Oct. 5, 1926. 1,602,023

G. E. HIGGINSON

TRACKWAY MAINTENANCE MACHINE

Filed Dec. 11, 1925 4 Sheets-Sheet 1

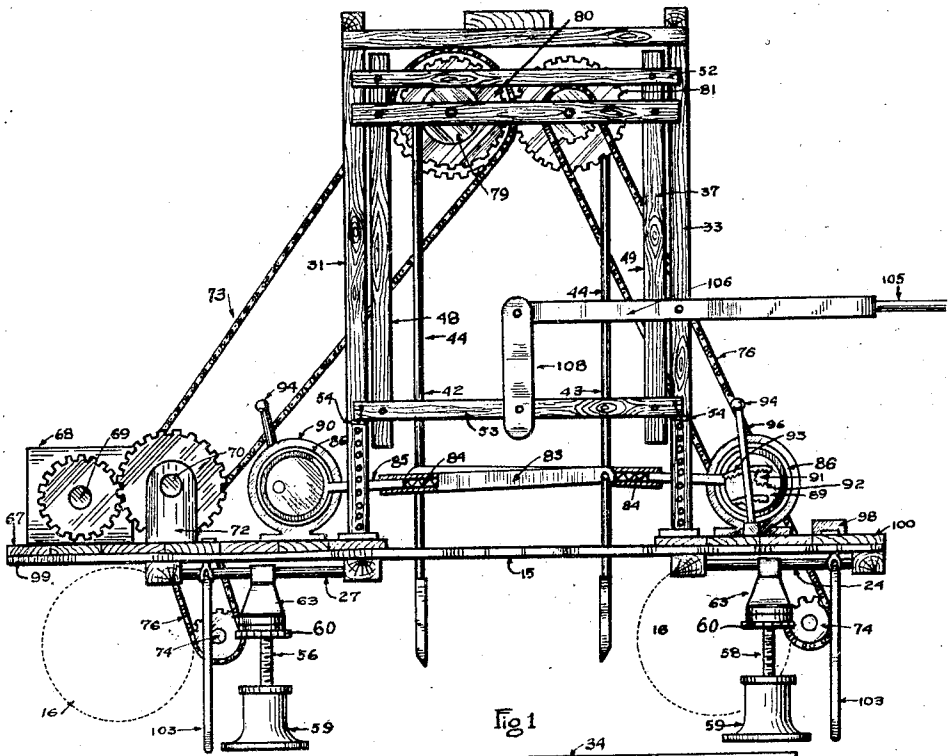


Fig 1

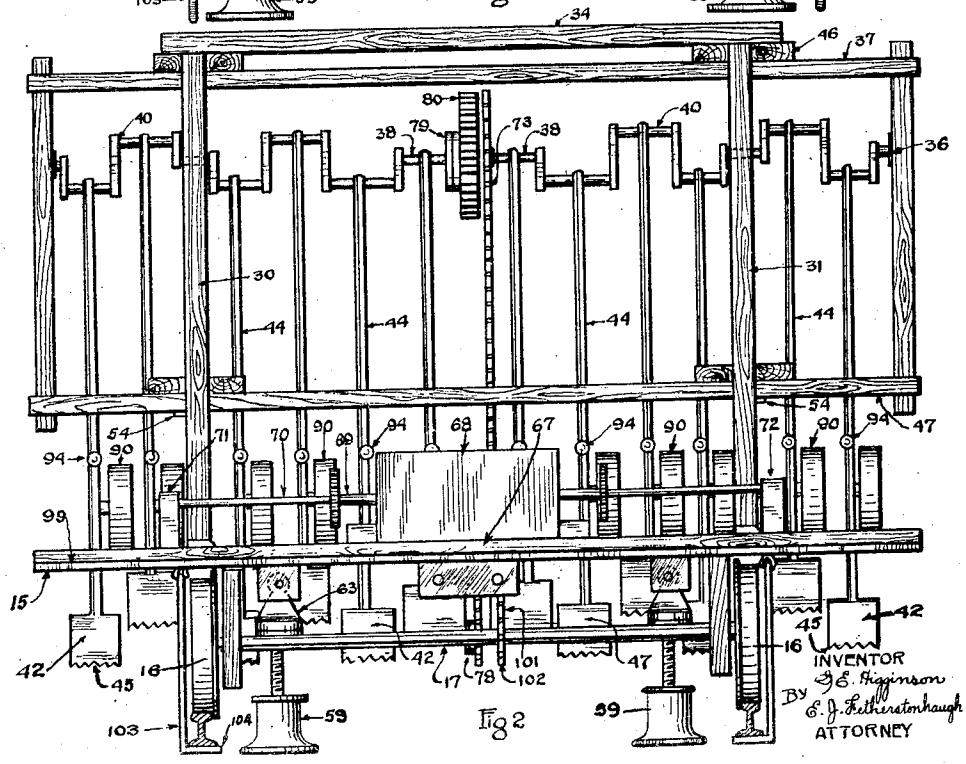


Fig 2

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Filed Dec. 11, 1925 4 Sheets-Sheet 2

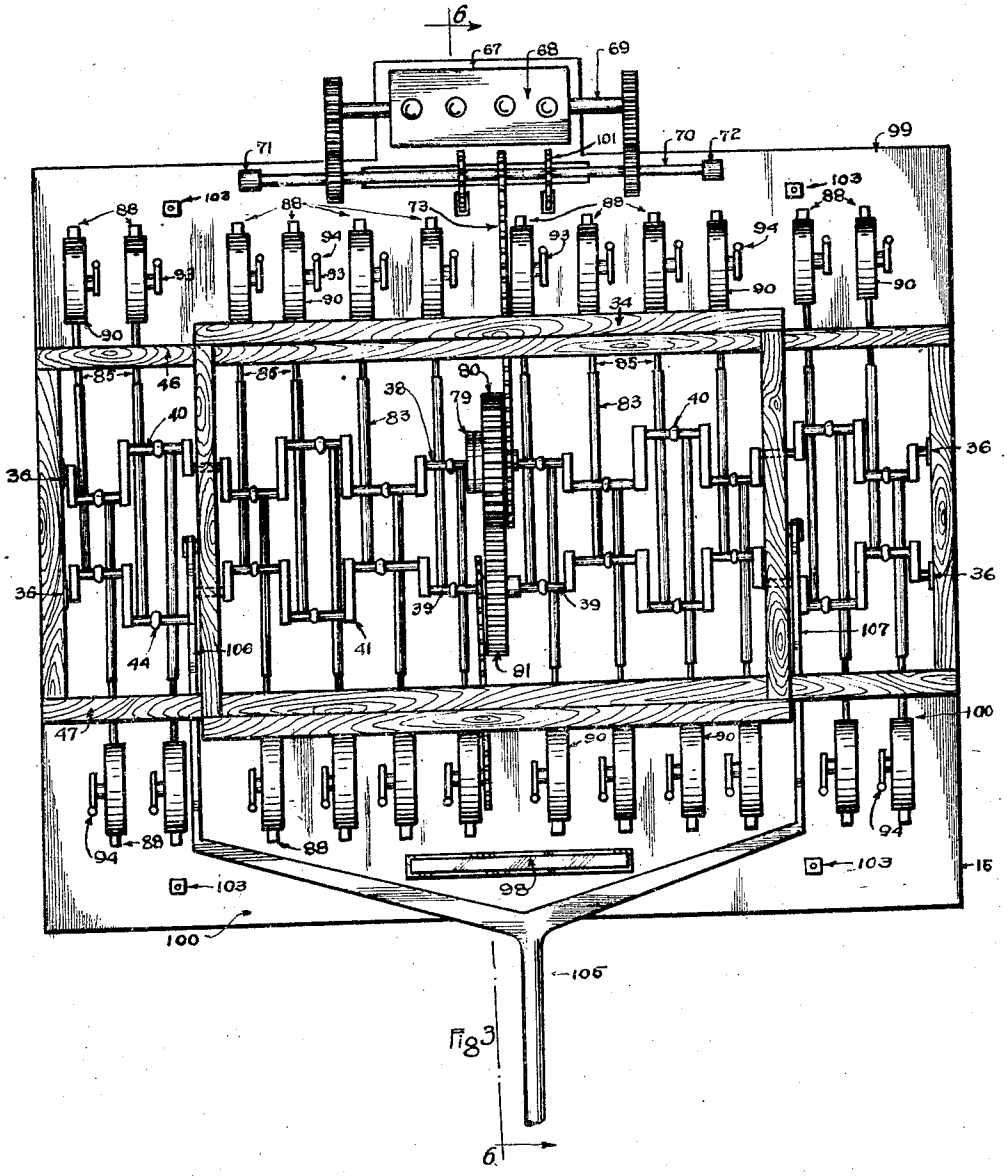


Fig 3

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TRACKWAY MAINTENANCE MACHINE

Filed Dec. 11, 1925 4 Sheets-Sheet 3

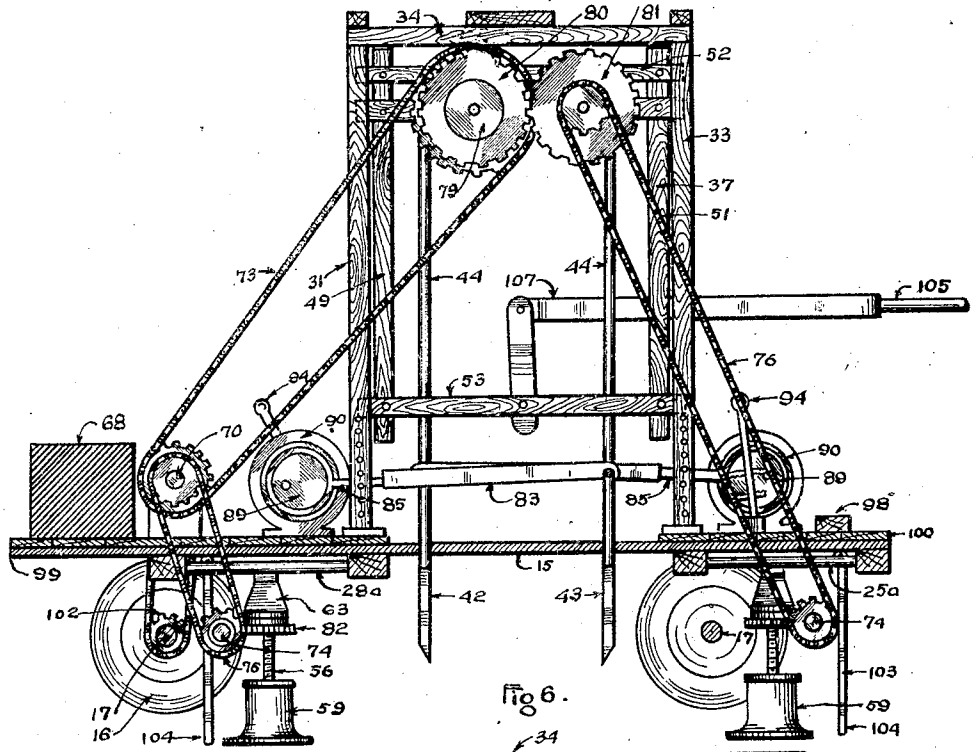


Fig 6.

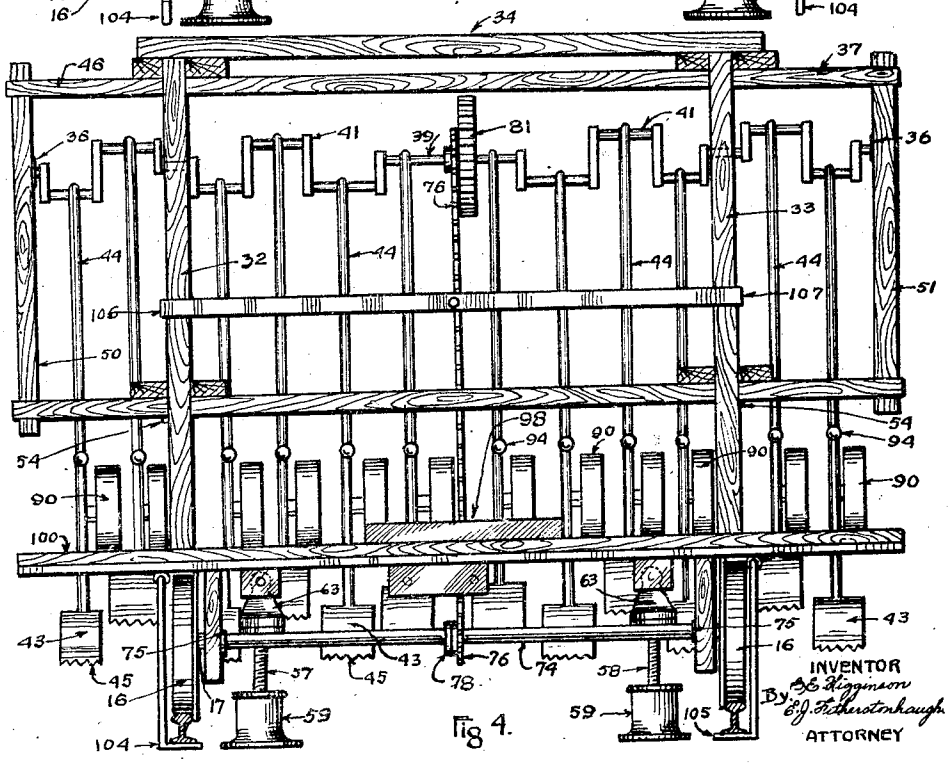


Fig 4.

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TRACKWAY MAINTENANCE MACHINE.

Filed Dec. 11, 1925 4 Sheets-Sheet 4

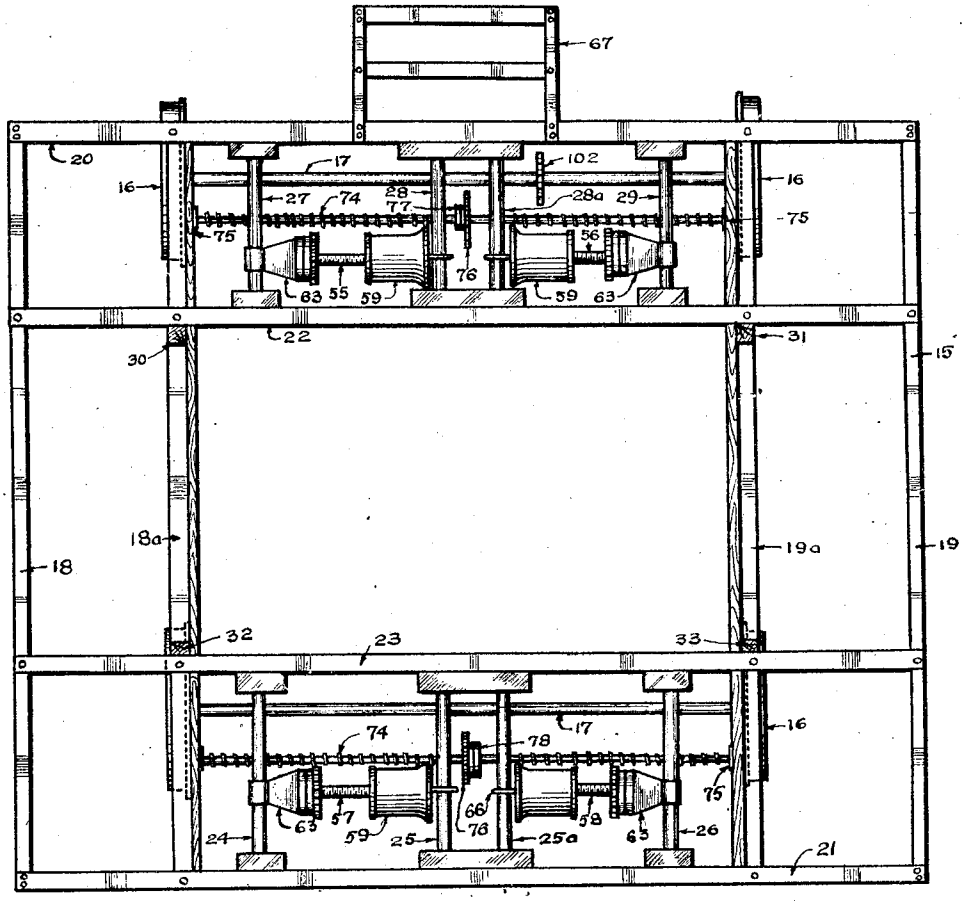


Fig 5.

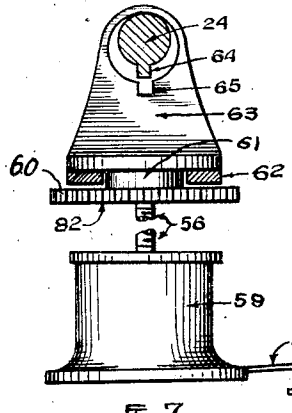


Fig 7.

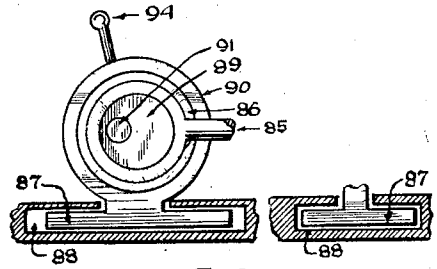


Fig 8.

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Patented Oct. 5, 1926. 1,602,023

UNITED STATES PATENT OFFICE.

GEORGE EDWARD HIGGINSON, OF CALUMET, QUEBEC, CANADA.

TRACKWAY-MAINTENANCE MACHINE.

Application filed December 11, 1925. Serial No. 74,759.

The invention relates to a trackway maintenance machine, as described in the present specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially of the novel features of construction pointed out broadly and specifically in the claims for novelty following a description containing an explanation in detail of an acceptable form of the invention.

The objects of the invention are to effect repair work on railway tracks at a minimum cost and in quick order; to avoid interruption of traffic on railway lines; to insure a perfectly level trackway; to eliminate much handling of the ties in levelling operations; to enable the railroad companies to increase the efficiency of their organizations for road maintenance and reduce the expenses thereof; and generally to provide good service in that department pertaining to the upkeep of the trackways and furnish for the purpose a reliable portable machine readily moved to the scene of operations and of light and economical, though durable construction.

In the drawings, Figure 1 is a side elevation of a truck showing the machine thereon.

Figure 2 is a front elevation of the truck and the machine.

Figure 3 is a plan view of the machine.

Figure 4 is a rear elevational vew of the machine.

Figure 5 is a plan view of the frame.

Figure 6 is a cross sectional view on the line 6—6 in Figure 3.

Figure 7 is a detail of the jack and mounting.

Figure 8 is a detail of the adjusting mechanism for the connecting rods.

Like numerals of reference indicate corresponding parts in the various figures.

Referring to the drawings, the numeral 15 indicates the truck frame mounted on the wheels 16 and axles 17 in a substantially similar manner to railway road car construction and formed of the outer side rails 18 and 19, the front and rear rails 20 and 21 respectively, the transverse intermediate rails 22 and 23, the longitudinal bars 24, 25 and 26 from the rail 21 to the rail 23 and the longitudinal bars 27, 28 and 29 from the rail 20 to the rail 22.

The uprights 30, 31, 32 and 33 are rigidly secured to the rails 18^a, 19^a, 22 and 23 and the uprights at their upper end are joined by the four sided frame 34 and braced at the sides by the bars 35.

The crank shaft bearings 36 are secured to the elevatable machine frame 37 and in these bearings the parallel crank shafts 38 and 39 having the numerous cranks 40, and 41 are journalled. To these cranks 40 and 41, the excavating and tamping shovels 42 and 43 are pivotally secured through their handles 44, these shovels preferably having the serrated digging edges 45 reaching at each stroke below the surface of the ground to the extent of the thickness of the railway tie and therebelow to a sufficient depth for tamping purposes. The elevatable frame 37 is formed of the longitudinal bars 46 and 47, the vertical bars 48, 49, 50, and 51, and the double end bars 52, and 53 at both ends and sliding in the uprights 30, 31, 32 and 33.

At the tamping depth the machine frame is resting on the truck frame and may be held thereto or thereabove by the pins 54 for the various operations.

The jack screws 55, 56, 57 and 58 are secured in the bases 59, which engage the ground in the operation of the machine. Each jack screw carries a nut 60 and form the rail elevating members. The nuts have the journal bosses 61 engaging the recessed bearings 62 in the lower ends of the heads 63, which are pivotally secured to the bars 24, and 26 and to the bars 27 and 29, the said bars having a key 64 from the under side of each of them registering with a key slot 65 in each head 63, for lifting operations.

The jacks swing upwardly in their travelling positions and are held to the bars 25 and 28 by the hooks 66 or like fastener.

The motor bracket 67 forms an extension from the front of the truck frame 15 and supports the motor 68 and the counter shafts 69 and 70 and bearings 71 and 72 therefor are supported adjacent thereto and are operatively connected to the crank shaft 38 by the chain and sprocket mechanism 73 and to the worm 74, journaled in the bearings 75 by the chain and sprocket mechanism 76.

The worms 74 are connected and disconnected through clutches 77 and 78 respectively and the crank shafts are connected and disconnected through the clutch 79 on the shaft 38, the latter driving the shaft 39 through the gears 80 and 81.

The worms 74 coact with the worm wheels 82 on the nuts 60 in raising the rails.

The adjustment of the shovels 42 and 43 is done by means of the connecting rods 83 pivotally secured to the shovel handles 45, these rods 83 being telescopically and resiliently held by the springs 84 in the eccentric rods 85 extending outwardly from the straps 86 the latter forming part with the bases 87, which are slidably mounted in the slideways 88 secured to the machine frame. The eccentrics 89 enclosed in the straps 86 are journaled in the casings 90 and their shafts 91 carry the gears 92 which coact with the racks 93 riveted to the levers 94.

The levers 94 are pivoted on the truck frame at their lower ends and therefore will turn the eccentrics within the straps and slide the latter forwardly and backwardly. Each lever is operated in a quadrant 95 having a latch 96 for locking purposes.

The spirit levels 97 and 98 are secured to the truck frame and are made with graduations to indicate the level of the rail lines in relation one to another for determining the proper transverse inclination of the trackway in rounding curves as well as fixing the level on the straight-a-way stretches.

The platforms 99 and 100 are supported by the truck frame for the operators to attend to all matters in the elevating and lowering of the machine frame and the adjusting of the various parts.

The truck drive is arranged from the motor shaft to the truck axle through the chain 100 and sprocket 101 and 102, said chain having a hooked link for detaching the drive during maintenance operations.

To raise the rails the tie rods 103 having hooked lower ends 104 are secured to the truck frame over the trackway rails and are four in number, so that the truck and rails can be made a unit for lifting operations from the ground by means of the jacks.

The elevatable frame is lifted by means of the lever handle 105 and is pivoted in the rigid rear uprights from the truck frame 15, through the lever sections 106 and 107, said lever sections extending inwardly into the elevatable frame and having pivotal connections with the lower bars thereof, through the links 108, therefore by applying pressure to the handle 105 the shovel frame is lifted and the shovels adjusted and set in working position.

The chain and sprocket connections may be loose enough to permit the raising of the shovel frame and if too slack, an idler in each may be employed to maintain the drives.

In the operation of this machine the maintenance crew drive the truck out to the stretch of road to be levelled under its own power, which may be by a chain and sprocket connection to the motor shaft, as described the chain being removed so that there is no interference with the movement of the machine frame for the levelling work.

The gravel of the road bed is preferably loosened by hand work, then the machine frame which has been raised by means of the lever 104, is adjusted in order to position the shovels and during this operation the crank shafts are declutched.

The lowering of the frame is accomplished by the lever as aforesaid or by any other suitable means. At the proper level for digging purposes the frame stops and the crank shaft is connected and the worms declutched, then the levers operating the eccentrics are adjusted to bring the tie properly within the shovels. The motor is now started again and the crank shaft imparts a natural digging and tamping motion to each of the many shovels, until the proper depth is reached, when the truck frame and machine frame come together.

The tie rods are now inserted at their hooked ends under the two lines of rails and as these rods are secured at their upper ends to the truck frame, the jacking up of the latter will pull on the track rail lines, consequently the rails and truck frame are lifted together from the ground and as the shovels are meanwhile working to capacity, the gravel and earth are tamped under the tie which is thus brought up to the raised rail, and tightly packed thereunder.

This operation may be continued with all the ties requiring to be raised to the level of the lifted rails thus providing a rapid means of levelling the complete section of trackway being operated by the maintenance crew.

What I claim is:—

1. In a trackway maintenance machine, a truck having a suitable frame, a machine frame mounted on said truck frame, tie rods adapted to fasten said frames to the trackway rails, oscillating shovels suspended in said machine frame, adjustable connecting rods engaging the shovel members, intermediately of their suspension, jacks adapted to lift said frames and rails and a motor operatively connected to the moving parts.

2. In a trackway maintenance machine, a truck having a suitable frame, a machine frame mounted on said truck frame, tie rods adapted to fasten said frames to the trackway rails, a crank shaft journalled on said machine frame, shovels having handles pivotally mounted on the cranks of said shaft, connecting rods pivotally secured to said handles and adjustably mounted on said machine frame, jack screws having nuts engaging said machine frame, and a motor operatively connected to said crank shaft and to said jack nuts.

3. In a trackway maintenance machine, a truck and truck frame, an elevatable machine

frame having end and side bars, uprights, braces and struts, shaft bearings secured to the upper structure of said machine frame, means for slidably securing said frames to one another, a crank shaft journalled in said machine frame, shovels having handles pivotally secured to the cranks of said crank shaft and suspended therefrom, jack screws mounted on bases and extending upwardly and pivotally mounted on said truck frame and having nuts, worms engaging said nuts and journalled on said truck frame, tie bars from said truck frame having hooks adapted to engage the trackway rails and a motor connected to the crank shaft and worm.

4. In a trackway maintenance machine, parallel crank shafts, a slidable frame mounted in said truck frame and supporting transverse bearings for said shafts, oscillatory shovels having handles secured to said cranks, eccentrics operated by levers and having slidable straps, connecting rods from said straps to said handles and resiliently joined to said straps to draw said shovels from opposite sides, and means for driving said shafts.

5. In a trackway maintenance machine, a truck frame and a machine frame slidably mounted thereon and having guides extending into corresponding guideways in the truck frame, locking pins adapted to secure said guides to the elevated positions, digging and tamping members suitably driven and means for raising and lowering said machine frame.

6. In a trackway maintenance machine, a truck frame and a machine, frame slidably mounted thereon and having guides extending into corresponding guideways in the truck frame, locking pins adapted to secure said guides to the elevated positions, digging and tamping members suitably driven, a lever mechanism linked to said slidable frame and fulcrumed on the uprights of said truck frame.

7. In a trackway maintenance machine, a truck frame and a machine, frame slidably mounted thereon, and having guides extending into corresponding guideways in the truck frame, locking pins adapted to secure said guides to the elevated positions, digging and tamping members suitably driven and worm driven jacks distributed in said frames and adapted to lift the truck and rails bodily.

8. In a trackway maintenance machine, a truck frame and a machine, frame slidably mounted thereon, and having guides extending into corresponding guideways in the truck frame, locking pins adapted to secure said guides to the elevated positions, digging and tamping members suitably driven, and worm driven jacks having screw shafts rising from bases and rotatable nuts with worm wheels and turning in bearings provided at the lower ends of jack heads pivotally attached to the truck frame.

9. In a trackway maintenance machine, a truck frame and a machine frame slidably mounted thereon, and having guides extending into corresponding guideways in the truck frame, locking pins adapted to secure said guides to the elevated positions, digging and tamping members suitably driven, and jack screws secured in bases and extending to the truck frame, nuts rotatable on said screws and having worm wheels thereon and upper journal surfaces, jack feet secured to the machine frame and extending downwardly therefrom and having in the under side recessed bearings for said nuts and worm shafts journalled in said machine frame and parallel and having worms engaging said worm wheels and suitably driven.

10. In trackway maintenance machines, shovel operating means including upper and lower frames and means for raising and lowering the former together with means for controlling the lowering apart from the driving means.

Signed at Montreal, Canada, this 30th day of October, 1925.

GEORGE EDWARD HIGGINSON.