J. BIERER & E. N. ZERN.

ROTARY DUMP FOR CARS.

APPLICATION FILED APR. 18, 1917.

1,277,836.

Patented Sept. 3, 1918.

3 SHEETS—SHEET 1.

Fig. 1.

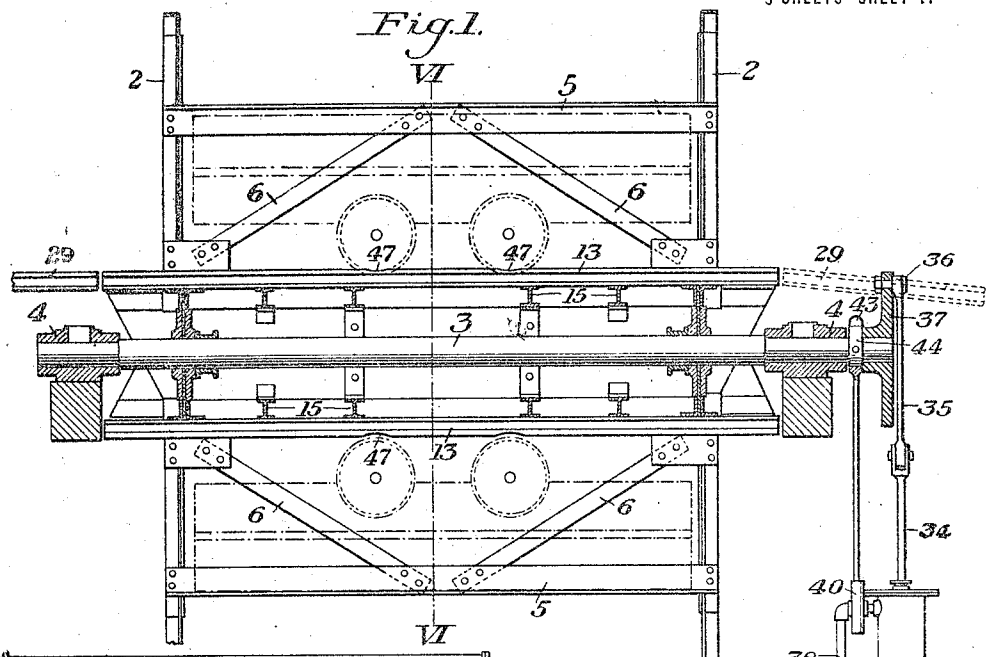
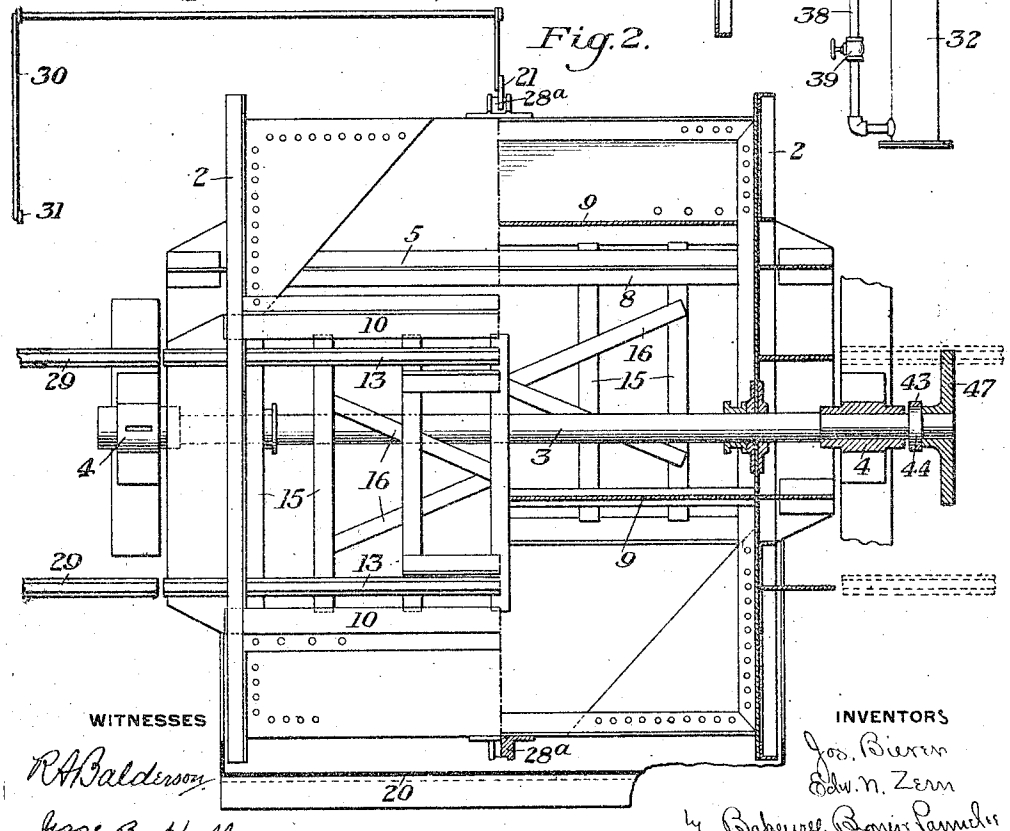


Fig. 2.



WITNESSES

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3 SHEETS—SHEET 2.

Fig. 3.

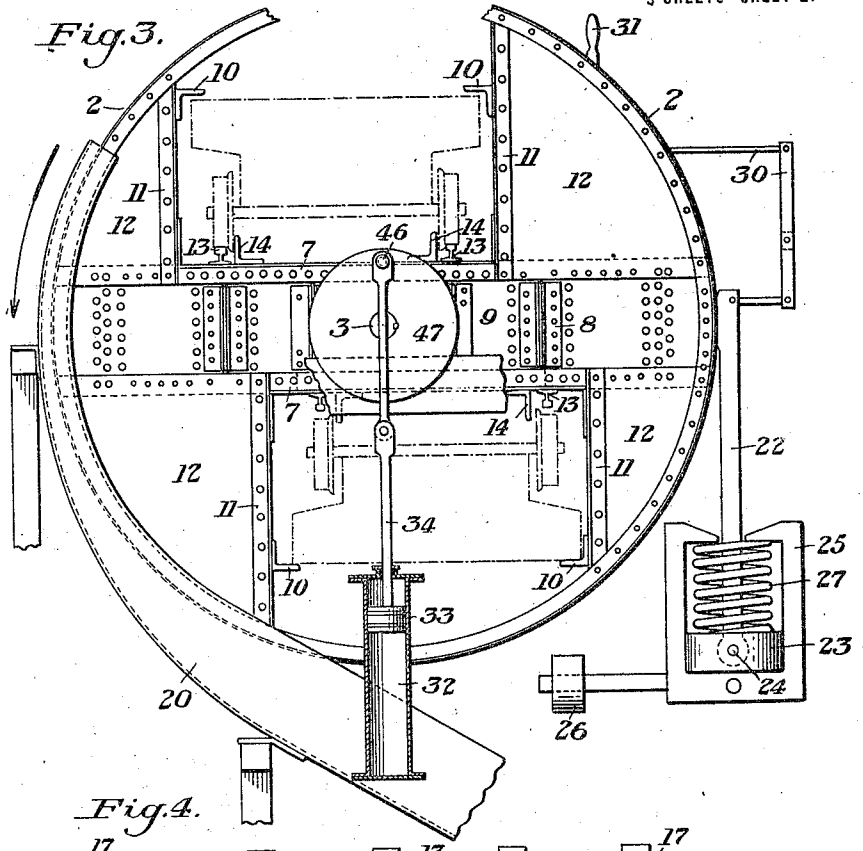


Fig. 4.

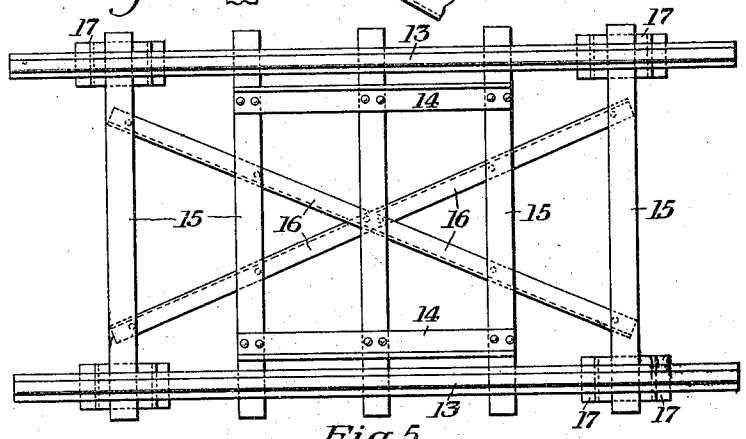
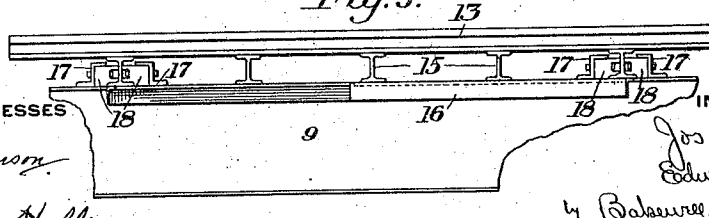


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

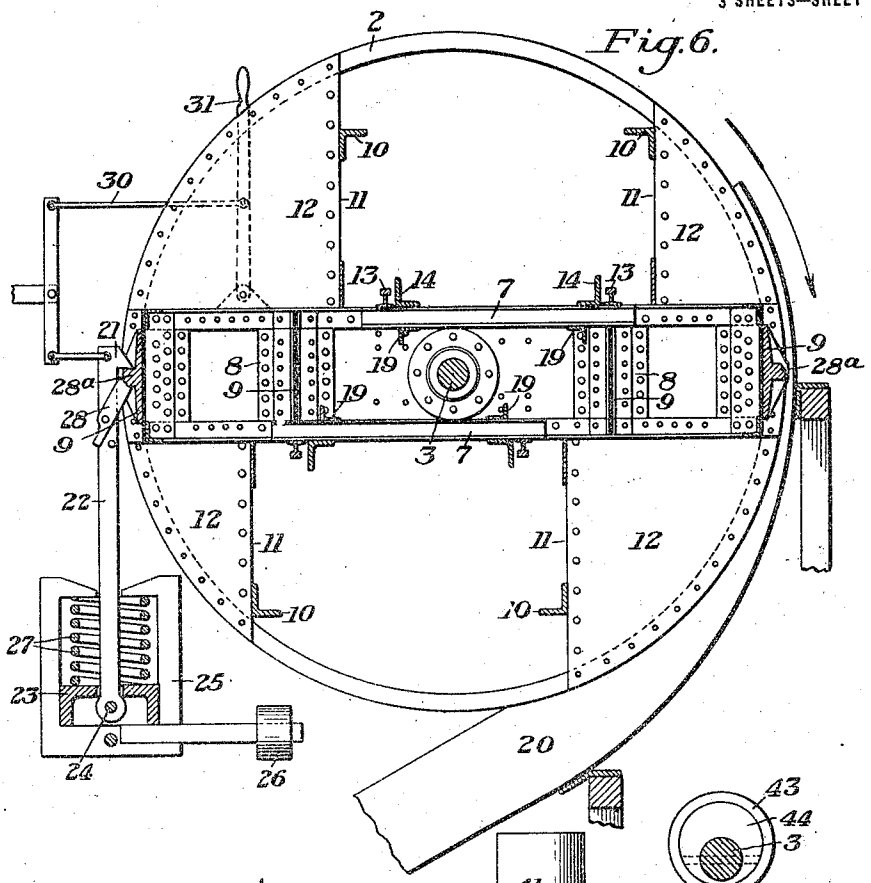


Fig. 7.

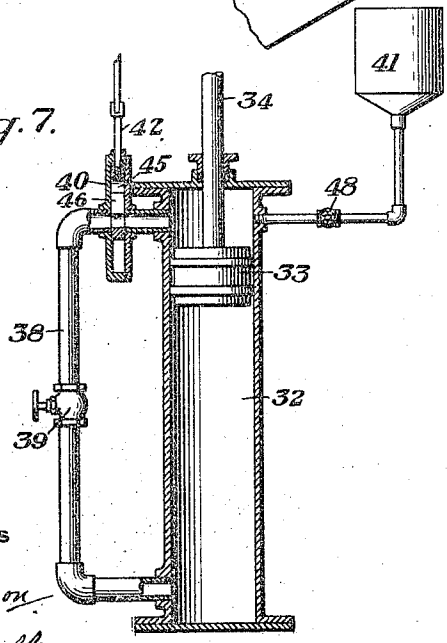
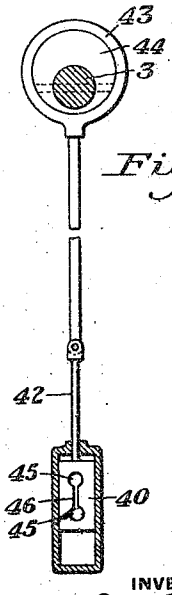


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOSEPH BIERER AND EDWARD N. ZERN, OF MORGANTOWN, WEST VIRGINIA, ASSIGNORS OF ONE-THIRD TO EVERHART BIERER, OF MORGANTOWN, WEST VIRGINIA.

ROTARY DUMP FOR CARS.

1,277,836. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed April 18, 1917. Serial No. 162,358.

To all whom it may concern:

Be it known that we, JOSEPH BIERER and EDWARD N. ZERN, both citizens of the United States, residing at Morgantown, Monongalia county, West Virginia, have invented a new and useful Rotary Dump for Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view partly in side elevation and partly in vertical section of a rotary dump embodying our invention.

Fig. 2 is a view of the same partly in top plan and partly in horizontal section.

Fig. 3 is an end view looking from the right hand end of Fig. 1, and partly broken away.

Fig. 4 is a plan view of one of the shiftable tracks.

Fig. 5 is a side view of the same, partly broken away.

Fig. 6 is a section on the line VI—VI of Fig. 1.

Fig. 7 is a detail sectional view of the dash-pot arrangement, and

Fig. 8 is a detail sectional view of the automatic controlling valve.

Our invention has relation to rotary dumps for cars, such, for instance, as are used at coal tipples and similar places.

Our invention is designed to provide a gravity operated dump which is simple in its construction, and reliable in its operations, and by means of which a car may be dumped for each 180 degrees of rotation. The invention also provides a dump of this character having means of improved character for controlling the dumping movement. Also means of improved character for properly holding the cars in dumping position, whereby the twisting strains on the cars and axles are greatly reduced.

The nature of our invention will be best understood by reference to the accompanying drawings in which we have shown the preferred embodiment thereof, and which will now be described, it being premised however, that various changes can be made in the details of construction, arrangement and combination of the several parts without departing from the spirit and scope of our invention as defined in the appended claims.

In these drawings the numeral 2 designates the end frames or circles of the rotary dump which are rigidly secured to a central shaft or axle 3 journaled in suitable fixed bearings 4. The end frames or circles 2 are suitably connected by means of longitudinal members 5 and braces 6. They are also connected by the central hollow frame structure consisting of the transverse beams 7, the connecting structures 8, and the longitudinal beams 9. 10 designates longitudinally extending angles which are secured to the struts 11 and which hold the car while being dumped. 12 designates strengthening plates at the ends of the structure.

13 designates track rails which are mounted in pairs upon opposite sides of the central the frame structure 7, both sets of rails being off-centered with respect to the axis of the central shaft 3, and this off-centering being in opposite directions for the two sets of rails. These rails, together with guards 14 which are preferably employed, are rigidly secured to a series of cross ties 15. Each track structure formed by the rails 13, the guard rails 14 and the guides 15 is suitably braced, as indicated at 16, so as to form a rigid structure capable of a limited lateral sliding movement on the longitudinal beam 9. Vertical displacement of the track structures is prevented by the angles 17 and tie-engaging blocks 18 secured by said angles and engaging the end cross ties 15 in a manner to permit said ties to slide in the direction of their length while holding them to their seats on said frame 7. The lateral shifting movement of the track structures is limited by the angles 19. These angles are secured to the cross-ties 15, and engage the flanges of the longitudinal beams 8 when the track structures shift to their extreme positions.

20 designates a fixed curved guard or shield for directing and confining the discharge of the coal or other material as it is dumped from the cars. The dump is stopped and held in its proper positions for receiving cars thereon by suitable stop means, such as the latch 21 on the upper end of a bar 22 which is pivoted at 24 to a follower 23 at is lower end portion. The follower 23 is slidably seated in a yoke 25 counterweighted at 26. 27 is a spring which is seated between the follower and the upper portion of the yoke. 28 is a catch or trigger pivoted to the bar 22 below the latch

21, said catch and latch being adapted to engage the locking projection 28ª on the side longitudinal members 9 of the rotary dump structure. The action of the counterweight 26 normally holds the bar 22 and latch 21 in position to engage one of the projections 28ª and thereby stop the dump with its tracks in horizontal position and in alinement with the fixed approach tracks 29. The catch 28 then acts to positively hold the dump in this position. When it is desired to make a dumping operation the latch is withdrawn by means of the connections 30 operated by the hand lever 31.

In order to properly control and regulate the dumping movement, we provide a suitable retarding device. This is preferably in the nature of a dash-pot and is shown as consisting of a cylinder 32 having therein a piston 33 whose rod 34 is connected at its upper end by a link 35 with a wrist pin 36 on a crank arm or plate 37 fixed in one end of the central shaft 3 (see Fig. 1). The end portions of the cylinder 32 above and below the piston are connected by a by-pass 38 having therein a hand regulating valve 39 and also an automatic regulating valve 40. The cylinder 32 is designed to be filled with oil or other liquid which may be supplied from a suitable container 41, and the general flow of this liquid from one side of the piston to the other can be regulated by the hand valve 39 to thereby control the rapidity of the dumping movement. This is further controlled by the automatic valve 40, whose stem 42 is connected with an eccentric strap 43 working on an eccentric 44 on the shaft 3. The valve 40 is shown as having a port opening therein consisting of the larger end portions 45 connected by a relatively narrow slot 46. The eccentric 44 is so set that at the start of each movement of the rotary dump one of the enlarged end portions 45 of this port will be in line with the passage of the by-pass pipe 38, thereby giving a free initial dumping movement. As this movement proceeds, the narrow portion 46 of the slot will come in line with the passage in the by-pass pipe, thereby restricting the flow of liquid and preventing too rapid movement of the dump during that part of its movement in which the weight of the car is most effective in producing the movement. Toward the end of the dumping operation the other larger end portion of the valve port will come into operative relation, thereby insuring the free movement of the dump to its full dumping position.

The operation will be readily understood. A car to be dumped is run into the dump on the upper tracks, as shown in dotted lines in Fig. 3, and is stopped in proper position thereon by any suitable means such as depressions 47 in the rails and which are engaged by the pair of wheels. The latch releasing lever 31 is then operated to release the latch and the weight of the car will then start the dumping movement in the direction of the arrows, Figs. 3 and 6, by reason of the off-centering of the tracks in this direction. As the dump commences to turn the upper tracks will slide laterally until the car is stopped by the angles 10 at that side. If there is an empty car which has been previously dumped in position on the lower tracks, as is indicated in Fig. 3, this car will be carried up by the weight of the loaded car which is being dumped, and the lower pair of tracks will be, during this movement, shifted back to their original position. The rapidity of the dumping movement is controlled in the manner before described.

The feature of the shiftable tracks is one of considerable importance in the operation of the dump. Generally, heretofore, in rotary dumps the car is held by the wheels in dumping. That is to say, an angle is placed at such a height on the dump that the car wheels pass under it in going into the dump, and in the rotating movement the width of the angle is sufficient to catch the flanges of the wheels and prevent their dropping. This practice is open to serious objections in that, first, the strain is all taken by the car axles, causing these in time to work loose; and, second, the car is subjected to a severe twisting strain during the first part of the dumping movement, the wheels on one side of the car pressing against the angle, while the wheels on the opposite side are resting on the rail. This twisting ceases only when all the wheels are off the rails and pressing against the angles. In other forms of dumps, angles are riveted to the sides of the car and which pass under similar angle irons riveted to the dump. In other constructions the car is held by angle irons fixed on the dump at such height that the top of the car sides will pass directly beneath, as in the arrangement of angles which we have shown. In all of these arrangements, however, with fixed tracks, severe strains are thrown upon the car trucks and car bodies. These strains are very greatly reduced by the provision of the shiftable tracks. While we prefer to place the angles so as to engage the upper edges of the sides of the car as shown in Fig. 3, they may be placed in any position known in the art, in case there should be undue interference with "topping" of the cars, such as is practised in some regions.

The duplex feature of the dump, making it possible to dump one car for each 180 degrees of rotation also greatly increases the capacity of the dump. While we do not limit ourselves to the particular controlling means which we have shown and described,

the particular means described are peculiarly effective. Since the dump is essentially a gravity one, and the car is placed off-center as it enters the dump a very rapid rotation would take place if some means were not devised to prevent it. The cylinder may be kept constantly filled with oil from the container 41, and the supply pipe leading from this chamber may be provided with a check valve, as indicated at 48, to prevent the return of oil to the container. The hand valve 39 may be arranged to be operated from any suitable point, and when the right regulation is attained is left in the adjusted position, the auxiliary automatic valve then operating in the manner before described.

The device for stopping the dump is necessary in order that the dump stop at a proper definite position to facilitate the passage of cars onto and off from the dump. We do not, however, limit ourselves to the particular device which we have herein shown and described, since obviously there are many devices of this character which may be employed. The particular construction of the dump frame which we have herein shown and described is also not essential to our invention, since a proper frame can be constructed in various ways.

We claim:

1. A rotary dump for cars, comprising a central shaft, a frame rigidly secured to said shaft and having upper and lower car supports which are oppositely offset with respect to the axis of said shaft, a crank member on said shaft, and a dash-pot device connected to said crank member to exert a controlling and regulating action on the dumping movement of said frame; substantially as described.

2. A rotary dump for cars, comprising a central shaft, a frame rigidly secured to said shaft and having upper and lower car supports which are oppositely offset with respect to the axis of said shaft, a crank member on said shaft, and a dash-pot device connected to said crank member to exert a controlling and regulating action on the dumping movement of said frame, said crank member and dash pot device having means whereby the resistance exerted is least during the beginning and end portions of each half rotation of the shaft; substantially as described.

3. A rotary dump for cars, comprising a central shaft, a frame rigidly secured to said shaft and having upper and lower car supports which are oppositely offset with respect to the axis of said shaft, a dash-pot operatively connected to said shaft, and having a by-pass connecting its opposite end portions, a valve in said by-pass, and means for actuating said valve as the said shaft and frame are turned, said valve having means whereby it provides a larger port opening during the initial part of its movement, and a smaller port opening during its immediately following movement, substantially as described.

4. The combination with a rotary dumping frame having an off-centered track, of a fluid containing cylinder, a piston in said cylinder and connected to the dumping frame, a by-pass around said piston, valve means controlling the by-pass, said valve means consisting of a main hand valve, and an auxiliary automatic valve having an actuating connection with the dumping frame and having a port provided with portions at different transverse areas, substantially as described.

In testimony whereof, we have hereunto set our hands.

JOSEPH BIERER.
EDWARD N. ZERN

Witnesses:
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