

May 9, 1933.

J. L. GETAZ

1,908,673

RAILWAY

Filed Aug. 13, 1929

3 Sheets-Sheet 1

Fig. 1.

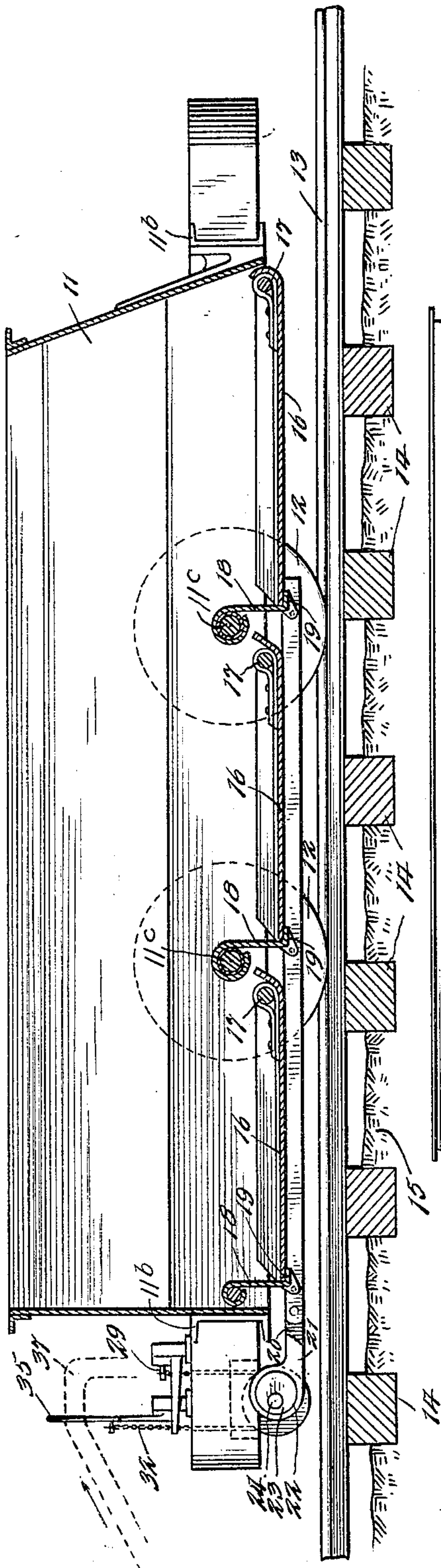
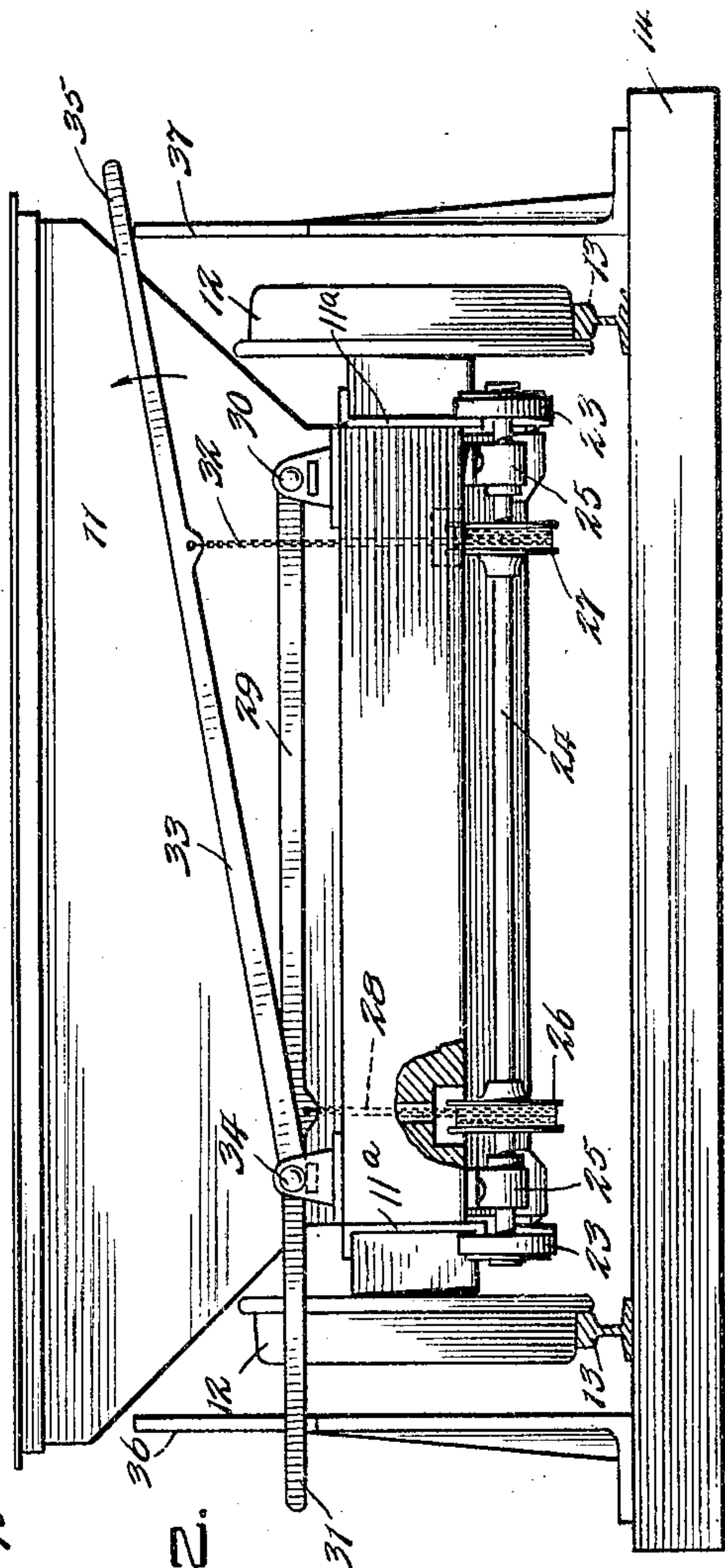


Fig. 2.



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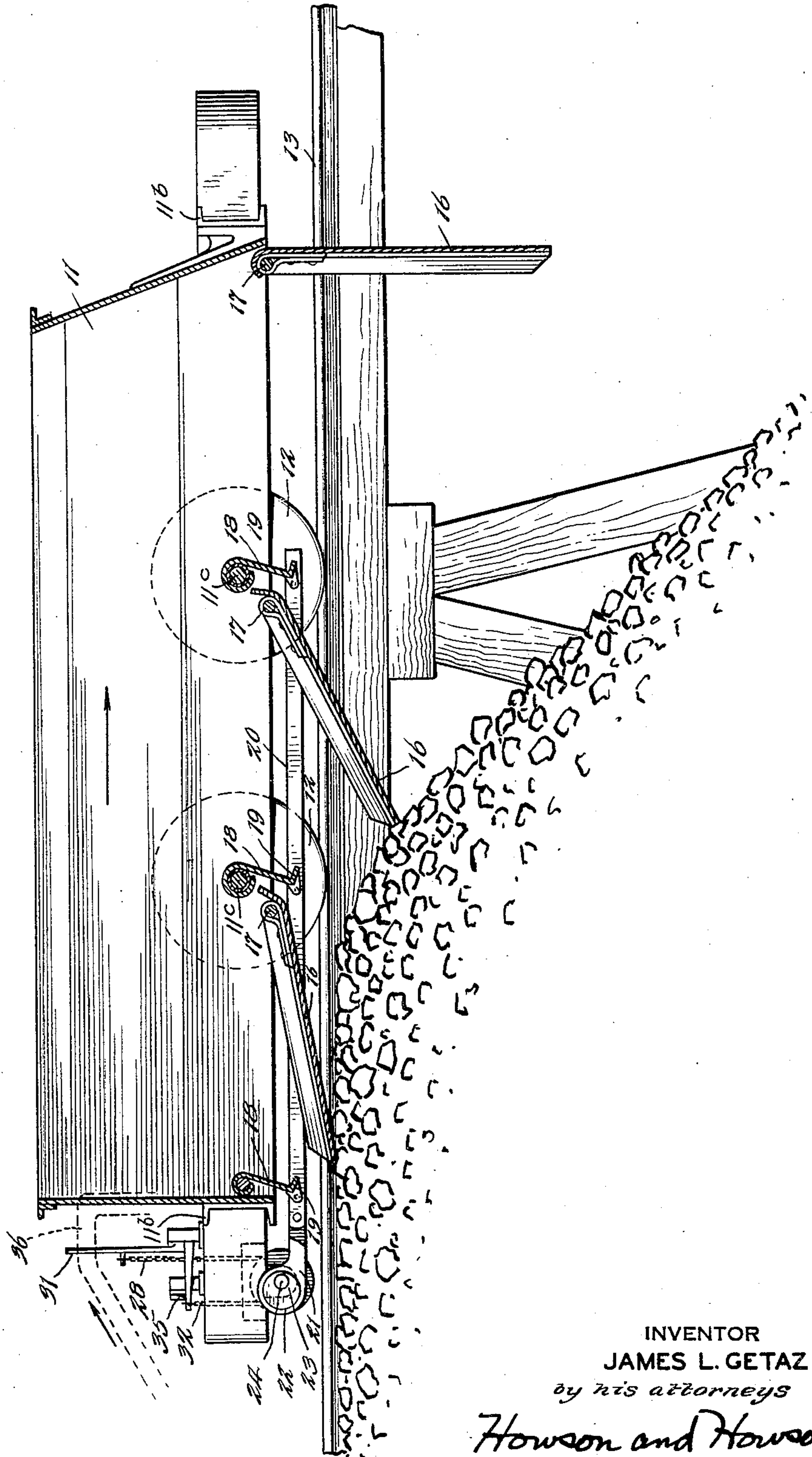
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Fig. 3.



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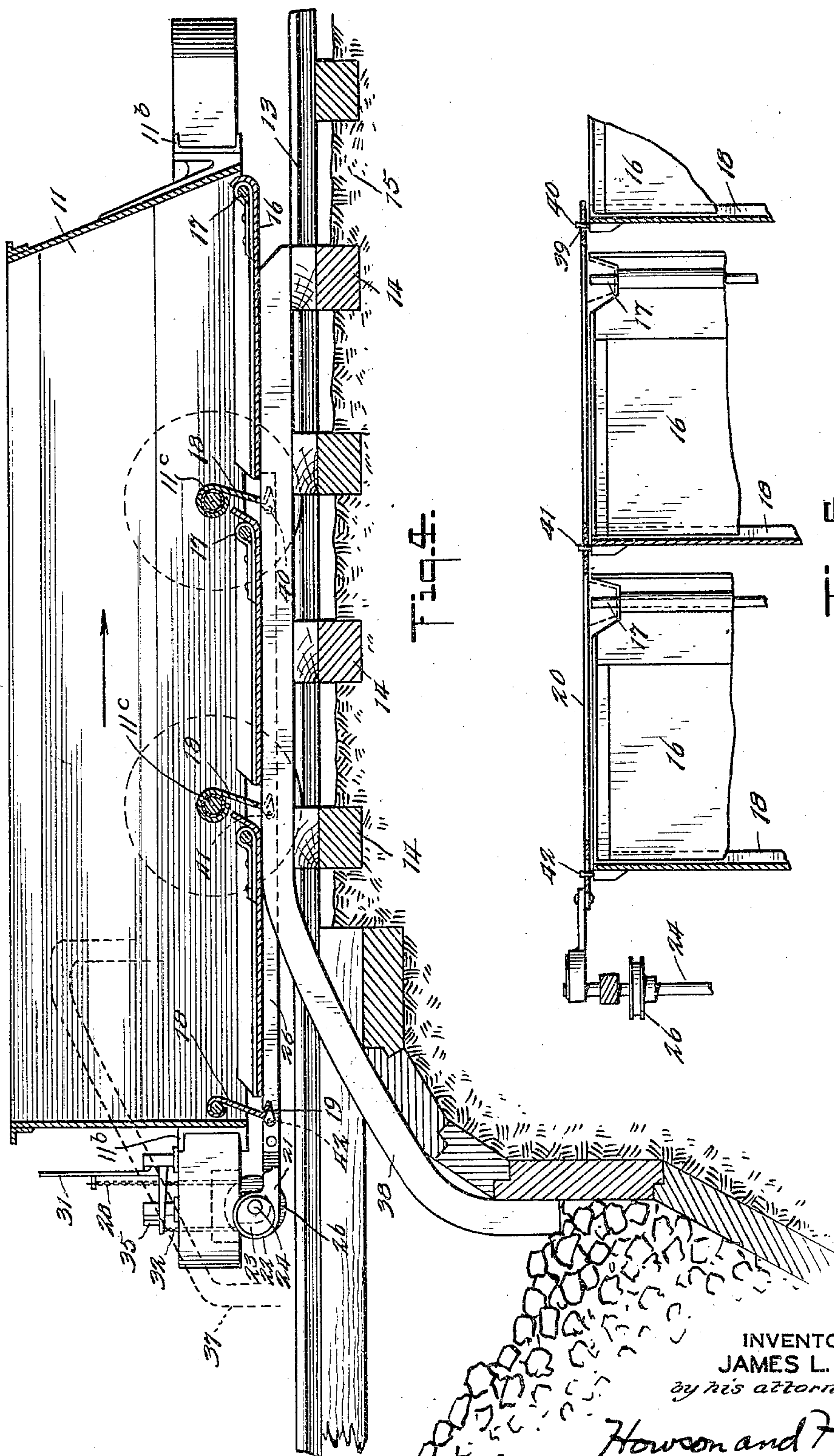
**J. L. GETAZ**

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RAILWAY

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3 Sheets-Sheet 3



✓ INVENTOR  
JAMES L. GETAZ  
*by his attorneys*

Howson and Howson



## UNITED STATES PATENT OFFICE

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## RAILWAY

Application filed August 13, 1929. Serial No. 385,492.

My invention relates to railways and particularly railways wherein loose material is carried from a point of loading to another point where it is automatically dumped.

5 The invention is particularly useful in connection with the transportation and dumping of soft minerals, which it is desired to maintain in the sizes in which they exist when loaded, and which cannot be further  
10 broken up without loss.

Among the objects of the invention may be mentioned the provision of a railway including dump cars and means external to the cars for dumping them and for returning  
15 the cars to loading position. Another object is the provision of automatic means for dumping the cars at a point where the minimum fall of the loaded material will result and hence a minimum breakage thereof.  
20 Further objects will appear upon consideration of the present specification.

The invention is illustrated by way of example in the accompanying drawings, wherein—

25 Figure 1 is a longitudinal section of a dump car and associated parts all constructed in accordance with the invention,

Fig. 2 is an end elevation of the car and associated parts illustrated in Figure 1, as  
30 seen from the left in Figure 1,

Fig. 3 is a longitudinal section of the car and associated parts shown in Figure 1, the car being in dumping position,

35 Fig. 4 is a longitudinal section of the car and associated parts, the car being returned to loading position, and

Fig. 5 is a fragmental plan view of a car bottom and its latching and tripping mechanism.

40 Where soft material such as some kinds of ore, and particularly soft coal, is dumped from dump cars, it is generally of importance that the load in the car shall not be allowed to fall any great distance. In the  
45 case of soft coal, for instance, such a fall will break up the large lumps and materially reduce the size of the coal, as well as produce a large percentage of slack. The value of the coal is thus greatly diminished by such  
50 dumping. I have found that, by giving

dump cars a certain special construction, and by providing certain other parts independent of the car but associated with the roadway upon which the car travels, it is possible to dump the cars in such a way as to  
55 give a minimum breakage of the material with which they are loaded. Although the invention is useful in connection with other materials than coal, the description for simplicity will be limited to coal. 60

In the accompanying drawings there is shown a dump car 11, having a traction truck frame comprising side sills 11a and end sills 11b, axles 11c supporting the frame, and  
65 wheels 12 running on tracks 13, carried in the usual manner upon ties 14, placed in a road-bed 15. The car has a dumping bottom composed of sections 16, which are preferably flat, having hinges 17 about which  
70 they are adapted to swing. The sections 16 here shown constitute a plurality of drop doors hinged transversely of the length of the car, and they constitute at least a part of the bottom of the car. The bottom sections are formed to give the car as nearly  
75 as possible a flat bottom, and are hinged as low as possible, both conditions tending to insure a maximum car capacity. The bottom sections 16 are independent, as will be seen from the following description. It is  
80 found desirable to have at least portions of the car bottom lying below the plane of the tops of the axle journals, and also below the plane of the bottoms of the side sills. In the case illustrated the drop doors or sections 16 lie entirely below the axles 11c. The  
85 sections 16 are held in the closed or loading position (see Figure 1) by means of hinged latches 18, which support their free ends. However, it is to be understood that the  
90 hinged latches 18 here described by way of illustration are only one form of supporting means adapted to maintain one edge of each of the sections or doors in closed position and upon withdrawal to release the edges  
95 of the doors permitting them to drop, or swing downward on their hinges.

I also provide longitudinally movable releasing means connected with the supporting means employed. In the illustration 100



here given, the hinged latches 18 are pivoted adjacent the unhinged ends 19 to a controller or side bar 20 which connects all of the hinged latches and is positioned in the present illustration beneath the car. I prefer to provide two such controller or side bars 20, one near each side of the car, but both acting in unison because both are connected to each of the hinges. Mechanical means are provided for actuating the controller bars 20, one form of which will now be described. One end of each controller bar is pivotally connected with the free end of a connecting bar 21 which has formed in the opposite end thereof an eye 22, and an eccentric 23 is positioned within the eye 22 for a purpose which will subsequently be described. There are thus provided two controller or side bars 20 and connecting bars 21 each formed with an eye 22 at its end, and each eye containing an eccentric 23 therein. Thus the longitudinally movable side bar 20 releases the doors 16 by motion in one direction, and latches them closed by motion in the opposite direction.

The eccentrics 23 are connected by a shaft 24 so that they will act in unison, and the shaft is carried in bearings 25 which are fast to the framework of the car. Mounted on the shaft 24 are two flanged wheels 26 and 27, each flanged wheel being keyed to the shaft so that the wheels and the shaft will rotate together.

Wound about the flanged wheel 26 is a connection, which may be a flexible connection, for instance a chain 28, having one end attached to the flanged wheel. The other end of the chain 28 is attached to a lever 29, which is pivoted at a point 30 upon the dump car 11. The end 31 of the lever 29 farthest from the pivot 30, extends in a generally horizontal direction past the chain 28 and beyond the adjacent wheel 12 of the dump car.

The flanged wheel 26, connection 28, and lever 29, thus constitute one form of movable lever mechanism; and the controller bars 20, with connections is, broadly speaking, a train connecting this lever mechanism with the supporting means, here illustrated by the hinged latches 18.

In a similar manner a chain 32 has one end attached to the flanged wheel 27, which it surrounds. The other end of the chain 32 is attached to a lever 33 which is pivoted at a point 34 on the opposite side of the dump car from the pivot 30 of the lever 29. The lever 33 extends in a generally horizontal direction away from the pivot 34 and past its connection with the chain 32 until its end 35 extends beyond the car wheel 12 which is nearest the flanged wheel 27.

The chain 28 and the chain 32 are wound in opposite directions around the flanged wheels 26 and 27 respectively. Thus when the end

31 of the lever 29 is raised the shaft 24 is turned in one direction, whereas when the end 35 of the lever 33 is raised, the shaft 24 is turned in the opposite direction. When the shaft 24 is rotated the eccentric 23 is also rotated shifting the controller bar 20 either forward or backward under the car.

From what has been said it will be evident that by raising one lever end, say 35, the control lever 20 may be moved forwardly until the latches assume the position shown in Figure 1, holding the sections 16 in closed position. On the other hand by raising the end of the other lever, say the lever 29, the control lever 20 may be withdrawn into the position shown in Figs. 3 and 4, releasing the sections 16. The latches 18 may, therefore, be moved into latching position by raising the end of one lever and withdrawn from latching position by raising the end of the other lever.

I prefer to provide means for raising the lever ends automatically in the form of cam members 36 and 37 situated at suitable points adjacent the track over which the dump car moves. Thus, as the front end of the dump car comes to the edge of the dump, the end 31 of the lever 29 slides up the cam member 36 extending the chain 28 and moving the eccentric 23, until the latches 18 release the bottom sections 16 of the car and the latter fall downwardly. Thus the car is dumped as illustrated in Fig. 3.

At the other side of the pit into which the car is dumped, I provide a replacing rail 38 parallel with and between the rails 13 upon which the car travels. The replacing rail 38 extends upwardly from a position within the pit to a horizontal position between the rails 13 at the elevation of the floor sections 16 when closed. The floor sections, when depending as is the first section illustrated in Fig. 3, come in contact with the replacing rail 38 as the car moves forward and are swung upward into closed position by contact with the replacing rail (Fig. 4).

When the car has reached a position where all of the bottom sections 16 have ridden up on the replacing rail and are in closed position, the end 35 of the lever 33 rides up upon a second cam member 37 and the chain 32 is pulled upwardly rotating the flanged wheel 27, the shaft 24 and the eccentric 23. The control lever is thereby moved forwardly and the latches 18 engage with the floor sections 16. The dump car is now once more in loading position and may be returned to the source of the coal and again loaded.

It will be observed that by latching and unlatching all of the floor sections simultaneously and by properly positioning the cam member 36 the floor sections may be released when the latched end of the first section is adjacent the edge of the coal pile to which the coal in the car is to be added. The first



section dumps at once, its unlatched rear edge swinging downwardly adjacent the face of the piled coal. A minimum fall is thereby permitted the coal so deposited. The following sections when unlatched drop to the level of the road-bed between the rails 13, which becomes built-up with coal until it will support the sections in latched position, even though unlatched, until the face of the pile is reached. Thus little coal is lost between the rails until the edge of the dump is reached, but dumping takes place along the edge of the pile as soon as the latch end of each floor section arrives at that point. For this reason there is no appreciable dropping of the coal and very little breakage due to falling.

I may construct one end of the lading body of the car so that it slopes inwardly and upwardly in order to prevent the contents of the car from arching over and remaining in the car owing to friction against its sides and ends. The front ends of the cars illustrated in the drawings are shown as constructed in this manner. Thus the coal will not arch between the front axle and the front of the car.

By means of the present invention, it is possible to deposit in a hopper, bin, or depression the softest of coal without breaking it up and incurring large losses through the formation of slack.

While soft coal has been specifically referred to, it is apparent that other breakable material may be similarly handled with great advantage. The invention is not limited to soft coal nor yet to any particular material.

The details of structure here described and illustrated may be varied by one skilled in the art without departing from the proper scope of the present invention. For instance, known means may be provided whereby the latches may be withdrawn successively from front to rear of the car. In such a case the forward floor section will be released when the lever 28 has ridden only part way up the cam member 35, the second floor section will be released when the lever 28 has ridden still farther up the cam member 35, and the third floor section will be released as the lever 28 attains the top of the cam section 35. One means for accomplishing this result is the arrangement illustrated in Fig. 5, wherein a bearing 39 on the controller bar 20 is completely in contact with a pin 40 on the forward bottom section, while pins 41 and 42 on the succeeding sections extend through slots 43 and 44 respectively of different length in the controller bar 20. This is a well-known method of causing a rod to operate several parts successively. Obviously other known constructions for accomplishing the same result could be employed.

With the understanding, therefore, that

the invention is not limited to the details here shown, by way of example

I claim:

1. A railway comprising dump cars, bottom sections hinged to one of said cars forming a substantially flat bottom therefor, latches hinged to said car adapted to hold said bottom sections in loading position, and a member external to said cars for tripping said latches and releasing said sections, in combination with means external to said cars for returning said sections to loading position, and a second member external to said cars for operating said latches and latching said sections in loading position.

2. A railway comprising dump cars, bottom sections hinged to one of said cars forming a substantially flat bottom therefor, latches hinged to said car adapted to hold said bottom sections in loading position, and a cam member external to said cars for tripping said latches and releasing said sections, in combination with a replacing rail external to said cars for returning said sections to loading position, and a second cam member external to said cars for operating said latches and latching said sections in loading position.

3. In a dump car, independent flat sections forming a dumping bottom, hinges about which said sections are adapted to swing, hinged latches adapted to hold said sections in loading position by supporting their free ends, and a controller bar connecting all of the hinged latches, in combination with a mechanism comprising an eccentric associated with said controller bar, a shaft connected to said eccentric, a lever pivoted to the car, and a flexible connection between said shaft and said lever, adapted to withdraw the controller bar and release the sections when said lever is elevated.

4. In a dump car, independent flat sections forming a dumping bottom, hinges about which said sections are adapted to swing, latches adapted to hold said sections in loading position by supporting their free ends, and a controller bar connecting all of the latches, in combination with a mechanism comprising an eccentric associated with said controller bar, and shaft connected to said eccentric, a lever pivoted to the car, and a connection between said shaft and said lever adapted to withdraw the controller bar and release the sections when said lever is elevated.

5. In a railway, the combination with a dump car having hinged bottom sections, and latches to hold the bottom sections in loading positions, of a member externally of the car for tripping the latches to release the sections, means for returning the sections to loading positions, and a second member externally of the car for operating the latches to latch the sections in loading positions.



6. In a railway, the combination with a dump car having hinged bottom sections, and hinged latches to hold the bottom sections in loading positions, of a cam member externally of the car for tripping the latches to release the sections, means externally of the car for returning the sections to loading positions, and a second cam member externally of the car for operating the latches to latch the sections in loading positions.

7. In a dump car, the combination of hinged sections forming a dumping bottom, latches for holding the sections in loading positions, a controller bar connected with the latches, an eccentric associated with the controller bar, a shaft connected with the eccentric, a lever, and a connection between the shaft and lever for actuating the controller bar.

8. In a dump car, the combination of hinged sections forming a dumping bottom, latches for holding the sections in loading positions, a controller bar connected with the latches, an eccentric operatively connected with the controller bar, a shaft connected with the eccentric, a pivoted lever, and a flexible connection between the shaft and lever and adapted to withdraw the controller bar and release the sections on upward movement of the lever.

9. In a dump car, the combination of a plurality of drop-bottom doors, means for hingedly supporting an edge of each of the doors for swinging movement about an axis extending transversely of the car, latches engaging the free edges of the doors and mounted for swinging movement about axes parallel with the door axes, means pivotally supporting the latches and a longitudinally slidable controller bar pivotally connecting the latches together for controlling the release of the latches.

10. In a mine or other rail car, the combination of car axles, car wheels, a lading body, longitudinal sill-members having upright sections substantially at the level of the horizontal plane of the axes of the wheels, a plurality of transverse drop doors pivotally hinged at their forward ends and located at least in part below the plane of the axes of the wheels, latch mechanisms for releasing the rear end of each of the doors for dropping, longitudinally movable means located beneath the car axles and extending substantially from the rear end of the lading body of the car forward to an association with the said latch mechanism of the forward doors whereby a longitudinal movement of the said movable means serves to release for dropping each door forward of the rearward door, and lever means operable from the side of the rear end of the car whereby its operation creates a longitudinal movement in the said movable means.

11. In a dump car, the combination of a

lading body, car wheels, car axles, a plurality of drop doors having bottoms located at least in substantial part below the horizontal plane of the axes of the car wheels, longitudinal sill-members having at least substantial portions lying below the horizontal plane of the axes of the car wheels, releasable supporting mechanisms for the free edges of the drop doors, a controller bar arranged for longitudinal movement in respect of the lading body, and located at least in substantial part below the horizontal plane of the axes of the car wheels, and extending from the rear end of the car forward and connected mechanically with the supporting mechanisms of the forward door whereby a longitudinal motion of the controller bar will release the forward door for dropping, a lever mechanism at the rear end of the car and operable from the side of the car either manually or automatically by engagement with a cam mechanism alongside the track, and the said lever mechanism being associated mechanically with the controller bar whereby a movement of the lever mechanism imparts longitudinal motion to the controller bar whereby the forward door is released for dropping.

12. In a mine or other rail car, the combination of car axles, car wheels, a lading body having a plurality of transverse drop doors pivotally hinged at their forward ends and supported releasably at their rearward ends and located at least in substantial part below the horizontal plane of the axes of the car wheels, a lever mechanism at the rear end of the lading body of the car and operable from the side of the car, latch supports for each of the doors, a connecting bar associating the lever mechanism mechanically with the rearward door, a longitudinally movable side bar associating the connecting bar with each forward door whereby a movement of the lever releases the rearward door for dropping and also induces a longitudinal movement of the side bar which in turn causes a releasing movement of the latch supports for each forward door whereby each said door is released for dropping.

13. In a dumping vehicle, the combination of axles, wheels, a lading body having a plurality of transversely pivoted drop doors, each pivotally hinged at one end and supported releasably at the other end, operating mechanism at the rear end of the lading body and operable from the side of the vehicle, a latch support arranged to support the free end of each of the doors, means associating the operating mechanism mechanically with the rearward door, a longitudinally movable bar associating said means with each forward door, whereby a movement of the operating mechanism releases the rearward door for dropping and also induces a longitudinal movement of the bar which in turn causes a releasing movement of the latch sup-



ports for each forward door, whereby each said door is released for dropping.

14. In a mine or other rail car, the combination of side sills, car axles, car wheels, a lading bottom having a plurality of transverse drop doors all pivotally hinged at their forward ends and located at least in part below the horizontal plane of the axes of the car wheels, latch mechanisms for releasing the rear ends of the doors for dropping, said latch mechanism for a forward door being mounted for movement in the direction of the length of the car, means operable from the side of the car and connected mechanically with the latch mechanisms whereby a movement of said means may release all the doors for dropping simultaneously, said means extending transversely at least in part intermediate the upright planes of the side sills and located outside the lading chamber of the car.

15. In a mine or other rail car, the combination of a car frame having side sills, car axles, car wheels, a lading bottom having a plurality of transverse drop doors all pivotally hinged about transverse axes at their forward ends and located at least in part below the horizontal plane of the axes of the car wheels, said doors being restrained against longitudinal shifting with respect to the car frame, a latch mechanism for releasing the rear end of each of the doors for dropping, said latch mechanism for a forward door being mounted for movement in the direction of the length of the car, means operable from the side of the car and connected mechanically with the latch mechanisms whereby a movement of said means releases all the doors for dropping in any prearranged order, said means extending transversely at least in part intermediate the upright planes of the side sills and outside the lading chamber of the car.

16. In a dumping vehicle, the combination of a frame having side-supporting sills, axles, wheels, a lading bottom having a plurality of transverse doors all pivotally hinged at their forward ends about transverse axes and located at least in part below the horizontal plane of the axes of the wheels, said doors being held against longitudinal shifting with respect to the frame, latch mechanisms for releasing the rear ends of the doors for dropping, said latch mechanism for a forward door being mounted for movement in the direction of the length of the vehicle, means operable from the side of the vehicle and connected mechanically with the latch mechanisms, whereby a movement of the said means releases all the doors for dropping in any prearranged order, said means having at least a part thereof extending transversely of the vehicle intermediate the upright planes of the side-supporting sills and outside the lading chamber of the vehicle.

17. In a mine or other rail car, the combination of side sills, car axles, car wheels, a lading bottom having a plurality of transverse drop doors all pivotally hinged at their forward ends about transverse axes and located at least in part below the horizontal plane of the axes of the car wheels, latch mechanisms for releasing the rear ends of the doors for dropping, said latch mechanism for a forward door being mounted for movement in the direction of the length of the car, means operable from the side of the car and connected mechanically with the latch mechanisms whereby a movement of said means releases all the doors for dropping before the rear edge of any one door has dropped below the lowest part of the structure of the lading body, said means having at least a part thereof extending transversely of the vehicle intermediate the upright planes of the side sills and rearwardly of the rear lading end wall of the car.

18. In a mine or other rail car, the combination of a car frame having side sills, car axles, car wheels, a lading bottom having a plurality of transverse drop doors all pivotally hinged at their forward ends about transverse axes and located at least in part below the horizontal plane of the axes of the car wheels, said doors being restrained against longitudinal shifting with respect to the car frame, latch mechanism for releasing the rear end of each of the doors for dropping, said latch mechanism for a forward door being mounted for swinging movement in the direction of the length of the car, lever bar means operable from the side of the car and connected mechanically with the latch mechanisms whereby an upright movement of the lever bar releases all the doors for dropping before the rear edge of any one door has dropped below the lowest part of the structure of the lading body, said lever bar means having at least a part thereof extending transversely of the car intermediate the upright planes of the side sills and spaced rearwardly of the rear lading end wall of the car.

19. In a mine or other rail car, the combination of side sills, car axles, car wheels, a lading bottom having a plurality of transverse drop doors all pivotally hinged at their forward ends and latched releasably at their rearward ends, the body being in hopper-form whereby there is complete discharge of the lading by gravity between the rails and on both sides of each axle of the car, the said drop doors having bottoms located at least in substantial part below the horizontal plane of the axes of the car wheels, latch releasing mechanisms for all of the doors, said latch mechanism for a forward door being mounted for movement in the direction of the length of the car, a bar controlling the latch releasing mechanisms, and the doors being released



by a movement of said bar whereby all doors may be simultaneously released for dropping, said bar having at least a part thereof extending transversely of the car intermediate the upright planes of the side sills and disposed outside the lading chamber of the car.

20. In a mine or other rail car, the combination of side sills, a car frame, car axles, car wheels, a lading bottom having a plurality of transverse drop doors all pivotally hinged at their forward ends and latched releasably at their rearward ends, said doors being held against longitudinal shifting with respect to the car frame, the body being in hopper-form whereby there is complete discharge of the lading by gravity between the rails and on both sides of each axle of the car, the said drop doors having bottoms located at least in substantial part below the horizontal plane of the axes of the car wheels, latch releasing mechanisms for all of the doors, said latch mechanism for a forward door being mounted for movement in the direction of the length of the car, a lever bar controlling the latch releasing mechanisms, and the doors being released by a movement of the lever bar whereby all doors may be simultaneously released for dropping, said lever bar having at least a part thereof extending transversely of the car intermediate the upright planes of the side sills and spaced rearwardly of the car lading chamber.

In testimony whereof I have signed my name to this specification.

JAMES L. GETAZ.