W. CORMACK.

ESCALATING VEHICLE.

APPLICATION FILED JAN. 30, 1920.

1,434,682.

Patented Nov. 7, 1922.

4 SHEETS—SHEET 1.

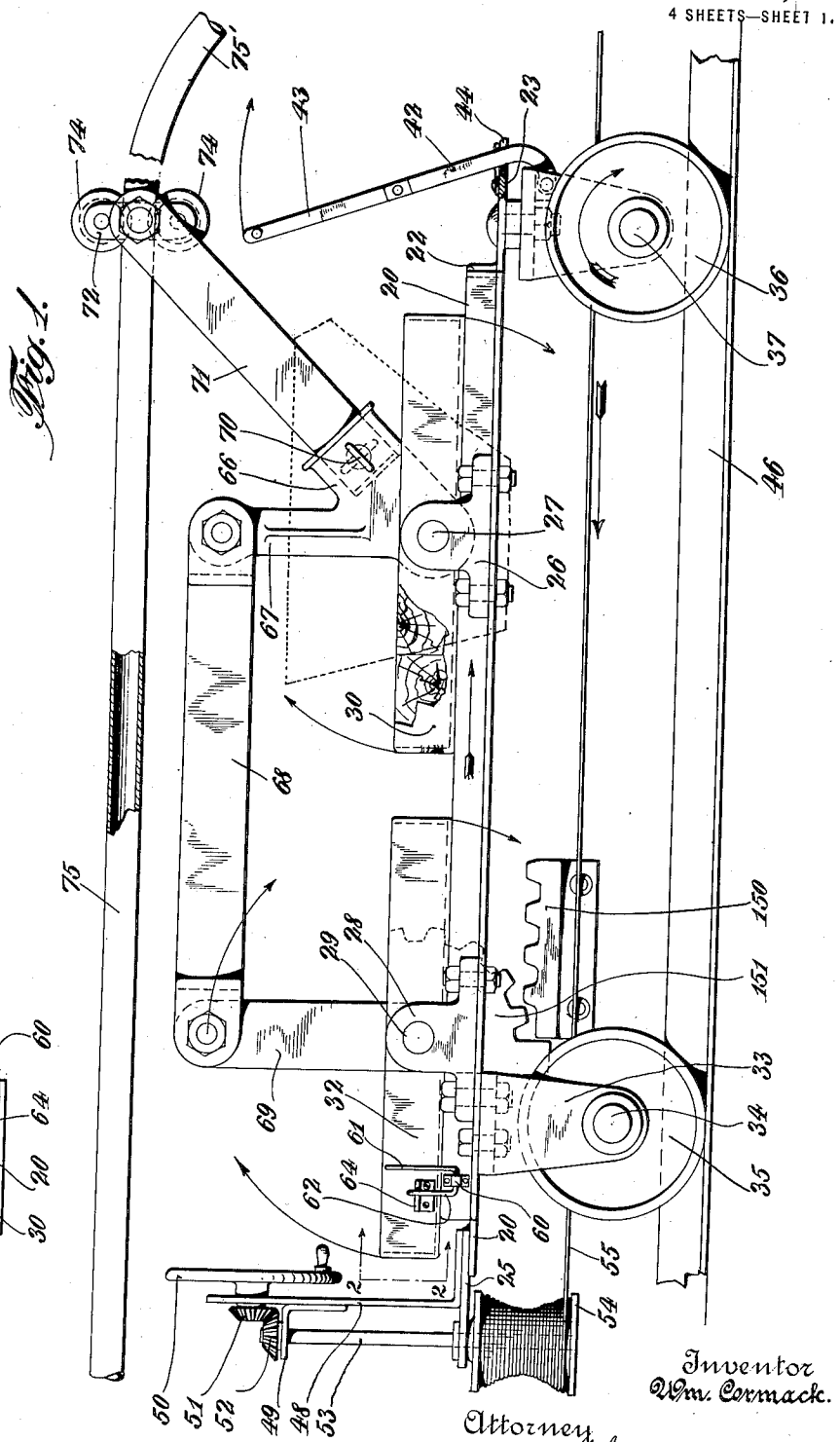


Fig. 1.

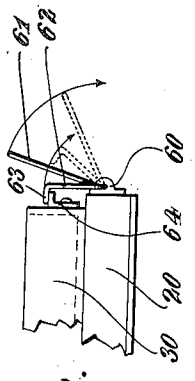


Fig. 2.

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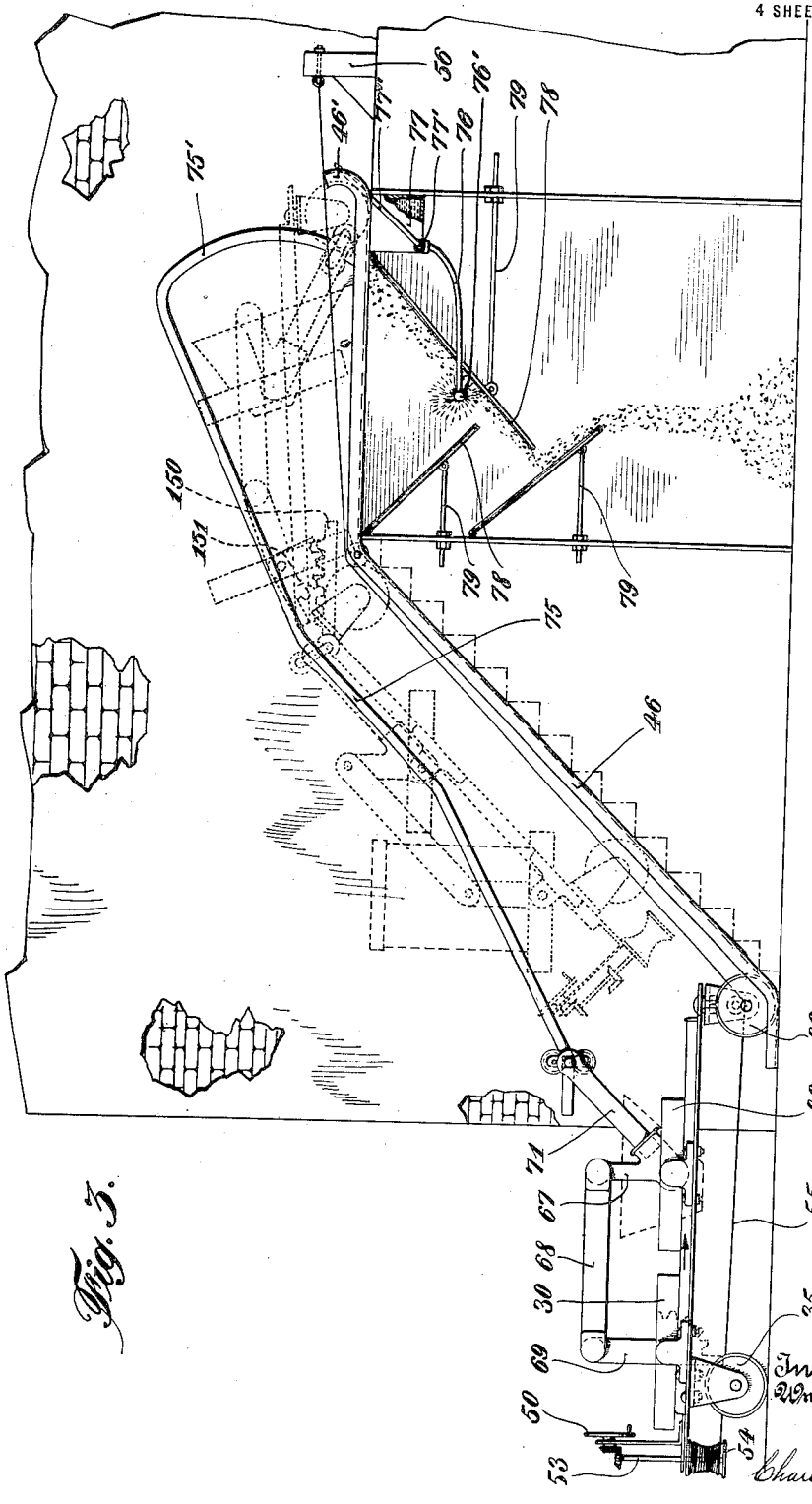



Fig. 3.

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4 SHEETS—SHEET 3.

Fig. 8.

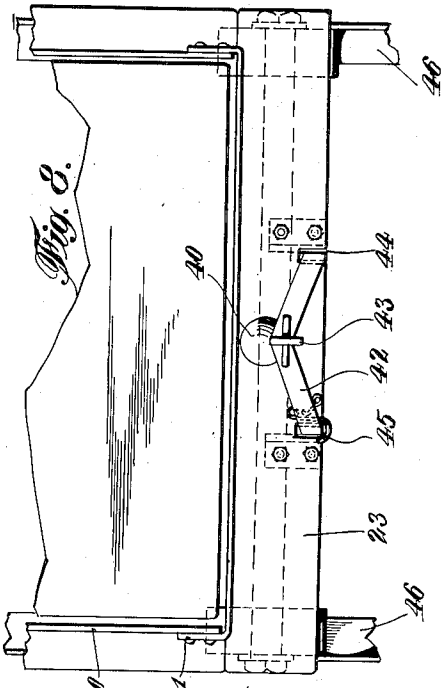



Fig. 9.

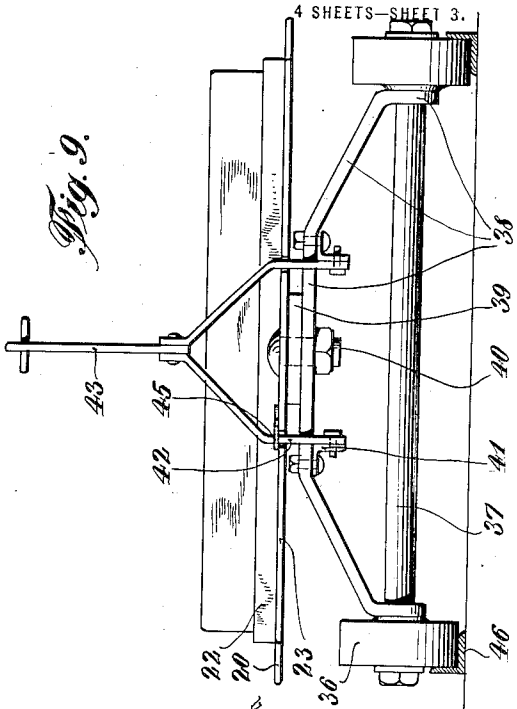



Fig. 5.

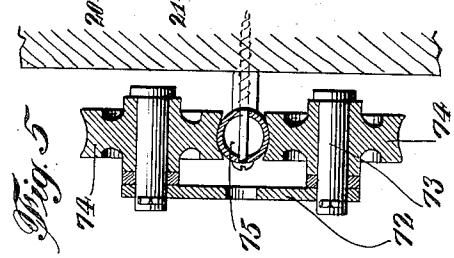



Fig. 7.

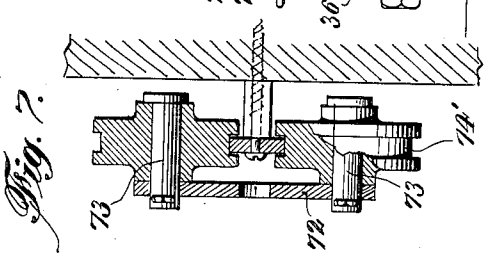



Fig. 4.

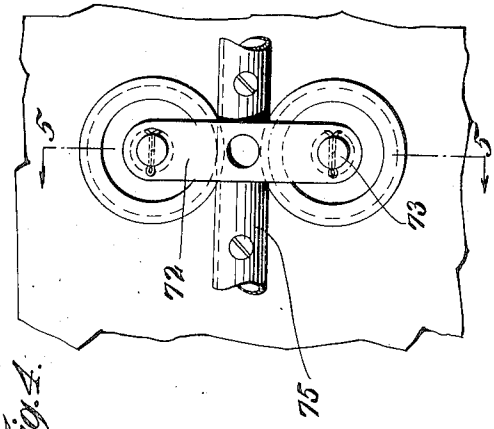
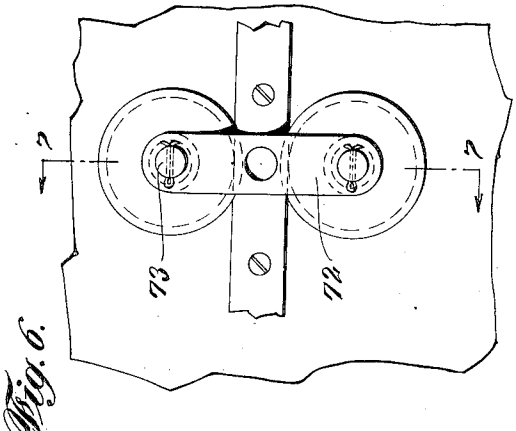



Fig. 6.




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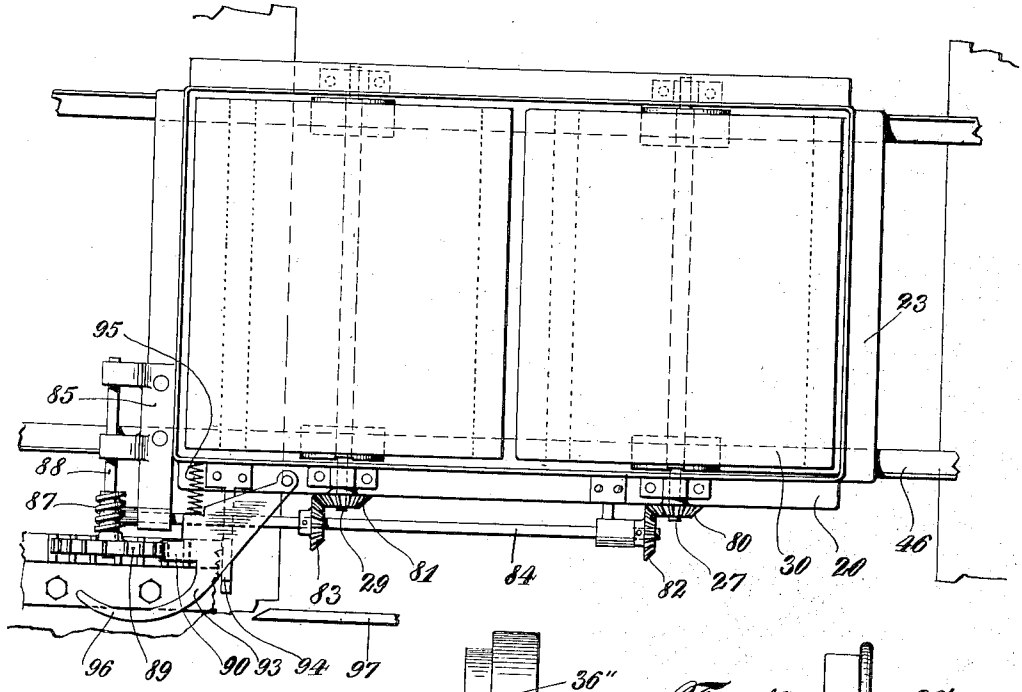
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4 SHEETS—SHEET 4.

Fig. 10.



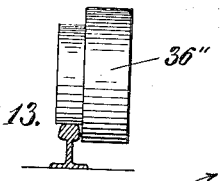




Fig. 13.

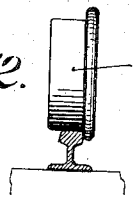



Fig. 12.

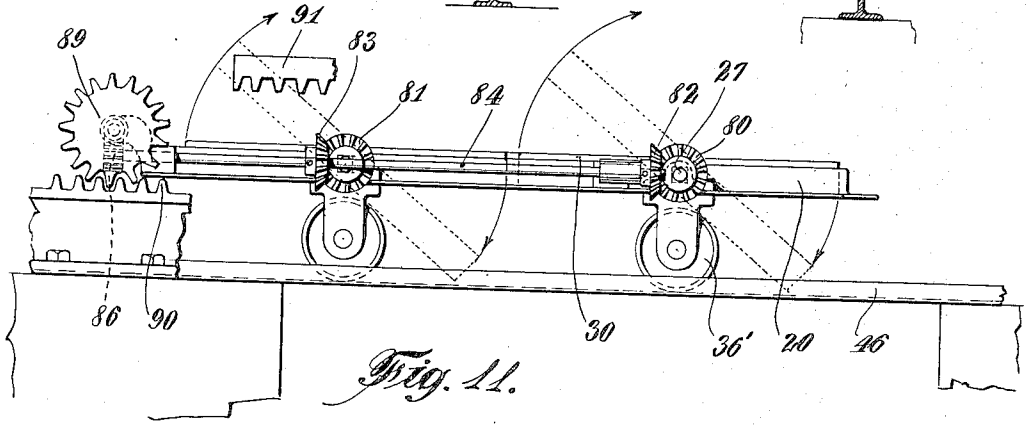



Fig. 11.

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Patented Nov. 7, 1922. 1,434,682

# UNITED STATES PATENT OFFICE.

WILLIAM CORMACK, OF NEW YORK, N. Y.

## ESCALATING VEHICLE.

Application filed January 30, 1920. Serial No. 355,031.

*To all whom it may concern:*

Be it known that I, WILLIAM CORMACK, a subject of King of England, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Escalating Vehicles, of which the following is a specification.

This invention has as its object to provide a vehicle which, in one of its several forms, is adapted for use in excavating trenches, subways, tunnels, etc., conveying the excavated material to points remote, either on the same level or upon an incline.

A further use for such vehicle is in the construction of buildings, masonry and cement work, including means for hauling coal, gravel, etc., ash cans and like containers, loading barges, dock handling, freight and like purposes.

Still another purpose for which a modified form of the device is adapted is that of a scenic railway apparatus, or as a toy.

These objects, in addition to others which will become apparent as the description progresses, are attained by the novel construction, combination and arrangement of parts hereinafter described and shown in the accompanying drawings, forming a material part of this specification, and in which:—

Figure 1 is a side elevational view of a preferred embodiment of the vehicle, showing the track, haulage and dump control means.

Figure 2 is a fragmentary side view of the platform locking means, looking on line 2—2 of Fig. 1.

Figure 3 is a side elevational view showing the escalating vehicle at the foot of an incline, and indicating by broken lines the several positions assumed by it, and its pivoted platforms, in ascending and dumping.

Figure 4 is an enlarged fragmentary side view of one form of the platform controlling device.

Figure 5 is a vertical sectional view taken on line 5—5 of Figure 4.

Figure 6 is a view similar to Figure 4 showing modified form of guide rail and pulleys.

Figure 7 is a vertical sectional view taken on line 7—7 of Fig. 6.

Figure 8 is a partial top plan view of the truck showing the front end thereof.

Figure 9 is a front elevational view of the same.

Figure 10 is a plan view of the truck showing a modification in platform operating means.

Figure 11 is a side view of the same.

Figure 12 is a front view showing a type of track-rail wheel.

Figure 13 is a similar view showing a type of wheel which can be used on a rail or level surface.

Referring to the drawings in detail, particularly Figs. 1 and 3, a truck is shown comprised of a rectangular frame having side elements 20, here shown as rolled angles, their upper elements being connected at the front by riveting the bent ends 21 of another angle 22, having a wide lower element 23, while at the rear the lower elements of the angles 20 are extended and have secured to them a plate 25, thus forming a rigid frame.

Bolted to the horizontal elements of the side angles 20 are pairs of brackets, 26 and 28, respectively front and rear, in which are journalled pivots 27 and 29, their inner ends being secured in opposite sides of tilting carriers, containers, or receptacles 30 and 32, as indicated by the pans, platforms, or buckets shown, and which are suited to the work purposes to be performed, and also in such number as may be best suited to the work.

A pair of downwardly extending brackets 33 are bolted to the angles 20 near their rear ends, the same acting as housings for the rear axle 34 to which are secured the wheels 35.

The front wheels 36 are fixed on an axle 37 carried in a yoke bracket 38, having between it and the element 23, a fifth wheel 39, while a king bolt 40 connects the parts so that the front axle is free to swivel.

Bolted to the yoke bracket 38 are angles 41 pivotally engaging the spread, lower ends 42 of a tongue 43, by which the truck may be manually drawn and steered.

The lower spaced elements 42 of the tongue extend parallel and are adapted to be received in slots 44 formed in the truck elements 23, to which are pivotally attached

hasp-like clips 45 by which the tongue, when in a raised position can be locked, thereby maintaining the front axle parallel with the rear axle, causing the truck to move on a straight course.

The wheels 36, as shown in Fig. 9, are plain cylinders adapted to move freely on any level surface, or be guided by the vertical elements of angle rails 46. Other types of wheels 36′, are adapted to be used with ordinary track rails, as shown in Fig. 12, while Fig. 13 shows a wheel 36″, adapted to be used either on a plain level surface or on a rail as indicated.

Secured to the horizontal plate 25 is a vertical bracket 48 supporting an angular bracket 49. A spindle, journalled in the upper portion of the bracket 48, has secured to it an operating hand wheel 50, while on the outer end of the spindle is fixed a bevel gear 51 meshing with a mating gear 52 fixed on the upper end of a vertical shaft 53, rotatable in the bracket 49 and plate 25, its lower extending end having secured to it a drum 54, to which is attached one end of a haulage cable 55, the other end of the cable being fastened to a fixed object, as the post 56, as shown in Figure 3.

Obviously the cable may be attached to the truck and the winding done from a fixed point in a manner reverse to that indicated by whatever source of power that is convenient.

A lock for holding the carriers 30 to the truck frame is shown in Figs. 1 and 2, the same consisting of a bracket 60 fastened to the truck frame side and pivotally containing a rod having a handle 61 projecting at an angle from one end, while from the other is an arm 62 having a bent end 63 engageable over an angle bracket 64, fixed on the side of the carrier 30, and preventing it from tipping until the handle 61 is pulled outwardly, or other equivalent means used.

These trucks are adapted to be drawn up inclined surfaces, as indicated best in Fig. 3, in which a stairway is shown having tracks 46 adjacent to the ends of the steps, the tracks ending in stops 46′ which limit the forward movement of the truck.

In order to maintain the several carriers, all of which are pivotally supported by the truck frame, in a horizontal plane, irrespective of the inclination of the body of the truck, control devices are used of which the preferred embodiment consists of a pair of levers 67 and 69 rigidly secured at one side of the truck frame to the points 27 and 29, these levers being at all times at right angles with the planes of the carriers 30, and are pivotally bolted at their upper ends to a connecting bar 68 so that all of the carriers are oscillated as a unit.

The front lever 67 has an angular arm 66 containing a socket in which is secured, by a locking device 70, a bar 71 pivotally engaging at its outer end a plate or head 72.

In opposite ends of this head are secured headed spindles 73 on which are rotatably mounted wheels 74, having concave faces adapted to engage with a tubular rail 75 as shown in Figs. 1, 4 and 5, or wheels 74′ having grooves engageable with rectangular rails as shown in Figs. 6 and 7.

These rails, of whatever cross section may be preferred, are bent to form fixed elongated cams and rigidly secured at spaced intervals along their length to adjacent walls so as to extend lengthwise above the rails 46, and may be used as hand rails along the stairs, but so shaped that their cam-like profile will, by reason of the wheels, levers and connections, cause the carriers to remain truly horizontal during the travel of the truck.

In order to cause the receptacles to tilt and deposit their contents, a short rack section 150 is fixed on an appropriate support along the track where dumping is to take place, and engageable with this rack is a gear segment 151 whose hub is keyed or otherwise secured to a carrier pivot, as 29, in such manner as to cause the pivot and carrier to partly rotate as the segment 151 engages the rack 150, thereby dumping said carrier.

Thus the dry ingredients of mortar, cement and the like may be conveyed in separate receptacles, dumped and commingled with water supplied by the pipe 75 having spray heads 76′, from the tank 77, the valve 77′ being opened automatically by the truck, at the end of its run, striking the valve handle 77′, so as to moisten and mix the ingredients, the mixed contents passing down the inclined grooved planes 78, which are adjustable by the bolts 79, as best seen in Fig. 3.

It will be clear that the dumping of the carriers may take place at the other terminus of the truck run, or by providing racks 150 for co-action with segment 151, also that any number of the carriers may be used with one truck compatible with its capacity.

A modified means of dumping the carriers is shown in Figs. 10 and 11, in which a pair of bevel gears 80 and 81 are secured directly to the pivots 27 and 29, the same meshing with mating gears 82 and 83 fixed on a shaft 84 arranged longitudinally at one side of the truck frame, the rear end of the shaft passing through a bracket 85 and having fixed to it a worm wheel 86, driven by a worm 87 secured to a horizontal shaft 88, journalled in the bracket 85 and having beyond the worm a spur gear 89 engageable with a rack 90 stationary adjacent the track, a similar but reversed rack 91 being in opposed relation and at a little distance therefrom.

Thus when the gear engages the rack 90, obviously the carriers are tipped to such an

extent as to cause dumping, but as the truck continues to advance and the gear engages the track 91, the carriers are rotated into a horizontal position, it being understood that the length of the racks are such as to accomplish the purpose of transmitting the degree of rotary motion required in the shaft 84.

In order to hold the gear 89 from jarring loose, and thus inadvertently tilting the platforms 30, a latch 93 is pivoted to the frame, the same resting on a bracket 94, rigidly extending from the frame, the latch being held in operative position relative to the teeth of the gear by a spring 95, and pivoted with an extending curved arm 96 reaching outward beyond the side of the gear.

A fixed projection 97, of suitable length is arranged adjacent to the side of the track and, as the truck moves past the dumping point, strikes the arm, releasing the catch or latch, from the teeth of the gear and allowing it to be rotated.

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

1. An escalating vehicle comprising a truck, a track therefor, said track having an inclined portion, a carrier pivoted transversely in said truck, a cam rail along said track, and pivotal connections between said cam rail and said carrier to hold the carrier in a horizontal plane whether the truck is in a horizontal plane or an inclined plane upon the track.

2. An escalating vehicle comprising a truck, a track therefor, said track having an inclined portion, a carrier pivoted transversely to said truck, a cam rail along said track, and pivotal connections upon said truck with means adapted to travel along said rail, to hold the carrier in a horizontal plane whether the truck is in a horizontal plane or an inclined plane upon the track.

3. An escalating vehicle comprising a truck, a track therefor, said track having an inclined portion with a fixed rack at its highest point, a cam rail along said track, pivotal connections upon said truck with means adapted to travel along said rail, to hold the carrier in a horizontal plane whether the truck is in a horizontal plane or an inclined plane upon the track, and spur means extended from said pivotal means to engage said rack, thereby causing the carrier to be rotated for dumping purposes.

4. A escalating vehicle comprising a truck, a track therefor, said track having an inclined portion, a number of carriers pivoted transversely in said truck, a cam rail over said track, levers extending vertically from said carriers, connections between said levers, an arm extending angularly from one of said levers, and a pair of opposed guide wheels carried at the end of said arm for engagement with said rail.

5. The combination, with a truck, of a carrier pivotally mounted thereon, a track including an inclined portion, a cam rail, means co-acting between said carrier and rail to maintain said carrier in a horizontal plane when the truck is inclined, and means for tilting said carrier to dump its contents at a predetermined point in its path of travel.

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

WILLIAM CORMACK.