J. E. TOBIN.

TRACK ELEVATING AND BALLASTING MACHINE.

APPLICATION FILED APR. 2, 1919.

1,313,353.

Patented Aug. 19, 1919.

3 SHEETS—SHEET 1.

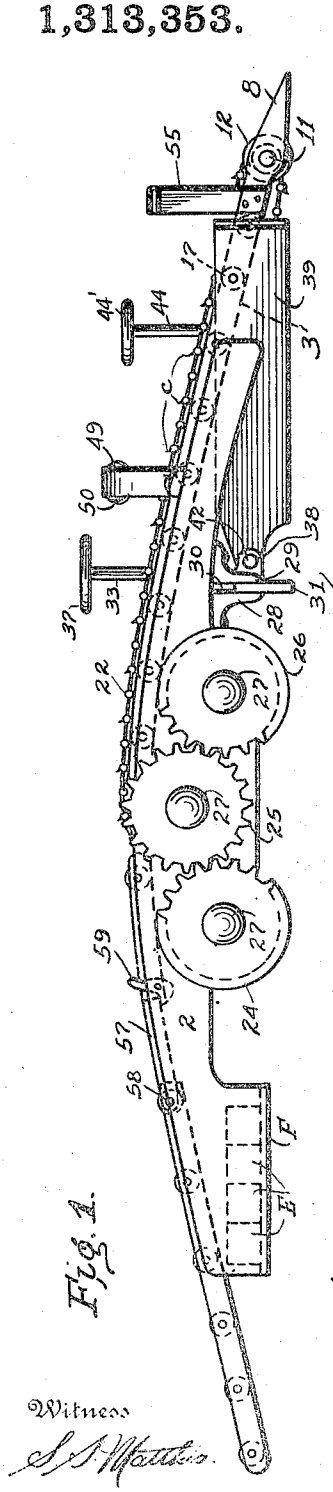


Fig. 1.

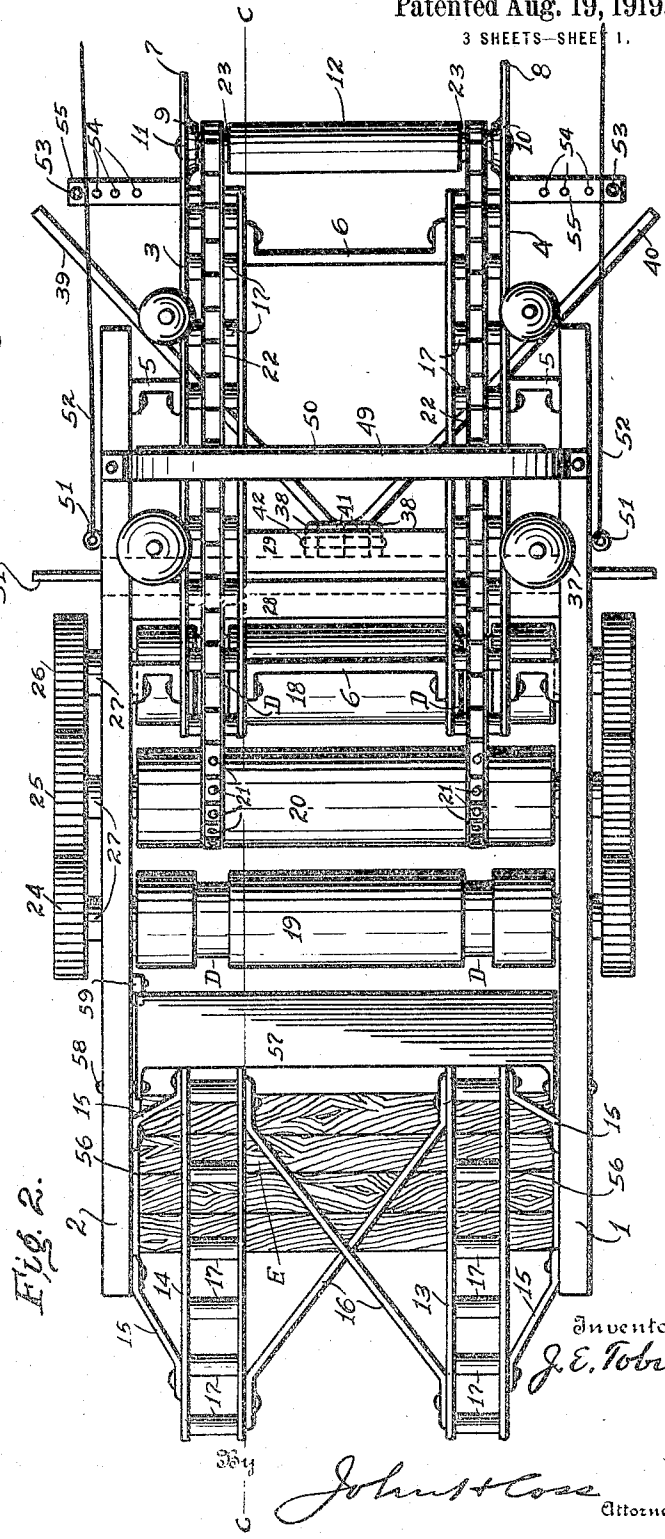


Fig. 2.

Witness

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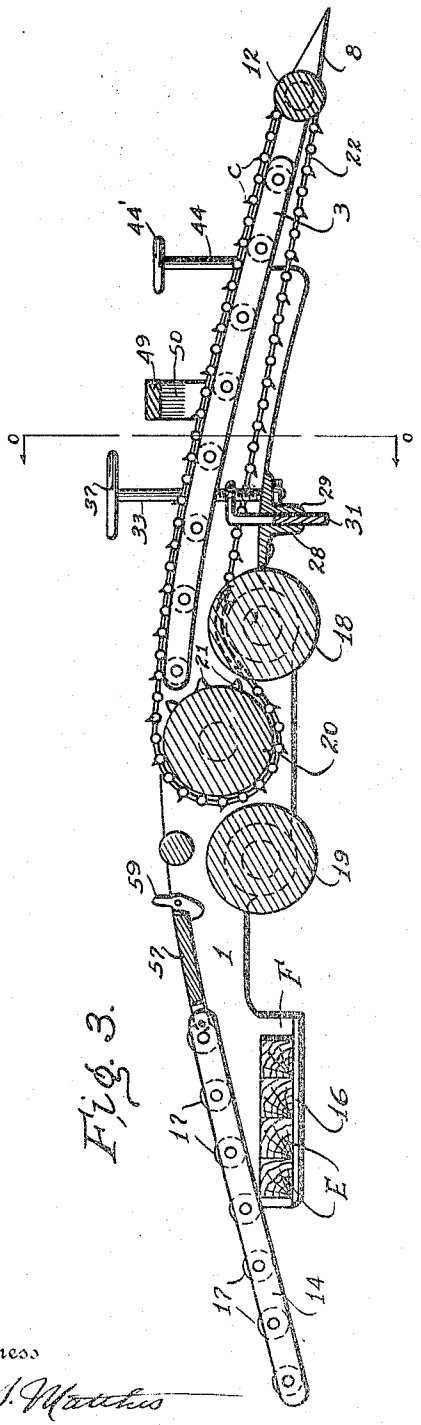


Fig. 3.

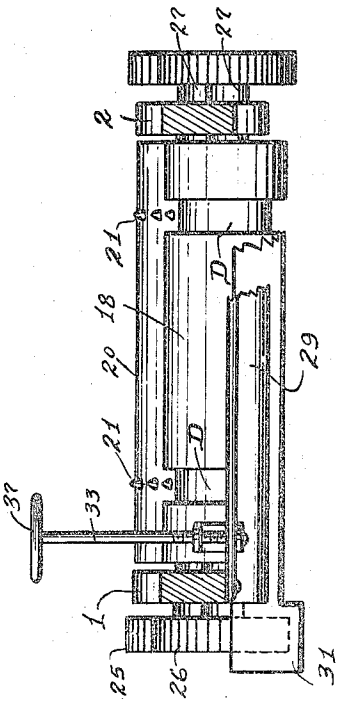


Fig. 4.

Witness

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3 SHEETS—SHEET 3.

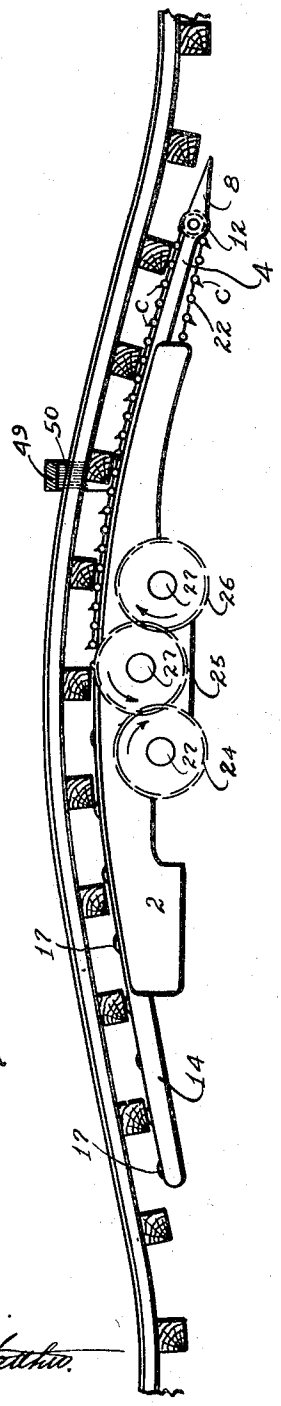


Fig. 5.

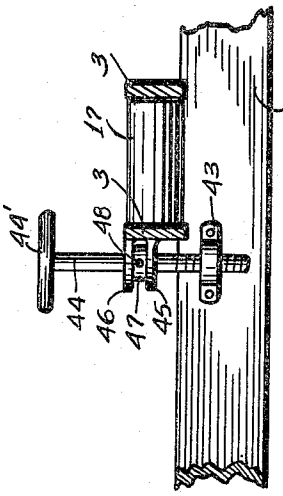


Fig. 6.

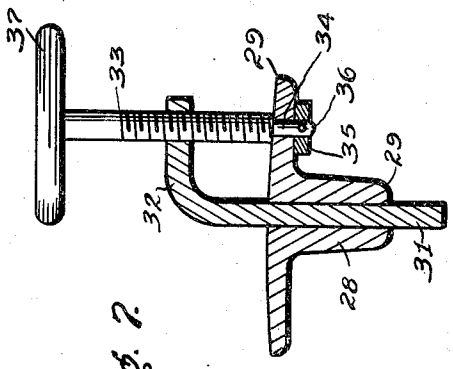


Fig. 7.

Witness

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UNITED STATES PATENT OFFICE.

JOHN EDWARD TOBIN, OF MANSFIELD, OHIO.

TRACK ELEVATING AND BALLASTING MACHINE.

1,313,353. Specification of Letters Patent. Patented Aug. 19, 1919.

Application filed April 2, 1919. Serial No. 287,018.

To all whom it may concern:

Be it known that I, JOHN EDWARD TOBIN, a citizen of the United States of America, residing at Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Track Elevating and Ballasting Machines, of which the following is a specification.

This invention relates to a track elevating and ballasting machine.

It is well known to those skilled in the art of leveling and ballasting the road beds of railroads and the like that the tracks are first elevated by hand operated jacks, and that the road bed is then ballasted and leveled by hand manipulation.

The primary object of the present invention is to construct a machine adapted to be placed and operated underneath the track of a railroad or the like at a predetermined point, and attaching same to any well known source of power for the purpose of imparting movement thereto, which machine when actuated will simultaneously elevate the track, gather and force into position the ballast which has been previously laid along side of and upon the road bed level and thoroughly pack the ballast into the road bed or the like.

These and other objects are attained by the mechanism illustrated in the accompanying drawings in which:

Figure 1 is a side elevation of the machine.

Fig. 2 is a plan view of the machine.

Fig. 3 is a longitudinal section of the machine taken on the line *c*—*c* of Fig. 2.

Fig. 4 is a cross section of the machine taken on the line *o*—*o* of Fig. 3.

Fig. 5 is a side elevation of the machine showing the position assumed by the track and ties when elevated by the machine and their relation thereto.

Fig 6 is a detailed view of the means provided for adjusting the gathering plates.

Fig. 7 is a detailed view of the means provided for adjusting the leveling plate.

In the drawings reference numerals 1 and 2 represent the side portions or bars of the frame work of the machine which portions or bars are preferably formed to incline toward the rear and front from the center thereof as shown in Figs. 1, 5 and 3. Roller frames 3 and 4 are provided and secured to the frame bars 1 and 2 by brackets 5. The roller frames are spaced apart to correspond with the gage of the track that it is desired to ballast, and they are secured together in spaced relation by braces 6. The roller frames are provided with tapered projecting portions 7 and 8 and they are enlarged at the points indicated by reference numerals 9 and 10 to provide suitable journals for the shaft 11 upon which the roller 12 is loosely mounted.

Roller frames 13 and 14 are securely attached to the frame bars 1 and 2 in the rear of the machine by braces 15 and 16. The roller frame attached to the frame bars in the front and the roller frame attached to the frame bars in the rear of the machine aline with each other and incline downwardly in opposite directions from the center toward the rear and front of the machine. The roller frames are preferably attached to the machine in such a position as to have their inner ends substantially abutting against each other as shown in Fig. 1. If desired one or more separately mounted rollers (not shown on the drawing) can be interposed between the inner ends of the roller frames thereby providing substantially continuous roller tracks from the front to the rear end of the machine.

A series of rollers 17 are journaled in the roller frames at predetermined distances apart as shown in Fig. 2. The frame work of the machine is carried by the rollers 18 and 19 the ends of which, or shafts, upon which they are mounted being journaled in suitable bearings formed in the frame bars 1 and 2. Intermediate of the rollers 18 and 19 another roller 20 is journaled to the frame bars 1 and 2 but at a higher plane than the rollers 18 and 19 as shown in Fig 1. The roller 20 is provided with a series of sprocket chain teeth 21 to receive sprocket chains 22 which travel over the teeth and the roller as shown in Fig. 2 and in the grooves 23 formed on the roller 12.

The rollers 18, 19 and 20 are geared to each other at each end by a train of gears 24, 25 and 26 which gears are mounted upon the reduced ends of the rollers or roller shafts 27. Adjacent to the front of the roller 18 an angle brace and guiding bar 28 is attached to the under portion of the frame bars 1 and 2. A similar angle brace and guiding bar 29 is attached to the under portion of the frame bars 1 and 2 and spaced apart from the angle bar 28 to leave a space 30 therebetween.

A leveling plate 31 of predetermined

width and length is fitted to be slidably adjusted in the space 30 as shown in Fig. 1. The plate 31 preferably extends beyond the outer ends of the ties. The plate 31 is provided with angular portions 32 having screw threaded apertures formed therein to engage similar screw threaded adjustable rods 33, the ends of which are reduced as shown at 34 to loosely fit an aperture formed in the angle brace and guiding bar 29. The rods 33 are held in position upon the brace and guiding bar 29 by the bolts or washers 35 provided on the reduced portions 34. The washers 35 are held in place by spring cotter pins 36 or the like.

When movement is imparted to either of the wheels 37 the bar 31 is raised or lowered at either end or both as desired by the operator for leveling purposes. Ears 38 are formed in spaced relation on the angle brace and guiding bar 29 and project toward the front of the machine.

Gathering plates 39 and 40 are provided with eyes 41 which eyes are interposed between the ears 38 and pivoted upon a pin 42 in such a manner as to leave the gathering plates diverging from their pivoted connection so as to extend over the ends of the ties as shown in Fig. 2.

To provide means of adjusting the gathering plates in a vertical direction and to support the free ends thereof brackets 43 are attached to the gathering plates 39 and 40 and are provided with screw threaded apertures to engage the screw threaded ends of rods 44. Brackets 45 and 46 are spaced apart and attached at a point on the roller frame that will bring them directly over the top of the brackets 43. Apertures are formed in the brackets to receive the rods 44 which pass through said apertures. Collars 47 are interposed between the brackets 45 and 46 and fitted to the rods 44. The screw threaded ends of the bars engage the screw threaded apertures in the brackets 43 thereby adjustably supporting the free ends of the gathering bars when the collars 47 are securely fastened to the bars 44 by the set screws 48.

A yoke member 49 is fastened to the top of the frame bars 1 and 2 as shown in Fig. 1, and a rotatable sweeper 50 is mounted in said yoke for a purpose which will be described hereinafter. To attach the machine to any source of power for imparting movement thereto screw eyes or the like 51 are secured to the machine and cables or the like 52 are attached thereto at one end and the opposite ends to any source of power.

The direction or pull of the cables when the machine is being pulled around a curve is regulated to compensate for any irregular or indirect pull when the machine is being pulled around the curve by pins 53 which are adjusted to change the relation of the cable with respect to the pull on the machine by changing the pins from one to another of the series of holes 54 formed in the bars 55. The rear portion of the machine is provided with shelves or supporting members 56 to provide a receptacle for supporting the ties.

A door 57 is hinged upon a pin 58 at the rear of the machine and held in its normal position by a latch 59 the purpose of which will be described hereinafter.

Attention is called to the fact that the present invention can be used to elevate the track, level and pack the ballast under a newly laid track and ties, and that it also can be used to perform the same functions on an old road bed.

The operation of the invention is as follows:

The fish plates that hold and fasten abutting rails together are removed so as to permit the separation and elevation of the ends of the rails. The track and ties are elevated in any well known manner to such a height as will permit the projecting tapered ends 7 and 8 of the frame to enter underneath the adjacent tie. The cables 52 are then attached to any source of power and the machine drawn forward forcing the machine to elevate the ties and rails which are attached thereto in contact with the prongs —C— provided on the sprocket chains.

As the machine is drawn forward the traction of the roller 18 imparts a rotating movement to the chains, thereby imparting movement to the intermediate roller 20 and roller 19 through the train of gears 24, 25 and 26. It will be noted that the gear 20 is driven in an opposite direction to that of the rollers 18 and 19. As the machine is drawn forward the prongs —C— which are secured to the sprocket chain bite and grip into the lower surfaces of the ties and tends to force the ties toward the rear of the machine. The friction of the chains in traveling over the roller tracks are minimized by the rollers 17. The ties and track are elevated to assume substantially the form shown in Figs. 1–3 and 5.

When the machine is being drawn forward the ballast which has been previously laid along the track is gathered up by the gathering plates 39 and 40 and forced to the proper position along the road bed. More or less of the macadam can be forced or carried along the road bed by the gathering arms by adjusting the free ends of the plates in a vertical direction by the manipulation of the handles of the wheels 44^1 (see Figs. 5 and 6).

Attention is called to the fact that the transverse leveling plate 31 which is arranged immediately in the rear of the gathering plates performs the function of level-

ing the ballast to a predetermined height. The leveling plate can be adjusted in a vertical direction by the manipulation of the wheels 37. The rollers 18 and 19 which are located in close proximity to the transverse plate 31 thoroughly pack the ballast into the road bed by their traction and weight. In order that the ballast may be provided with a ridge underneath the rails where the greatest weight is upon the road bed, grooves —D— are formed in the rollers 18 and 19. The grooves —D— formed in the roller 18 also permit a clearance for the sprocket chains permitting them to travel over the roller 18 without coming in contact with same. A number of ties —E— are usually placed in a receptacle —F— provided in the frame to receive them so that they can be withdrawn therefrom to replace a tie that has become worn out or defective from use or otherwise. When the ties are elevated as shown in Fig. 5 and a defective tie reaches a position in its travel directly over the door 57 the latch 59 is forced to pivot and the door then swings downwardly upon its hinge and the defective tie can then be removed from the rails and permitted to drop down through the opening normally closed by the door 57 into the receptacle from which it can be removed at a convenient time and place.

When the machine is elevating and ballasting a track around a curve the pins 55 are adjusted in the apertures 54 so as to exert an indirect pull on the machine to maintain and pull the machine around the curve in a central position under the track. This is accomplished by changing the angular relation of the pull of cables between their connections to the machine and their connections at the opposite ends to the source of power.

While the machine is in operation any ballast or other debris on the top surfaces of the ties is swept therefrom by the rotating sweeper 50.

I claim:

1. In a combined track elevating and ballasting machine, a frame, a roller provided with journals which are fitted to bearings arranged adjacent to the front end of the frame, and a pair of rollers secured to and adapted to movably support the frame.

2. In a combined track elevating and ballasting machine, a frame, a roller provided with journals which are fitted to bearings arranged adjacent to the front end of the frame, a pair of rollers secured to and adapted to movably support the frame, and a roller provided with sprocket teeth said roller being secured to the frame intermediate of said pair of rollers and geared thereto.

3. In a combined track elevating and ballasting machine, a frame, a roller provided with journals which are fitted to bearings arranged adjacent to the front end of the frame, a pair of rollers secured to and adapted to movably support the frame, a roller provided with sprocket teeth and secured to the frame intermediate of said pair of rollers and geared thereto, and sprocket chains provided with a plurality of prongs, said chains being adapted to engage the teeth on said last mentioned roller and to travel in grooves formed in the roller located at the front end of the machine.

4. In a combined track elevating and ballasting machine, a frame, a roller provided with journals which are fitted to bearings arranged adjacent to the front end of the frame, a pair of rollers secured to and adapted to movably support the frame, a roller provided with sprocket teeth and secured to the frame intermediate of said pair of rollers and geared thereto, sprocket chains provided with a plurality of prongs, said chains being adapted to engage the teeth on said last mentioned roller and to travel in grooves formed in the roller located at the front end of the machine, and a yoke mounted on the frame and provided with bearings and a sweeper having journals fitted to said bearings.

5. In a combined track elevating and ballasting machine, a frame, a roller provided with journals which are fitted to bearings arranged adjacent to the front end of the frame, a pair of rollers secured to and adapted to movably support the frame, a roller provided with sprocket teeth secured to the frame intermediate of said pair of rollers and geared thereto, sprocket chains provided with a plurality of prongs, said chains being adapted to engage the teeth on said last mentioned roller and to travel in grooves formed in the roller located at the front end of the machine, a yoke mounted on the frame and provided with bearings, a sweeper having journals fitted to said bearings, and roller frames secured to the main frame, and a series of rollers secured to the roller frames providing substantially continuous roller tracks lengthwise of the machine.

6. In a combined track elevating and ballasting machine, a frame, a roller provided with journals which are fitted to bearings arranged adjacent to the front end of the frame, a pair of rollers secured to and adapted to movably support the frame, a roller provided with sprocket teeth secured to the frame intermediate of said pair of rollers and geared thereto, sprocket chains provided with a plurality of prongs, said chains being adapted to engage the teeth on said last mentioned roller and to travel in grooves formed in the roller located at the front end of the machine, a yoke mounted on the frame and provided with bearings, a sweeper having journals fitted to said bearings, roller

frames secured to the main frame, a series of rollers secured to the roller frames providing substantially continuous roller tracks lengthwise of the machine, angle braces secured to the side bars of the main frame in spaced relation to each other and a leveling plate adjustably interposed between said angle plates.

7. In a combined track elevating and ballasting machine, a frame, a roller provided with journals which are fitted to bearings arranged adjacent to the front end of the frame, a pair of rollers secured to and adapted to movably support the frame, a roller provided with sprocket teeth secured to the frame intermediate of said pair of rollers and geared thereto, sprocket chains provided with a plurality of prongs, said chains being adapted to engage the teeth on said last mentioned roller and to travel in grooves formed in the roller located at the front end of the machine, a yoke mounted on the frame and provided with bearings, a sweeper having journals fitted to said bearings, roller frames secured to the main frame, a series of rollers secured to the roller frames providing a substantially continuous roller track lengthwise of the machine, angle braces secured to the side bars of the main frame in spaced relation to each other, a transverse leveling plate adjustably interposed between said angle plates, and means to support and adjust said leveling plate.

8. In a combined track elevating and ballasting machine, a frame, a roller provided with journals which are fitted to bearings arranged adjacent to the front end of the frame, a pair of rollers secured to and adapted to movably support the frame, a roller provided with sprocket teeth secured to the frame intermediate of said pair of rollers and geared thereto, sprocket chains provided with a plurality of prongs, said chains being adapted to engage the teeth on said last mentioned roller and to travel in grooves formed in the roller located at the front end of the machine, a yoke mounted on the frame and provided with bearings, a sweeper having journals fitted to said bearings, roller frames secured to the main frame, a series of rollers secured to the roller frames providing substantially continuous roller tracks lengthwise of the machine, angle braces secured to the side bars of the main frame in spaced relation to each other, a leveling plate adjustably interposed between said angle plates, means to support and adjust said leveling plate, and means to pivotally secure diverging gathering plates to one of said braces.

9. In a combined track elevating and ballasting machine, a frame, a roller provided with journals which are fitted to bearings arranged adjacent to the front end of the frame, a pair of rollers secured to and adapted to movably support the frame, a roller provided with sprocket teeth secured to the frame intermediate of said pair of rollers and geared thereto, sprocket chains provided with a plurality of prongs, said chains being adapted to engage the teeth on said last mentioned roller and to travel in grooves formed in the roller located at the front end of the machine, a yoke mounted on the frame and provided with bearings, a sweeper having journals fitted to said bearings, roller frames secured to the main frame, a series of rollers secured to the roller frames providing substantially continuous roller tracks lengthwise of the machine, angle braces secured to the side bars of the main frame in spaced relation to each other, a leveling plate adjustably interposed between said angle plates, means to support and adjust said leveling plate, gathering plates, means to pivotally secure said gathering plates to one of said braces, and means to support and adjust the free ends of the gathering plates.

10. In a combined track elevating and ballasting machine, a frame, a roller provided with journals which are fitted to bearings arranged adjacent to the front end of the frame, a pair of rollers secured to and adapted to movably support the frame, a roller provided with sprocket teeth and secured to the frame intermediate of said pair of rollers and geared thereto, sprocket chains provided with a plurality of prongs, said chains being adapted to engage the teeth on said last mentioned roller and to travel in grooves formed in the roller located at the front end of the machine, a yoke mounted on the frame and provided with bearings, a sweeper having journals fitted to said bearings, roller frames secured to the main frame, a series of rollers secured to the roller frames providing substantially continuous roller tracks lengthwise of the machine, angle braces secured to the side bars of the main frame in spaced relation to each other, a leveling plate adjustably interposed between said angle braces, means to support and adjust said leveling plate, gathering plates, means to pivotally secure said gathering plates to one of said braces, means to support and adjust the free ends of the gathering plates, and means to connect the machine to a source of power which can be changed to vary the direction of the pull.

11. In a combined track elevating and ballasting machine, in combination, means to elevate the track and super-structure, means to gather ballast previously laid along the track and to place same in a proper place on the road bed, adjustable means to regulate the grade or level of said ballast, means to pack the ballast into the road bed and means to engage the superstructure of the road bed when movement is imparted to the above described mecha-

nism, all of the above described means being so arranged as to coöperate with each other and operate automatically and simultaneously.

12. In a combined track elevating and ballasting machine, in combination, means to elevate the track and super-structure, means to gather ballast previously laid along the track and to place same in a proper place on the road bed, adjustable means to regulate the grade or level of said ballast, means to pack the ballast into the road bed, means to engage the super-structure of the road bed when movement is imparted to the above described mechanism, all of the above described means being so arranged as to coöperate with each other and operate automatically and simultaneously, and sweeping means arranged to coöperate simultaneously with the above described means.

13. In a combined track elevating and ballasting machine, means to elevate the track and super-structure, means to gather ballast laid along the track to a predetermined position, means to level said ballast, means to pack the ballast in the road bed so as to leave ridges alined with the track all of said means being mounted on a frame inclining from the center toward the rear and front of the machine, a roller mounted in the forward end of the machine and means traveling over said roller carrying prongs which are adapted to engage the ties and tend to move them rearward while the machine is moving forward.

14. In a combined track elevating and ballasting machine, a main frame having a roller secured to the frame at its front end, a pair of rollers mounted on the frame to movably support and carry same, a third roller provided with sprocket teeth, sprocket chains connecting the front roller and third roller, said sprocket chains being provided with prongs to bite into and grip the ties when movement is imparted to the machine.

15. In a combined track elevating and ballasting machine, a main frame having a roller secured to the frame at its front end, a pair of rollers mounted on the frame to movably support and carry same, a third roller provided with sprocket teeth, sprocket chains connecting the front roller and third roller, said sprocket chains being provided with prongs to bite into and grip the ties when movement is imparted to the machine, and means to gather the ballast and distribute same along the road bed.

16. In a combined track elevating and ballasting machine, a main frame having a roller secured to the frame at its front end, a pair of rollers mounted on the frame to movably support and carry same, a third roller provided with sprocket teeth, sprocket chains connecting the front roller and third roller, said sprocket chain being provided with prongs to bite into and grip the ties when movement is imparted to the machine, means to gather the ballast and distribute same along the road bed, and means to regulate the height of and level the ballast along the road bed.

17. In a combined track elevating and ballasting machine, a main frame having a roller secured to the frame at its front end, a pair of rollers mounted on the frame to movably support and carry same, a third roller provided with sprocket teeth, sprocket chains connecting the front roller and third roller, said sprocket chain being provided with prongs to bite into and grip the ties when movement is imparted to the machine, means to gather the ballast and distribute same along the road bed, means to regulate the height of and level the ballast along the road bed, and roller tracks provided on the machine to support the sprocket chains.

18. In a combined track elevating and ballasting machine, a main frame having a roller secured to the frame at its front end, a pair of rollers mounted on the frame to movably support and carry same, a third roller provided with sprocket teeth, sprocket chains connecting the front roller and third roller, said sprocket chains being provided with prongs to bite into and grip the ties when movement is imparted to the machine, means to gather the ballast and distribute same along the road bed, means to regulate the height of and level the ballast along the road bed, roller tracks provided on the machine to support the sprocket chains, and a sweeper mounted on the frame to sweep the ballast from the ties.

19. In a combined track elevating and ballasting machine, a main frame having a roller secured to the frame at its front end, a pair of rollers mounted on the frame to movably support and carry same, a third roller provided with sprocket teeth, sprocket chains connecting the front roller and third roller, said sprocket chains being provided with prongs to bite into and grip the ties when movement is imparted to the machine, means to gather the ballast and distribute same along the road bed, means to regulate the height of and level the ballast along the road bed, roller tracks provided on the machine to support the sprocket chains, a sweeper mounted on the frame, and a receptacle for receiving and carrying ties.

20. In a combined track elevating and ballasting machine, a main frame, a roller secured to the frame at its front end, a pair of rollers mounted on the frame to movably support and carry same, a third roller provided with sprocket teeth, sprocket chains connecting the front roller and third roller, said sprocket chains being provided with

prongs to bite into and grip the ties when movement is imparted to the machine, means to gather the ballast and distribute same along the road bed, means to regulate the height of and level the ballast along the road bed, roller tracks provided on the machine to support the sprocket chains, a sweeper mounted on the frame, a receptacle for receiving and carrying ties, and means for opening or closing communication to the tie receptacle.

21. In a combined track elevating and ballasting machine, means for elevating the tracks, means for gathering the ballast in position on the road bed, means for leveling the ballast, and means for packing the ballast in the road bed, and means for engaging the super-structure whereby a rearward pressure is exerted thereon while the machine is moving forward.

22. In a combined track elevating and ballasting machine, means for elevating the tracks, means for gathering the ballast in position on the road bed, means for leveling the ballast, means for packing the ballast in the road bed, and means for engaging the super-structure whereby a rearward pressure is exerted thereon while the machine is moving forward, all of said means being so arranged and constructed as to automatically and simultaneously operate together.

23. In a combined track elevating and ballasting machine, means for elevating the tracks, means for gathering the ballast in position on the road bed, means for leveling the ballast, means for packing the ballast in the road bed, and means for engaging the super-structure whereby a rearward pressure is exerted thereon while the machine is moving forward, all of said means being so arranged and constructed as to automatically and simultaneously operate together, and means to connect the machine to a source of power for imparting movement to the machine.

24. In a combined track elevating and ballasting machine, means for elevating the tracks, means for gathering the ballast in position on the road bed, means for leveling the ballast, means for packing the ballast in the road bed, all of said means being so arranged and constructed as to automatically and simultaneously operate together, means to connect the machine to a source of power for imparting movement to the machine, and means associated with the connecting means to vary the pull of the connecting means on the machine.

25. A combined track elevating and ballasting machine for railroads comprising means of elevating the rails, leveling and packing the ballast in the road bed and means for engaging the super-structure whereby a rearward pressure is exerted thereon while the machine is moving forward.

26. A ballasting machine for road beds comprising means to gather ballast, means to level same, and means to pack the ballast into the road bed and means for engaging the super-structure whereby a rearward pressure is exerted thereon while the machine is moving forward.

27. In a combined track elevating and ballasting mechanism comprising a frame inclining forward and rearward from the center thereof, means to gather the ballast and force same to a predetermined point along the road bed of the track, means to level said ballast and means to pack said ballast into the road bed, all of said means being constructed and arranged to operate underneath the track and super-structure of the road bed.

28. In a combined track elevating and ballasting mechanism comprising a frame inclining forward and rearward from the center thereof, means to gather the ballast and force same to a predetermined point along the road bed of the track, means to level said ballast, means to pack said ballast into the road bed, all of said means being constructed and arranged to operate underneath the track and super-structure of the road bed, and means to engage the superstructure of the road bed tending to force it rearward while the machine is moving forward.

In testimony whereof I affix my signature.

JOHN EDWARD TOBIN.