Mar. 6, 1923.

E. RAMSAY.

1,447,428.

AUTOMATIC ROTARY DUMP.

FILED OCT. 31, 1921.

2 SHEETS—SHEET 1.

Fig. 1

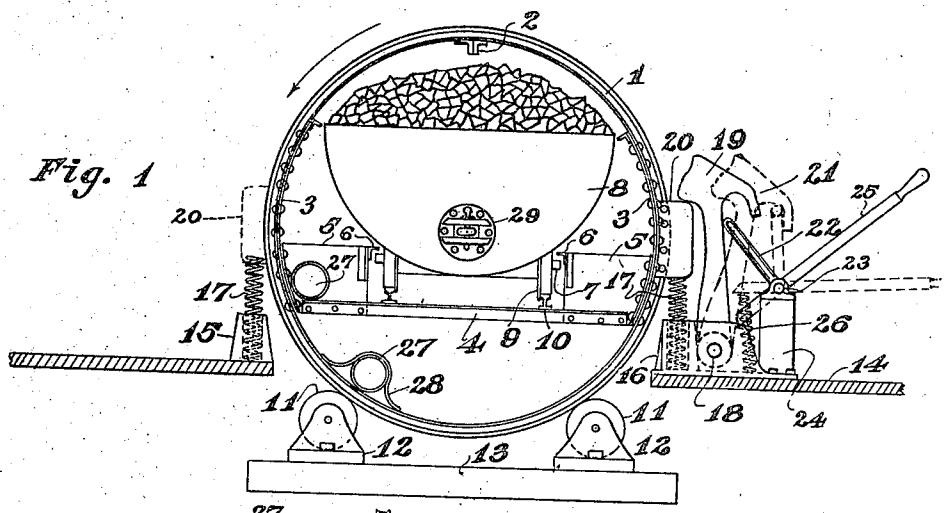
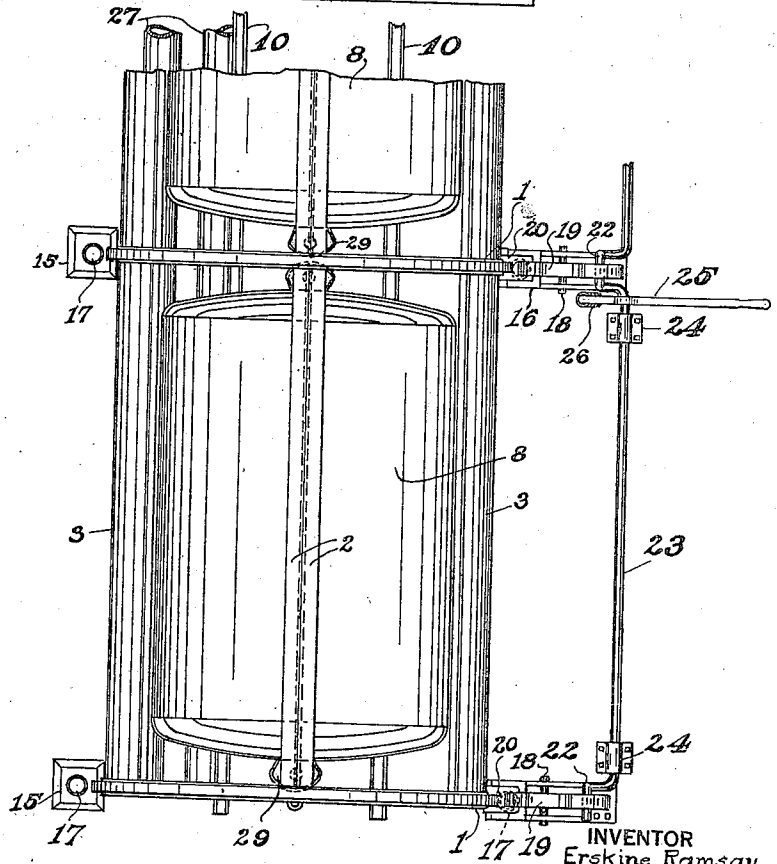



Fig. 2




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2 SHEETS—SHEET 2.

Fig. 3

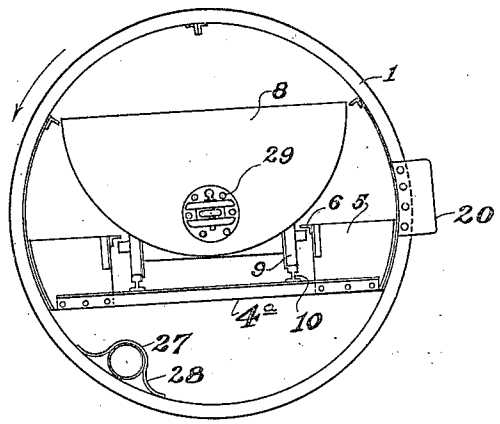



Fig. 4

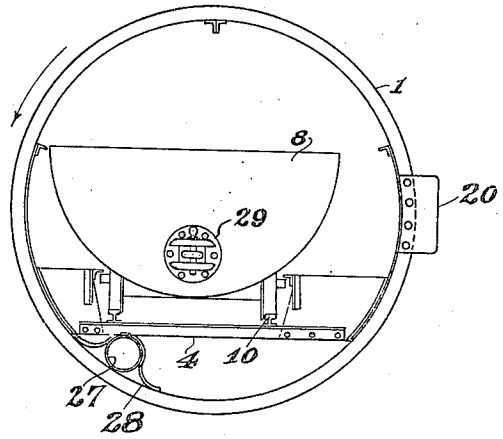
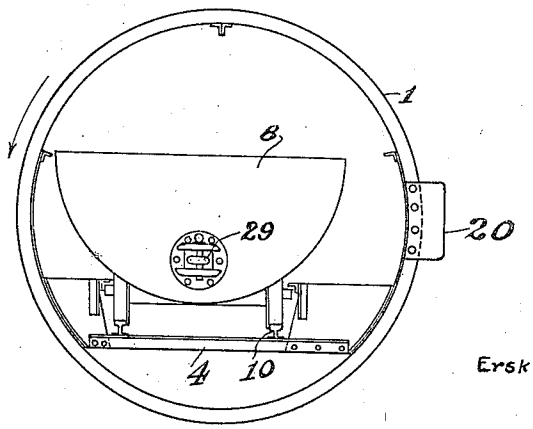



Fig. 5




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# UNITED STATES PATENT OFFICE.

ERSKINE RAMSAY, OF BIRMINGHAM, ALABAMA.

## AUTOMATIC ROTARY DUMP.

Application filed October 31, 1921. Serial No. 511,656.

*To all whom it may concern:*

Be it known that I, ERSKINE RAMSAY, a citizen of the United States of America, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Automatic Rotary Dumps, of which the following is a specification.

My invention relates to a rotary dump adapted for automatic operation responsive to the joint control of buffer springs and gravity, which latter is brought into play either by the unbalanced position of the center of gravity of the car in the dump or by the incorporation of additional counterweight means to unbalance the dump, or by both in co-operation.

It is a feature of my invention that such supplemental unbalancing counterweights, when used, shall be so disposed as to be effective for the starting of the dump's movement both in the direction that it moves to dump and in the opposite direction as it starts back on its return, my invention contemplating that the dump shall have only a partial rotation.

My invention further contemplates the mounting of the dump to rotate about a fixed center responsive to the joint control of gravity and springs, which latter serve as buffers to stop the partial rotations of the dump in either or both directions, and to store energy with which to start the dump quickly when released for operation.

My invention further contemplates the provision of means, automatic in its action, to latch the dump in initial upright position and, if desired, in inverted position with the appropriate spring buffers held under compression and thus adapted to co-operate with gravity in quickly overcoming the inertia of the dump.

My invention also comprises the novel details of construction in the design and arrangement of the dump counterweights, of the automatic latch means, and of the means for operating a series of said latches simultaneously where the dump is elongated to receive a number of cars.

According to the drawings which illustrate a typical embodiment only of my invention:—

Fig. 1 is an end elevation of the dump shown in initial or upright position with the spring buffer or buffers on one side held under compression by the engagement of the latch with the buffer latch lug or lugs on the dump.

Fig. 2 is a plan view of Fig. 1 showing the dump broken away.

Fig. 3 is a diagrammatic end view of the dump in upright position with its tracks on center but sufficiently tilted to unbalance the dump without however displacing the car coupling substantially out of line with the axis of the dump.

Fig. 4 is a similar diagrammatic view showing the dump unbalanced by shifting its level track so as to bring the vertical center line of the car to one side of the center line of the dump, a counterweight being also used.

Fig. 5 is a similar view showing the dump adapted to operate without the assistance of a counterweight.

Similar reference numerals refer to similar parts throughout the drawings.

In the embodiment of my invention illustrated, I show a rotary dump which may be fabricated in any well known manner, but which, as shown, is formed by spaced riding rings 1 connected together lengthwise of the dump by top angles 2 and by side plates 3, the dump having opposite each ring a cross angle 4 attached to plates 5 which are bolted or riveted through the side plates 3 of the dump to the rings 1 and which carry the overhanging angle bars 6 which extend lengthwise of the dump on each side and serve as hold-downs for the axles 7 or other desired part of the mine car or cars 8, the wheels 9 of which are shown riding the rails 10 which extend lengthwise through the dump and are supported by the cross angles 4. Each riding ring is adapted to rest on two supporting trunnion wheels 11 mounted in bearings 12 on any suitable support 13. As shown, this support is arranged below the tipple floor level 14 on which is mounted at each side of the dump the seats 15 and 16 for the buffer springs 17 which normally project substantially above the top level of the seats. I pivot to each seat 16 by a pin 18, a latch 19, the upper end of which is adapted to be forced outwardly by an approaching buffer lug 20 on the dump and to snap back into position above this lug to hold the dump in initial position with

the adjacent spring 17 under the lug held under any desired compression. The latch itself has an overhung outer lip or trip arm spaced from the latch so as to form a pocket 21 for a crank 22 on a crank shaft 23, the pocket being designed to permit the latch to be pushed both against the crank sufficiently to let the buffer lug 20 pass the latch. The crank shaft 23, which in the preferred arrangement carries the several cranks 22, has at suitable intervals bearings 24 and an operating lever 25 is made fast to the shaft with its free inner end engaged by a coil spring 26 which normally pulls the lever and shaft cranks to the full line position, Fig. 1, and causes the cranks to press the latches towards the dump. By grasping the handle and moving it to dotted position, Fig. 1, the cranks will all engage the lips 21 and will move all of the latches together to release the lugs 20 simultaneously so that the adjacent springs 17 are free to expand and give the dump a quick start.

If desired the dump may have one or more counterweights of any suitable character, such for instance as the cylinders 27 arranged on its discharge side and disposed below the horizontal center line of the dump. These cylinders may be attached to the riding rings in any desired manner, as by bent metal straps 28 or by being passed through a suitable opening in the plate 5. Obviously, there may be one or more than one of such counterweights employed, according to the operating conditions confronting the user. The latches and buffer springs can be arranged at suitable intervals along the length of the dump, which length will vary according to the number of cars to be handled at a time in the dump.

In Fig. 3 I show a modified manner of unbalancing the dump. Here the cross angle $4^a$ stands at an acute angle to a horizontal plane inclined downwardly towards the dump's discharge side and this will cause the car to tilt to one side, though leaving its coupling 29 still concentric with the axis of the dump as is the case of Fig. 1. The loaded car will thus unbalance the dump both overhead and towards its discharge side. The dump is further unbalanced by a counterbalance weight exemplified by the cylinder 27 mounted by its fastening straps 28 on the riding rings in the lower quadrant of the upright dump on its discharge side.

In Fig. 4 the car is set lower in the dump and its track is horizontal but is shifted to one side so as to unbalance the dump overhead and on its discharge side. Here the dump is also provided with a counter-balance weight, such as 27, having fastening straps 28, but in Fig. 5, which otherwise corresponds to Fig. 4, this counterweight is absent and the dump must rely on the force of gravity resulting from its unbalanced condition and from the spring 17 to start it quickly from initial position and to carry it through its dumping and return travel. In these three latter figures the dump riding rings are each provided with a buffer lug 20 which is intended to co-operate with its respective springs 17 and latch 19, not shown, in exactly the same manner as described in connection with the dump shown in Figs. 1 and 2.

In operation, the loaded car or cars to be dumped are run into the dump which is held in initial position, as shown in Fig. 1, by the latches 19 engaging the lugs 20 which hold under compression their respective springs 17. If there are a large number of cars in the dump there will be more than two of these springs and latches, all of which are operated in unison by the common crank shaft 23. A desired amount of counterweighting material, regardless of its character, can be conveniently introduced into the counterweight cylinders 27 until the requisite weight to produce the desired operation is obtained. In Fig. 1 this counterweight and the energy stored in the compression of the buffer springs 17 on the other side of the dump are the sole means relied upon in starting the dump from initial position. As the dump starts to rotate the loaded car, the center of gravity of which is above the center of the dump, becomes unbalanced towards the dump's discharge side and thus co-operates with the counterweights to give it momentum which will swing it through the desired arc necessary to discharge its contents, which is generally somewhat less than a half revolution. After the car dumps its contents its center of gravity changes and is again above the center of the dump and thus it will co-operate with the counterweights in acting to slow up the dump as it approaches the end of its dumping rotation which end it reaches approximately at the time that its lug or lugs 20 strike and compress their respective buffer springs on the opposite side of the dump from the latch. These buffer springs co-operate with the then reversely unbalanced dump, due to the position of the counterweights and the center of gravity of the inverted car, to start the dump back quickly on its return rotation, it being observed that the running gear of the inverted car and the counterweights 27 are in a position when the dump starts back to exert their maximum gravitating influence to give the dump considerable momentum as it tends to swing back to initial position and this momentum will carry the dump back and cause the buffer lugs to engage and compress the right hand buffer springs 17 after passing the latches 19. These latches, by virtue of the pressure exerted on them through spring 26, will snap back over the buffer lugs and hold the dump with the right hand buffer

springs under compression and in this position the empty cars can be removed and loaded cars replaced in the dump, whereupon the operation is repeated.

The operation as described is the same for the design shown in Figs. 3 to 5, except that in Fig. 3 the car being dumped can remain coupled to the other cars in a train or to its haulage means as its coupling is substantially in the center of the dump, while in Figs. 4 and 5 the coupling is displaced below and to one side of the dump center and will thus, when too far off center for the coupling used, require the disconnection of the cars in the dump from cars in the same train outside of the dump, but if a whole train of cars is being dumped at a time this may be accomplished without disconnecting the train from the haulage means. The counterweight cylinders permit the ready insertion and removal of counterweighting material therein to the end that the dump can be readily balanced to the extent desired.

My invention may be variously modified without departing from its substance as set forth in the appended claims.

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

1. A rotary automatic dump adapted to rotate partially about its long axis, roller supports for the dump, a track in the dump adapted to support a car therein so that when loaded its center of gravity will be above the center line of the dump and when empty below the center line of the dump, and counterweight means mounted in the dump in position to unbalance the dump when upright on its discharge side, said weight being disposed to counter-balance the inverted dump on the opposite side.

2. A rotary automatic dump adapted to rotate partially about its long axis, roller supports for the dump, a track in the dump, and a counterweight means mounted in the lower quadrant of the dump on the side towards which its initial dumping movement is directed.

3. A rotary automatic dump adapted to rotate partially about its long axis, roller supports for the dump, a track in the dump disposed to bring the center of gravity of a loaded car above the center of the dump and of an empty car below the center of the dump, and a counterweight means mounted in the lower quadrant of the dump on the side towards which its initial dumping movement is directed.

4. A rotary automatic dump adapted to rotate partially about its long axis, roller supports for the dump, a track in the dump disposed to bring the center of gravity of a loaded car above the center of the dump and of an empty car below the center of the dump, a counterweight means mounted in the lower quadrant of the dump on the side towards which the initial dumping movement is directed, and means to arrest the dump at the completion of a predetermined partial rotation.

5. A rotary automatic dump adapted to rotate partially about its long axis, roller supports for the dump, a track in the dump disposed to bring the center of gravity of a loaded car above the center of the dump and of an empty car below the center of the dump, counterweight means mounted in the lower quadrant of the dump on the side towards which its initial dumping movement is directed, and means to arrest the dump at the completion of a predetermined partial rotation of approximately 160 degrees.

6. A rotary dump adapted to rotate partially about its long axis, roller supports for the dump, car tracks in the dump, a buffer lug mounted on the dump, a spring buffer adapted to be engaged and depressed by the buffer lug as the dump returns to initial position after dumping, and latch means to catch and hold the dump in initial position with the buffer spring under tension.

7. A rotary automatic dump adapted to rotate about its long axis, roller supports for the dump, a track in the dump adapted to receive a car to be dumped, means to unbalance the dump with a loaded car upright therein so that it will tend automatically to rotate, a buffer lug on the dump, a spring buffer adapted to be engaged by the buffer lug when the dump has completed a predetermined partial rotation, said spring acting as a cushion stop and to start the dump back on its return travel, and means to stop and latch the dump in initial position.

8. A rotary automatic dump adapted to rotate about its long axis, roller supports for the dump, a track in the dump adapted to receive a car to be dumped, means to unbalance the dump with a loaded car upright therein so that it will tend automatically to rotate, a buffer lug on the dump, a spring buffer adapted to be engaged by the buffer lug when the dump has completed a predetermined partial rotation, said spring acting to cushion and start the dump back on its return travel, and means to stop and latch the dump in initial position, said latter means comprising a buffer spring adapted to be engaged by said buffer lug, and latch means automatically operative to engage and hold the dump in initial position.

9. An automatic rotary dump adapted to rotate about its long axis, roller supports for the dump, a track support in the dump for a car to be dumped, means to unbalance the dump with a loaded car upright therein to cause it to rotate, buffer springs on opposite sides of the dump, a buffer lug adapted to co-act with the springs on both sides of the

dump to stop the dump at both ends of its travel, and an automatic latch means to stop and hold the dump in initial position.

10. A rotary automatic dump adapted to rotate about its long axis, roller supports for the dump, track supports in the dump for the car to be dumped, means to unbalance the dump with a loaded car therein to cause it to rotate, a buffer lug on the dump, a buffer spring adapted to be engaged and compressed by the lug as the dump swings back to initial position, and a spring-pressed latch adapted to be tripped by said lug and to hold it in initial position with said buffer spring under substantial compression.

11. A rotary automatic dump adapted to rotate about its long axis, roller supports for the dump, a track in the dump for the cars to be dumped, means to unbalance the dump with loaded cars therein, a series of buffer lugs mounted at intervals along the dump, a buffer spring adapted to be engaged by each buffer lug as the dump swings back to initial position, a series of latches adapted to engage the buffer lugs and latch the dump in initial position with said spring under compression, spring means normally pressing said latches towards the dump, and a common actuating means adapted when manually operated to simultaneously disengage all of the latches and release the dump for rotation.

In testimony whereof I affix my signature.

ERSKINE RAMSAY.

Witness:
NOMIE WELSH.