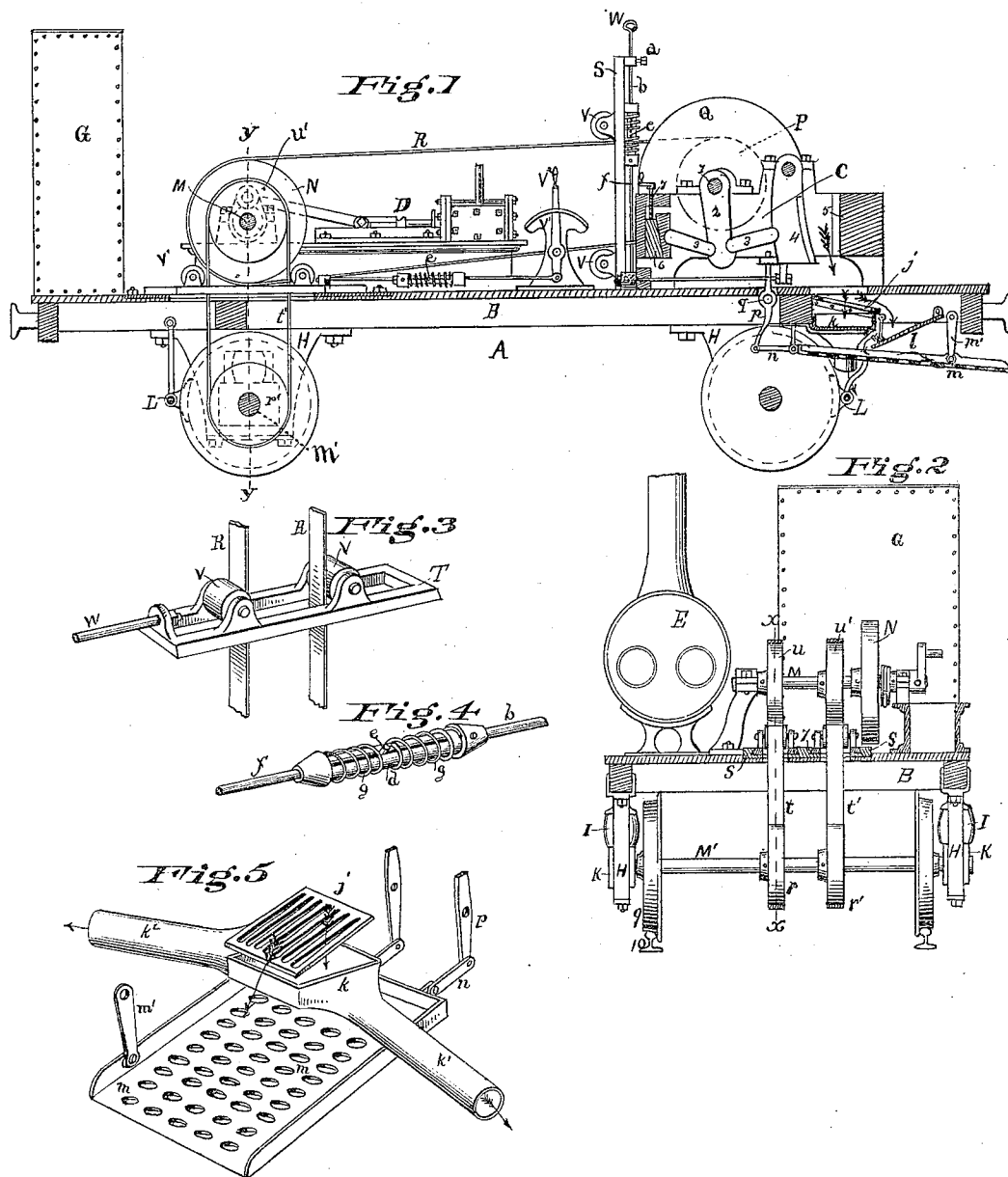


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Machine for Preparing Ballast and Ballasting Railways
No. 242,581.
Patented June 7, 1881.



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MACHINE FOR PREPARING BALLAST AND BALLASTING RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 242,581, dated June 7, 1881.

Application filed May 9, 1879.

To all whom it may concern:

Be it known that I, ARONAMOUS B. AUSTIN, of the town of Ludlow, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Machines for Preparing Ballast and Ballasting Roadways, of which the following is a specification.

My invention relates to that class of vehicles which are employed in the crushing of rock for ballasting of roads of various descriptions; and it consists, in general, of a vehicle supporting an engine and a ballast-crushing device and mechanism whereby the engine can be employed to propel the car or the ballast-crusher.

Heretofore this class of machines has been so constructed that in cases where the engine has been employed to operate the ballast-crusher and propel the car at one and the same time no provision has been made for enabling the vehicle to be started while the engine was operating the ballast-crusher; but the engine had to be stopped before such connection could be made between the engine and the vehicle as could enable the engine to propel the latter. Likewise when the engine was propelling the vehicle there was no provision whereby the ballast-crusher, when stationary, could be started without stopping the vehicle.

My invention consists, in general, of new and improved means, combined with a vehicle, engine, and ballast-crusher, whereby the car may be propelled forward or backward and the crusher operated either together or independently of each other at will, and whereby the crusher can be started in operation, operated, or stopped while the engine is propelling the vehicle, or the latter can be started, propelled, or stopped while the crusher is being operated, and these results can be obtained without injuring the machinery. These advantages derived from this feature of my invention enable a saving in time and in expenditure of motive power.

A second improved feature of my invention consists in certain new and improved means, particularly hereinafter described, whereby the ballast may be delivered on the roadway perfectly free from dust.

A third feature of my invention consists in a combination, with the first feature of my invention, of a device whereby either side of the

pulley-belt may at will be tightened to any desired degree and retained there, thus enabling me the better to carry out the purposes contemplated in the use of the first feature of my invention, and also to obviate the necessity of continually attending to the idlers.

A fourth feature of my invention consists in the combination, with the first feature of my invention, of a provision whereby the rising and falling and jerking and jolting and thrust of the vehicle are compensated for, and do not therefore interfere with steady action of idler or idlers and the belts.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of a machine embodying the various features of my invention, and taken at the dotted line *xx* of Fig. 2. Fig. 2 is a vertical transverse section of the same, taken at the line *yy* of Fig. 1, and looking from right to left. Fig. 3 is a detached view, in perspective, of the preferred form of idlers and the device for causing either half of the pulley-belt to be tightened and the belt to take hold of the pulleys. Fig. 4 is a detached view, in perspective, of the device which enables the idler to retain an equable pressure upon that half of the belt it is caused to press against. Fig. 5 shows, in perspective and detached from the rest of the machine, the apparatus for sifting from the ballast the dirt and dust, and for conveying the latter away from the ballast, and also the screen, &c., for separating the ballast of the desired size from that which is too large.

For the purposes of illustration I will describe my invention as applied to a vehicle adapted to run on a common railroad.

A represents the vehicle, and B the platform of same. Upon this platform, and securely attached thereto, is the ballast-crusher C, of any desired kind, the kind here shown being that known as the "Blake crusher," described in various Letters Patent of the United States granted to said Blake, and for a particular description thereof reference is hereby made to said Letters Patent. In this crusher, 1 is the eccentric which elevates and depresses the pitman 2, which, in turn, operates the toggles 3, which latter cause the jaw 4 to reciprocate to and from stationary jaw 5. A wedge, 6, and screw 7 admit of adjusting the dis-

tance between jaws 4 and 5. Securely attached to this platform is the engine D, capable of being reversed by any of the well-known methods, and the furnace and boiler E, and also, preferably, a water-tank, G. The platform is supported upon two pairs of flanged wheels, 9, connected by the ordinary axle, resting on rails 10 by means of trucks H, springs I, and boxes K in the manner usual with single-wheel trucks, and is provided with a brake, L. The driving-axle M of the engine operates a driving-pulley, N, made heavy, so as to operate as a balance-wheel. A belt, R, on this wheel passes over the pulley-wheel P, which operates the crusher, the wheel P being fixed on the same shaft as the balance-wheel Q of the crusher.

The device for tightening the pulley-belt R consists of the upright frame S, in which slides a frame, T, whose edges are beveled so as to fit under corresponding beveled edges in the upright frame S, and is thereby prevented from leaving the latter. Attached to frame T are the idlers V, between which runs the belt R, as shown. The frame T is elevated or depressed by a rod, W, attached to the bottom of said frame and sliding through a stud upon the upper portion of frame S. A set-screw, *a*, in this stud screws against rod W and regulates its vertical position. The device for accommodating the tension of the pulley-belt to the vertical springing or jolting of the car is applied as follows: The rod W is cut, and the lower end of the upper half, *b*, of said rod is fastened to a sleeve, *d*, and provided on either side with a longitudinal slot, in each of which slots plays a stud, *e*, the studs being opposite each other and fastened to the head of the upper end of the lower half of said rod, as shown in Fig. 4. At each end of the sleeve *d*, and between each shoulder and the stud *e*, is a spring, *g*, so that there are two springs upon the same sleeve. The arrangement of these springs, as will be seen, allows the frame T and the idlers to give either up or down, according to the jolting of the car.

The opening or hopper *h* between the jaws of the crusher opens down upon an inclined sifter or screen, *j*, provided with openings of any desired form, preferably longitudinal slots, as shown, of such size or width as to allow of the passage through them of dust, dirt, &c., and fine particles of stone, but to not admit the larger pieces of stone.

Directly below the screen *j* is a dust-receiver, *k*, which receives the dust, dirt, and grit passing through the screen and conveys same into the inclined pipes *k'* *k''*, which latter convey it away. Below and also to the front of this screen is an inclined plane, *l*, which receives the ballast from the top of screen *j* and delivers same to the upper end of the inclined shaking-screen *m*, hung upon hangers *m'* attached to the body of the car, and oscillated by means of appropriate levers connected with either jaw of the crusher. Here the leversem-

ployed are *n* and *p*, the latter oscillating upon a pivot, *q*, and its upper end being worked by the movable jaw of the crusher. When desired, either the screen *j* or the inclined plane *l*, or both, may be caused to shake by appropriate mechanism similar to that whereby the screen *m* is operated.

The mechanism for enabling the engine to propel the car or vehicle is as follows: The axle M' and the driving-wheels are so fixed as that the rotation of the axle shall rotate the wheels. Upon this axle are fixed two pulleys, *r* *r'*. Belts *t* *t'* pass around these pulleys *r* *r'*, and around pulleys *u* and *u'* fixed upon the shaft M of the engine. Each of these pulleys is tightened on either side by a couple of idlers, V, supported on a frame, T, lying horizontally and sliding in a frame, S, having beveled edges 7 overlapping the beveled edges of the frame T, (see Fig. 2,) the frame S being secured to the platform of the car. The frame T is moved by a rod, W, preferably divided into rods *f* and *b*, as shown in Fig. 4, and provided with the equalizing device—viz., sleeve *d*, spring *g*, studs *e*—heretofore particularly described in connection with the pulley connecting the engine and crusher; and these rods *f* and *b* are each operated by a device preferably such as shown—viz., a lever, V², supported by a standard, V³, the lever V² being capable of being set at any desired point by appropriate means, as, for example, there may be holes in the lever and standard and a pin passed through a selected hole in each of same, or there may be a ratchet on the standard and a latch in the lever, with a handle whereby the latch may be lifted, and a spring whereby it may be made to bear upon and enter the notches of the ratchet.

When desired, the provision of the springs *g* *g*, sleeve *d*, and studs *e* may be omitted from the rod W, either as regards the idlers regulating the tensions of the belts *t* *t'* or belt R.

The object of having duplicate devices for propelling the car—viz., pulleys *u* *r* and belt *t*, and pulleys *u'* *r'* or belt *t'*—is in order to enable repairs to be made upon one set of pulleys, belt, &c., without in any manner interfering with the propulsion of the car.

My invention operates as follows, viz: Steam being gotten up, the supply of fuel and water taken aboard, the idlers connected with the pulley-belt R working the crusher are thrown off of said belt R, thereby loosening the latter and allowing the crusher to remain at rest when the engine is started. The latter is now set in motion, so as to revolve the pulley-wheels *u* and *u'* in the direction necessary to propel the car in the desired direction, the idler which is next the slack side of the belts *t* *t'* (the slack side being always on that side of the belt which is next the direction in which the car is running) being pressed by lever V² against said slack side of the belt till the slack is all taken up, when the car will be propelled forward. The lever V² is now set, and the car will be

moved to the desired place. The belts t or t' are then loosened by setting the levers V^2 at the center of their standards, and the machine is at rest. The engine may be left in motion.

5 The idlers or pulley-belt R are now moved so as to tighten this belt on the slack side, and the crusher thus set in motion, the idlers being retained in position by means of the set-screw a . The pulley-belt R may be run in either direction to conform to the direction in which the engine is rotating without interfering with the action of the crusher. The rough stone is now taken from an adjacent car, or, as is more usually the case, from the roadside, and fed into the hopper of the crusher, where it is immediately crushed between jaws 4 and 5, and the stone as broken, together with dust, grit, sand, and dirt, falls through the bottom of the hopper onto the screen j , where the dust, grit, and sand fall through the opening of screen j into the receiver k and pass out through the conduit-pipes k' k^2 , outside of the ties, away from the roadway. One of these pipes k' or k^2 is frequently sufficient. The broken stone, now cleaned of dirt, &c., slides off of the lower end of the screen upon the inclined plane l and thence onto the upper end of the shaking-screen m . The ballast of the requisite size now passes through the openings of the screen onto the roadway.

It may be here remarked that the crusher has been previously adjusted to crush ballast of the desired size, and a screen, m , having openings of dimensions just sufficient to allow of the desired size of ballast to pass through same, has been previously adjusted in place.

For each different size of ballast a screen with proper-sized openings must be employed and substituted for the one previously in the machine. That small portion of ballast which is too large to pass through the openings in screen m passes off the lower end of the latter and is passed back to the crusher for rebreaking or utilized in some other way. When the roadway has received sufficient ballast in this place the car may be moved any desired distance, no matter how short, by operating one or both of the levers V^2 , and thus tightening the belt t or t' .

When it is desired to deliver the crushed ballast outside of the rails the screen j may be omitted, in which event the ballast, on leaving the crusher, will fall directly into the receiver k , and will then be conveyed by the conduits k' k^2 thereof directly to the outside of the rails.

When my invention is applied to common roadways the device will not be materially changed. The flanges on the wheels 9 will, of course, be dispensed with, and such obvious minor changes are to be made in the size, shape, and construction of platform and springs (if the latter be employed) as will best enable it to operate in its new circumstances.

A crusher provided with my improvements may be advantageously operated by an engine

placed on the same vehicle, without reference to the motive power of said vehicle.

My improvements for tightening the pulley-belt, preventing disturbance of the pulley-belt, &c., are of value independently of car, crusher, &c., anywhere when employed between a driving-pulley and the pulley which said driving-pulley is intended to operate. Also, the device for equalizing the effect upon the belts of the jolting and jerking of the car is of value wherever these belts may be employed to operate machinery upon a vehicle or other supporting frame-work which is subject to be moved in an irregular or sudden or jolting manner; but I do not claim by themselves either these improvements for tightening the pulley-belt, &c., or the device for equalizing the effect upon the belts of the jolting, &c., of the car, as I propose hereafter making them the subject of a separate application for other Letters Patent.

The combination of a ballast-crusher and devices for separating the ballast, with or without devices for cleaning the same, is also of value without the presence of the engine, &c., or vehicle, as the crusher may be otherwise operated and be moved from place to place as desired, by horses, traction-engine, &c. I am aware that an engine has been used to operate a crusher by means of a belt, and to propel a car, but not to perform both operations simultaneously.

What I claim as new and of my invention is—

1. The combination of an engine, ballast-crusher, platform, wheels, axle M' , pulley r , shaft M , pulley u , belt t , pulley N , belt R , mechanism for tightening either belt at will, pulley P , and connecting and operating mechanism, substantially as and for the purposes specified.

2. The combination of wheels 9, axle M' , platform, connecting mechanism, pulleys r u , belt t , shaft M , idlers V' , operating-engine, pulleys N P , band R , idlers V , and ballast-crusher, substantially as and for the purposes specified.

3. The combination of operating-engine, shaft M , axle M' , pulleys r u , band t , idlers V' , pulleys N P , band R , idlers V , ballast-crusher, and connecting and operating mechanism, substantially as and for the purposes specified.

4. The combination of axle M' , pulley r , located thereon, loose belt t , idler or idlers V , pulley u , shaft M , engine D , supporting-platform, wheels, and connecting and operating mechanism, substantially as and for the purposes specified.

5. The combination of the pulleys r u , belt t , idler V , lever V^2 , engine, supporting frame or platform, supporting-wheels, and connecting and operating mechanism, substantially as and for the purposes specified.

6. The combination of the pulleys r u , belt t , idler V , lever V^2 , spring g , engine, and supporting-wheels, and connecting and operating

mechanism, substantially as and for the purposes specified.

7. The combination of the pulleys *u r*, belt *t*, idlers *V*, lever *V*², spring *g*, and mechanism
5 connecting said lever *V*², said spring *g*, standard *V*³, and device for setting the lever *V*², engine, and supporting-wheels, substantially as and for the purposes set forth.

8. The combination of an operating-engine,

vehicle supporting the same, shaft *M*, pulley *ro* *N*, loose band *R*, pulley *P*, and idlers *V*, and ballast-crusher, and connecting mechanism, substantially as and for the purposes specified.

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