Oct. 20, 1925. 1,557,908

P. URSINO

RAILWAY TRACK REBALLASTING APPARATUS

Filed March 2, 1925 3 Sheets-Sheet 1

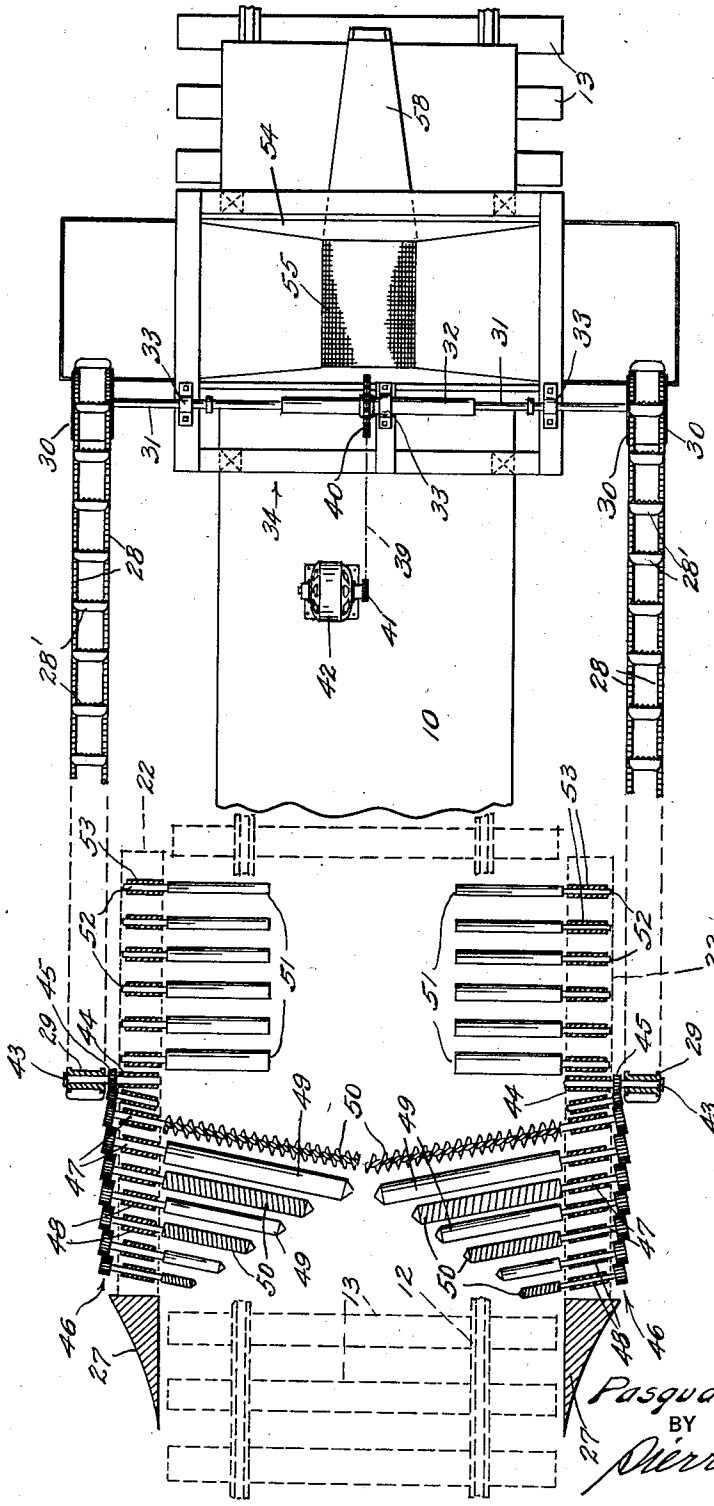


Fig. 1.

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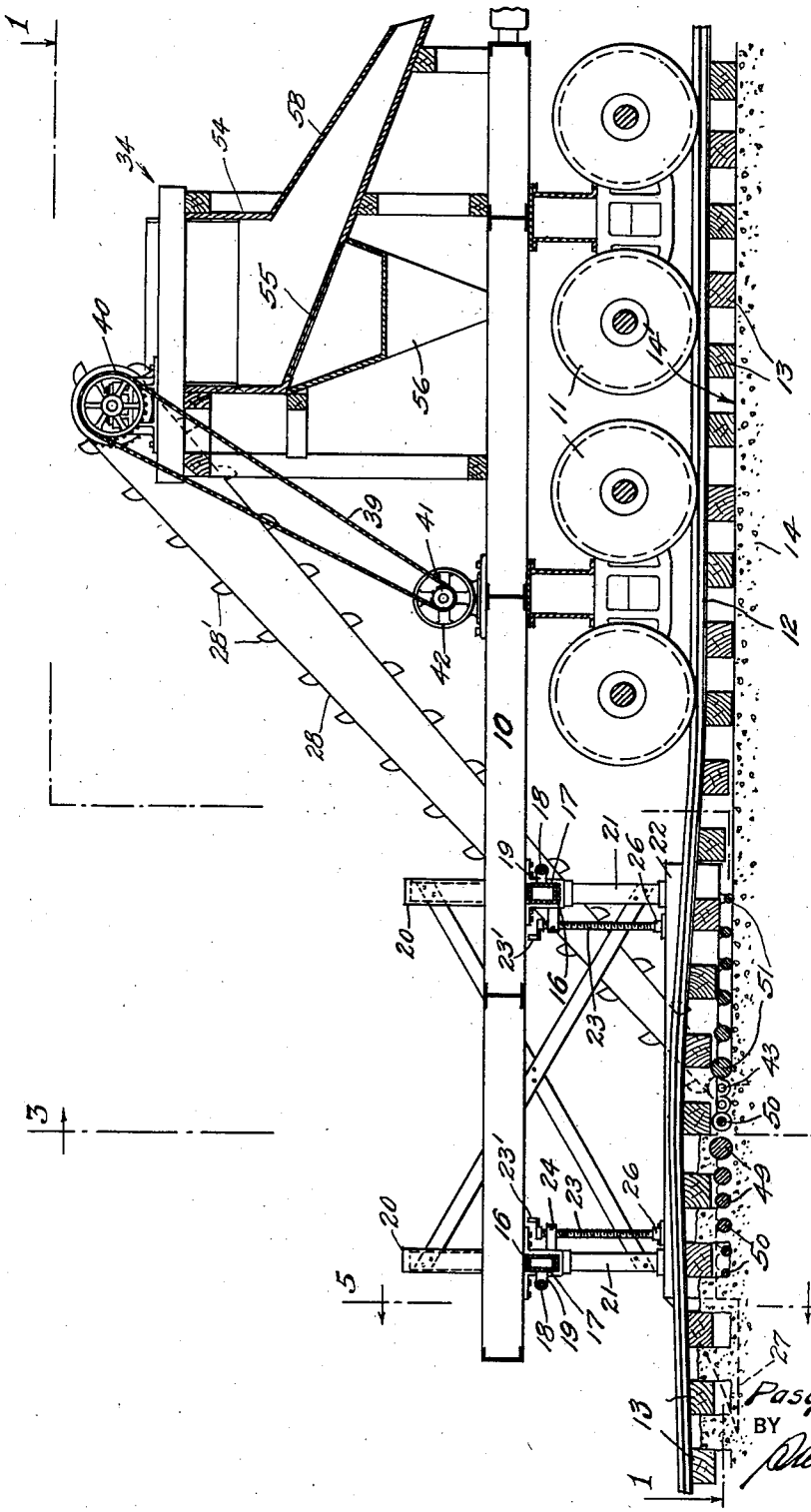


Fig. 2.

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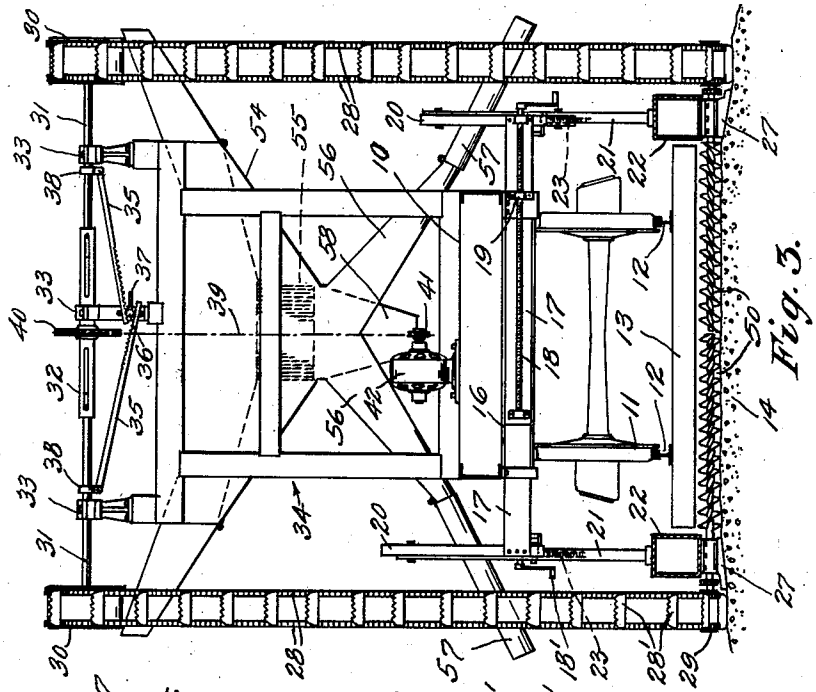
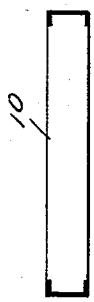


Fig. 3.



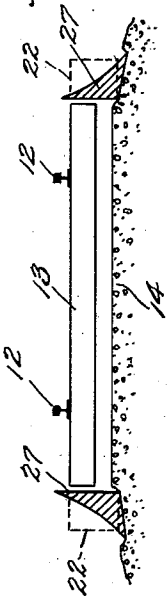


Fig. 5.

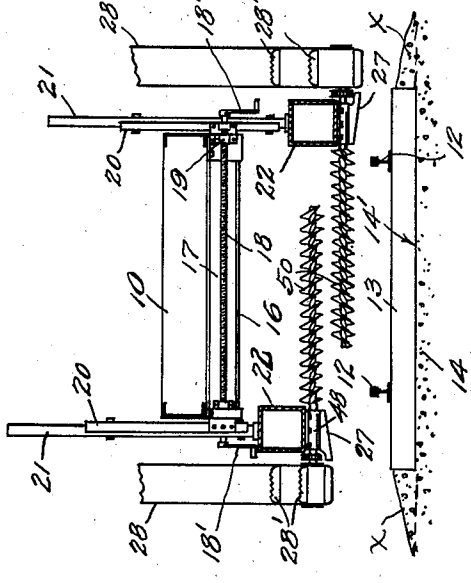


Fig. 4.

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Patented Oct. 20, 1925. 1,557,908

UNITED STATES PATENT OFFICE

PASQUALE URSINO, OF SEATTLE, WASHINGTON.

RAILWAY-TRACK-REBALLASTING APPARATUS.

Application filed March 2, 1925. Serial No. 13,551.

To all whom it may concern:

Be it known that I, PASQUALE URSINO, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Railway-Track-Reballasting Apparatus, of which the following is a specification.

This invention relates to apparatus for removing from a railway track ballast and separating foreign substances therefrom to afford reconditioned ballast for reballasting purposes.

Hitherto such operations have been performed by manual labor, an expensive undertaking requiring considerable time.

The object of the present invention is to provide apparatus whereby track reballasting may be performed in a more rapid and efficient manner.

The invention consists in the novel construction, adaptation and combination of parts hereinafter described with reference to the accompanying drawings showing apparatus now preferred by me, and finally pointed out in the appended claims.

In such drawings,—

Figure 1 is a view of an embodiment of the invention taken substantially on broken lines 1—1 of Fig. 2, illustrating the same partly in plan and partly in horizontal section. Fig. 2 is a longitudinal vertical section of the apparatus, parts being omitted. Fig. 3 is a view partly in elevation and partly in transverse vertical section substantially on plane 3—3 of Fig. 2, illustrating the ballast conveying devices and the elevators in their operating positions. Fig. 4 is a fragmentary section on line 3—3 showing the ballast conveying devices and the elevators in their relatively contracted positions. Fig. 5 is a vertical transverse section on line 5—5 of Fig. 2.

In said drawings, the reference numeral 10 designates the platform of a railway car supported upon wheels 11 located under the rear portion of the platform and mounted to travel upon the track rails 12.

These track rails are spiked or otherwise rigidly secured to ties 13 which seat upon a bed 14 of ballast, composed of broken rock or an equivalent, the ballast being also employed between the ties in a known manner.

The purpose of the present invention, more particularly, is to remove the ballast from between the track ties and above a plane, such as 14^1, at or slightly below the under surfaces of the ties when in place.

As illustrated there is secured to the underside of the structure of the platform, in front of the foremost of the car wheels 11, guides 16 for bracket beams 17 which are movable transversely of the car as by means of manually operated screws 18 carried by the respective beams engaging in internally screw threaded blocks 19 secured to the respective guides.

There are two or more of said bracket beams for each side of the car, those for one side of the latter and the guides therefor are, for clearness, omitted from Fig. 2.

To the outer end of each of said beams is rigidly secured a guide 20 for a vertically movable bar 21. The lower ends of a pair of bars 21 at each side of the car are connected to a rigid frame 22 disposed longitudinally of the car.

The frames 22 are adjustably movable together with the guiding bars 21 therefor by any suitable means, that shown comprising vertically disposed screws 23 taking in internally threaded boxes 24 secured to the beams 17, the lower ends of the respective screws being connected against axial movement to the associated frame 22 as by means of stirrup boxes 26 of known construction.

As illustrated, the screws 18 are rotatable by means of crank handles 18^1 to impart lateral adjustments to the respective frames 22, and the screws 23 are provided with crank handles 23^1 to impart vertical adjustment to said frames. Secured to the forward end of each frame 22 is a plow member 27 arranged when located as shown in Figs. 1, 2 and 3, to dislodge the ballast from the ends of the ties outwardly into the paths of inclined elevators, one at each side of the car. Each of these elevators consists of an endless chain or chains 28 carrying buckets 28^1, the lower and upper ends of such chain elevators pass about sprocket wheels 29 and 30, respectively.

The upper sprocket wheels are mounted upon the outer ends of horizontal shafts 31, one for each wheel, the inner ends of said shafts extend into and are splined to an annular coupling shaft 32. The shafts 31 and 32 are journaled in bearing boxes

33 mounted upon a superstructure 34 of the car platform. Axial adjustments of the sprocket wheels 30 to regulate the lateral positions of the upper ends of the respective elevators is controlled as by means of rack bars 35 (Fig. 3) engaging the teeth of a spur pinion 36 which is mounted upon a crank shaft 37, said rack bars being connected to collars 38 which are connected to the respective shafts 31 against relative axial movement.

To drive said elevators I employ, preferably, an endless chain 39 passing around a sprocket wheel 40, on the coupling shaft 32, and a sprocket wheel 41 of a motor 42 carried upon the car platform 10.

The motor 42 is preferably operated by electricity the current for actuating the motor being supplied from any suitable source or reservoir (not shown) of electricity.

The sprocket wheel 29 at the lower end of an elevator is mounted upon a shaft 43 in a journal box 44 secured to the underside of the respective frame 22. The shaft 43 has mounted thereon a spur pinion 45 (Fig. 1) constituting the prime mover of a train of gears 46 of a series of shafts 47 which are also journaled in boxes 48 provided upon the underside of a frame 22 in front of the elevator driven shaft 43 or between the latter and the associated plow.

The shafts 47 carried by each frame 22 are arranged with respect thereto in about the angular relation in which they are represented in Fig. 1. Integral with said shafts and protruding from the respective frame toward the center of the track is a system of alternating rollers 49 and screw conveyors 50, respectively, of progressively increasing diameters and lengths from front to rear of the systems.

The rollers 49, however, are of diameters such as to prevent the conveyors 50 from contacting with the ties when the latter are borne upon the rollers in the operation of the same as will presently be described. The helical configuration of each of the conveyors is such as to cause the ballast material to be moved outwardly from the center of the track toward and eventually into the path of the respective elevator.

Associated with each system of conveyors and rollers above referred to there is provided to the rear thereof a series of rollers 51 having axles 52 which are journaled in bearing boxes 53 of the associated frame 22.

The rollers 51 are, like the aforesaid rollers and conveyors, located at the track side of the respective frames and may be arranged in inclined relations thereto or, as shown, perpendicularly and are of successively decreasing diameters from front to rear of the series.

The material raised by the elevator buckets 28^1 is deposited in a hopper 54 having at its bottom a grizzly or inclined screen 55 of a mesh to permit small particles of the material, or refuse, to pass therethrough into waste spouts 56 having hingedly connected thereto extensions 57 whereby the refuse may be discharged at either or both sides of the track bed.

The larger pieces of the material deposited upon the screen 55 and which will not pass therethrough is discharged by gravitation into a spout 58 extending from the hopper 54 either upon the track to the rear of said car or, if desired, into a gondola car to be transported to another section of track for reballasting the same.

The car carrying the apparatus above described is desirably propelled upon the track by power means (not shown) provided upon the car and employing two or more of the wheels 11 for traction purposes.

If desired, however, the car and the gondola in which the reconditioned ballast material is received may be propelled by means of a suitable locomotive.

When the car or train carrying the apparatus is enroute to or from the place of operation, the apparatus is preferably reduced to its minimum width and the frames 22 and parts depending and movable therewith are elevated to position the roller and conveyor devices above the track rails as shown in Fig. 4.

Arriving at the work, the ballast material occupying the wedge shaped sections at opposite ends of the ties are removed by means of picks and shovels for a short distance and the track structure including the rails and ties, is raised by means of the well known track jacks to have the lower surfaces of the ties elevated to about six or seven inches. The ballast is then, by hand operated shovels or other tools, removed from under the elevated ties to the plane 14^1 which latter serves as a floor in the ballast excavation operation.

The car is then moved to position the frames 22 above the elevated portion of the track. The screws 18 and the rack bars 35 are then actuated to cause the beams 17 and shafts 31 to be moved laterally to carry the elevators, frames 22, etc., outwardly until the inner extremities of all of the conveyors 50 and rollers 49—51 are outside of the tie ends. The screws 23 are then actuated to lower said frames and the parts connected therewith until said conveyors and rollers are below the heights of the bottoms of the previously elevated ties, whereupon the screws 18, and rack bars 35 are again actuated to insert the conveyors and rollers beneath the elevated portion of the track structure. The various parts of the apparatus now occupy the relative positions, approximately, in which they are rep-

resented in Figs. 1, 2, and 3, and the jacks above referred to are removed permitting the track structure to be borne by the rollers 49 and 51 which are supported upon the ballast floor 14^1.

The motor is now operated to impart motion through the shafts 32, 31 to drive the elevators which, in turn, act through the medium of the gears 45—46 to rotate the conveyors 50 and rollers 49. The car is propelled forward, and in the progressive travel of the conveyors the latter act to excavate the ballast material above the level of the floor 14^1 and to transfer such excavated material to the elevators whereby such material is elevated into the hopper 54 to be screened and classified as hereinbefore explained.

As the material above the floor 14^1 is removed, the progressive travel of the car carries the power driven roller 49 ahead to effect the raising of the track which proceeds continuously as the work progresses.

The raising the track is permitted by the bending or flexing of the rails which return to their original shapes and positions subject to the action of the rollers 51 which serve as what may be termed replacement rollers.

The function of the rollers with respect to the track is illustrated in Fig. 2, although for lack of space the deflected or bending portion of the track rails are shown much shorter than would obtain in actual practice. By alternating the positions of the rollers 49 and conveyors 50, one with the other, and driving the same by means of a series of intermeshing gears as shown, the conveyors are caused to turn in an opposite rotary direction from that of the rollers.

While I have illustrated and described apparatus now preferred by me, I do not wish to be understood as confining myself specifically thereto except as limited by the appended claims.

What I claim, is,—

1. In apparatus for removing material from beneath a track, a car mounted for travel upon said track, means carried by the car for excavating said material, means to raise and lower respectively the track in front and to the rear of said excavating means during the progressive travel of the car.

2. In apparatus for removing ballast from beneath a track, a car mounted to travel upon said track, conveyors carried by the car and adapted to be employed beneath said track for excavating material therefrom, and rollers also carried by the car and rendered operative by the progressive travel of the car for effecting the raising and lowering successively of the track.

3. In combination with apparatus as defined in claim 2, a hopper having a plurality of outlets, means for elevating the excavated material into said hopper, a screen for separating the material within the hopper and delivering portions of the material to the respective outlets.

4. In apparatus for removing ballast from beneath a track, a car mounted to travel upon the track, devices carried by the car for elevating the track structure during the progressive travel of the car, excavating devices for removing material from beneath raised portions of the track, a hopper provided upon the car and provided with a discharge spout, a screen within the hopper, elevators for conveying material from said excavating devices and the delivery of the same into said hopper above the screen, means to actuate the elevators, and means operated by said elevators for actuating said devices.

5. In apparatus for removing ballast material from beneath a track, a car mounted to travel upon the track, frames connected to the car for vertical and lateral movements, means for effecting said movements selectively to said frames, a plow provided at one end of each of said frames, a series of track raising rollers and a series of material excavating devices rotatably connected to each of said frames, a receptacle provided upon said car, elevators for conveying excavated material to said receptacle, means for actuating said elevators, and means operatively connecting the respective elevators with said rollers and excavating devices for driving the same.

6. In apparatus for removing ballast material from beneath a track, a car mounted to travel upon the track, frames connected to the car for vertical and lateral movements, means for effecting said movements selectively to said frames, a plow provided at one end of each of said frames, a series of track raising rollers and a series of material excavating devices rotatably connected to each of said frames, a receptacle provided upon said car, elevators for conveying excavated material to said receptacle, means for actuating said elevators, and means connecting the respective elevators with said devices to effect the turning of the rollers in one rotary direction and the excavators in the opposite rotary direction.

Signed at Seattle, Washington, this 15th day of January, 1925.

PASQUALE URSINO.