

G. E. HUTTELMAIER.
ROTARY CAR DUMPING MECHANISM.
APPLICATION FILED JUNE 20, 1913.

1,171,521.

Patented Feb. 15, 1916.

4 SHEETS—SHEET 1.

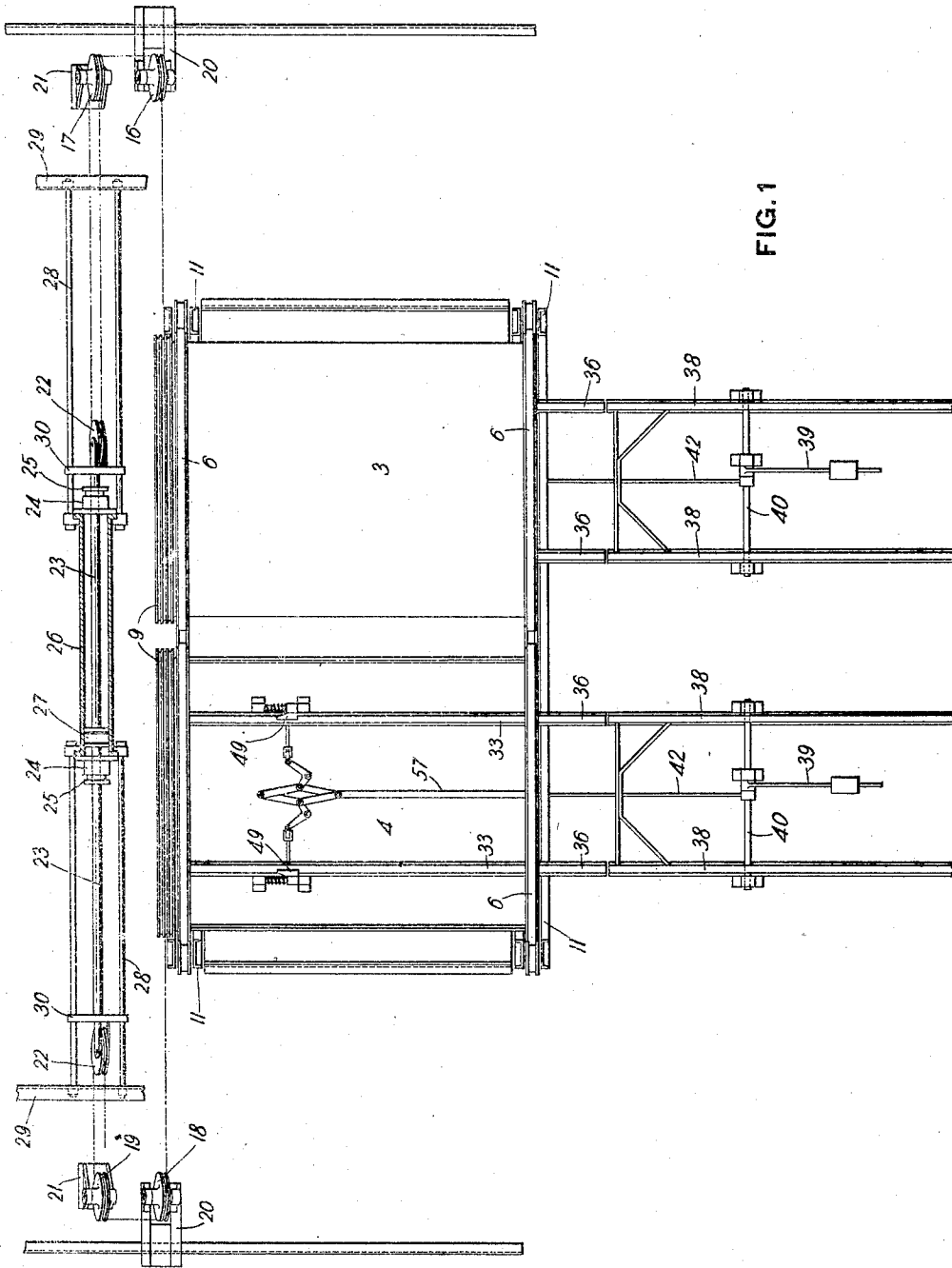


FIG. 1

WITNESSES

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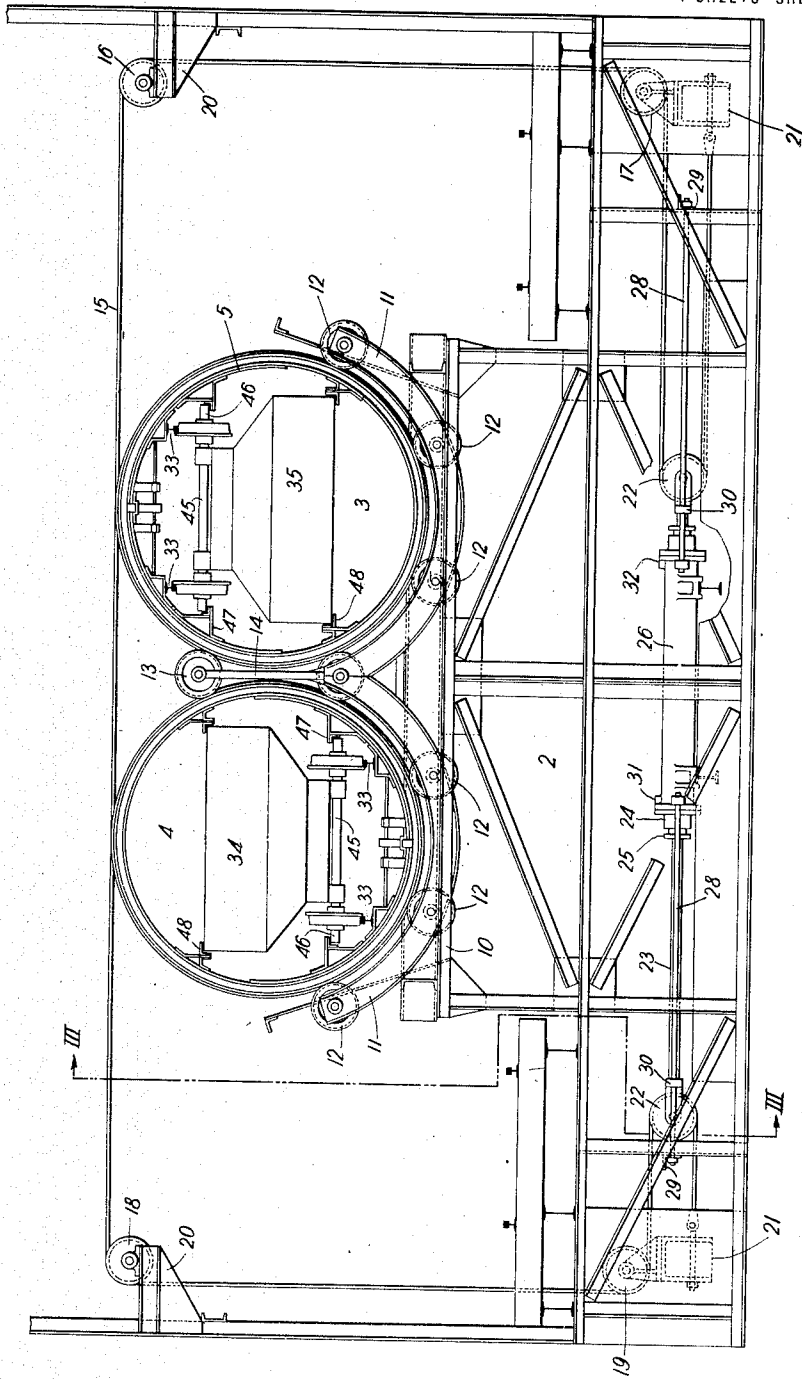
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4 SHEETS—SHEET 2.

FIG. 2



WITNESSES

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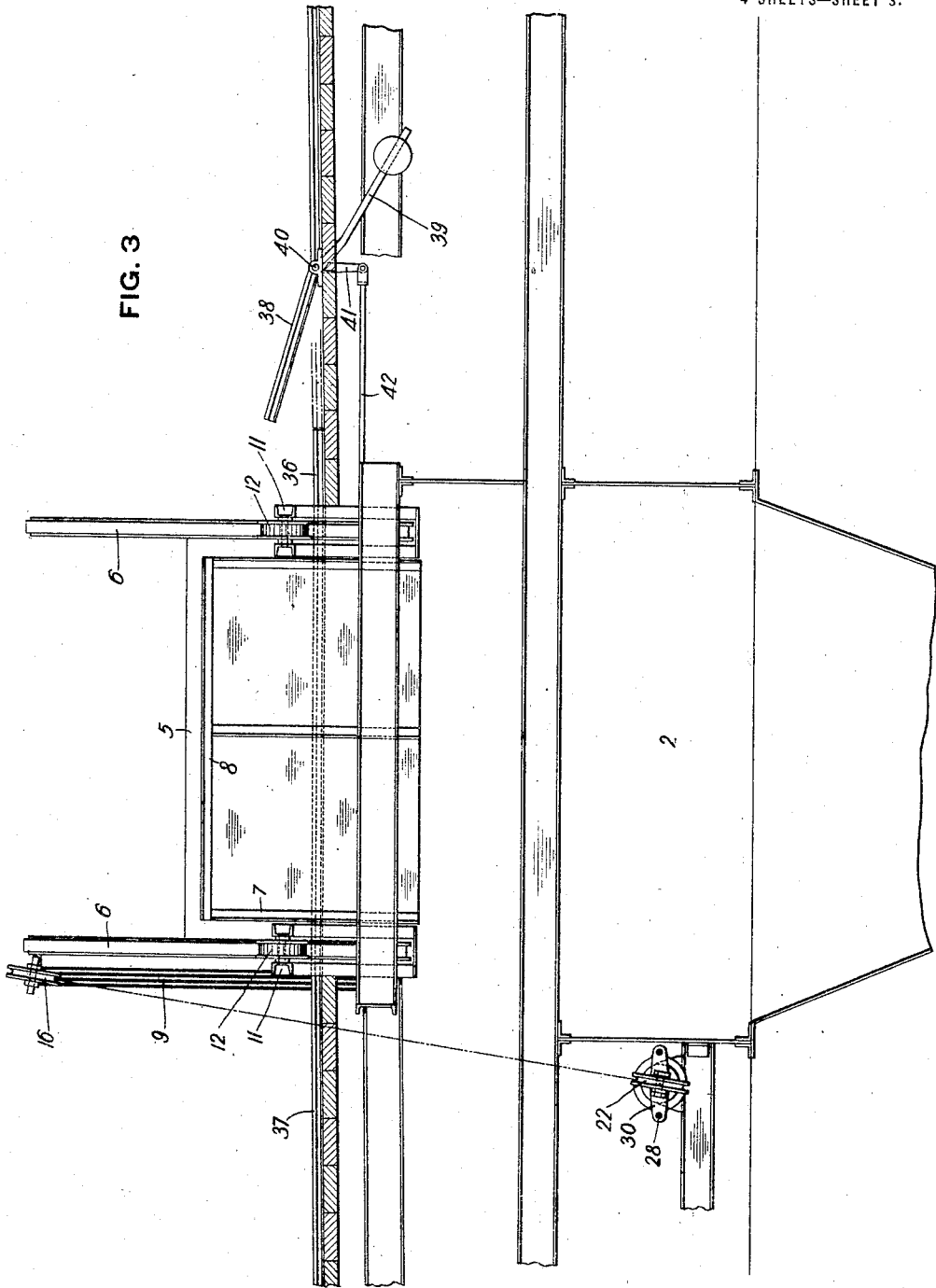


FIG. 3

WITNESSES

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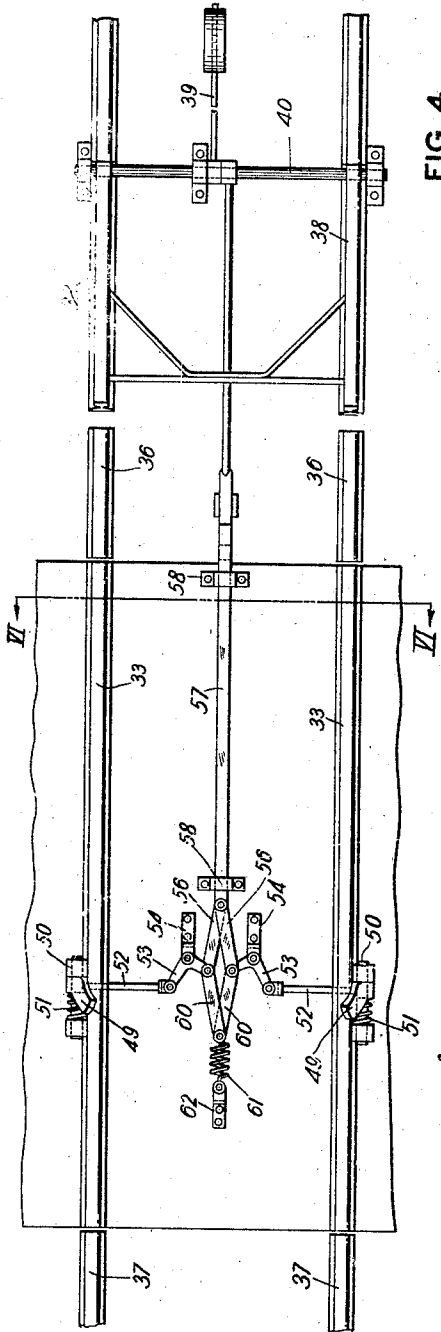


FIG. 4

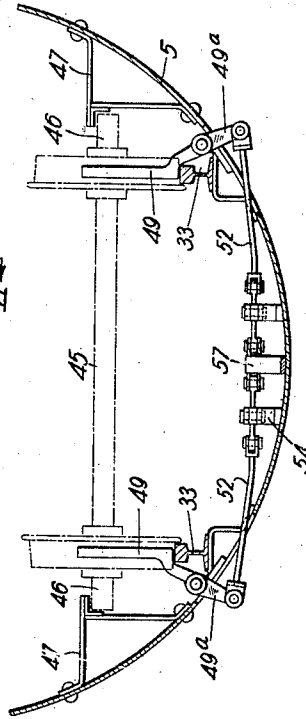


FIG. 6

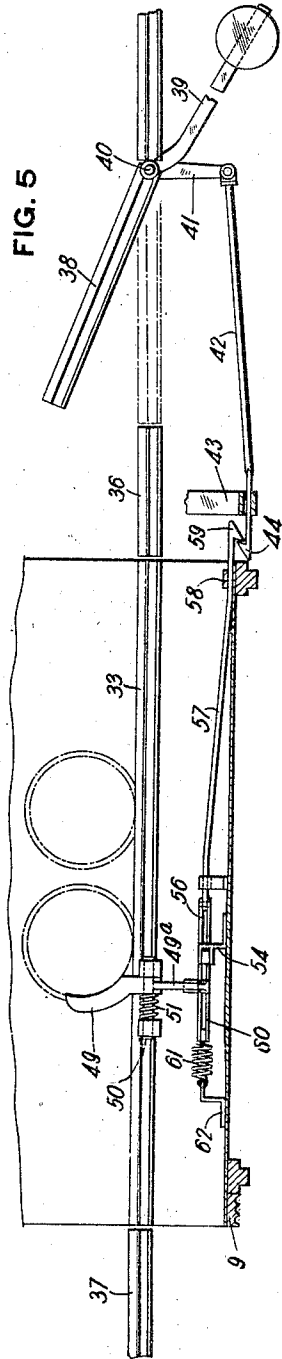


FIG. 5

WITNESSES

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ROTARY CAR-DUMPING MECHANISM.

1,171,521.

Specification of Letters Patent. Patented Feb. 15, 1916.

Application filed June 20, 1913. Serial No. 774,926.

To all whom it may concern:

Be it known that I, GUSTAVE E. HUTTELMAIER, a citizen of the United States, residing at Scottdale, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Rotary Car-Dumping Mechanism, of which the following is a specification.

My invention relates to apparatus for dumping used to empty cars of their contents, and more particularly relates to apparatus for dumping the cars or buggies used in handling and conveying mined coal in delivering it from the mine or other point of supply to a hopper or chute or other place of disposal.

One object of my invention is to provide a car dumping mechanism having novel means whereby the car dumping operations are facilitated and the time required in effecting the necessary dumping operations is lessened.

Another object of my invention is to provide a car dumping mechanism having improved means whereby the cars are mechanically dumped and the power required in effecting the dumping operations is lessened and reduced.

Another object of my invention is to provide a car dumping mechanism having novel means by which the cars are positioned and held in dumping position on the car dumping mechanism.

A further object of my invention is to provide a car dumping mechanism having novel means whereby the cars are stopped and held in dumping position on the dumping mechanism, and improved means for mechanically operating the stop whereby the stop is automatically moved into and out of operative position.

A still further object of my invention is to provide a car dumping mechanism having novel means whereby the dumping mechanism is actuated.

Still further objects of my invention will appear hereinafter as the invention is more fully disclosed in the specification and appended claim.

Referring to the drawings forming part of this specification, Figure 1 is a plan showing a car dumping mechanism constructed and arranged in accordance with my invention. Fig. 2 is an end elevation of the apparatus shown in Fig. 1. Fig. 3 is a sectional side elevation on the line III—III of Fig. 2.

Fig. 4 is a sectional plan, on a larger scale, showing the construction of the mine car stop and stop operating mechanism forming part of this invention. Fig. 5 is a sectional side elevation of the apparatus shown in Fig. 4. Fig. 6 is a transverse section, taken on the line VI—VI of Fig. 4, showing in end elevation the stop and stop operating mechanism.

In the accompanying drawings, the numeral 2 designates a bin or hopper above which is mounted a pair of operatively connected twin dumping cylinders 3 and 4. These dumping cylinders are similar in construction and have a semi-cylindrical metal shell 5 which is provided with annular rings forming tires 6—6 and with stiffening angles 7 and 8. The shell 5 of the cylinders, on one end thereof, is also provided with an annular ring 9 which is provided with a spiral or helical groove in the outer surface thereof for a purpose to be described later.

Secured on the framework 10 above the top of the bin 2 are pairs of curved track girders 11—11, one pair for each dumping cylinder; the girders being provided with a series of anti-friction rollers 12. The rollers 12 are flanged and are arranged at separated intervals in the length of the girders to engage with the outer surface of the tires 6—6 of the dumping cylinders to form a track or curved support therefor. Between the dumping cylinders 3 and 4 and at a point above the axial centers thereof at each end of the cylinders is a similar anti-friction roller 13 these rollers being rotatively secured to the upper ends of the vertical posts 14 which are secured to the ends of the track girders 11.

Wrapped around the spiral groove in the grooved ring 9 on each of the dumping cylinders is a cable or other flexible connection 15, the cable being wrapped a plurality of times around each of the rings 9 and passing over the guide rollers 16 and 17, 18 and 19 which are secured in suitable brackets 20 and 21 fastened to the framework above and at the sides of the bin 2. The opposite ends of the cable 15 also pass around movable pulleys 22, one of which is fastened to each end of the piston rod 23 which extends through the stuffing boxes 24 and gland 25 on each end of the fluid pressure cylinder 26. The cylinder 26 is secured to the framework forming part of the bin and car dumping mechanism, and the piston rod 23 extends through the cylinder 26 and is provided at

the middle of its length with a piston 27 which is positioned within the fluid pressure cylinder 26.

The ends of the cylinder are connected by tie-rods 28 to the angles 29 forming part of the framework of the bin or hopper below the car dumping mechanism, these tie-rods conveniently forming guides for the cross-heads 30 on which the movable pulleys 22 are mounted. The cable 15, after passing around the pulleys 22, is fastened by its ends to the bracket bearings 21 for the guide pulleys 17 and 19. The port openings 31 and 32 on opposite ends of the cylinder 26 are connected by suitable piping to a four-way valve (not shown) which is positioned in a suitable location for operating the dumping mechanism and is connected to a source of fluid pressure supply and also has an exhaust outlet opening through which the exhaust fluid pressure is discharged from the cylinder 26.

From the above description it will be seen that when the piston 27 is reciprocated in the fluid pressure cylinder 26 the cable 15 will simultaneously rotate the twin dumping cylinders 3 and 4, the cylinder and connecting mechanism being arranged to turn or rotate the dumping cylinders 3 and 4 through an angle of 180 degrees or half revolution. Each of the dumping cylinders 3 and 4 is provided with track rails 33—33, extending lengthwise through the dumping cylinders, on which mine cars or buggies 34 and 35 are positioned during the car dumping operations, and connected to the ends of the horizontally extending track rails 33 in each cylinder so as to be in alinement therewith are the ends of the track rails 36—36 forming part of the car delivery track and the rails 37—37 forming the receiving track upon which the cars are discharged from the dumping cylinders 3 and 4 after the dumping or car emptying operations. The delivery track has short pieces of rails 38 pivoted by one end a short distance beyond the end of the dumping cylinders, these pivoted rails being provided with a counterweighted lever 39 constructed to normally hold the rails 38 in elevated position as is shown in Fig. 5. The pivot shaft 40 for the rails 38 is also provided with a downwardly extending lever arm 41 which is pivotally connected to one end of the reach rod 42 and the other end of the rod 42 extends through the guide 43 and is provided with a hook 44 for a purpose described later.

As will be seen by reference to Fig. 2 the axles 45 for the mine cars 34 and 35 have overhanging portions 46 which are arranged to engage with the shelf 47 forming stops within the dumping cylinders 3 and 4 for maintaining the cars on the track rails 33 in the dumping cylinders. Above the mine cars 34 and 35 similar brackets or shelves 48

are provided which engage with the side and upper edge of the body of the mine cars 34 and 35 to maintain the cars on the track rails while the cars are being inverted in the dumping operation. While shelves 48 engaging with the car body and shelves 47 engaging with the ends of the car axles 45 are shown, but one set of the shelves may be employed when found desirable or necessary. Positioned within each of the dumping cylinders 3 and 4 on the bottom thereof are swinging car stops 49—49 which are arranged to swing into and out of position to engage with and hold the cars against movement lengthwise of the track during the car dumping operations. The stops 49 are pivoted by one end to the pivot shafts 50 which are secured in bearings alongside each of the track rails 33 and a helical spring 51 is employed on each of the pivot pins 50 to cushion the shock on the stops 49 when bumped or engaged by the car wheels. The lower swinging ends 49^a of the stops 49 are pivoted to the transversely extending reach rods 52 and the inner ends of these reach rods are connected to the end of one arm of the bell cranks 53 which are pivoted on brackets 54 secured to the metal shell 5 of the dumping cylinders 3 and 4. The outer ends of the other arms of the bell cranks 53 are connected together by links 56 to one end of a reach rod 57 which extends lengthwise in and overhangs one end of the dumping cylinders 3 and 4. The outer overhanging end of the rods 57 which project through the guides 58—58 are provided with a downwardly turned hook 59, these hooks 59 being arranged when the dumping cylinders 3 and 4 are in car receiving position to be engaged by the hook 44 on one end of the reach rod 42 operatively connected to the pivoted rail 38 forming part of the car delivery tracks leading to the dumping cylinders.

As will be seen by reference to Figs. 4 and 5 the hooks 44 and 59 on the co-acting reach rods 42 and 57 are arranged to engage in the car receiving position of the dumping cylinders and to permit their disengagement when the dumping cylinders are rotated in performing the dumping operations. The links 56 and arms of the bell cranks 53 connected thereto are also connected by links 60 to one end of a helical spring 61, the other end of this spring being fastened by the bracket 62 to the shell 5 of the dumping cylinders so as to retract the reach rod 57 and swing the bell cranks 53 to bring the swinging car stops 49 into position to engage with and stop a mine car in dumping position on the track rails 33 of the dumping cylinders. The pivoted rails 38 of the railroad tracks are made of such length that when the rear wheels of the cars passing thereover pass the swinging ends of these

rails, the rails will be released and permitted to move from the dotted position shown in Fig. 5 into that shown by full lines in this figure and permit the spring 61 to act to shift the swinging car stops 49 into car holding position. The downward movement of the rails 38 from the position shown in full lines into that shown in dotted lines in Fig. 5, which occurs only when a car is being moved into a dumping cylinder, causes the hooks 44 and 59 to be engaged and swing the car stops 49 from the vertical position shown in Figs. 5 and 6 into inoperative position to permit a car positioned within the dumping cylinder to pass therefrom when bumped by the incoming car.

In erecting my improved apparatus the dumping cylinders 3 and 4 are positioned on the curved tracks therefor so that when the rails forming the track within one dumping cylinder are in their lowermost position, the rails in the other of the dumping cylinders are positioned in their uppermost position. The cable 15 is then secured in the grooved rings 9 of these cylinders so as to turn the cylinders in unison and by positioning the tracks in the above described manner the weight of the loaded car being dumped is counterbalanced to the extent of the weight of the dumped car being returned to its upright position by the turning movement of the second dumping cylinder, in this way lessening the power required in operating the cylinders.

In the operation of my improved apparatus the parts are assembled as shown. A loaded car 34 or 35 is then moved along one of the inclined tracks 36 until positioned within one of the dumping cylinders, with its front wheels in engagement with the stops 49. Fluid pressure is then admitted to the required end of the cylinder 26 by manipulating the four-way valve and the piston 27 is thereby caused to reciprocate within the cylinder so as to move the pulleys 22 on opposite ends of the piston rod and shift the position of the cable with respect to the cylinder. The movement of the cable 15 rotates the two dumping cylinders and inverts the car positioned within the dumping cylinder so as to cause its contents to be discharged through the open upper end of the semi-cylindrical cylinder into the bin 2. Another loaded car is then moved into the other cylinder in the manner just described and the piston in the cylinder 26 is then moved in the opposite direction to rotate the dumping cylinders in the opposite direction. The cylinders being rotated through an angle of 180 degrees by the movement of the piston in the cylinder 26 inverts the second car in the second dumping cylinder and at the same time turns the empty car in the other cylinder to its upright position. A loaded car on the delivery

track leading to the cylinder containing the empty car is then allowed to descend on the inclined track rails 36 and bump against the end of the empty car within the dumping cylinder. The impetus given the empty car by the bumping operation causes it to move on the track out of the dumping cylinder to the track rails 37 on the discharge end of the dumping cylinders. As the loaded car passes over the pivoted section of the delivery track formed by the pivoted rails 38 the reach rods 42 and 57 are moved thereby to extend the spring 61 and at the same time move the bell cranks 52 to shift the car stops 49 from the operative position shown into their car releasing position, and by the time the rear wheels of the loaded car entering the dumping cylinder have passed over the end of the pivoted rails 38 the rear wheels of the empty car will have passed the pivoted stops 49 in the dumping cylinder. When the pivoted section of the track formed by the rails 38 becomes disengaged from the track wheels of the loaded car, the counterweighted lever arm 39 acts to lift the rails 38 into the inclined position shown by full lines in Fig. 5. This movement of the counterweighted lever arm 39 also permits the spring 61 to move the stops 49 from their disengaged position into the wheel engaging position shown in Figs. 4 and 5 and engage with the forward wheels of the incoming loaded car to bring it to a stop in the desired position within the dumping cylinder. The above described operations are then repeated with successive cars as often as required and the successive cars are thereby emptied of their loads, the coal or other material forming the loads being deposited in the bin 2 below the dumping cylinders. Instead of employing a bin as shown, chutes or hoppers may be substituted therefor, by which the coal discharged from the wagons or cars is delivered into other cars or other place of disposal.

It is to be noted that the weight of the loaded car assists in righting the empty car and reversely, the weight of the empty car serves to retard the over-turning movement of the loaded car. This lessens the power required and serves to assist in controlling the turning movement of the cylinders and cars.

The advantages of my invention will be apparent to those skilled in the art. The apparatus is simple and is easily kept in repair.

Modifications in the construction and arrangement of the parts may be made without departing from my invention as defined in the claims.

I claim:—

A car dumping mechanism comprising a pair of rotary car dumping cylinders, curved supports for said cylinders, and

means whereby the cylinders are rotated on said supports to empty cars positioned therein, said means comprising a fluid pressure cylinder having a piston rod therefor, and a flexible connection secured to said piston rod and said dumping cylinders, said flexible connection engaging with and rotating the cylinders to invert cars in one cylinder when the other is turning into car receiving position. 10

In testimony whereof, I have hereunto set my hand.

GUSTAVE E. HUTTELMAIER.

Witnesses:
 AUSTIN KING,
 JALEX YAHNER.