

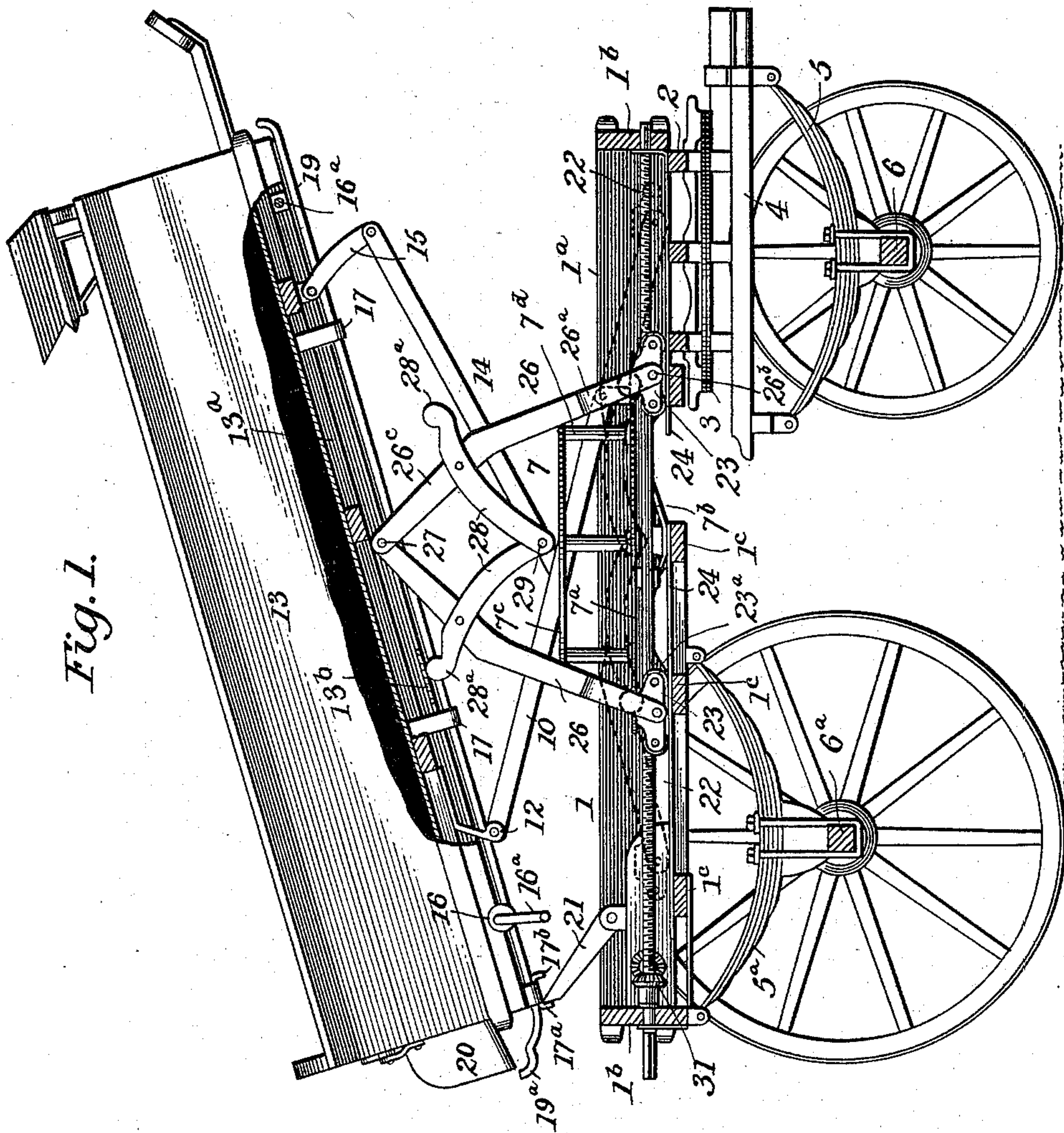
(No Model.)

3 Sheets—Sheet 1.

E. L. LAYTON.
DUMPING WAGON.

No. 573,987.

Patented Dec. 29, 1896.



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(No Model.)

3 Sheets—Sheet 2.

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Fig. 2.

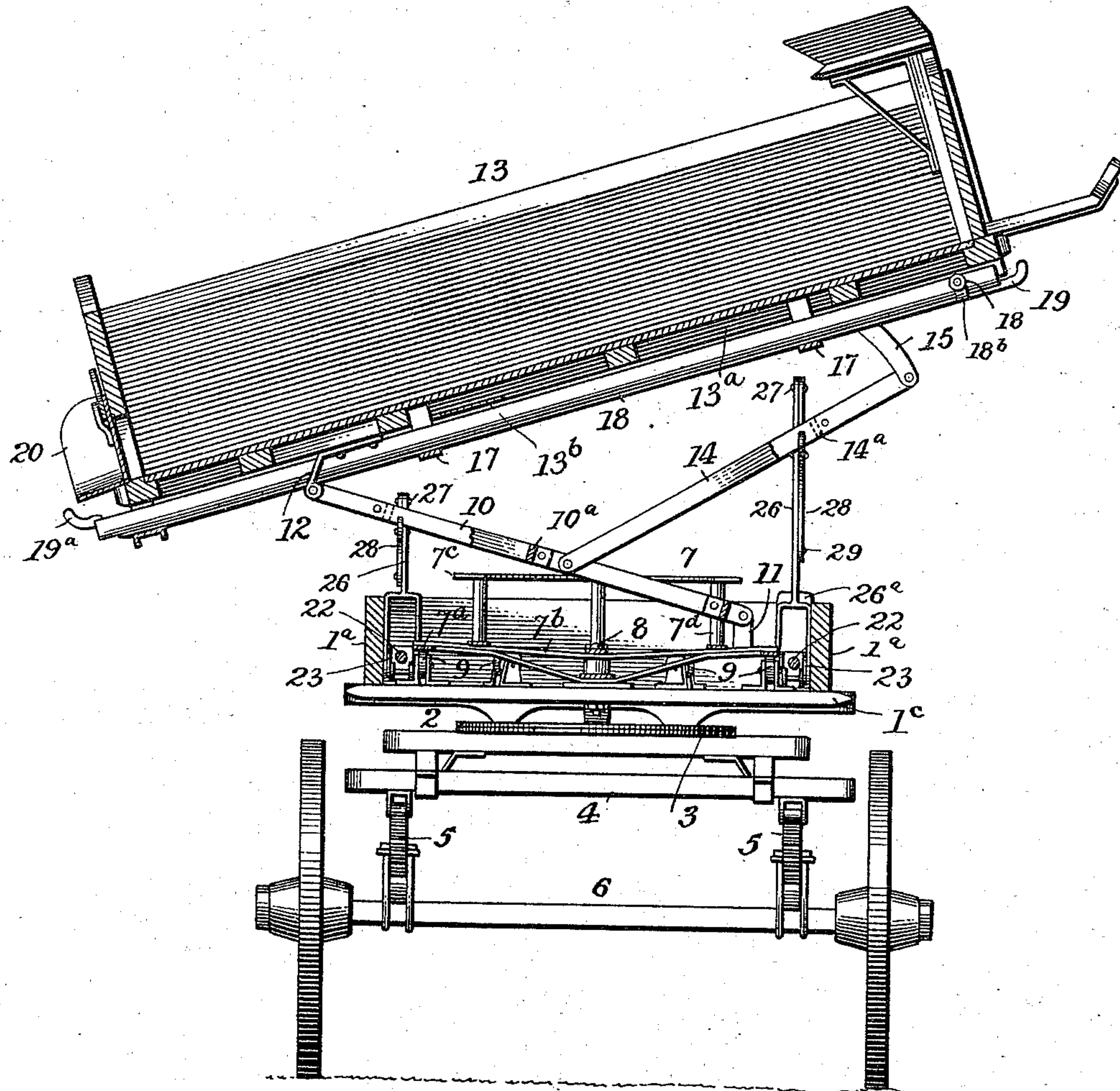
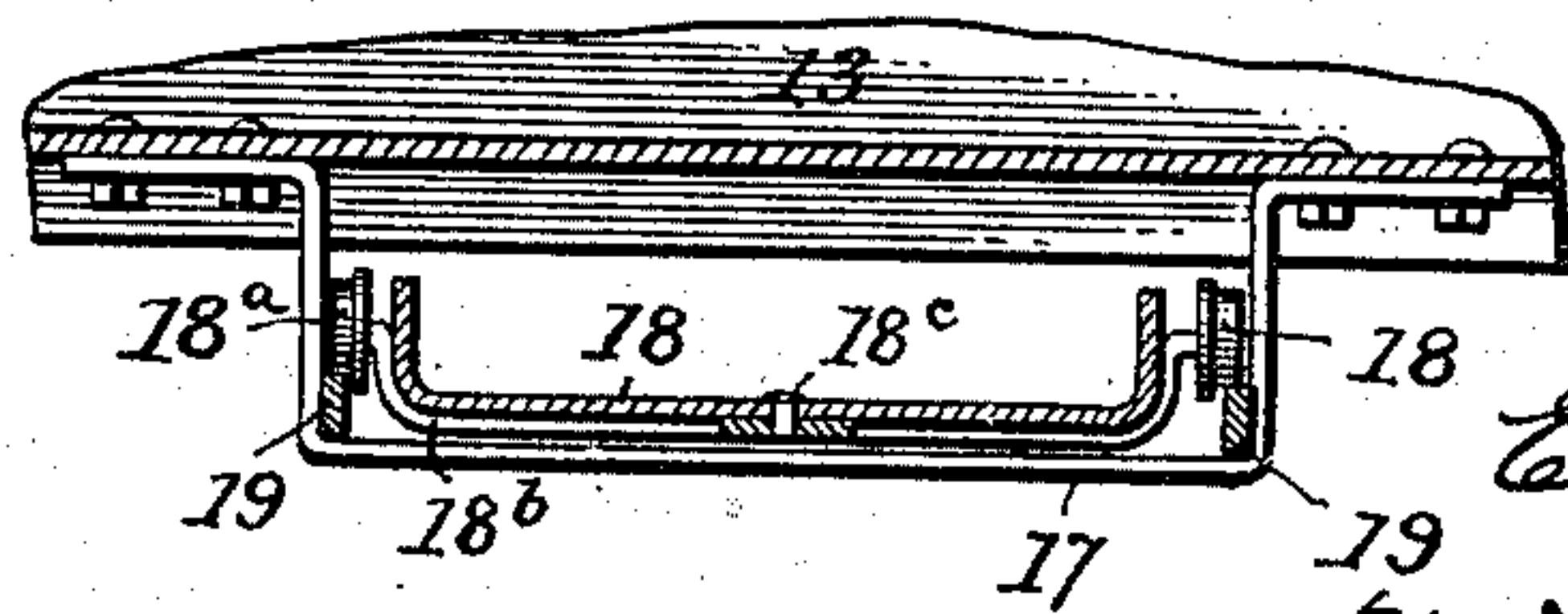


Fig. 6.



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Fig. 3.

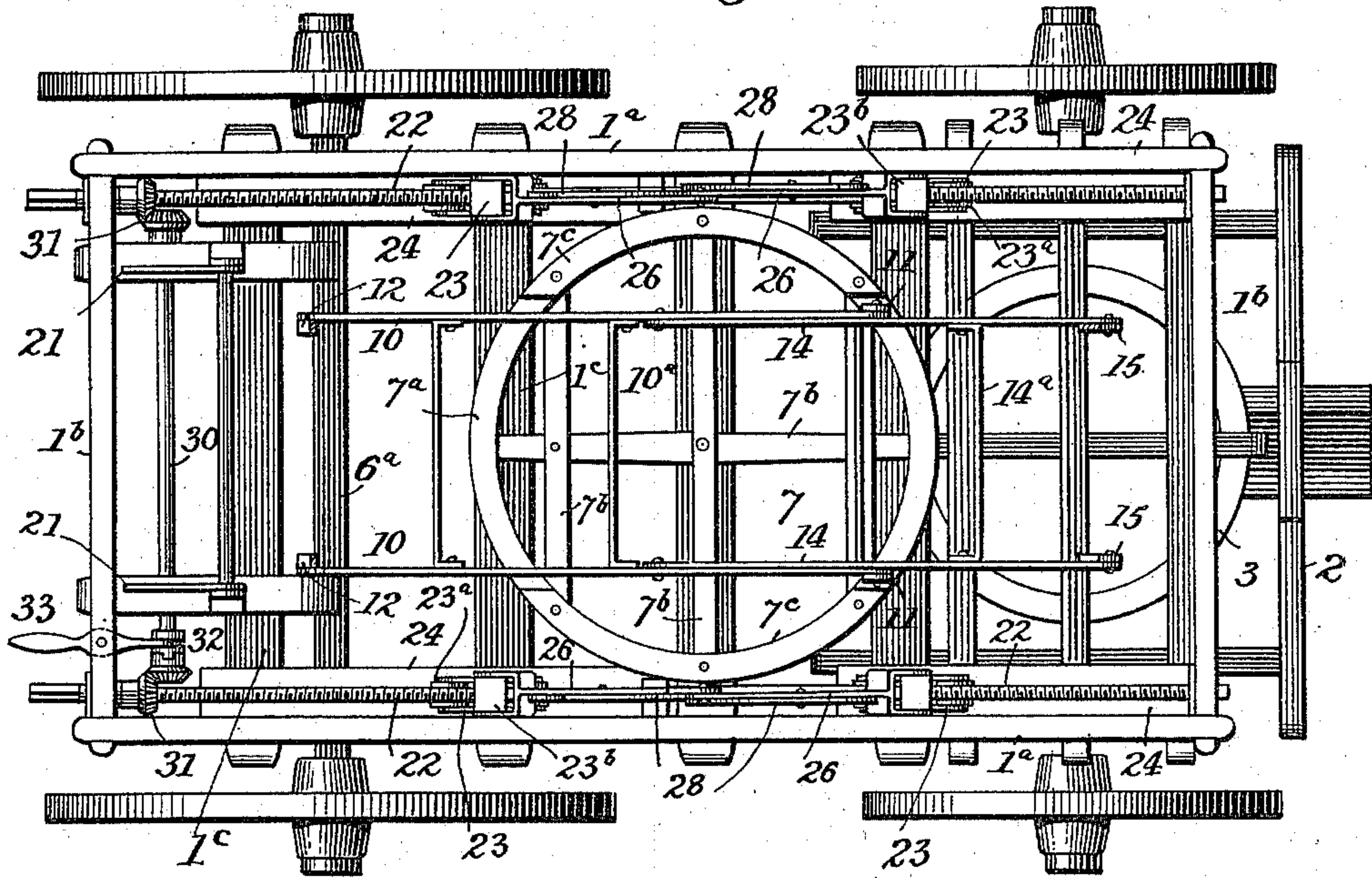


Fig. 4.

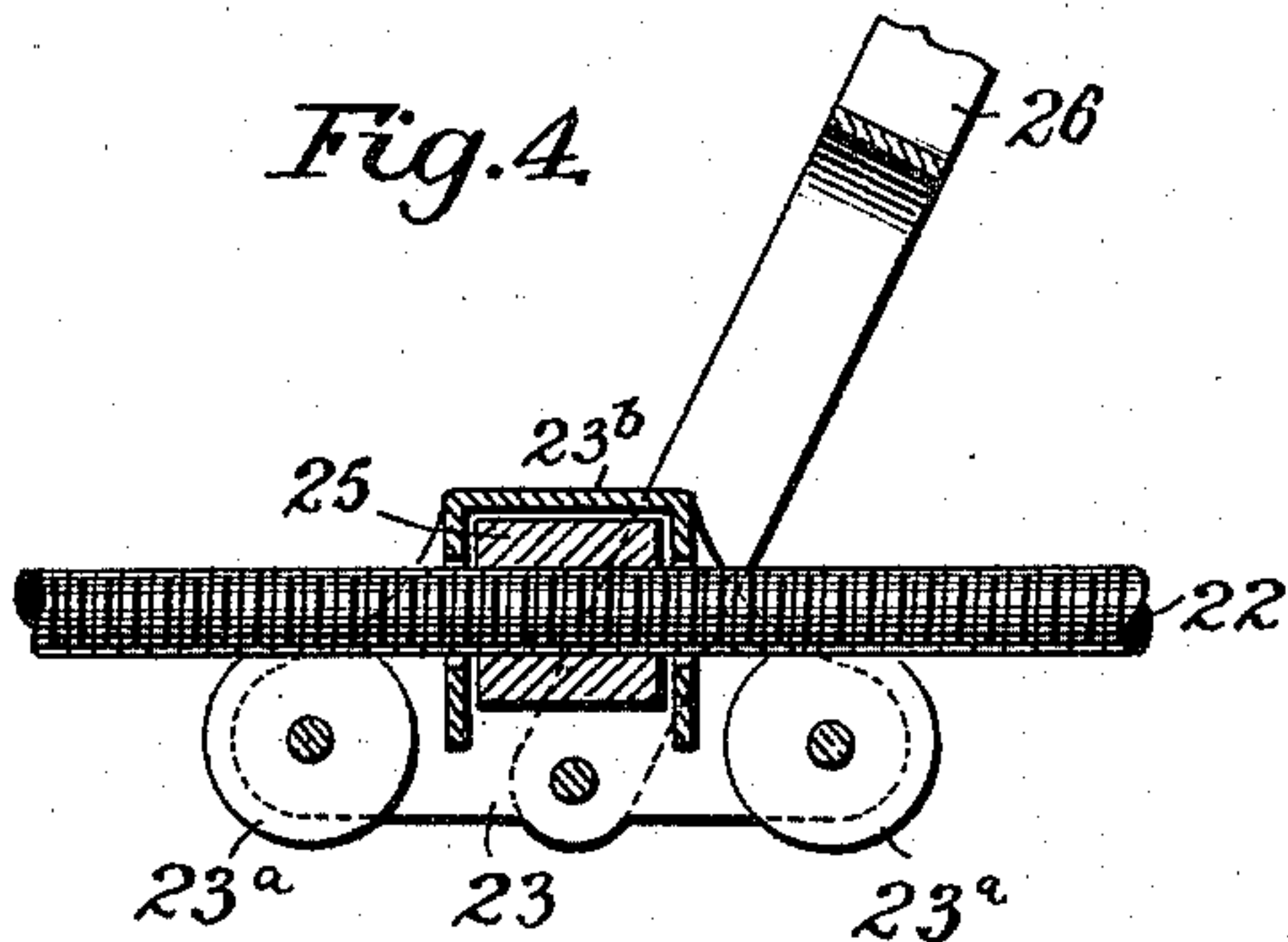


Fig. 5.

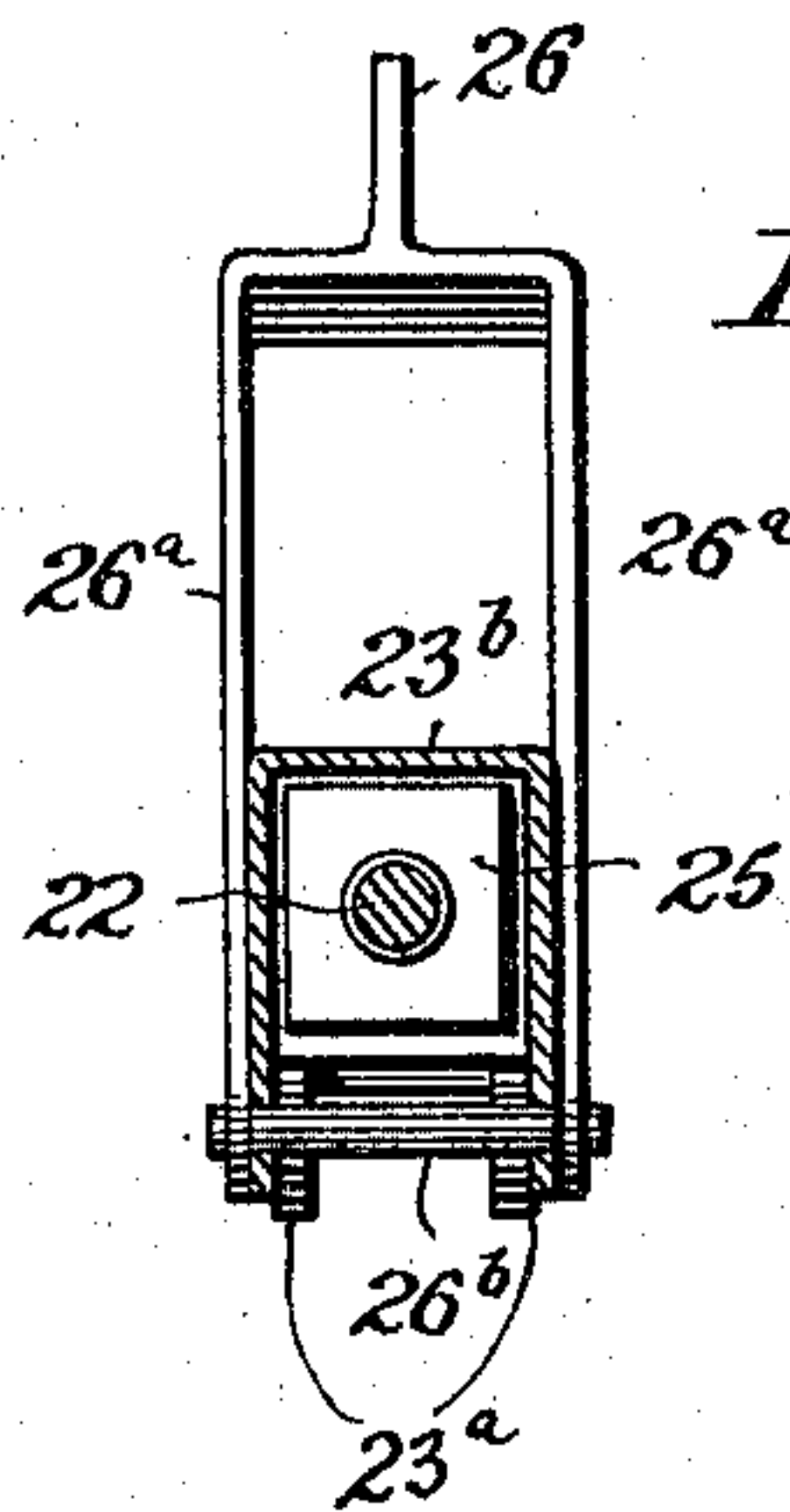
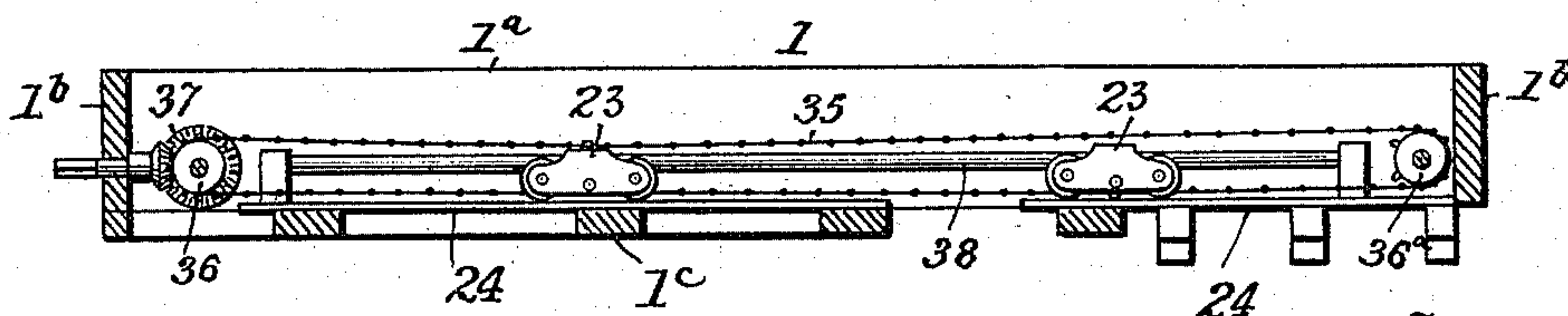


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWARD L. LAYTON, OF TRENTON, NEW JERSEY, ASSIGNOR OF FOUR-FIFTHS TO J. GRUMBACHER, WILLIAM FAGAN, W. G. SICKELL, AND W. H. LIMBERG, OF SAME PLACE.

DUMPING-WAGON.

SPECIFICATION forming part of Letters Patent No. 573,987, dated December 29, 1896.

Application filed March 4, 1896. Serial No. 581,785. (No model.)

To all whom it may concern:

Be it known that I, EDWARD L. LAYTON, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Dumping-Wagons, of which the following is a specification.

My invention relates to dumping-wagons, and more especially to such wagons which are adapted to the delivery of coal and other material and to dump it either in the rear or at either side of the wagon at pleasure; and the object of my present invention is to improve the construction and arrangement of the parts of such a wagon, whereby it can be more quickly and easily manipulated, raised to a higher position, and firmly supported in all positions, and at the same time shall be exceedingly strong and simple in construction and not liable to get out of order.

To these ends my invention consists of the various features of construction and arrangement of parts hereinafter more fully set forth.

I have shown my improvements embodied in a dumping-wagon which belongs generally to the class of wagons illustrated in my prior patent, No. 431,064, granted July 1, 1890, and in some respects the present invention may be said to be an improvement in this class of wagons.

Referring to the accompanying drawings, wherein I have illustrated the preferred embodiment of my invention, Figure 1 is a side view, partly in section, showing the frame, wagon-body, and connections, the wagon-body being elevated to deliver a load at the rear. Fig. 2 is a rear elevation showing the wagon-body and some other parts in section, the wagon-body being elevated to deliver the load at one side. Fig. 3 is a plan view of the frame and operating devices, the body being removed. Figs. 4 and 5 are respectively enlarged sectional views, longitudinal and transverse, of the lever-blocks and screws. Fig. 6 is a detail transverse sectional view showing the preferred way of mounting the chute, and Fig. 7 is a sectional view illustrating a modification.

The wagon comprises a suitable bed-plate

1, which is made in any desired way to form a support for the elevating apparatus and other parts of the wagon and which may be supported in any suitable way, it being shown as having a head-block 2, to which is attached the fifth-wheel 3, which in turn is mounted on a frame 4, supported by U-shaped springs 5, attached to the axle 6, while the rear portion of the bed-plate is shown supported directly by the U-shaped springs 5^a, interposed between the bed-plate and the rear axle 6^a. The bed-plate comprises, essentially, the side pieces 1^a, end pieces 1^b, and the transverse connecting-pieces 1^c, all of which are suitably mortised or otherwise joined together in a manner well understood.

As in my former patent, I make use of a turn-table 7, which turn-table is mounted to rotate on a central pivot 8, supported on a framework, and the outer ring 7^a of the under portion of the turn-table bears upon a number of rollers or casters 9, secured to the bed-plate, and the outer ring 7^a is further connected by cross-pieces 7^b, which tend to strengthen the turn-table and form a support for the elevated platform 7^c of the turn-table, which is mounted on and supported by the pedestals 7^d. The elevated platform 7^c is segmental in shape, there being a segment on each side of the central space in which operate the links hereinafter described, and it will be seen that the turn-table, with its elevated platform, constitutes practically a single element adapted to support the wagon-body and to rotate or turn it in any desired position, and, as will hereinafter be seen, also furnish a rotatable support for the connections between the turn-table and wagon-body.

In my prior patent before referred to the wagon-body was connected to the turn-table by a single pair of links, which were bent at right angles at their free ends, which were connected to the body of the wagon, while their other ends were pivotally connected to the turn-table. While this construction was satisfactory in many respects, I have found that it is objectionable in that it did not permit of sufficient movement to the wagon-body.

I provide links 10, which are pivotally connected to the turn-table at one end, preferably to the standards 11, mounted on the turn-table, while the other ends are pivotally
 5 connected to brackets 12, secured to the under portion of the wagon-body 13. Connected to the links 10 are the auxiliary links 14, one of their ends being pivoted to the links 10 at or about the middle thereof, while the other
 10 ends are pivoted to the swinging arms 15, which in turn are pivoted to the wagon-body. It will readily be seen that as the wagon-body is elevated in the manner hereinafter set forth the links 10, together with the aux-
 15 iliary links 14, tend to steady the movement of the body in a rear dump and in a side dump (especially when used in connection with the elevating apparatus hereinafter described) serve as bearings to prevent any tilt-
 20 ing or side movement of the wagon-body.

In order to relieve the turn-table from the whole weight of the load, as in my prior patent, I provide the body with cams 16, having means, as a crank 16^a, which is preferably
 25 permanently connected thereto, to turn the cams either to support the wagon-body or to relieve the bed-plate from the weight of the wagon-body. Thus when the wagon is being moved the wagon-body rests not only on the
 30 turn-table, but is supported at its outer corners or near there by the cams bearing on the upper surface of the bed-plate, and when it is desired to dump the load by moving the cranks 16^a the bed-plate is relieved of the
 35 weight of the wagon-body, and it can be readily turned for a side dump. Of course it will be apparent that when the load is to be dumped to the rear it is not necessary to previously operate the cams.

40 Connected to the under side of the body are the loops 17, which constitute a receptacle for the chute 18, which is adapted to be pushed in under the bottom of the wagon-body and supported in the loops when not in
 45 use, and when it is desired to use it it can be readily drawn out from under the body. In order to facilitate this operation, I provide the chute 18 with rollers 18^a, which are attached at or near the forward end of the chute in
 50 any desired way, but preferably in the manner substantially as shown in Fig. 6, where the rollers 18^a are mounted on the axle 18^b, pivoted to the chute at 18^c. These rollers run on tracks 19, which may be conveniently sup-
 55 ported in the loops or brackets 17. These tracks are turned up or curved at their rear ends, as indicated at 19^a, and in this way they not only serve to retain the chute in its normal position under the wagon-body, but
 60 when it is withdrawn to deliver the load the rollers 18^a rest in the recesses or curved portions of the turned-up ends 19^a of the track and hold the chute in close proximity to the delivery-mouthpiece 20 of the wagon, so that
 65 the coal or other material is delivered directly into the chute. By pivoting the axle 18^b in the manner indicated in Fig. 6 it is possible

to direct the chute at an angle to the wagon-body when it is necessary to reach a desired delivery-point out of direct line with the
 70 wagon-body.

The rear loop or bracket 17^a not only serves to support the chute, but is also provided with flanges 17^b, forming a channel for the reception of the ends of the toes 21, which,
 75 as in my prior patent, are pivoted to the bed-plate and serve to insure the raising of the rear of the wagon-body in making a rear-end dump, as fully set forth in said patent.

Some of the essential features of my present invention relate more particularly to the elevating mechanism, which I will now describe.

Mounted in the bed-plate are the screw-shafts 22, having right and left hand screw-
 85 threads at their outer portions, and their rear ends are preferably squared or otherwise adapted for the reception of a suitable instrument for rotating them. In my former
 90 patent I mounted on these shafts suitable blocks having screw-threads, by means of which they were adjusted with relation to each other, and to which blocks the lever-arms were connected. I have found, how-
 95 ever, that this construction is open to certain difficulties in that they have to support the whole weight of the wagon-body and its load, and especially in heavy loads it was liable to cause a binding between the screw-shafts and the blocks, hindering the ready and effective
 100 operation of the elevating mechanism. To overcome this, I provide carriages 23, having suitable wheels 23^a, adapted to roll upon the bed-plate 1, and in order to facilitate their rolling and prevent wear I provide the bed-
 105 plate with metallic tracks 24. These carriages are formed with a housing 23^b, through which the shafts 22 freely pass, and mounted on the shafts and in the housing are the nuts 25. These nuts travel back and forth on the
 110 shafts and serve to move the carriages; but it will be observed that the nuts are loosely inclosed in the housing of the carriages, so that they are free from any direct weight of the wagon-body and its load, and there is,
 115 therefore, no liability of binding or cramping between the nuts and shafts, while the carriages can be positively and easily moved back and forth by turning the shafts in the
 120 nuts, the shafts serving as guides for the carriages. This I find a very practical solution of the difficulty, rendering the operation certain and preventing any undue friction or strain upon the shafts.

To further aid in avoiding the objections
 125 to the construction shown in my prior patent, I pivot the levers 26 at the lower portions of the carriages 23, so that the weight is supported as near the line of support of the carriages as possible. In order to do this, I pref-
 130 erably bifurcate the lower ends of the levers 26, as shown at 26^a, having two arms or bifurcations embracing the carriages and secured by a pivot pin or rod 26^b. I have found that

this arrangement of the levers and carriages is a very simple and valuable feature, especially in the construction of wagons for heavy loads, as it relieves the shafts of all weight and only requires of them that they should operate to cause the two carriages on each side of the bed-plate to approach and recede from each other, the weight of the load being supported by the carriages on the tracks on the bed-plate. The wheels of the carriages prevent undue friction and wear, as well as furnish a stable and substantial bearing for the ends of the levers.

In my former patent the levers were pivoted together at their inner ends, and their pivotal point bore upon the under side of the wagon-body in order to lift it. In my present construction I make what I term "compound" levers. As before, these levers 26 are pivoted together, as at the point 27, and connected to the levers 26, at a point intermediate their pivotal point and their connections with the carriages, are pivoted the auxiliary levers 28, which in turn are pivoted together at the point 29, while their outer ends 28^a extend beyond the levers 26, and are preferably notched or shaped substantially as shown in Fig. 1. Further, the levers 26, instead of being straight, have their upper ends bent or inclined, as at 26^c, so that when they are in their depressed position these edges will not project above the sides of the frame, as shown in dotted lines in Fig. 1.

When the wagon-body is elevated for a rear dump, as indicated in Fig. 1, the upper portion or pivotal point 27 of the levers bears against the sill 13^a of the wagon-body, while the ends 28^a of the rear levers 28 bear on a plate or block 13^b, which is connected to the sill of the wagon-body, or, if preferred, it may bear directly on the sill. Thus it will be seen that there are two points of bearing on each side of the wagon-body, which conduces to steadiness and facilitates the elevation of the wagon-body in making a rear dump. My improved compound levers, however, are of still more and greater advantage in making a side dump, as will be more apparent on reference to Fig. 2. In this case the pivotal point 27 of the levers 26 does not bear against the wagon-body, but the links 10 and auxiliary links 14 rest upon the projecting ends 28^a of the levers 28, thus furnishing practically four substantial bearing-points for the links supporting the wagon-body on the levers. Furthermore, by the aid of the compound levers the power applied to the shafts is used to a better advantage, so that heavier loads can be raised with greater ease. In order to overcome any tendency of the compound levers moving outward under a heavy load, the links 10 and 14 are provided with cross-pieces or brackets 10^a and 14^a, and these aid in preventing any tendency of the load to tilt one way or the other to the side of the wagon.

As in my former patent, the shafts 22 are connected by a counter-shaft 30 and bevel-

gears or similar connections 31, and there is a clutch 32, operated by a handle 33, so that the shafts 22 may be driven independently or together, as desired.

Having thus generally described the construction illustrated in the accompanying drawings and set forth the operation thereof, it may be an advantage to describe the manner of manipulating the various parts, as follows: When the wagon is loaded, the body portion rests upon the turn-table, and is further supported by the cams 16 at or near the ends, so that there is no tendency to move from its normal position. Assuming first that it is desired to make a rear dump of the load, it is only necessary to apply a suitable crank or other device to one of the screw-shafts 22, they being connected by the clutch and shaft 30, and to rotate the same, when the shafts operate the traveling nuts 25, causing the carriages on opposite sides of the bed-plate to approach each other. The pivotal point 27 of the compound levers first bears against the sill of the wagon-body, and as it is moved slightly the ends 28^a of the auxiliary levers 28 bear against the under side of the wagon-body and together elevate the body and maintain it at the desired inclination, the toes 21 assisting more or less in preserving these relations.

It will be seen that the wagon-body is connected to the turn-table by the two sets of links 10 and 14, and that there are two sets of bearings between the wagon-body and the compound levers, and all these, together with the toes, aid in maintaining the stability of the wagon-body as it is elevated, as I have found it practicable to elevate it to a considerable height. When this is accomplished, the chute is withdrawn from its position under the wagon-body, the track facilitating its withdrawal, and the rollers are supported in the curved portions 19^a of the track directly under the mouthpiece to insure the reception and delivery of the contents of the wagon. After the contents have been discharged the shafts are rotated in the opposite direction and the parts resume their normal position.

When it is desired to make a side dump, the cams 16 are turned by their cranks 16^a, so as to relieve them of pressure on the bed-plate, and the wagon-body rotated on the turn-table. It is then generally desirable to operate one of the shafts 22, adjacent the front of the wagon-body, and to elevate it sufficiently to cause the body to assume the desired inclination. The clutch is then operated to connect the two shafts together, and after that both shafts are operated in conjunction and the wagon-body elevated to the desired distance, maintaining always the same inclination. In this operation it will be seen that the compound levers do not bear directly against the bottom of the wagon-body; but, on the contrary, they support the links 10 and 14 on the extensions of the auxiliary levers 28, as before pointed out, and the wagon-body

is thus practically supported at four points throughout all its movement, and I am enabled to raise it eight feet, more or less, without danger of collapse or undue strain upon the parts. When it has reached its proper position, the chute is adjusted as before and the load delivered, when the shafts are turned in their opposite directions, withdrawing the carriages from each other, and the parts are restored to their normal position, the body being swung around on the turn-table and the cams adjusted to receive another load.

It is evident that if it is only desired to make a rear-dumping wagon the turn-table may be omitted, but as I find it desirable to provide for a dump at the rear or on either side or in front it is desirable to use the turn-table.

In Fig. 7 I have illustrated a modification in the elevating devices wherein the carriages 23 are propelled by means of a chain 35, mounted on sprocket-wheels 36 36^a. This chain is attached to the carriages 23 by any suitable means, one portion of the chain being attached to one of the carriages on each side at the top and the other at the bottom. The sprocket-wheels 36 are driven by the bevel-gear connections 37, arranged substantially as in the mechanism for driving the screw-shafts 22, and instead of using a screw-shaft I use a guide-shaft 38, mounted in the frame of the bed-plate and passing through the body of the carriages 23, so that these shafts serve to guide the carriages and maintain them in proper position while they are moved to and from each other by means of the sprocket wheels and chain. When this device is used, the other parts of the apparatus may be the same as those previously described.

While I have thus specifically described the embodiment of my invention illustrated in the drawings, it will be evident that the details of construction and arrangement may be varied by those skilled in the art without departing from the principles thereof, and I do not, therefore, limit myself to the precise construction shown.

What I claim is—

1. In a dumping-wagon, the combination with the bed-plate and turn-table, of a wagon-body, links connected to the body and the turn-table, auxiliary links also connected to the wagon-body and to the first set of links, and means for elevating the wagon-body, substantially as described.

2. In a dumping-wagon, the combination with the bed-plate and turn-table, of a wagon-body, links connected to the turn-table and wagon-body, auxiliary links connected to the first set of links, swinging arms interposed between the auxiliary links and wagon-body and means for elevating the wagon-body, substantially as described.

3. In a dumping-wagon, the combination with the bed-plate and turn-table, of a wagon-body, links connected to standards on the turn-table and to brackets on the wagon-body,

auxiliary links connected to the first-named links, swinging arms interposed between the auxiliary links and wagon-body and means for elevating the wagon-body, substantially as described.

4. In a dumping-wagon, the combination with the bed-plate and wagon-body, of elevating devices comprising levers, screw-shafts, and wheeled carriages connected to the levers and adapted to be moved by the screw-shafts, substantially as described.

5. In a dumping-wagon, the combination of the bed-plate and wagon-body, of elevating devices comprising levers, screw-shafts, carriages connected to the levers, and nuts mounted on the screw-shafts and loosely connected to the carriages, substantially as described.

6. In a dumping-wagon, the combination of the bed-plate and wagon-body, of elevating devices comprising levers, screw-shafts, wheeled carriages connected to the levers, housings in the carriages, and nuts mounted on the shafts and inclosed in said housings, substantially as described.

7. In a dumping-wagon, the combination of the bed-plate and wagon-body, of elevating devices comprising levers, screw-shafts, carriages, and nuts mounted on the shafts and connected to the carriages, the levers being connected at the lower sides of said carriages, substantially as described.

8. In a dumping-wagon, the combination of the bed-plate and wagon-body, of elevating devices comprising levers, screw-shafts, carriages, and nuts mounted on the shafts and connected to the carriages, the ends of the levers being bifurcated and embracing the carriages, substantially as described.

9. In a dumping-wagon, the combination with the bed-plate and wagon-body, of elevating devices comprising levers pivoted together, means for operating their outer ends, and auxiliary levers pivoted to the first levers and pivoted together and having extending ends, substantially as described.

10. In a dumping-wagon, the combination with the bed-plate and wagon-body, of elevating devices comprising levers pivoted together, carriages connected to the ends of the levers, means for moving the carriages, and auxiliary levers pivoted to the first levers and pivoted together, the outer ends of the auxiliary levers projecting beyond the first levers, substantially as described.

11. In a dumping-wagon, the combination with the bed-plate and turn-table, of a wagon-body, links connecting the wagon-body and turn-table, elevating devices comprising compound levers forming supports for the links, and means for operating the compound levers, substantially as described.

12. In a dumping-wagon, the combination with the bed-plate and turn-table, of a wagon-body, links connecting the wagon-body and turn-table, the links being provided with cross-pieces, elevating mechanism compris-

ing compound levers adapted to support the links and to be held in position by the cross-pieces, and means for operating the compound levers, substantially as described.

5 13. In a dumping-wagon, the combination with the wagon-body, of the tracks supported beneath the wagon-body and having upwardly-curved ends, a chute provided with rollers running on said tracks, and a pivotal
10 axle for said rollers whereby the rollers may

be supported in the upward-curved ends and the chute be extended at an angle therefrom, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of 15 two subscribing witnesses.

EDWARD L. LAYTON.

Witnesses:

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F. L. FREEMAN.