No. 688,174. Patented Dec. 3, 1901.

J. O. HIPP.
DUMPING CAR.

(Application filed Aug. 13, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

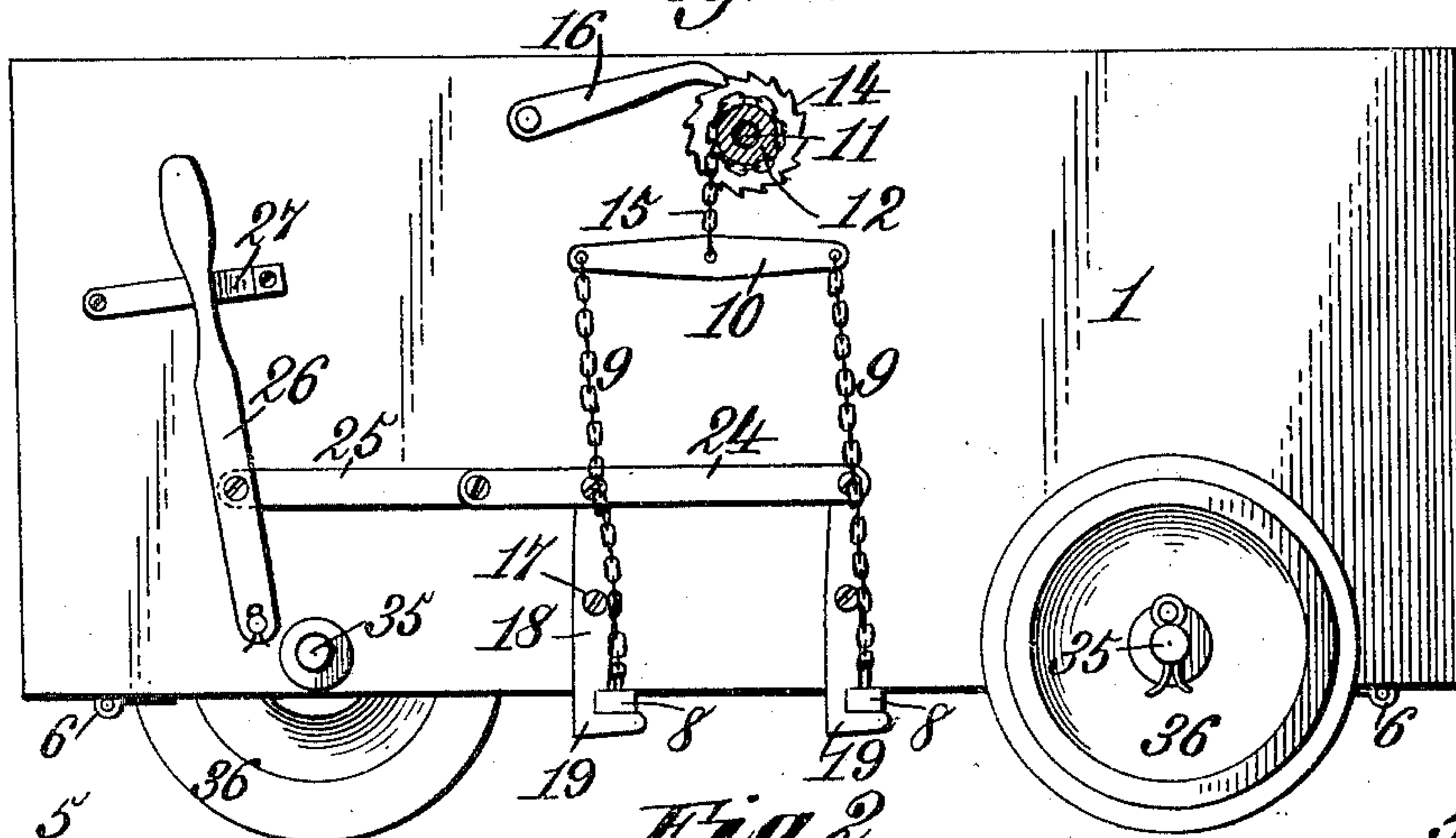


Fig. 2.

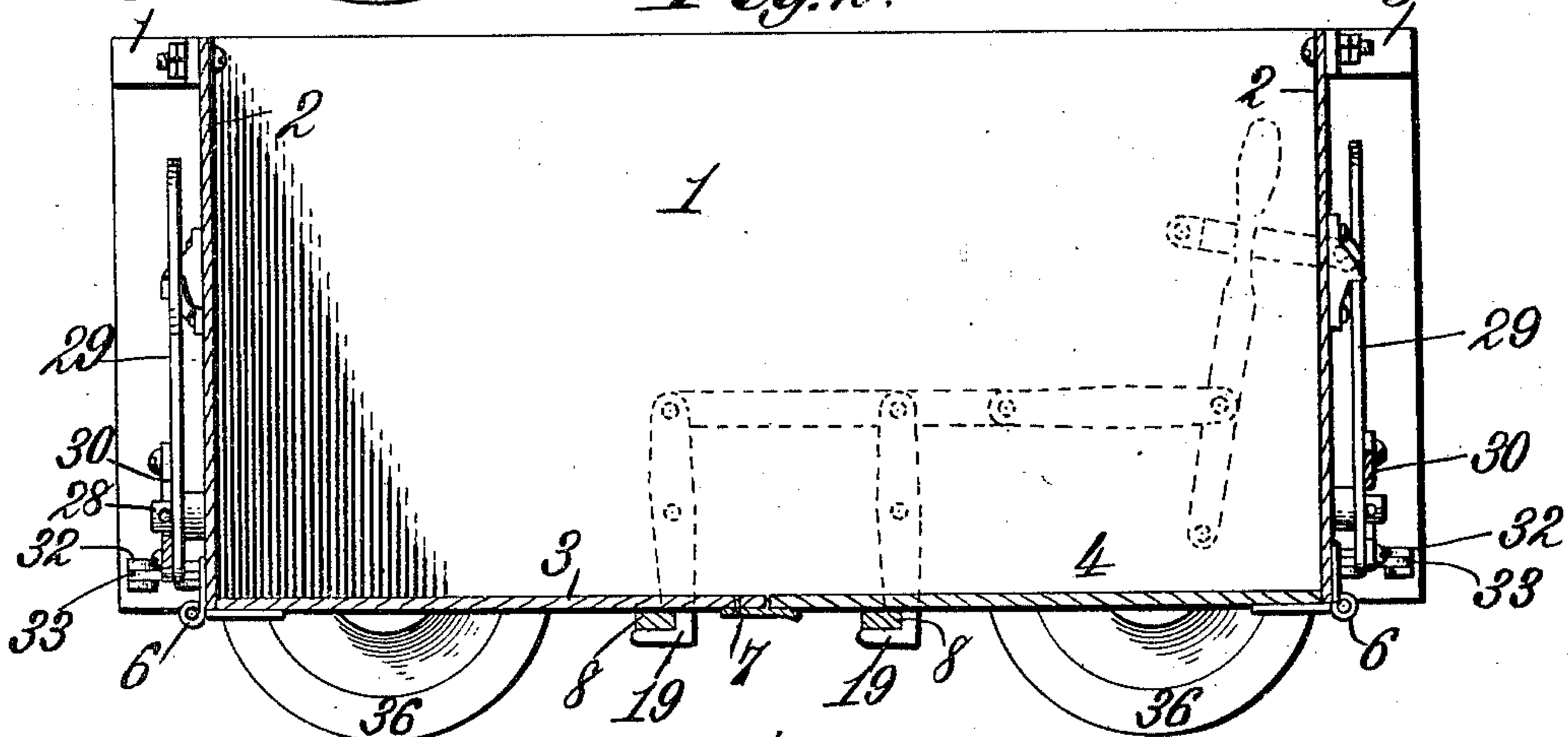
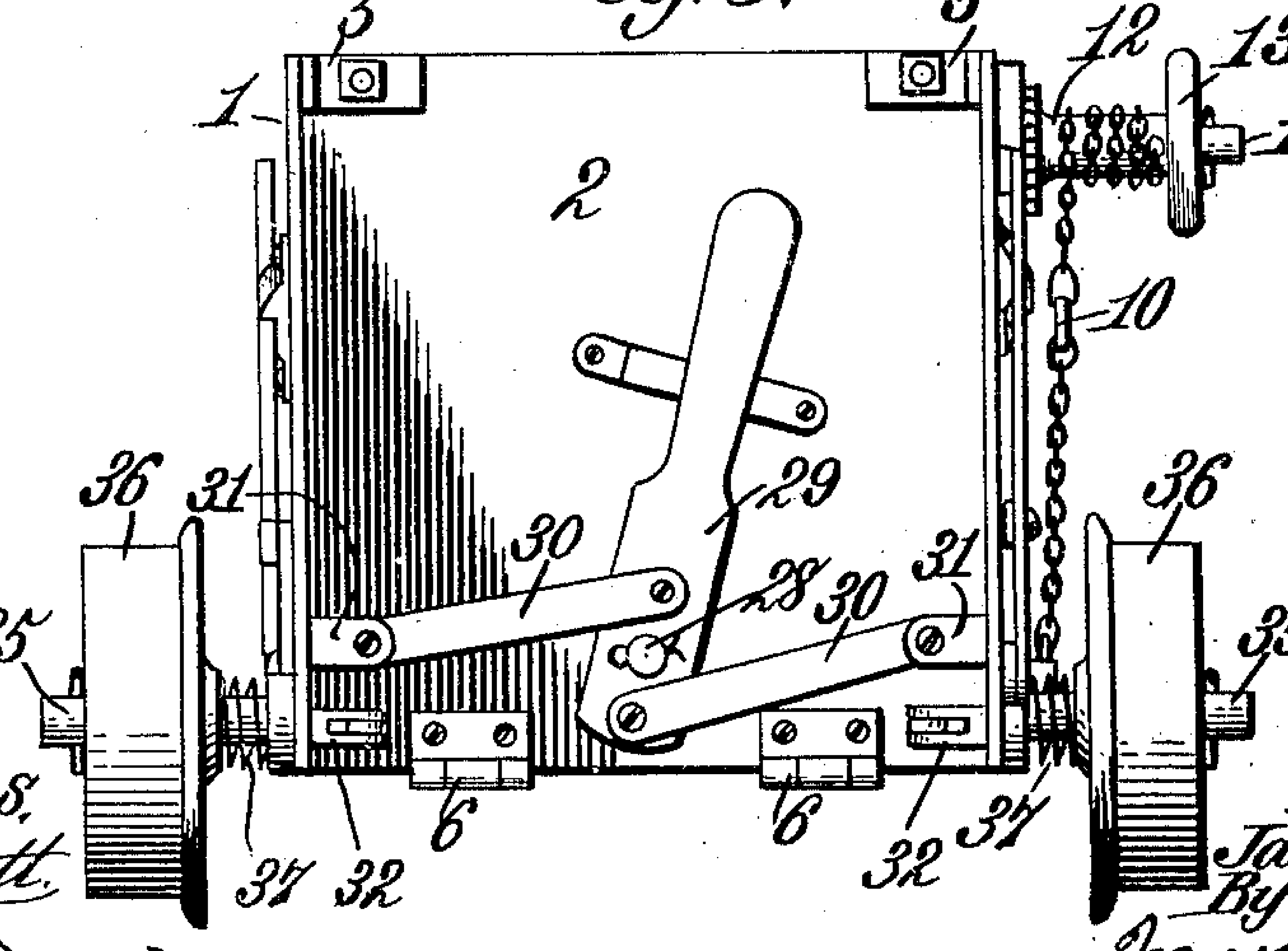


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 4.

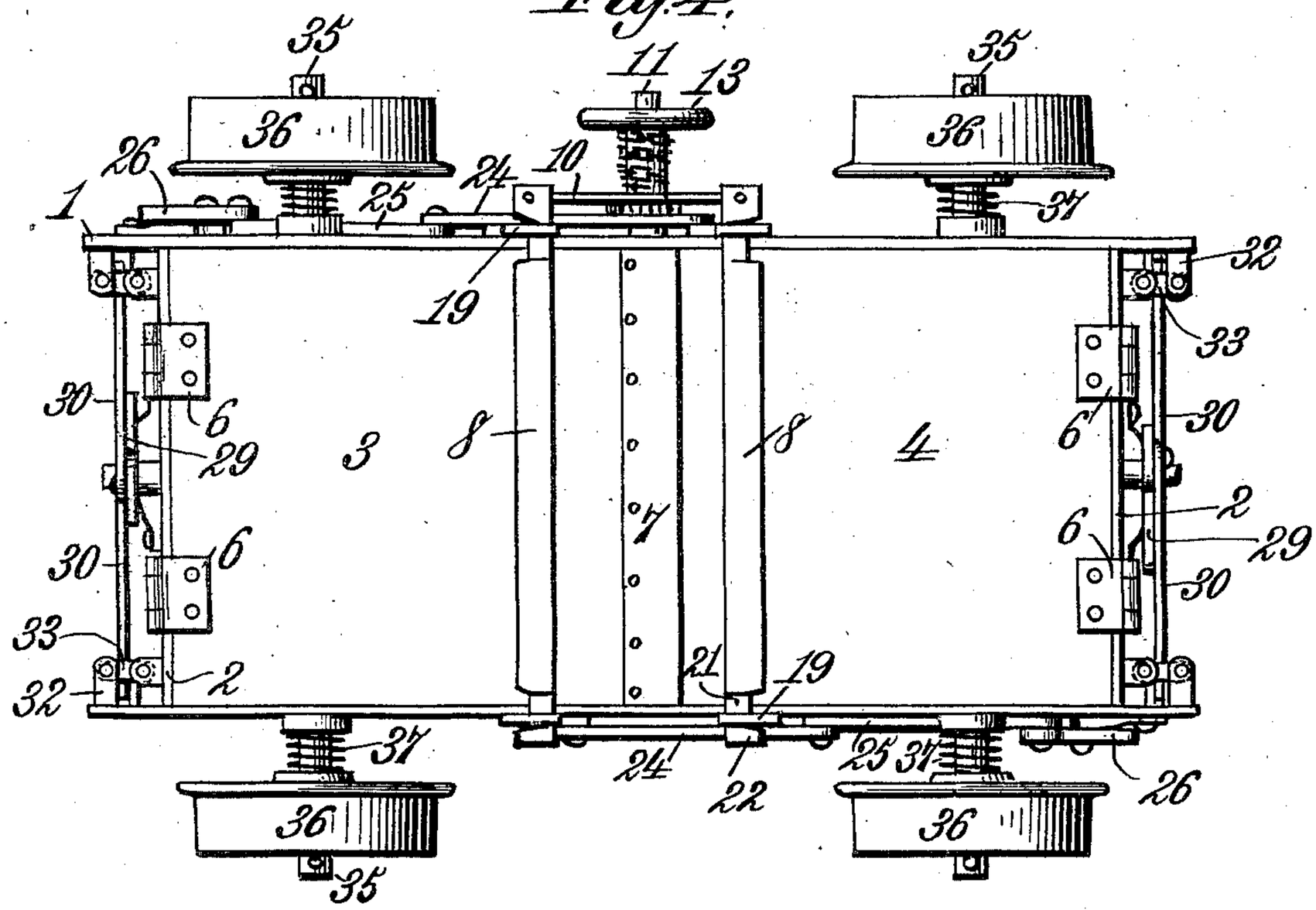


Fig. 5.

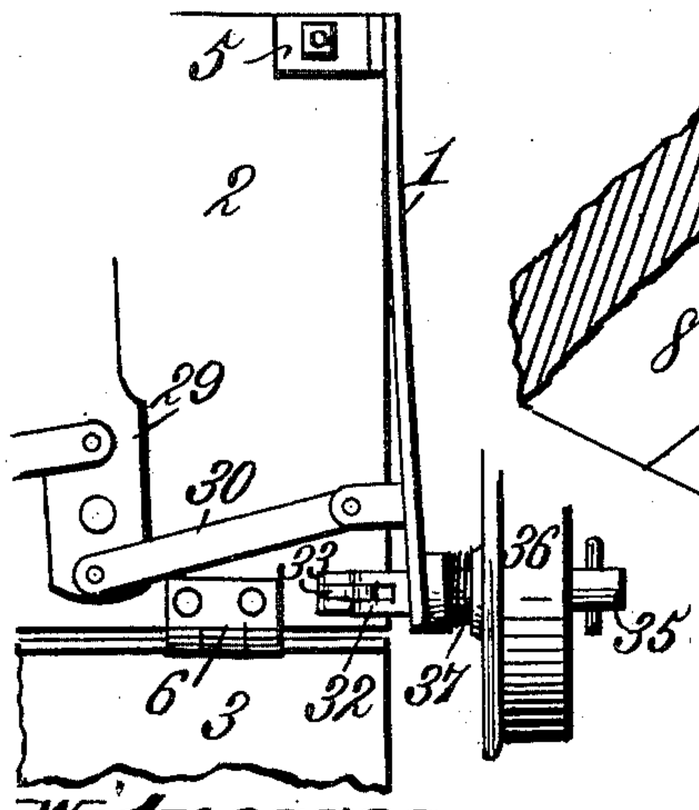


Fig. 6.

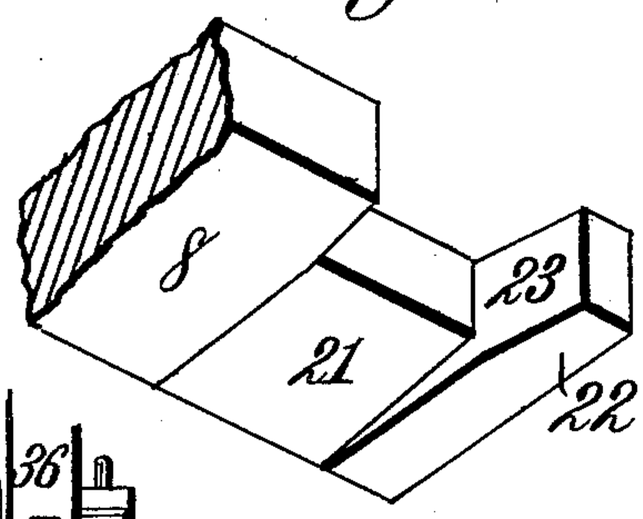
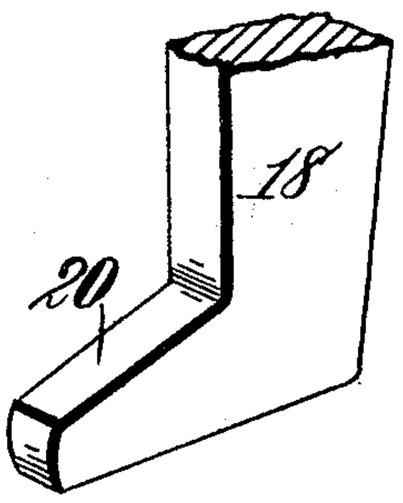


Fig. 7.



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UNITED STATES PATENT OFFICE.

JAMES OTTIS HIPP, OF WINSTON, NORTH CAROLINA.

DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 688,174, dated December 3, 1901.

Application filed August 13, 1901. Serial No. 71,936. (No model.)

To all whom it may concern:

Be it known that I, JAMES OTTIS HIPP, a citizen of the United States, residing at Winston, in the county of Forsyth and State of North Carolina, have invented new and useful Improvements in Dumping-Cars, of which the following is a specification.

This invention relates to dumping-cars, and is especially designed for use in factories for the manufacture of acid phosphates. Formerly it was the custom in acid-phosphate factories to run the mixed ingredients into cars which when it was desired to dump the mixture had to be inverted or turned bottom upward. This obviously was an inconvenient method of handling the mixture, necessitating the employment of many laborers, consuming much time in digging and loosening up the material with picks, and in some cases rendering necessary the use of dynamite or other explosives for the purpose. The acid phosphate was mixed in a liquid or semi-liquid state to cause it to readily run from the car, and by being dumped in this state it cooled off before the sulfuric acid had time to fully operate on the phosphate rock and caused the mixture to become very hard, and picks and explosives were used, as before stated, to loosen and disintegrate the mass. Consequently a hard, stiff, and low-grade rock resulted. Such cars, as improved methods of mixing the phosphate were adopted, have been gradually superseded to a greater or less extent by wooden cars having heavy removable sides. The mixture is run into these cars from the mixer and is allowed to stand for about fifteen or twenty minutes until it becomes dry and stiff. The wooden sides are then removed, and the acid phosphate is raked or dug out with hoes, requiring four to six men from three to four minutes to empty one car, and the mixture is so hot and throws off such quantities of gas and acid fumes that the laborers can empty but few cars at a time, being compelled to cease their labor at frequent intervals in order to cool off and obtain fresh air.

It is the purpose of my invention to provide an improved dumping-car for the purpose above stated that will require the services of but one man to dump, that can be dumped very quickly and in such manner as to discharge the entire contents of the car in bulk at a single operation, and which will discharge the acid phosphates in a dry and mealy condition.

To these ends my invention consists in the features and in the construction, combination, and arrangement of parts hereinafter described, and particularly pointed out in the claims following the description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a view in side elevation of my improved dumping-car. Fig. 2 is a vertical longitudinal sectional view of the same. Fig. 3 is an end view thereof. Fig. 4 is a bottom plan view. Fig. 5 is a detail view of one corner of the car, showing the sides and ends spread apart and the bottom-section dropped. Fig. 6 is an enlarged detail perspective view of one end of one of the transverse bars attached to the bottom-sections, and Fig. 7 is a similar view of the hooked end of one of the latch-levers.

Referring to the drawings, the numeral 1 indicates the sides of the car, 2 the ends, and 3 and 4 two hinged sections constituting the dumping-bottom. The sides, ends, and bottom of the car preferably consist of flat steel plates or plates of any desired metal, the sides being preferably slightly longer than the distance between the ends, said sides and ends being rigidly secured together at the upper portions of their corners by angle-brackets 5, which are fitted against the outer sides of the ends 2 and inner sides of the sides 1 of the car-body and are rigidly riveted or bolted or otherwise suitably fastened to said ends and sides. The lower portions of the sides and ends of the car are unattached to one another, and the metal of which they are constructed being more or less resilient said sides and ends can be sprung apart or away from one another at the bottom of the car, as will be more fully hereinafter explained. The plates 3 and 4, constituting the bottom of the car, are hinged at their outer ends, as at 6, to the lower edges of the ends 2, the inner edges of said plates being arranged to abut one another when the plates are raised to close the bottom of the car, and in order that the joint between said ends of the plates may be closed tight I attach to the under side of the inner

edge of one of said plates a metallic strip 7, that laps under the adjacent edge of the other plate when the plates are raised. The plates or gates 3 and 4 are arranged to drop by gravity when released and are raised and held closed by the following means:

Fastened to the under side of each of the gates or bottom-sections 3 and 4, near its inner end, is a transverse bar 8, that projects at its opposite ends beyond the side edges of said section, and attached to one end of each of said bars is a chain 9, the other ends of said chains being attached to the ends of an equalizer 10. Rigidly attached to and projecting horizontally outward from one of the sides 1 of the car is a shaft 11, on which is rotatably mounted a drum 12, having fixed on its outer end a hand-wheel 13 and on its inner end a ratchet 14. A chain 15 is attached at one end to the drum and at its other end is attached to the equalizer, midway between the ends of the latter. It will be obvious that by turning the drum in the proper direction the chain 15 will be wound up upon the drum and through the medium of the equalizer and chains 9 will raise up or close the hinged bottom-sections 3 and 4. A pawl 16 is pivoted to the side of the car and normally engages the ratchet 14 and prevents the drum from unwinding. Pivoted to the side of the car, as at 17, above the ends of the bars 8, are oscillating latch-levers 18, each of which is provided at its lower end with a laterally-projecting hook 19, beveled on its upper side, as at 20. The hooks 19 are adapted to engage the under side of the ends of the bars 8, and the latter are beveled on their under side, as at 21. Each of said bars is provided on one side of each of its ends with a shoulder 22, beveled on its inner side, as at 23, the arrangement being such that when the hooked ends of the latch-levers are forcibly moved into engagement with the ends of the bars the latch-levers engage the beveled shoulders 22, which press said levers and the sides 1 of the car inward, and the beveled hooks 19 engage the beveled under side of the bars and draw the bottom-sections up tight, thus making a tight joint or closure between the sides 1 and the bottom-sections 3 and 4 of the car. To the upper ends of each pair of the levers 18 is pivoted a connecting-bar 24, and to said bar is pivoted one end of a link 25, the other end of which is pivoted intermediate the ends of a hand-lever 26, which in turn is pivoted at one end to the side of the car. A catch 27 is fixed to each side of the car to hold the hand-levers 26 against accidental displacement when the latch-levers are in operative engagement with the bars 8. It will be evident that after the hinged bottom-sections of the car have been raised or closed by the drum and chains before described by moving the hand-levers 26 toward the ends of the car the hooked ends of all the lever-latches will be caused to simultaneously engage the ends of the bars 8 and will draw the sides and bottom-sections closely and tightly together and will lock them in such position.

When it is desired to dump the contents of the car, the hand-levers 26 are moved in the proper direction to throw the latch-levers out of engagement with the bars 8. The bottom-sections are then slowly lowered by the drum and chains. The acid phosphate being very gummy and sticky will not drop from the car when the bottom-sections are lowered, but remains in the car, owing to its adhering to the sides and ends thereof, and in order to cause the mass to drop from the car the lower portions of the sides and ends of the car are spread or sprung outward or away from one another. This is accomplished by the following means, and inasmuch as said means are duplicated at the opposite ends of the car the mechanism at one end of the car only need be described. Pivoted centrally to the end of the car, near the lower edge thereof, as at 28, is a hand-lever 29, and pivoted to the latter above and below the pivot 28 are the inner ends of two links 30, the outer ends of which are pivoted to brackets 31, fixed to the ends of the sides 1 of the car. It will be readily understood that if the lever 29 be moved in the proper direction the links 30 will be forced apart and will thrust the lower portions of the sides 1 outward in opposite directions, or away from the bottom-sections of the car. Brackets 32 are fixed to the sides 1 and ends 2 of the car, near the lower edges thereof, and each two adjacent brackets are connected by short links 33, pivoted to said brackets. Hence when the sides 1 are spread apart in the manner immediately above described the ends will also be drawn outward or spread apart. The spreading movement of the sides and ends of the car is and need be but slight, the sides each moving outward approximately about one inch and the ends three-fourths of an inch, and the natural resiliency of the metallic sides and ends of the car is amply sufficient to permit of such spreading movement. To draw the sides and ends tightly together, it is merely necessary to move the hand-levers 29 in the opposite direction to that above referred to, and the sides and ends are locked in such position by catches 34, which engage the free ends of the said levers and hold the latter against movement.

The car constructed as above described is mounted on the wheels as follows: To the lower portions of the sides 1 of the car, near each end thereof, are rigidly secured short axles 35, which project horizontally outward, and loosely journaled on said axles and movable longitudinally thereon are the car-wheels 36, of usual and well-known construction. Coiled springs 37 are disposed on the axles between the wheels and the adjacent sides 1. By mounting the car in the manner described the axles do not extend transversely of the car and there is nothing beneath the bottom sections to interfere with the latter freely dropping down when the car is dumped. The

springs hold the wheels in place on the rails when the car is in motion, and when the sides of the car are spread outward or apart to release the contents of the car the axles slip through the wheels, the springs yielding to permit such movement.

From the foregoing description the construction and operation of my improved dumping-car will be readily and thoroughly understood. The car is drawn or moved to the mixer and filled from the latter and is then removed and the contents allowed to stand from fifteen to twenty minutes. The operator then throws the hand-levers 26 to release the bottom-sections and lowers said sections by the drums and chains. As before explained, the mass still remains in the car. Then by throwing the levers 29 in the proper direction the sides and ends of the car are spread apart, causing the body of the car to increase in width and length from the top downward, or, in other words, to assume the shape of a truncated pyramid, whereupon the entire mass of phosphate drops in bulk from the car. After the car is emptied the drum is rotated to raise the bottom-sections. The hand-levers 26 are then moved outward to force the bottom-sections and the central portions of the sides up tightly to place, and the levers 29 are moved in the proper direction to draw the ends and the ends of the sides closely against the bottom, when the car is in readiness to be again filled. By means of my improved car one man is enabled to do the work of from four to six men in about one-fourth the time, thereby effecting an economy in the cost of labor and the number of cars necessary to be employed.

It will be evident to those skilled in the art that the details of construction of the parts of my improved car and their arrangement may be altered or modified without departing from the spirit of my invention, and while the improved car is especially designed for use in factories for manufacturing acid phosphates it is obvious that it can be employed for various different purposes.

Having described my invention, what I claim is—

1. In a dumping-car, the combination with the body thereof provided with a hinged and downwardly-swinging bottom, of resilient sides and ends rigidly connected together at their upper edges, and means for spreading apart the lower portions of said resilient sides, substantially as described.

2. In a dumping-car, the combination with a dumping-bottom, of the sides and ends, and means for spreading apart the lower portions of the said ends, substantially as described.

3. In a dumping-car, the combination with a dumping-bottom, of the sides and ends, and means for spreading apart the lower portions of said sides and ends, substantially as described.

4. In a dumping-car, the combination with a dumping-bottom, of the sides and ends rigidly fastened together at their upper ends and movable toward and from one another at their lower ends, and means for spreading apart the free portions of said sides and ends and for drawing them together, substantially as described.

5. A dumping-car comprising metallic sides and ends rigidly fastened together at their upper edges and unattached at their lower edges, and a dumping-bottom, in combination with means for spreading apart the free lower portions of said sides and ends and for drawing and locking them together, substantially as described.

6. In a dumping-car sides and ends rigidly fastened together at their upper edges and unattached at their lower edges, and a dumping-bottom, in combination with hand-levers pivoted intermediate their ends to the ends of the car, links pivoted at their inner ends to the hand-lever respectively above and below the pivot of the hand-lever, and links pivotally connected at one end to the ends of the sides and at the other end to the lower edges of the ends of the cars, whereby the sides and ends of the cars may be simultaneously spread apart.

7. In a dumping-car, sides and ends rigidly fastened together at their upper edges and unattached at their lower edges, and a dumping-bottom, in combination with means for spreading apart the ends of said free lower portions of said sides and for drawing them together, and means for drawing together the free portions of the sides intermediate the ends of the latter, substantially as described.

8. In a dumping-car, the combination with the sides and ends thereof and a dumping-bottom comprising two sections hinged at their outer ends to the lower edges of the ends of the car and arranged to abut at their inner edges when raised to a horizontal position, of transverse bars attached to the under side of the inner ends of the bottom-sections and projecting beyond the sides of the latter, the ends of said bars being beveled on their under sides, oscillating latch-levers pivoted intermediate their ends to the sides of the car and provided at their lower ends with laterally-projecting hooks beveled on their upper sides and arranged to engage the beveled under sides of the said bars, and means for oscillating said latch-levers to cause them to engage the bars and draw the bottom-sections up tightly to place, substantially as described.

9. In a dumping-car, the combination with the sides and ends thereof and a dumping-bottom comprising two sections hinged at their outer ends to the lower edges of the ends of the car and arranged to abut at their inner edges when raised to a horizontal position, of a drum and chains for simultaneously raising said bottom-sections, transverse bars attached to the under sides of the free ends of said bottom-sections and projecting beyond the sides of the latter, the ends of said bars being beveled on their under sides, oscillating latch-le-

vers pivoted intermediate their ends to the sides of the car and provided at their lower ends with laterally-projecting hooks beveled on their upper sides and arranged to engage the beveled under sides of the bars, and means for oscillating the latch-levers to cause them to engage the bars and draw the bottom-sections up tightly to place, substantially as described.

10. In a dumping-car, the combination with the body thereof having outwardly and inwardly movable sides and a bottom comprising two sections hinged at their outer ends to the ends of the car, and arranged to abut at their inner ends when raised, means for raising said sections, transverse bars attached to the under side of the inner ends of said sections and projecting beyond the sides of the latter, said bars being provided at their ends with laterally-projecting shoulders beveled on their inner edges, oscillating levers attached to the movable sides of the car and arranged to engage the beveled inner edges of the said shoulders, and means for oscillating said levers to force them into engagement with the said shoulders and press the movable sides inward, substantially as described.

11. A dumping-car comprising a body having outwardly and inwardly movable sides and a bottom consisting of two sections hinged at their outer ends to the ends of the car and arranged to abut at their inner ends when raised, in combination with axles independently attached to the movable sides of the car and projecting horizontally outward from the latter, and wheels mounted on said axles, substantially as described.

12. A dumping-car comprising a body having outwardly and inwardly movable sides and a bottom consisting of two sections hinged at their outer ends to the ends of the car and arranged to abut at their inner ends when raised, in combination with axles independently attached to the movable sides of the car and projecting horizontally outward from the latter, wheels loosely mounted and longitudinally movable on said axles, and coiled springs disposed on the axles between the movable sides of the car and the wheels, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES OTTIS HIPP.

Witnesses:
WM. H. MASLIN,
J. L. WAGNER.