of the cogs, for the reason that in cases of long wagon-bodies and for the attainment of conditions of greater elevation of body it may be preferable to cast the cogs upon the convex edge. In regard to the material used in construction of the same I prefer cast-steel, either in whole or in part, both for increased strength and for the attainment of greater uniformity of cog contour and surface, as well as on account of the comparative inexpensiveness of construction. By a further examination of the said lifting-arcs it is seen that the lower ends of the same are connected by a rigid rod or bar 23 of Fig. 2, which not only gives a most desirable rigidity and mutual support to the said arcs, but at the same time serves to limit their upward movement, guarding the same from being forced beyond the required scope of meshing in the event of the operator through carelessness failing to cease rotating the crank at the required limit of elevation of the body.

In Fig. 10 I show a modification of the mode of connecting the upper ends of the lifting-arcs 15 with the body-sills, in that I dispense with the use of the guards 19, guides 20, and rollers 18 and attach said upper ends to the body-sills to attain a common motion therewith. This is done, as shown in Fig. 10, by bolting the ends of the transverse arms of a T 3<sup>a</sup> through the webs of the body channels and sills and pivoting to the vertical stem of the said T the bifurcated ends of said lifting-arcs 15 by means of pins of a suitable thickness, the said pins journaling the terminal jaws of said arcs and said T-stem-receiving orifices being wrought therein, so that the said arcs may accommodate themselves to the different angles of elevation assumed by the body in ascent or descent. This modified construction is preferably available when it is required to shift the line of gravity of the body forward during the act of elevation in order that said line may be retained within the base of the wagon structure when said base is limited in longitudinal area, as is the case of a wagon of excessively short coupling, said shortness of coupling being an essential when lightness of draft is required at the expense of stability in the case of an excessively-elevated loaded body under the conditions of dumping. Otherwise I prefer in practice to retain the truck-rails and body-sills in relation to each other within the same longitudinal limits, a desideratum attainable under the accommodations of the terminal

arc-rollers 18 and the engaging guide 19, as hereinbefore described.

In Fig. 3 is shown a modification of guide 19, in which the lower angular bearing is projected considerably below the body-sills and the bearing-surface of the guide is carried rearwardly at an incline. By this arrangement greater height of body is attained as the jaws of the arcs approach said angular bearing.

As to the material, location, and function of the housing-plates 9 9, I prefer that the same be of steel, for obvious reasons. By reference to Fig. 1 it will be seen that said plates and their coördinates upon the opposite sides of the wagon are located at or near the longitudinal centers of the truck-rails and that they are riveted or bolted upon the upper edges or borders to the vertical webs of the channels 2 and the intervening wood beam 8<sup>a</sup>. Moreover, they not only perform the important function of aprons or housings for the covering and protection of the actuating mechanism, but they also furnish bearings for the shafting of the gearing hereinbefore described and also supply additional bearings for the axles of two or more friction-rollers 23 24 25, upon which the outer, central, and lower convex portions of the lifting-arcs 15 slide when in motion. They also supply bearings for the necessary attachments of brake-shoes and truss-rods when such are required.

Having hereinbefore described the means for the elevation of the front end of the body 1, I will now give in detail the attachments by the coöperation of which the rear end of the same is raised for dumping. As contributory thereto I first mention the cross-shaft 26, whose ends are journaled in boxes 27, firmly fastened to the under side of the beams 8<sup>a</sup> by means of bolts extending upward through the same between the laterally-supporting channels 2, said boxes 27 27 being so constructed as to admit of the revolution therein of the said ends of the said shaft 26. Also contiguous to said boxes 27 27, upon the under side of the body upon each side thereof, two arms 31 31 are rigidly attached by their ends to the said shaft 26 or pins at right angles thereto, the other ends of the said arms 31 31 being hinged to the lower terminals of the arms 32 32, whose other upper ends are also hinged to suitable bearings 33 33 on the cross rear sill of the body 1, as shown in Figs. 1, 3, and 4, as and for the purpose hereinafter set forth. Moreover, two other and lower arms 34 34 are terminally and rigidly attached to the said shaft 26 or pins at right angles to the said arms 31 31 at or near to the point of the latter's rigid connection with the said shaft 26, as and for the purpose set forth, as shown in Figs. 1 and 3. It is readily seen that in attaching said arms 31 and 34 rigidly and substantially at right angles to the said transverse shaft 26 or pins I may either weld the



same to the said shaft or I may journal there-  
 on or the said pins a solid right-angular plate  
 35, said plate being of such thickness as to  
 admit of its ends being socketed longitudi-  
 5 nally for the reception of the free ends of the  
 said arms 31 and 34, respectively, and their  
 retention therein by bolts perforating trans-  
 versely said sockets and inclosed arm ends  
 of said arms 31 and 34; or, again, I may make  
 10 said arms 31 34 as the terminals of solid right-  
 angular plates instead of a casting elbow, per-  
 forated at their point of angular intersection  
 with orifices of such dimensions as to admit  
 15 of their being journaled upon the said shaft  
 26 or pins and keyed rigidly thereto at their  
 point of permanent retention. It is also  
 readily seen that as a substitute for said shaft  
 26 I may use pins of cross-section similar to  
 20 that of the said shaft upon each side of the  
 body 1 and journaled to the truck-rails there-  
 of similarly as described in the case of the  
 said shaft 26 with equally-efficient results and  
 at less expense of cost and weight than en-  
 25 tailed in the use of the said shaft for the per-  
 formance of the same function. It is obvious  
 that the said pins 26 are of such length only  
 as is sufficient to supply bearings for the piv-  
 otting thereon of the said rigid angular con-  
 30 nections of the arms 31 34, the said connec-  
 tions being prevented from lateral movement  
 thereon on the one side by the free ends of the  
 said pins 26, being upset to form heads there-  
 of, as it were, and washers or collars on the  
 35 other side interposed between the said connec-  
 tions and the vertical faces of the truck-rails.  
 It is also further seen that the two rods 36,  
 which I shall designate as "pull-bars," are  
 so attached or pivoted to the free ends of  
 40 the arms 34 as to adjust themselves in their  
 function of raising the rear end of the body  
 for the purpose of dumping and at the same  
 time accommodating themselves to the differ-  
 ent heights of elevation to which the front  
 45 end has already been or is being raised under  
 the action of the elevating mechanism and  
 also admitting of being detached at will from  
 said pivot connections when it is desired to  
 raise the front end of the body 1 only. It is  
 also seen that the said pull-rods 36 are at-  
 50 tached by their forward ends to the body-sills  
 at some point more or less distant or forward  
 from the longitudinal center thereof, accord-  
 ing to the requirements of the maximum  
 height to which it is desired to elevate the  
 55 rear end of the body at a more or less accel-  
 erated motion. When, however, it is desired  
 to secure and maintain a common motion with  
 that of the elevating-arcs and an average  
 limited height, the upper ends of the pull-  
 60 rods 36 are pivoted upon the roller-axes of  
 the upper ends of the lifting-arcs 15, and  
 hence have a forward motion coincident there-  
 with. The connections of the upper ends of  
 the said pull rods or bars 36 with their said  
 65 bearing-points may be by means of a rod or  
 bar extending transversely across the under  
 side of the body and terminating upon the

outer vertical faces of the body-rails 2, or it  
 may be by means of two short rods or pins  
 having the same supporting-bearings as the 70  
 said single rod, but terminating inwardly at  
 such distance from said body-sills as is suffi-  
 cient to afford the required bearings for the  
 attachment thereto of the said forward ends  
 of the said pull-bars 36, as and for the pur- 75  
 pose set forth. In further description of my  
 said pull-rods 36 it is seen that they each con-  
 sist of two pieces or sections telescoping ter-  
 minally with each other. This requirement  
 of telescopic adjustment or its equivalent 80  
 adaptation is necessary to the attainment of  
 the elongation of the rod in accommodation  
 to the constantly-increasing length of diago-  
 nal distance from the point of operative con-  
 85 nection of the lower end of the compound  
 pull-bars or lower extremity of the bars 34 34  
 and the forward part of the body to which  
 the forward or upper ends of said pull-bars  
 are attached when said body is being elevated.  
 The extent or scope of the telescoping of said 90  
 bar-sections is determined by the height to  
 which it is desired to raise the front of the  
 wagon-body independent of the rear end  
 thereof before the elevation of the rear end  
 95 commences and simultaneously thereafter  
 when the front and rear ends rise, if the re-  
 quirements of dumping demand such con-  
 tinuous action. The construction of the en-  
 gaging bar-sections for the attainment of said  
 telescopic adjustment is as follows: Two bars 100  
 of iron or steel of such relative length as when  
 connected terminally and longitudinally will  
 be commensurate with said above-described  
 diagonal distance are each furnished at their  
 105 opposite ends when connected with a four-  
 sided rectilineal box or sleeve 37, open as to  
 its opposite ends and of such parallel and  
 transverse amplitude as will conform loosely  
 to the cross-section of the bar-shaft itself, said  
 110 sleeve or box 37 being jumped onto or other-  
 wise permanently fastened to the flat surface  
 or face terminally of each bar-section, so that  
 when journaled therein the edges and faces of  
 the said sections may be located in the verti-  
 115 cal plane of the said diagonal line of distance.  
 The desired adjustment of bar-section to bar-  
 section is made by passing the plain end of  
 each, 36, through the sleeve-terminus 37 of the  
 other, so that the continuous plain flat sur-  
 120 face of each bar-section will engage longitu-  
 dinally with the corresponding flat surface of  
 the other, each to each. By the act of the  
 said elongation of said pull-bars 36 under the  
 motion transmitted thereto by the gear mech-  
 125 anism each sleeve moves freely upon the in-  
 closed shaft of the superficially-engaging bar-  
 section and approach each other while the  
 front of the body is being raised, the limit of  
 said front elevation independent of the rear  
 130 elevation being reached when the said sleeves  
 collide terminally with each other. In order,  
 however, that said elongation should be a fact  
 in practice, the free ends of the lower bar-  
 section after having been journaled through



their engaging sleeve are attached to the lower ends of the rear lifting-arms 34 by means of an axial pin that is journaled through said lower ends of said arms, the forward ends of said bar-sections having been previously fastened to the forward end of the body-sills, as hereinbefore described. In addition, however, to said terminal hole in the lower bar-section two or more additional holes are drilled through the said bar at convenient points between said terminal hole and the rigid sleeve that terminates the opposite end of the same, the location of said holes being determined by the different heights to which it is desired to raise the rear end of the body. To this end the said bar-sections are detachable at will simultaneously upon the opposite sides of the wagon from the said axial pins that horizontally journal the lower arms 34, as above described, and rejournaled thereon through any pair of said additional holes, as the judgment of the operator may determine, according to the demands of dumping at points more or less distant from the delivery tail-gate of the body. For the purpose of safely and expeditiously attaching said lower bar-sections to said ends of said arms 34 I prefer after registering the desired or coördinate holes of the same with that of the said arms to use a drop-bolt 80, as shown in Figs. 13 and 14, because of its double function of a locking device and that of an axial pin that is not liable to be jostled from its place and readily lost. It is well also to have the head 81 of said bolt furnished with an eye for the attachment thereto of a light carrying-chain 82 for its retention when the bolt is not in use. The usual form of a drop-bolt is that of a pin slotted longitudinally for a limited distance on its central axial line from its free end for the insertion therein of the flat tongue end 83 of the thrust-point section 84 thereof, said tongue 83 being when in use placed in said slot and pivoted therein to admit of the vertical motion of the thrust end or section of the bolt after insertion into the registered holes of the said pull-bars and the lifting-arms 34. By this said possibility of vertical motion of said thrust-section of the bolt the latter after insertion drops to a right angle with the other section of the bolt, and thus operates as a locking device. Said motion also admits of the thrust-section 84 being lifted to a right line with the slotted section when it is required to draw the bolt from its functional engagement.

Upon further examination of my wagon attachments it is seen that I use in connection with the means of elevating the front part of my body standards or supports 38 38 38, which consist, substantially, of four rods or bars, (the upper two being somewhat longer than the lower two,) said bars 38 being pivoted terminally in pairs, the one pair to said vertical and opposite faces of the truck-rails and the other pair to the coördinate faces of the body-sills, while the four op-

posite ends are pivoted together each to each, as shown in Figs. 1 and 4—an arrangement that admits of the said bars being compressed together fan-like two by two in the same plane when the body rests upon the truck-rails or in pyramidal separation, the common pivot connection of the bars constituting the apex thereof when the body is being elevated, the basis of the said pyramidal engagement being the greatest when the body has reached its maximum height, as shown in Figs. 1 and 2. It is also seen that an additional bar 39 is also pivoted at its forward end to said apex, and its rearward end is free. This bar 39 is placed with its broad surface in a vertical plane and ratcheted on its lower edge, said plane being about equidistant from the vertical planes of the truck-rails and superimposed body-sills. Being thus connected with the standard or brace supports 38 38 38 38, said ratchet-bar 39 acquires the motion common to them with that of the forward part of the body when in process of elevation or descent. This motion is therefore utilized to obstruct said descent at will in the following manner and for the purpose as hereinafter stated. Said bar 39 is ratcheted on its lower edge for about one-third of its length, the teeth commencing at the lower free end and supported when at rest or in motion by gravity upon the rear cross-bar of the gear-platform 30. Upon the point of contact with said bar there is located a bolt-like sliding pawl 44, of the general form of a cross, with arms of about equal length. This locking device or plate is fixed upon the rear vertical face of the said rear cross-bar, with its pawl-projecting end extending vertically upward above the horizontal face of said bar 30, as shown in Figs. 1 and 5. When said pawl device 44 is in place, the lateral arms 40 40 pass through and are retained in operative position by loosely-fitting loops or holders 41 41, that are in turn terminally pierced by holes for the reception of bolts 42 42, which pass horizontally through said platform cross-bar 30 and are rigidly held thereto by the terminal nuts 43 43. The end of the arm 40 of the device next to the truck-rail to which the gear-wheels are attached is furnished with an eye or equivalent projection, to which is fastened a light push-and-pull rod 45, which is journaled through said truck-rail and terminates at its free end in a grip 28 at handy proximity to the crank-handle, by which the elevating mechanism is operated, and therefore under ready control of the crank operator. By further examination of said locking device 44 it is seen that the upwardly-projecting vertical end terminates in a hawk-bill extension so modified in shape as to fit snugly into the engaging teeth of the said ratchet-bar 39 when the latter slides forward thereover when the body is being elevated, and the said hawk-bill projection is thrust thereunder into contact therewith by the operation of the said push-rod 45. Again, when the body after dumping is permitted to descend



the said pawl projection is pulled away from said contact, and the teeth of the ratchet-bar pass rearwardly over the said cross-bar unobstructed. In order, however, that the said ratchet-bar 39 may be held in a fixed vertical plane in its movement, it is made to pass through a terminally-pivoted hood or housing 46, whose side walls are parallel to said bar, said hood being pivoted on the top surface of said cross-bar 30 to accommodate itself to the different inclines assumed by the ratchet-bar in its functional movements. It is thus seen that the function of said pawl-and-ratchet bar is that of an automatic safety-lock, whose operation is not only as an auxiliary to the standard-braces 38 38 38 38, but also as a rigid support against the descent of the body in the event that the cogged gearing should break while being operated, and thus prevent the descent of the body under gravity, with liability to further breakage of the body appliances and injury to the operator of the elevating mechanism.

In Fig. 3 is shown a modification of the above-described automatic ratchet-bar, in which modification I use two automatic bars 48 instead of one, 39, and connect the same directly with the body-sills and truck-rails, one on each side of the wagon structure. These bars, however, are not ratcheted, but plain, and in order that they may perform the desired automatic and locking function aforesaid I combined them with a cooperating device hereinafter described. To this end I swivel each of said plain and straight bars at their upper ends when in place to pins or bolts suitably registered through the body sills or channels and extend the lower free ends rearwardly at a suitable incline and pass each of the same through the periphery edge of a revolving disk or centrally-pivoted cap 47, of a circular form, more or less, and perforated as to its periphery in the line of its diameter and in the plane of the said supporting-bars 48 48 by orifices of a shape corresponding more or less accurately with the cross-section of the said bars or standard-supports. As an equivalent to said disk-boxes 47 instead of piercing the same, as described, it may be less expensive or difficult to substitute in place of said disk-boxes plain disks 49 of a contour similar to said boxes and in lieu of said perforations to raise upon the inner vertical faces of each of said disks 49 when in place two loops 50 or holders, one loop on each side of the centers of said disks, said loops 50 being in the clear of their internal dimensions in conformity to the cross-sections of said bar-supports 48 to admit of the free passage through the same of the said supports, the perforated centers of the said disks 49 being located, preferably, between the said loops or holders 50. In practice I prefer to make said central holes or disk-perforations countersunk upon the vertical surface adjacent to the said bar-supports 48 and fit therein flat-headed swivel pins or axles

whose mallet end shall be flush with that of the disks 49, and thus admit of the unobstructed passage thereover of the said bar-supports 48 in the performance of their functions under the action of the rising and falling of the body as necessitated by the act of dumping. Upon a further examination of said disks 49 it is seen that their circumferential contour for at least a quadrant portion of their periphery is ratcheted or notched for the reception of the free end of a pawl 72, that at the will of the operator admits of the locking of the said disks against the revolution of the same when desirable. Hence it is seen that when the loops 50 of the said disks are in line with the engaging surfaces of their inclosed bars 48 and the said pawls 72 are thrown back from their ratchet engagement with the peripheries of the said disks 49 the said disks will revolve in accommodation with the forward or rearward thrust movements of the said bars that take place when the body ascends or descends, in consequence of being swiveled thereto, when in dumping use. It is seen, however, that when the said pawls are thrown into ratchet engagement the disks 49 become locked against revolution, and in consequence thereof the loops 50 are also locked because of their being rigidly attached thereto, and hence in turn lock the inclosed bar-supports 48, which therefore necessarily prevent any vertical movement of the body so long as said pawl-and-ratchet engagement continues. In order to facilitate the control of the said pawls in the performance of their lock and release functions by the operator of the gear mechanism, I perforate the blunt or pivot ends of said pawls preferably with a square orifice, through which I register or journal a tightly-fitting pawl-rod 51, the opposite ends of said pawl-rod 51 being journaled in suitable bearing blocks or orifices attached to or perforating the opposite truck-rails, the pawls journaled thereon being so located within the vertical planes of the said disks as to unerringly perform their aforesaid functions, as described. It is also seen that I prolong the end portion of the said rod contiguous to the operating-crank side of the wagon to a sufficient degree to admit of its passing through the contiguous truck-rail and thereupon wrought into a grip-handle for the ready revolution of the said pawl-rod at will by the said crank-operator.

For convenience in depositing the contents of my wagon I locate an opening more or less central in the tail-board of my wagon-body and from thence extend to the rearward thereof a spout 52 of suitable length and somewhat narrower at its point of delivery in order to facilitate the flow of said contents into my chute 53. In such cases, as it is not desirable to dump the contents of my wagon-body directly from the spout 52 at a near point of delivery, but to deposit the same at a greater or less distance inaccessible by the wagon, I



propose to use a chute 53, consisting of one or more longitudinal sections telescoping together, and hence capable of being elongated at will to the desired length for convenient deposit. As the distance from the rear end of the wagon, to which the contents thereof is to be delivered, may be considerable, and hence the weight to be sustained by the chute is also proportionally increased, I propose to strengthen my chute by means of sections of band-iron riveted fast to the upper edges thereof, said band-iron being angle-shaped as applied to the section of chute next to the spout 52 and plain upon the edges of the additional sections—an arrangement that facilitates the labor of telescoping preparatory to transit to the place of dumping and also affords a guard against upward tilting of the latter section or sections by the edges of the latter impinging upon the under side of the horizontal inward extension of the angle-limb of the first section. This being the common practice in construction, the same need not be further described. Also in such cases, as I cannot deliver the contents of my wagon to a point inaccessible to the rear of my wagon directly, owing to the fact that said point is only approachable at some angle, either acute or right, I have so attached my chute 53 terminally to the said spout 52 of my body 1 as to admit of the chute being swung to one side at the desired angle for delivery. For this purpose I attach a bar to the under side of the bottom of my body, which for convenience I shall call my "chute-rod" 54. This said rod 54 I locate, preferably, about the longitudinal center of said body and suspend the forward end thereof in a slotted pendant 56, attached at its upper end to the front cross-sill of said body, and shape the forward end of my said rod 54 into a hook 55, whose function is to limit the rearward thrust of my said rod when the same is drawn rearwardly, the said hook 55 gripping upon the transverse closure of the slot in said pendant 56. By an examination of the rearward extension of my said rod 54 it is seen that I bend the end of the same back upon itself upon the under edge thereof and terminating the same also in a hook 55<sup>a</sup> of short curvature, also bent downward. It is also seen that I journal upon said rod 54 an eyebolt 57, having its threaded end pointing upward and made to pass through the bottom of the forward end of the first section of my chute 53 and securely fastened by a nut or otherwise upon the concave surface thereof. Said chute-rod 54 is also made independent of its bent section and of a somewhat greater length than that of the body 1 and spout 52 combined. This excess of length is required for the purpose of extending the rear end beyond the spout end, as hereinafter described and for the purpose set forth. By the above-mentioned position of my eyebolt 57 it is seen that my chute 53 rests upon the upper edge of my chute-rod 54, between the same and the bottom of the body, when nested for transit

from place to place—an arrangement that facilitates the handling of my chute 53 and admits of other movements that are desirable. 70

By reference to Figs. 4 and 7 the transverse-rod support 58 of my chute-rod 54 and its attachments are shown. Hence it is seen that said rod-support 58 is of a general H shape, terminating as to its upper verticals in more or less eccentric disks 59. Said disks 59 are also swiveled to the lower ends of two short plates 60, which in turn are pivoted at their upper ends to the longer limbs of two bearings 61, near the angular intersection of the arms thereof. It is also seen that the downward projections of the rear rod-support 58 are half-hinged at or near the longitudinal centers thereof in order that the ends of the same may rest in an angular position under gravity when the body is being elevated or descending, and hence not liable to come into contact when the chute 53 is being swung to one side or with obstructions in close proximity to the wagon, and yet capable of being used as continuous levers when used to force the chute 53 into close contact with the free end of the spout 52 while the contents of the wagon are being dumped. 85

The horizontal limbs of the chute-rod bearings 61 are bolted or otherwise securely fastened to the rear cross-sill of the body 1, and the horizontal bar 62 of the chute-rod support 58 is furnished centrally with two rigidly-separated collars 63, which afford a seat for the chute-rod 54 in its forward-and-backward thrust, and thus also prevent lateral motion in transit of the same. In Fig. 1 the chute-rod 54 is shown as thrust forward at its limit and in position for withdrawal of the chute 53 for load-delivery when the wagon is backed at right angles to the curb-line of the street and the chute-rod support 58 is thrown up to perform the function of a locking device to hold the chute 53 into close engagement with the free end of the spout 52, a movement that is attainable under the eccentric action of the lever-disks 59 and the swivel-plates 60 under the power exerted by the grip ends of said levers as exerted by the operator. 115

In the further description of my chute appliances a valuable adjunct is shown in the function performed by the shield 64. This appliance is adapted to be attached at the one end thereof to the side of the chute opposite to the end of the spout 52 when the said chute is swung around for a side delivery of the contents of the body at any angle with the side thereof, the other end of said shield 64 being extended in a curve across the concave bottom and the open upper end of the chute and fastened terminally to the other side thereof just above and contiguous to the said end of the spout 52. From the fact that the chute may be swung around to either side of the wagon the said shield is reversible end for end and adapted to prevent the said contents of the body when 130



under the impetus of discharge from being thrown over said opposite side of the chute by being diverted therefrom by the curve of the shield into the continuous concave channel of the chute. In order that the said shield 64 may be readily reversible for the purpose stated, the said shield is furnished near the ends of the same, upon the flat surface thereof in the one case, with a thin bar of iron of such length that the ends of the same may project beyond the longitudinal edge of said shield, so as to admit of said projections being rounded into a pivot-like form or pin for insertion into eyebolt-heads, whose threaded ends pass horizontally through said chute edges. The ends of the transverse iron bar similarly fastened to the opposite end of the said shield are terminally bent outward at a double right angle to slide as catches over the engaging edges of the chute contiguous thereto. Hence when in place the said shield assumes a general semi-circular form, but more or less rectilinear when released on account of its spring-like nature.

The rear gate of my wagon-body 1 is the ordinary lifting door swiveled more or less centrally to a laterally-vibrating bar, which in turn is swiveled to the lifting-lever, which has also an upward-and-downward motion in the vertical plane of the body and at a greater or less amplitude.

In adapting my body 1 for use in dumping sand, lime, soft coal, or other similar material it is preferable not only to widen the entrance to the discharge-spout 52 to a degree nearly as wide as that of the body itself, but also to incline the inner vertical side to the body rearwardly to such an angle as will be in a right line with that of the vertical sides of the said spout. To further facilitate the operation of dumping, the rear vertical end of the wagon-body is constructed in three longitudinal sections, which are designated as "upper" section 65, "intermediate" section 66, and "lower" section 67, the intermediate section being stationary and secured terminally to the rear ends of the sides of the body. The upper section 65 is hinged at its lower horizontal edge to the upper horizontal edge of the fixed section 66, and the lower section is hinged at its upper horizontal edge to the lower horizontal edge of the said fixed section in such manner as to admit of its being swung upward when discharging the load and may require a maximum opening for the delivery of the same. The hinging of the upper section 65 to the intermediate section 66 is to permit said section to be swung downward to facilitate and lessen the labor of loading when the same is done by shoveling, the height of the top of the body 1 being thus reduced by the vertical breadth of the said section 65. In the event of the material to be discharged not requiring the use of the maximum discharge-opening obtained by swinging the section 67 upward a lifting-door 68 is employed, which door is lo-

cated centrally of the lower section 67 and is capable of being lowered or elevated at will by means of a lever 69, terminally pivoted at the point 70 to the section 66 and pivoted centrally of its length to a swinging bar 71, one end of the lever being left free to be grasped by the operator for the purpose of elevating and depressing the same to operate the door.

In order to explain the preparatory operation of my chute, I will say that when I discharge my load in dumping by backing my wagon to the curb-line of the sidewalk I allow the chute-rod to remain as shown in Fig. 1, with the forward end projecting beyond the slotted pendant attached to the front end of the body. When, however, I wish to make a side delivery of my load, I pull the said chute-rod 54 rearwardly until the forward hooked end of the said rod 53 collides with the closure of the slot of the pendant 56, a rear movement of the said rod 54 that extends the curved rear end beyond the spout end to a degree that when the chute 53 is swung around to the right or left a sufficient extension is secured to admit of the entire breadth of the chute 53 being receptive of the contents of the spout 52, the rear curved end and eyebolt of the said chute-rod 54 being previously shifted from the central seat of the chute-bar support to the angular end of the same, the edge of the chute 53 contiguous to the spout end resting sufficiently under the said spout end to have a bearing-support to prevent a side tilting under the load in discharge and being locked thereto by the upward movement of the eccentrically-operating levers when forced thereto by the operator. Being thus locked to the spout 52, a maximum incline of chute 53 is obtained, that is of great advantage in cases of delivery at points distant from the rear end of the wagon. The more or less eccentric lever-disks 59 of the chute-rod support are attached to the pieces 61 by short plates 60; but in Fig. 12 I have shown a modification of this construction in that the plate 60 is done away with and the end 59<sup>a</sup> of the shorter arm of 59 is broadened and formed with ratchet-teeth and pivoted eccentrically at 59<sup>b</sup> to 60. A pawl 59<sup>c</sup> is adapted to engage the teeth and hold the eccentric disk 59 in whichever position desired.

I claim—

1. In a dumping-wagon, the combination with the body and truck frames, of lifting-arcs having their upper ends bearing on the under surface of the body-sills, rear lifting-levers pivoted to the truck-rails and to the body-frame respectively and terminally intermediately pivoted to each other, and pull-rods pivoted terminally at their lower ends to the free ends of the truck-rail levers, and the other ends of said pull-rods to the forward parts of the body, substantially as described.

2. In a dumping-wagon, the combination with the body and truck frames, of lifting-arcs having their upper ends bearing on the



under surface of the body-sills, rear lifting-levers pivoted to the truck-rails and to the body-frame respectively and terminally intermediately pivoted to each other, and pull-rods swiveled terminally at their lower ends to the free ends of the truck-rail levers, and the other ends of said pull-rods to the forward parts of the body, said pull rods or bars consisting of two sections telescoping with each other at their points of longitudinal engagements with each other, substantially as described.

3. In a dumping-wagon, the combination with the body and truck frames, of lifting-arcs having their upper ends bearing on the under surface of the body-sills, rear lifting-levers pivoted to the truck-rails and to the body-frame respectively and terminally intermediately pivoted to each other, pull-rods pivoted terminally at their lower ends to the free ends of the truck-rail levers, and the other ends of said pull-rods to the forward parts of the body, said pull rods or bars consisting of two sections telescoping with each other at their points of longitudinal engagements with each other, and truck-rails reinforced by channel-plates whose bearing-surfaces are either in horizontal or vertical contact therewith, substantially as described.

4. In a dumping-wagon, the combination with the body and truck frames, of lifting-arcs having their upper ends bearing on the under surface of the body-sills, rear lifting-levers composed of parts terminally pivoted to each other pivoted to the truck-rails and to the body of the frame respectively, and means for actuating said rear lifting-levers by the continuous application of the same power that elevates the front end of the body, to cause said rear lifting-levers to raise the rear end of the body, substantially as described.

5. The combination in a dumping-wagon with the body and truck frames, of vertically-lifting arcs having their upper ends bearing on the under surface of the body-sills, means for elevating the said arcs, ratchet-and-pawl devices independent of the elevating means for said arcs for locking a brace to support the front of said body at any point of body elevation in the event that the means for elevating the body should cease to operate by breakage of the mechanism or other cause, and the consequent injury to the operator or wagon appliances be thereby prevented, additional brace-bars, ratchet-and-pawl devices, and levers pivoted to the truck-rails and to the body-frame, respectively, for the elevation of the rear end of the body, substantially as described.

6. The combination in a dumping-wagon with the body and truck frames, of vertically-lifting arcs having their upper ends bearing on the under surface of the body-sills, means for elevating the said arcs, ratchet-and-pawl devices for locking the said body at any point of body elevation in the event that the means

for elevating the body should cease to operate by breakage of the mechanism or other causes, and the consequent injury to the operator or wagon appliances be thereby prevented, brace-bars, ratchet-and-pawl devices, levers pivoted to the truck-rails and to the body-frame, respectively, for the elevation of the rear end of the body, and telescoping pull-bars either of whose sections or both, on both sides of the wagon, are furnished with coördinate holes for the insertion therein of pins journaling the free arms of the rear lifting-levers regulative of the rear hoist of the wagon, substantially as described.

7. The combination in a dumping-wagon with body and truck frame, of means for elevating said body, a transverse chute-supporting bar having terminal angular arms, rigidly attached to each other, with ratcheted heads to receive pawls, the said chute-supporting bar being attached to the rear end of the body by such swivel connections as will admit of said supporting-bar being elevated without change of vertical plane so as to lock said chute against the bottom of the body when the wagon is in transit, or the receiving end of the chute to the delivery end of the spout when in process of load-delivery whether said delivery be in the line of the body extension or in right angles therewith, substantially as described.

8. In a dumping-wagon, the combination with the body and truck rails, of lifting-arcs having their upper ends bearing on the under surface of the body-sills, rear lifting-levers pivoted to the truck-rails and to the body of the frame respectively, means for actuating said rear lifting-levers by the continuous application of the same power that elevates the front end of the body, a transverse chute-rod, a horizontal-chute-rod support furnished centrally with rigidly-separated collars, which afford a seat for the chute-rod, a telescopic chute, and detachable and reversible shields to prevent the scattering of the load when the chute is used to deposit the load of the body at any angle to the plane of the side of the wagon-body, substantially as described.

9. In a dumping-wagon, the combination with the body and truck rails, of lifting-arcs having their upper ends bearing on the under surface of the body-sills, rear lifting-levers pivoted to the truck-rails and to the body of the frame respectively, means for actuating said rear lifting-levers by the continuous application of the same power that elevates the front end of the body, a transverse chute-supporting bar attached to the rear end of the body by such swivel connections as will admit of said supporting-bar being elevated without change of vertical plane so as to lock said chute against the bottom of the body when the wagon is in transit, said chute-supporting bar having an inclosing eyebolt by means of which the chute is carried upon the upper edge of the chute-rod instead of being suspended below it, a horizontal-chute-



rod support furnished centrally with rigidly-separated collars, which afford a seat for the chute-rod, a telescopic chute, and detachable and reversible shields to prevent the scattering of the coal and when the chute is used to deposit the load of the body at any angle to the plane of the side of the wagon-body, substantially as described.

10 In a dumping-wagon, the combination with the body and truck frames, of lifting-arcs having their upper ends bearing on the under surface of the body-sills, rear lifting-levers pivoted to the truck-rails and to the body of the frame respectively, means for actuating  
15 said rear lifting-levers by the continuous application of the same power that elevates the front end of the body, and drop-bolts for the disengagement of the latter at will from the operating connections by which the continuous application of the power is transmitted  
20 when it is proposed to elevate only the front end of the wagon-body, substantially as described.

11. The combination in a dumping-wagon  
25 with the body and truck frame, of vertically-lifting arcs having their upper ends bearing on the under surface of the body-sills, means for elevating the said arcs, and ratchet-and-pawl devices independent of the elevating  
30 means for said arcs, operating automatically for locking a brace to support the said body

at any point of body elevation in the event that the means for elevating the body should cease to operate by breakage of the mechanism or other cause, and the consequent injury to the operator or wagon appliances be thereby prevented, substantially as described. 35

12. The combination in a dumping-wagon with the body and truck frames, of vertically-lifting arcs having their upper ends bearing on the under surface of the body-sills, means for elevating the said arcs, ratchet-and-pawl devices independent of the elevating means for said arcs operating automatically for locking the said body at any point of body elevation in the event that the means for elevating the body should cease to operate by breakage of the mechanism or other cause, and the consequent injury to the operator or wagon appliances be thereby prevented, brace-bars, 40  
45 ratchet-and-pawl devices and levers pivoted to the truck-rails and to the body-frame, respectively, for the elevation of the rear end of the body, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 55

HENRY BITNER, SR.

Witnesses:

R. S. CARE,  
H. B. HAIN.