

UNITED STATES PATENT OFFICE.

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APPARATUS FOR RAISING THE SUPERSTRUCTURE OF AND BALLASTING RAILWAY ROAD-BEDS.

No. 816,076.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GRAHAM H. CRAVENS, a citizen of the United States, residing at De Queen, in the county of Sevier and State of Arkansas, have invented certain new and useful Improvements in Apparatus for Raising the Superstructure of and Ballasting Railway Road-Beds; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to an apparatus for raising the superstructure of and ballasting railway road-beds, and has for its object to provide a self-propelled road-ballasting apparatus embodying suitable means for raising the superstructure of the railway in advance of the apparatus and supporting same in its elevated position while the road-bed is being progressively ballasted therebeneath, means for moving ballasting material from the sides of the road beneath the superstructure and for leveling said material when so placed, means for automatically delivering ballasting material to the road-bed, means for tamping the ballasting material when delivered to the road-bed, means for regulating the delivery of the ballasting material from its source of supply to the road-bed, and means for varying the angle of the superstructure - supporting means to provide for curves in the track.

My present invention relates particularly to means for varying the angle of the superstructure, supporting means to provide for track curves, means for elevating the superstructure in advance of the ballasting-tamping parts, and the means operating the ballast gathering and leveling shovels, and is an improvement of the apparatus disclosed in my United States Patent No. 785,252, issued March 21, 1905.

My present invention consists in the novel construction and combination of parts, which will be fully described, and pointed out in the claims, reference being had to the accompanying drawings, forming part of the specification, in which like reference-numerals refer to like parts throughout the several views, and in which—

Figure 1 is a side elevation of an apparatus constructed according to my invention shown

in position on the track-rails. Fig. 2 is a top plan view of same, a portion of the forward frame being removed to better show the superstructure-raising parts. Fig. 3 is a detail view of the superstructure - raising parts shown in transverse vertical section on the line 3 3, Fig. 2, looking rearwardly. Fig. 4 is a detail view of the sliding guides operating the rails supporting the superstructure-raising parts. Fig. 5 is a top plan view of the rails which support the superstructure - raising parts as they appear when a section of curved track is being laid.

Referring more in detail to the drawings, 6 represents a platform of an ordinary flat-car carried on the usual trucks 7, provided with the flanged wheels 8, which ride on the track-rails 9, said rails and ties 10 forming the superstructure of the railway.

11 represents the road-bed to be ballasted. Extending horizontally from the forward end of platform 6 is a supporting-frame 12, the sides 13 of which are composed of channel-beams with the flanges directed inwardly, the rear ends of said sides being curved inwardly and rigidly secured to each other, forming an integral semicircular end portion 14, while the forward ends are joined by a transverse brace 15. The rear portion of frame 12 is supported by keepers 16, which extend from the front platform 6 and loosely engage the channel-iron sides 13.

17 represents cross-stays extending from side to side of frame 12 to provide a desired rigidity thereto.

Extending upwardly from the front of frame 12 are standards 18, with which are connected the sides 19 of an auxiliary frame 20, which is of the same length as frame 12 and is also provided with a semicircular end portion adapted to travel in keepers 21, which project inwardly from beams 22, mounted on platform 6.

Extending upwardly from the forward end of platform 6 is a conveyer-frame 23, and extending forwardly from the center of the front cross-beam of frame 23 is a yoke 24, in which, by means of a pin 25, is pivoted the rear end of a truss 26, which extends forwardly for some distance over frames 12 and 20 and has a forward portion 27 extending downwardly at an angle to the front of frame 20.

28 represents brace-rods extending from truss 26 to frame 20, and 29 is a king-pin extending through cross-stays in frames 12 and

20 and forming the axis upon which the parts revolve.

Extending over approximately the forward half of the frame 20 is the double track 30, the rails 31 of which are composed of heavy metal strips wound around drums 32 and having their ends joined to form continuous rails upon which the flanged wheels 33 may travel. Rails 31 are bowed upwardly in the middle, as shown in Fig. 1, and have horizontal offsets 34 at each end of the track, the parts being so arranged that the outer rails on each side will be directly over the rails of the superstructure. Wheels 33 are provided with axles 35, from which depend the hangers 36, carrying chains 37, which latter have grappling-hooks 38 secured to their lower ends, adapted to engage the rails 9 as the apparatus moves forwardly thereon. Wheels 33 are arranged at regular intervals on rails 31 and are connected by chains 39. As the apparatus moves forwardly the hooks 38 engage the rail 9 and clinging thereto hold the wheels 33 on its rail while the apparatus moves forward. As the bowed track 31 moves beneath the wheels 33 said wheels are elevated, raising the rails 9 and ties 10 till the center of the track is passed, when the parts are gradually lowered owing to the decline in track 31.

Upon the forward frames near the crest of the curved track 31 are mounted the supporting-frames 40 41, the forward one of which carries the ballast-gathering blades 42, while the latter carries the leveling-blades 43, suitable means being provided for adjusting each to conform to the condition of the work. Behind the levelers 43 is a roller 44, the axles 45 of which are journaled in standards 46 of a frame 47, and extending upwardly from frame 47 through a girder 48, connecting sides 13, are jack-screws 49, carrying hand-wheels 50, by means of which the roller is raised or lowered to suit the condition of the work.

51 represents nuts on screw 49, bearing against the under faces of girder 48, and 52 is a brace for frame 47.

Suitably journaled in standards on frame 6 is a shaft carrying drums 53 54, upon which are keyed the bevel gear-wheels 55 56. Adjacent to said shaft is a shaft 57, upon which are keyed the beveled gear-wheels 58 59, adapted to mesh with wheels 55 56, and 60 is a shipper-lever for throwing wheels 58 59 into and out of mesh with wheels 55 56.

61 is a pulley-wheel on shaft 57, and 62 is a belt connecting wheels 61 and the pulley 63 on the drive-shaft 64 of an engine 65, carried on platform 6.

Rigidly secured to drums 53 54 are the ends of chains 66 67, which run over idlers 68 69 to posts 70 71 on the forward frame 12.

When it is desired to move frame 12 to one

side or the other in constructing a curved track, the shaft 57 is moved in the direction of the side to which it is desired to swing the frame and the gear-wheels at that side thrown into mesh, revolving the drum on its shaft and winding its chain thereon, thereby drawing the forward frame to that side.

Extending transversely across frame 20 are the I-beams 72, and suspended from the lower adjacent flanges of said beams by a head-rail 73 is the E-frame 74, the depending posts 75 76 77 of which are rigidly secured to the track-rails 31 of the ballast-raising parts. At the sides of the frame are suitably secured jack-screws 78, which extend outwardly through frame 20 and carry hand-wheels 29. When working on a curved track, the rails 31 are bowed to one side or the other by turning the hand-wheels on the screws 78.

Extending across the conveyer-frame is a shaft 80, on the ends of which are sprocket-wheels 81, over which are run conveyer-trains 82, which extend backwardly beneath gates at the sides of a ballast-car 83, coupled to platform 6, the shaft 81 and sprocket-wheel 82 being operated by a belt 84, extending from a pulley 86 on the shaft 64 of engine 65. Beneath the conveyer-trains are hoppers 87 of chutes 88, which empty into the chute 89, depending from frame 20.

Suspended from frame 20 and surrounding chute 89 is a carriage 90, in which are supported the compressed-air cylinders 91, which operate the tampers 92.

93 represents tubes leading from cylinders 91 to an air-pump 94 on platform 6, which is operated by engine 65.

Forward of carriage 90 is a truck 95, in which are journaled the flanged wheels 96, which ride on the track-rails 9, truck 95 being provided with threaded posts projecting through frame 20 and carrying hand-wheels 97 for raising and lowering the wheels to proper adjustment on the track.

Journaled beneath platform 6 is a shaft 98, carrying a sprocket-wheel 99, having a belt connection with a pulley on the drive-shaft 64 of engine 65. 100 represents smaller sprocket-wheels on shaft 98, and 101 represents belts running from pulleys 100 to pulleys on the truck-axles, by which means the apparatus is propelled along the track.

In the use of my device the ballast-car is filled with material, and the depending parts on the forward frames having been raised out of contact with the superstructure the apparatus is propelled to the point where it is desired to operate by means of the belt connections between the engine 65 and the axles of the carrying-wheels 8. When the destination has been reached, the grappling-hooks are placed in contact with the rails of the superstructure and the apparatus moved slowly forward, wheels 34 ascending the inclined

track 31 and raising the superstructure, as has been previously mentioned. When the superstructure has been elevated to a sufficient height, the ballast gathering and leveling blades and the roller 44 are lowered to position, the gathering-blades serving to convey the ballast at the side of the road-bed to a position beneath the superstructure, the levelers spreading and leveling it, and the roller 44, carrying a portion of the weight of the front frame, rolling it into a compact mass. The superstructure is lowered onto its new bed behind the roller, and the wheels 96, also bearing part of the weight of the frame, sets it into place ready for the ballast-tampers, which follow immediately behind said wheels. The conveyers 82, traveling beneath the car 83, receive the ballast therefrom and convey it to the top of frame 23, where it is delivered into the chute 88 and carried to the road-bed between tampers 92, which, operated as described, firmly tamp it around the ties.

The means for varying the angle of the forward frames to conform to curves in the track has already been described, as well as the means for showing the superstruction carrying rails transversely.

While I have specifically described my invention, I do not wish to be understood as limiting myself to the exact details of construction therein shown and described, inasmuch as the same may be varied without departing from the spirit of my invention.

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

1. In a device of the class described, a power-propelled vehicle or car, means for raising the railroad superstructure above the bed of the road, in advance of the car, means for conveying material beneath the raised superstructure, and a roller following said conveying means, for the purpose set forth.

2. In a device of the class described, a power-propelled vehicle or car, means for raising the railroad superstructure above the bed of the road in advance of the car, ballast-material conveying and spreading devices beneath the raised superstructure and a roller beneath said raised superstructure and following said spreading device, substantially as set forth.

3. In a device of the class described, the combination of a suitable car, means for raising the railroad superstructure above the bed of the road in advance of the car, and means for conveying ballasting material beneath the raised superstructure.

4. In a device of the class described, a suitable car, means for raising the railroad superstructure above the bed of the road in advance of the car; means for conveying ballasting material from the sides of the track be-

neath the raised superstructure, and means for spreading said material therebeneath.

5. In a device of the class described, a suitable car, means for raising the railroad superstructure above the bed of the road in advance of the car, means for conveying ballasting material beneath the raised superstructure, a roller following said conveying means, and means for adjusting said roller.

6. In a device of the class described, the combination of a power-propelled vehicle or car having a forwardly-extending frame, means on said frame for raising the railroad superstructure above the bed of the road, and means for adjusting said frame transversely.

7. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on the end of said car, and adapted for rotary movement thereon, means for adjusting said frame transversely, and means on said frame for raising the railroad superstructure.

8. In a device of the class described, a power-propelled vehicle or car, a frame having semicircular end portions, carried by said car, guides on the forward end of said car engaging said frame, and means on said frame for raising the railroad superstructure in advance of the car.

9. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on the end of said car, and adapted for rotary movement thereon, and means for operating said frame, for the purpose set forth.

10. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on said car, a shaft journaled on said car, drums carried by said shaft, chains on said drums extending forwardly and secured to the sides of said frame, and means for separately actuating each of said drums, substantially as set forth.

11. In a device of the class described, a power-propelled vehicle or car, a forwardly-extended frame on said car, an upwardly-bowed track on said frame, and runners on said track substantially as set forth.

12. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on said car, an upwardly-bowed track on said frame, having horizontal end portions 34, and runners on said track for the purpose set forth.

13. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on said car, drums on said frame, an endless track on said frame and wound around said drums, and runners on said track for the purpose set forth.

14. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on said car, an endless track on said frame one of the rails whereof is di-

rectly over one of the rails of the superstructure, a series of runners on said rails, and means carried by said runners for grappling the rails of the superstructure.

5 15. In a device of the class described a power-propelled vehicle or car, a forwardly-extending frame on said car, an endless track on said frame, a series of runners on said track, means for connecting said runners together to form a train and means depending from said runners for grappling the superstructure-rails, substantially as set forth.

10 16. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on said car a track on said frame above each of the superstructure-rails, runners on said tracks, and means depending from said runners for grappling the superstructure rails.

15 17. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on said car, a track on said frame, runners on said track, means depending from said runners for grappling the superstructure rails, and means for bowing said track-rails transversely, for the purpose set forth.

20 18. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on said car, track-rails on said frame, a transverse supporting-frame above said rails, arms depending from said supporting-frame and engaging said rails and means for moving said arms transversely, for the purpose set forth.

25 19. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on said car, track-rails on said frame, I-beams extending transversely of said frame above said rails, a head-rail carried by said I-beams, arms depending from said head-rail and engaging said track-rails, and means for adjusting said head-rail and arms transversely, for the purpose set forth.

30 20. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on said car, track-rails on said frame, I-beams extending transversely of said frame above said rails, a head-rail carried by said I-beams, arms depending from said head-rail and engaging said arms, jack-screws carried by said head-rail and extending through standards on said forward frame, and hand-wheels on said jack-screws, substantially as and for the purpose set forth.

35 21. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on said car, means on said frame for raising the superstructure of the

railway, and wheels 96 depending from said 60 frame and riding on said rails, for the purpose set forth.

22. In a device of the class described, a power-propelled vehicle or car, a forwardly-extending frame on said car, means on said 65 frame for raising the superstructure of the railway, wheels 96 riding on said rails, and means for vertically adjusting said wheels, for the purpose set forth.

23. In a device of the class described, a 70 power-propelled vehicle or car, a forwardly-extending frame on said car, means for raising the superstructure of the railway, a frame 95 depending from said frame and having screw-posts extending upwardly through a suitable girder on said forwardly-extending 75 frame, wheels 96 carried by said frame 95, and hand-wheels 97 mounted on said screw-posts, substantially as and for the purpose set forth. 80

24. In a device of the class described, a power-propelled vehicle or car, keepers extending inwardly from the forward end of said car, a forwardly-extending frame having a semicircular end portion loosely carried by said keepers, side beams supported on said car having keepers on their forward ends, an auxiliary frame extending forwardly of said beams above said first frame and having a semicircular rear portion loosely carried 90 by the keepers on said beams, and a king-pin extending through perforations on each of said frames substantially as set forth.

25. In a device of the class described, a power-propelled vehicle or car, a forwardly- 95 extending frame carried by said car, vertical standards on the forward end of said car, and a forwardly-extending truss pivoted on said standards and suitably connected with said forwardly-extending frame, substantially as 100 set forth.

26. In a device of the class described, a power vehicle or car, a forwardly-extending frame on said car, means on said frame for raising the superstructure of the railway, bal- 105 last gathering and spreading blades and a roller beneath said raised superstructure, ballast-tamping means to the rear of said raising parts, means for supplying ballast, to said road-bed adjacent to said tampers, and means 110 for operating said tampers.

In testimony whereof I affix my signature in presence of two witnesses.

GRAHAM H. CRAVENS.

Witnesses:
ALEX HEDERSTEDT,
J. C. CARLSON.