

No. 865,261.

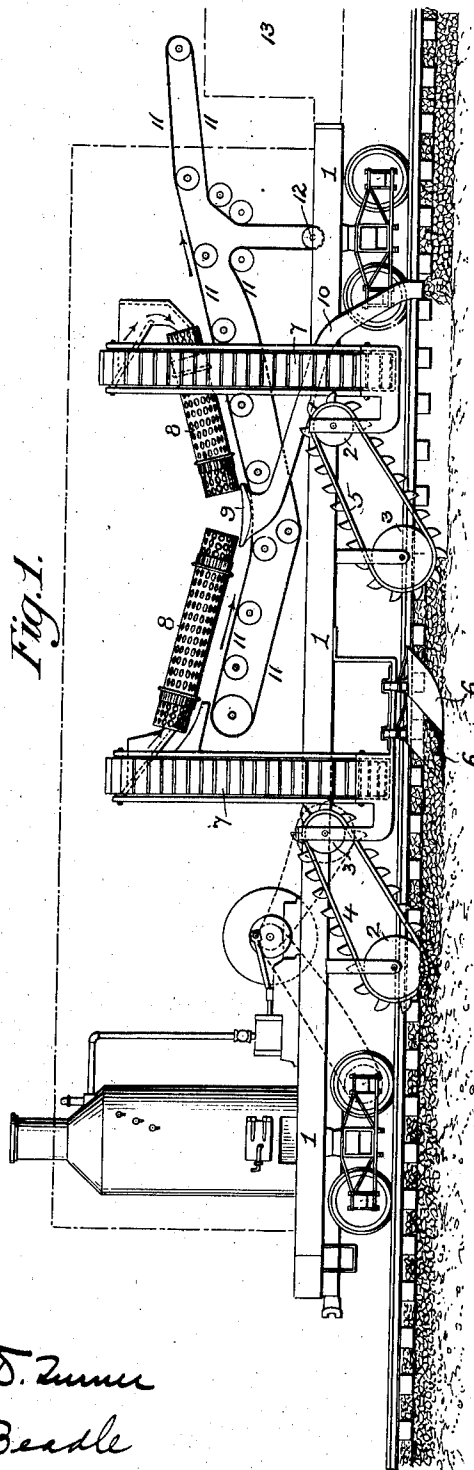
D. R. MEHAFFEY.

PATENTED SEPT. 3, 1907.

RAILWAY BALLAST HANDLING AND CLEANING APPARATUS.

APPLICATION FILED JULY 10, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

Hamilton D. Zimmer

Kate A. Beadle

INVENTOR

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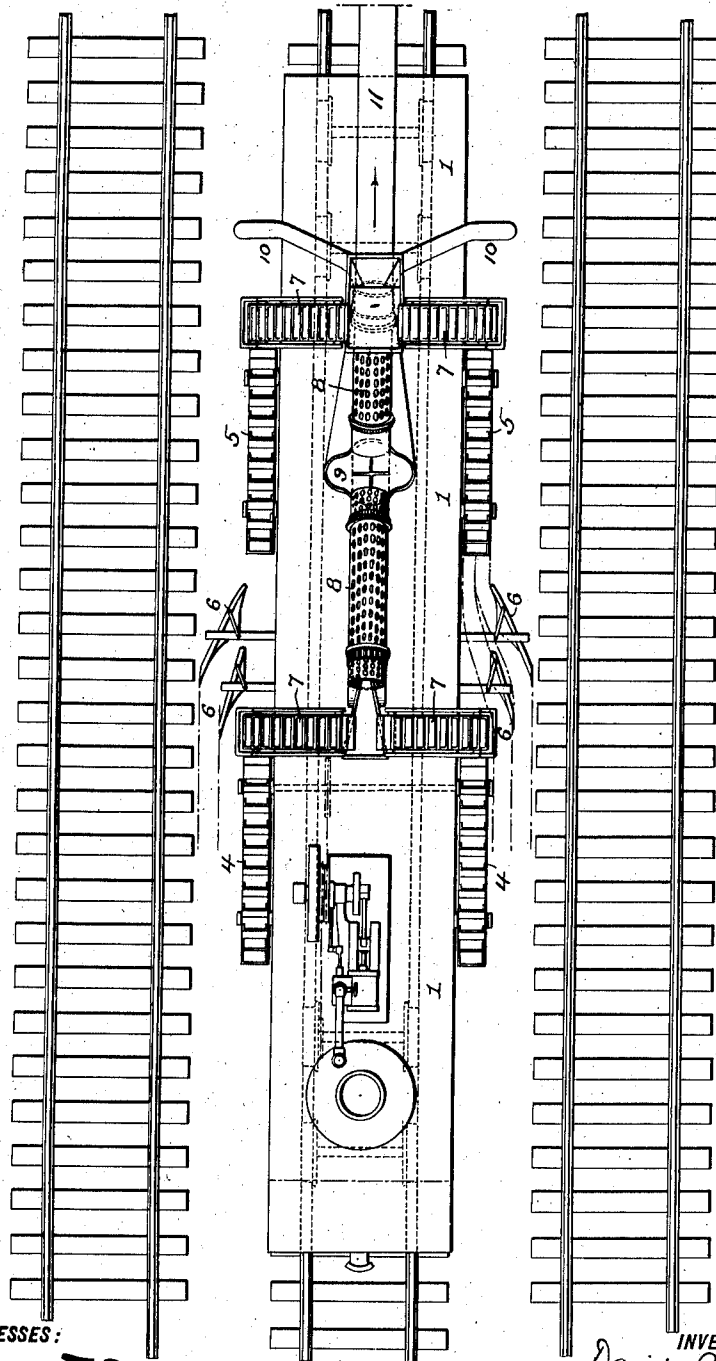
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Fig. 2.



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DAVID R. MEHAFFEY, OF PHILADELPHIA, PENNSYLVANIA.

RAILWAY BALLAST HANDLING AND CLEANING APPARATUS.

No. 865,261.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed July 10, 1906. Serial No. 325,504.

To all whom it may concern:

Be it known that I, DAVID R. MEHAFFEY, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Railway Ballast Handling and Cleaning Apparatus, of which the following is a specification.

The object of my invention is to largely or wholly dispense with hand labor in the operations of removing the ballast from the ditch between a pair of railroad tracks, cleaning said ballast, and returning it to the ditch. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which

Figure 1 is a view, showing, partly in elevation and partly in section, the essential features of apparatus constructed in accordance with my invention for removing, cleaning and returning railroad ballast; and Fig. 2 is a plan view of the same.

In order to maintain in proper condition the track ballast of a line of railway, it becomes necessary at times to remove from the ditch between adjoining tracks the ballast which has become fouled or clogged with dirt and cinders, and after cleaning the ballast to return it to the ditch, and heretofore these operations of removing, cleaning and restoring the ballast have been performed by hand, and have, in consequence, been slow and expensive.

The purpose of my invention is to effect the desired result by means of power-actuated mechanism which is practically automatic in its operation, hand labor being almost, if not quite, eliminated, and the operations being therefore performed with a minimum expenditure of time and labor.

The entire apparatus is mounted upon a suitably wheeled platform, which may resemble an ordinary flat car or box car and which is adapted to run upon a track alongside of the ditch if the ballast of but a single ditch is to be handled, or upon the track between a pair of ditches if the ballast of both ditches is to be handled simultaneously, the latter type of apparatus being illustrated in the drawings.

The wheeled platform 1 may be drawn along the track by a locomotive, or it may be provided with motive power apparatus whereby it is self-propelled, as shown in the drawing, and the same or additional motive power apparatus may be used for operating the various excavating, elevating, screening and conveying devices constituting elements of the complete apparatus.

As before stated, the apparatus shown in the drawings is intended for handling simultaneously the ballast of a pair of ditches, one set of excavating and elevating apparatus being employed at each side of the car, but as both sets of apparatus are alike, a description of one

will suffice, in fact, my invention, in its simpler form, 55 contemplates the use of but one set of such apparatus, and the handling of the ballast of but a single ditch at a time.

Upon suitable framework projecting from the side of the car are rotatably mounted two pairs of drums 2 and 3, which carry endless chain or belt bucket excavators 4 and 5, the rear drum of each pair being located at a point above the level of the track, and the foremost drum of each pair being at a lower level in order that the endless chain of buckets passing round the same 65 may reach to the bottom of the ditch between the tracks. It is preferable that the said forward drums of the pair be mounted so as to be adjustable in order that the excavators may be raised into an inoperative position when it is desired to move the car from place to place without disturbing the ballast. By preference, 70 also, each of the excavators 4 and 5 is disposed as closely as possible to the side of the car, the rearmost excavator traveling in the path of the foremost, and each excavator being of but half the width of the mass of ballast to be handled, or even less, whereby the supporting devices of the excavators can be rigidly braced, and each excavator thus fitted to perform the relatively severe duty for which it is intended. This disposition of the excavators necessitates the employment of some 80 means for removing the ballast from that half of the ditch which is furthest from the car side and the placing of the ballast thus displaced in the path of the rear excavator, and for this purpose I prefer to use one or more plows 6 carried by a frame or frames projecting from the 85 side of the car and rigidly braced, but preferably adjustable in order to lift the plows to inoperative position when it is desired to move the car from place to place without disturbing the ballast.

In the present instance I have shown a pair of plows 90 located in different transverse and longitudinal planes in order to divide the work between them, and thereby lessen the strain to which each plow is subjected. A single plow may, however, be employed if desired, or plowing devices independent of the rear excavator 95 may be dispensed with if said rear excavator is mounted at such a distance from the car side that it does not follow in the path of the forward excavator, or is diagonally mounted so that its forward or digging end is thus disposed, or in some cases a single excavator of the full width of the trench may be employed. It is preferable, however, to use a plurality of excavators in order to lessen the strain upon them, although each of such excavators may be of the full width of the ditch, the foremost excavator removing the upper portion of 105 the mass of ballast, and the rear excavator removing the bottom portion of said mass.

When the ballast is hard and compact, as for instance

when there is a considerable quantity of loam or clay mixed with it, as is likely to be the case when it has not been cleaned for several years, it may be necessary to employ, in advance of the first excavator some preliminary breaking or loosening device such as a light plow, a toothed wheel, or the like.

Either or both of the drums of each excavator may be positively driven by suitable gearing from the prime motor on the car, one of the drums of the forward excavator being shown as driven in this way. Each excavator discharges the contents of its buckets into the receiving leg or boot of an elevating conveyer 7 suitably mounted upon the car structure and driven from the same prime motor which drives the excavators, or independently thereof, as desired, and each elevating conveyer delivers into a hopper or chute which discharges into the upper end of an inclined rotary screen 8, the tailings from the lower end of the latter being received by a hopper 9 which has diverging spouts 10 whereby the ballast, freed from its dirt by the rotary screen, is returned to the ditch at a point rearwardly of that from which it has just been removed, any suitable form of deflector being, if desired, located at the delivery end of the spout for the purpose of spreading the ballast.

When two elevating conveyers and two screens are employed, each screen may, if desired, discharge its tailings into a special hopper, and instead of each hopper having a forked spout, it may have but a single spout, one spout discharging into one ditch and the other spout discharging into the other ditch, or the spouts discharging into different portions of the same ditch when the ballast of but a single ditch is being handled.

When the ballast of a pair of ditches is being handled, each of the rotary screens may receive the discharge from a pair of conveyers 7, as shown in Fig. 2, or each conveyer may have its own screen if desired.

The matter passing through the meshes of the screen is received upon the upper run of an endless conveyer 11 extending longitudinally beneath the screens and projecting from the rear end of the car, as shown in Fig. 1, so as to discharge into a following car 13 of the gondola type, the lower run of the conveyer being, by preference, provided with a depending loop passing around a weighted and vertically guided roller or pulley 12 in order to permit of the longitudinal extension of the rear end of the conveyer and the dumping of its load in any desired portion of the car 13, the roller or pulley 12 rising and falling as the horizontal portion of the conveyer is extended or contracted.

Instead of employing a conveyer for receiving the dirt from the screens and dumping the same into a following car, I may collect the dirt passing through the meshes of each screen in a suitable hopper or other receptacle and project it laterally therefrom into the flanking ditch or ditches of the track by means of a blast of air, steam, or other fluid under pressure.

I have not deemed it necessary to illustrate the mechanism whereby the various members of the apparatus are driven, as such mechanism forms no material part of my invention, and may be modified in many ways without departing therefrom.

In some cases it may be possible to so mount the ex-

cavator or excavators employed that the same will also serve as elevating conveyers for carrying the excavated material to the screen or screens, in which case, of course, no special elevating conveyers will be needed, and on the other hand, the excavators might in some cases be dispensed with and the ballast shov-
eled by hand into the boot of the elevator.

I claim:—

1. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying means for breaking out the ballast an excavator for removing the dirty ballast from the ditch, a screen for cleaning said ballast, and means for returning the cleaned ballast to the ditch.

2. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying means for breaking out the ballast a screen for cleaning the ballast, means for conveying the dirty ballast to said screen, and means for returning the cleaned ballast to the ditch.

3. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying means for breaking out the ballast a screen for cleaning the ballast, means for conveying the dirty ballast to said screen, and means for independently disposing of the tailings from the screen and of the material which passes through the meshes of the screen.

4. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying a screen for cleaning the ballast, means for conveying the dirty ballast to said screen, means for returning the cleaned ballast to the ditch, and an endless conveyer for receiving the material which passes through the meshes of the screen.

5. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying a screen for cleaning the ballast, means for conveying the dirty ballast to said screen, means for returning the cleaned ballast to the ditch, an endless conveyer for receiving material which passes through the meshes of the screen and means for extending and contracting said conveyer.

6. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying a screen for cleaning the ballast, means for conveying the dirty ballast to said screen, means for returning the cleaned ballast to the ditch, an endless conveyer for receiving the material which passes through the meshes of the screen, and means whereby said conveyer delivers its load at a point outside of the car which carries the screening mechanism.

7. Railway ballast handling apparatus comprising a wheeled car or other support carrying, at one side, a plurality of excavators, one in advance of the other, for removing the dirty ballast from the ditch.

8. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying, at one side, a plurality of excavators, one in advance of the other, for removing the dirty ballast from the ditch, a screen for cleaning said ballast, and means for returning the cleaned ballast to the ditch.

9. Railway ballast handling apparatus comprising a wheeled car or other support carrying, at one side, a plurality of excavators for removing the dirty ballast from the ditch, each of said excavators being of less width than the width of the ditch containing the ballast.

10. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying, at one side, a plurality of excavators for removing the dirty ballast from the ditch, each of said excavators being of less width than the width of the ditch containing the ballast, a screen for cleaning the ballast, and means for returning the cleaned ballast to the ditch.

11. Railway ballast handling apparatus comprising a wheeled car or other support carrying, at one side, a plurality of excavators disposed one in advance of another, for removing the dirty ballast from the ditch, each of said excavators being of less width than the width of said ditch.

12. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying, at one side, a plurality of excavators disposed one in advance of another, for removing the dirty ballast from the ditch, each of said excavators being of less width than the width of said ditch, a screen for cleaning the ballast, and means for returning the cleaned ballast to the ditch.

13. Railway ballast handling apparatus comprising a wheeled car or other support carrying, at one side, a plurality of excavators disposed one in advance of another, and in the same path, for removing the dirty ballast from the ditch, each of said excavators being of a width less than the width of the ditch, and means for displacing the ballast untouched by the leading excavator and throwing the same into the path of the following excavator.

14. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying, at one side, a plurality of excavators disposed one in advance of another, and in the same path, for removing the dirty ballast from the ditch, each of said excavators being of a width less than the width of the ditch, means for displacing the ballast untouched by the leading excavator and throwing the same into the path of the following excavator, a screen for cleaning the ballast, and means for returning the cleaned ballast to the ditch.

15. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying an excavator for removing the dirty ballast from the ditch, a screen for cleaning the ballast, an elevating belt conveyer interposed between the excavator and the screen, and means for returning the cleaned ballast to the ditch.

16. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying means for breaking out the ballast a plurality of excavators for removing the dirty ballast, a plurality of screens for cleaning said ballast, and means for returning the cleaned ballast.

17. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support carrying means for breaking out the ballast a plurality of excavators for removing the dirty ballast, a plurality of screens, one cooperating with each excavator for cleaning the ballast, and means for returning the cleaned ballast.

18. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support having at each side, means for breaking out the ballast one or more excavators for removing the dirty ballast from the ditches, one or more screens for cleaning the ballast, and means for returning the cleaned ballast.

19. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support having a plurality of excavators for removing the dirty ballast, a plurality of screens for cleaning the ballast, and means common to both screens for returning the cleaned ballast.

20. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support having a plurality of excavators for removing the dirty ballast, a screen, common to said plurality of excavators, for cleaning the ballast, and means for returning the cleaned ballast.

21. Railway ballast handling and cleaning apparatus comprising a wheeled car or other support having a plurality of excavators for removing the dirty ballast from a plurality of ditches, a screen, common to said plurality of excavators, for cleaning the ballast, and means for carrying the cleaned ballast from said screen partly to one ditch and partly to the other.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

DAVID R. MEHAFFEY.

Witnesses:

HAMILTON D. TURNER,
KATE A. BEADLE.