July 4, 1933. J. B. JARMIN 1,916,222

ROAD MACHINE

Filed March 28, 1932 9 Sheets-Sheet 1

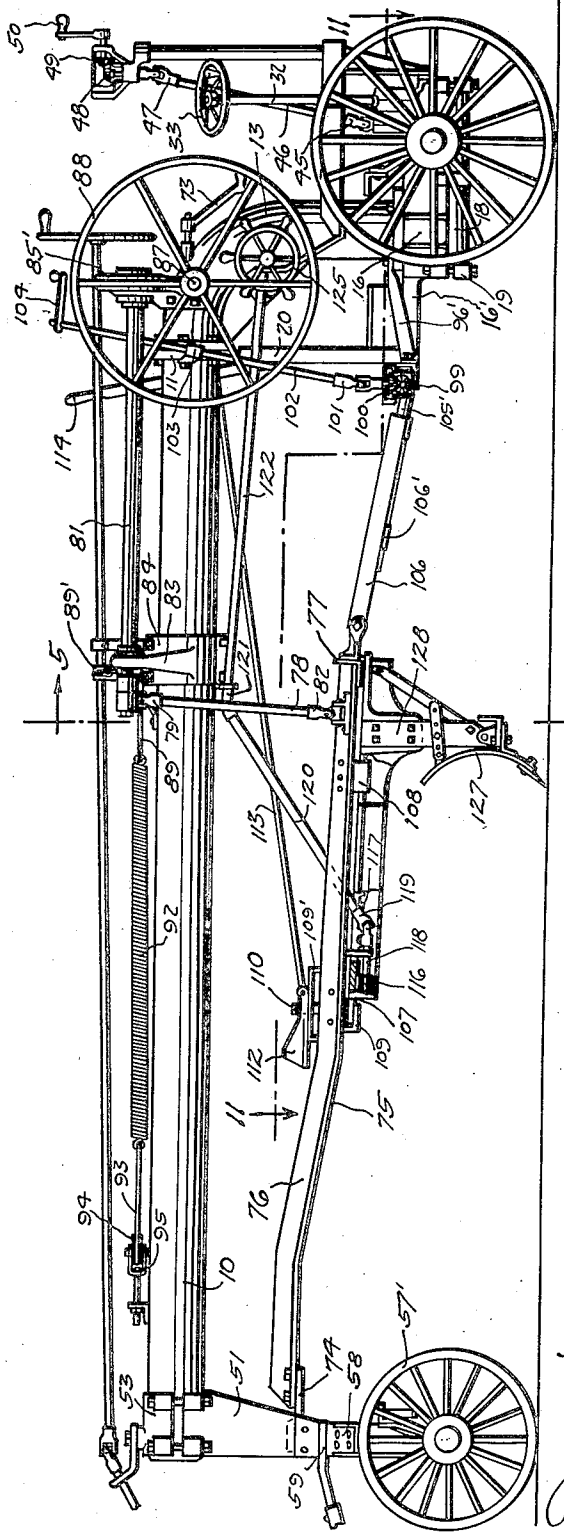


Fig. 1

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ROAD MACHINE

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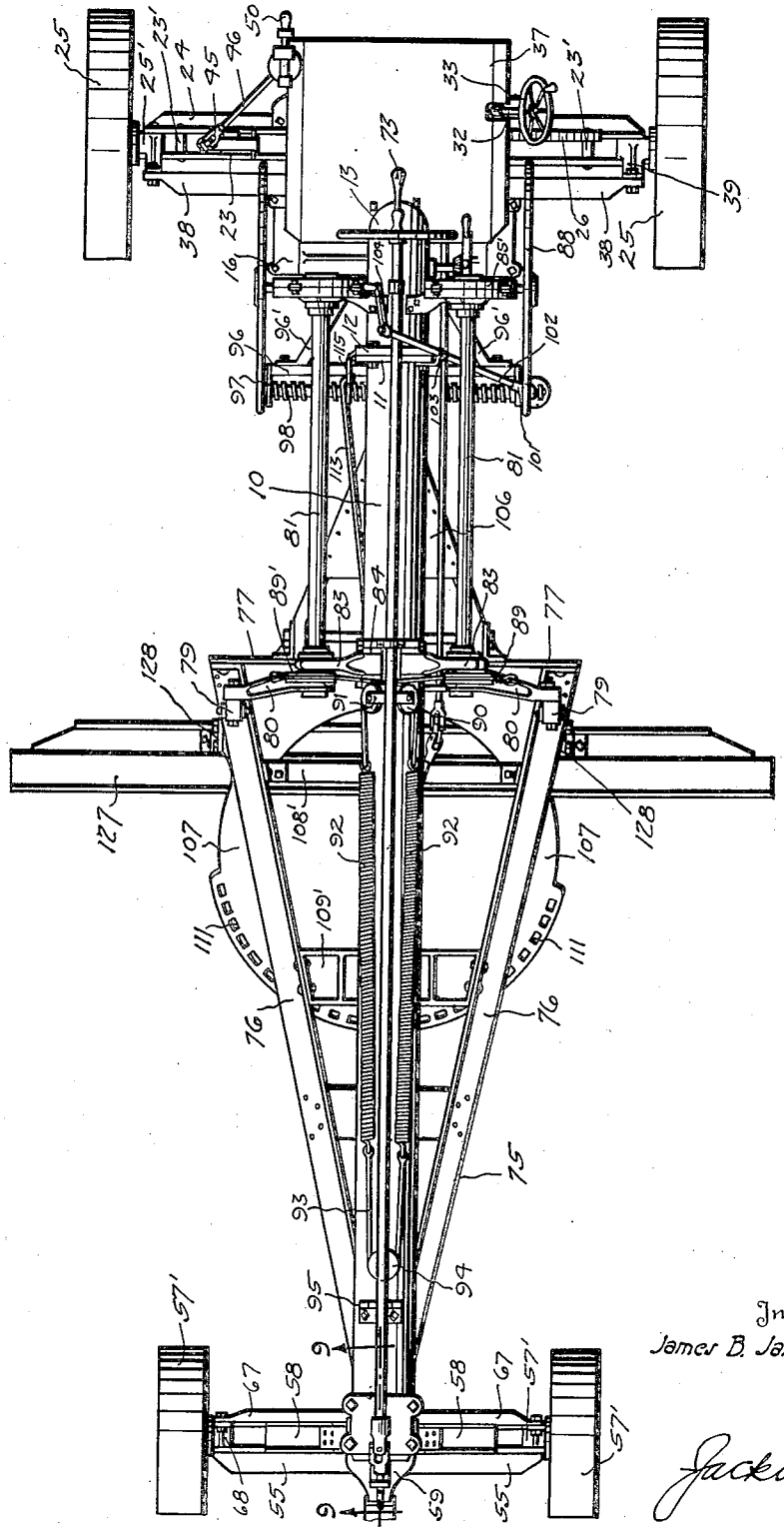


Fig. 2

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ROAD MACHINE

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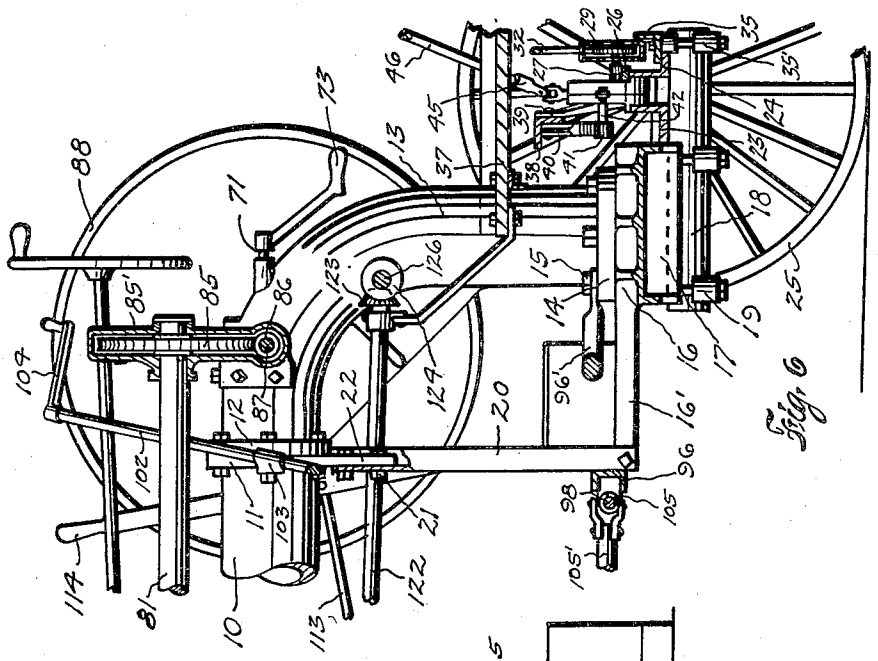


Fig. 6

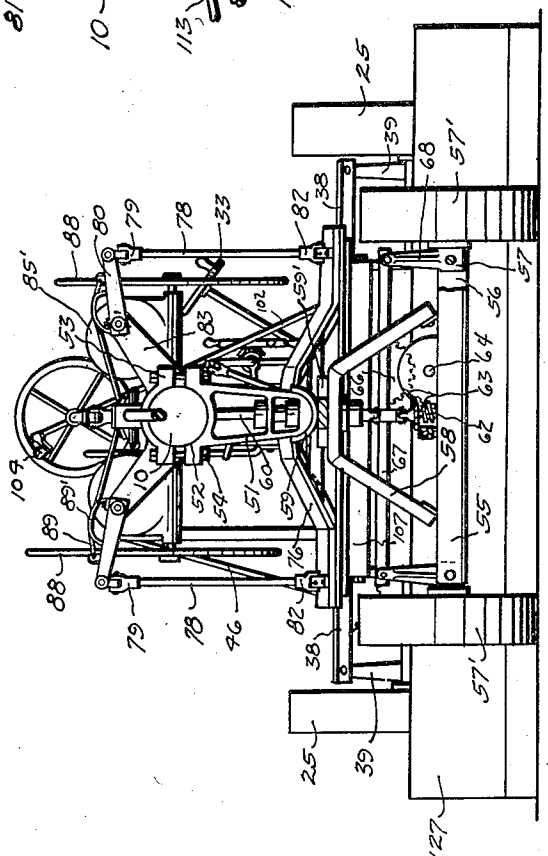


Fig. 3

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ROAD MACHINE

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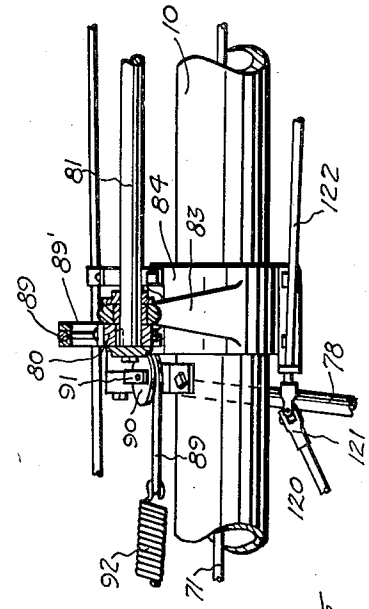


Fig. 7

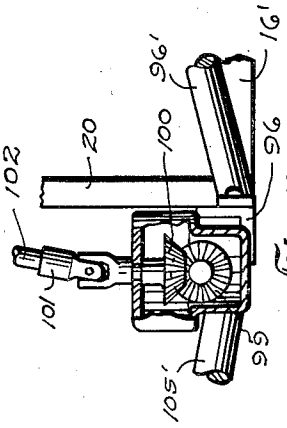


Fig. 10

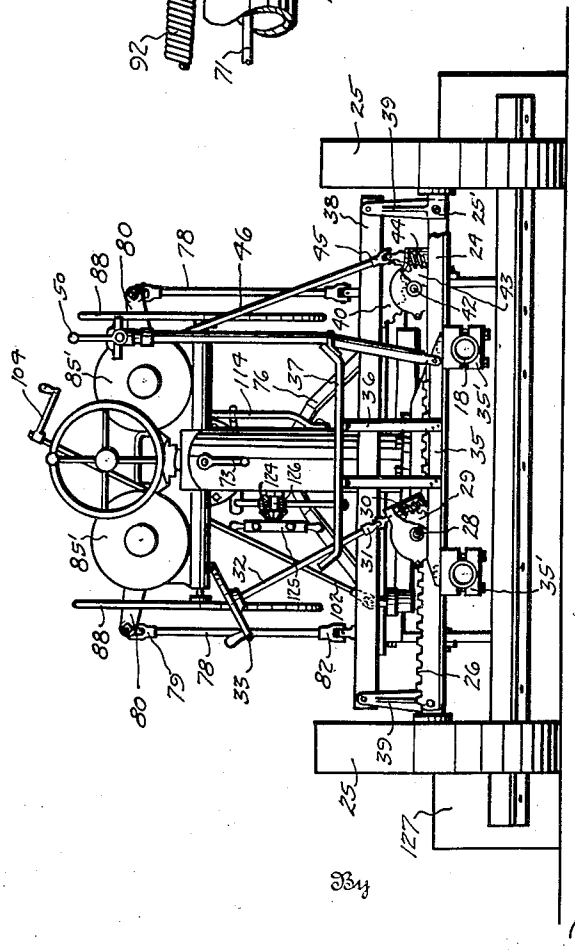


Fig. 4

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ROAD MACHINE

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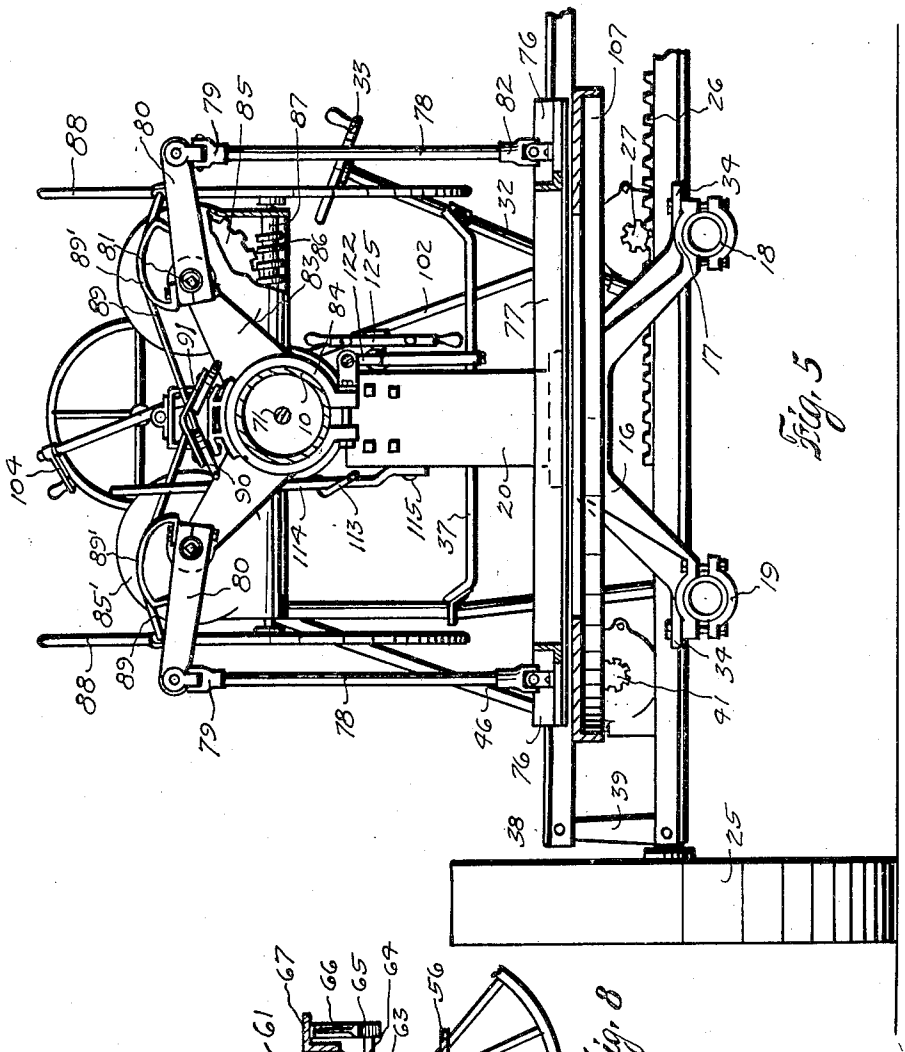


Fig. 5

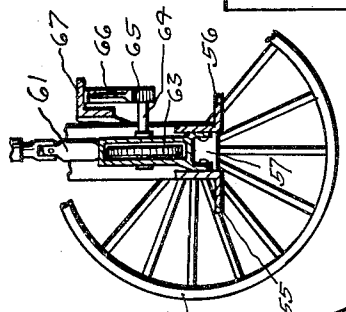


Fig. 8

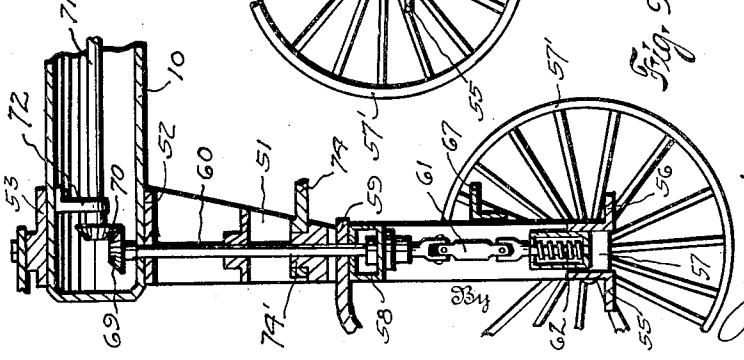


Fig. 9

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ROAD MACHINE

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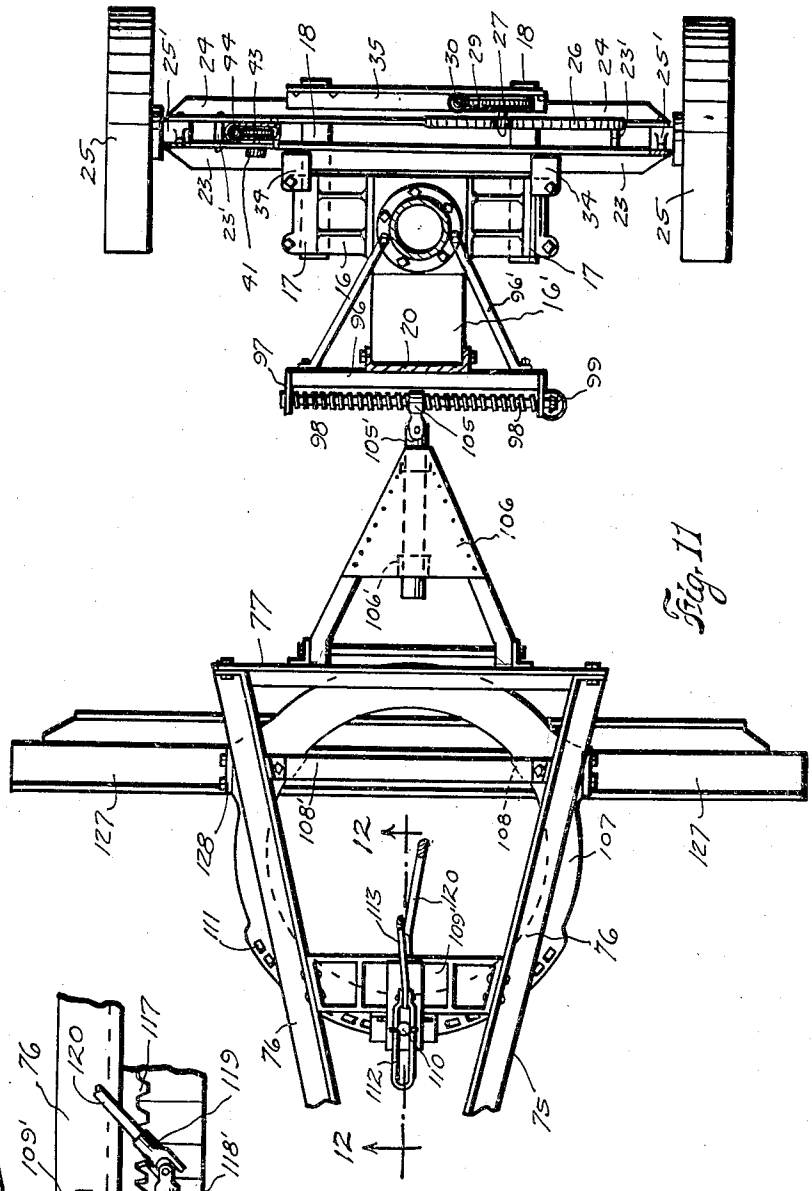


Fig. 11

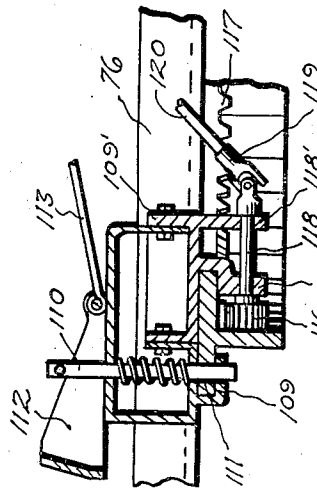


Fig. 12

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ROAD MACHINE

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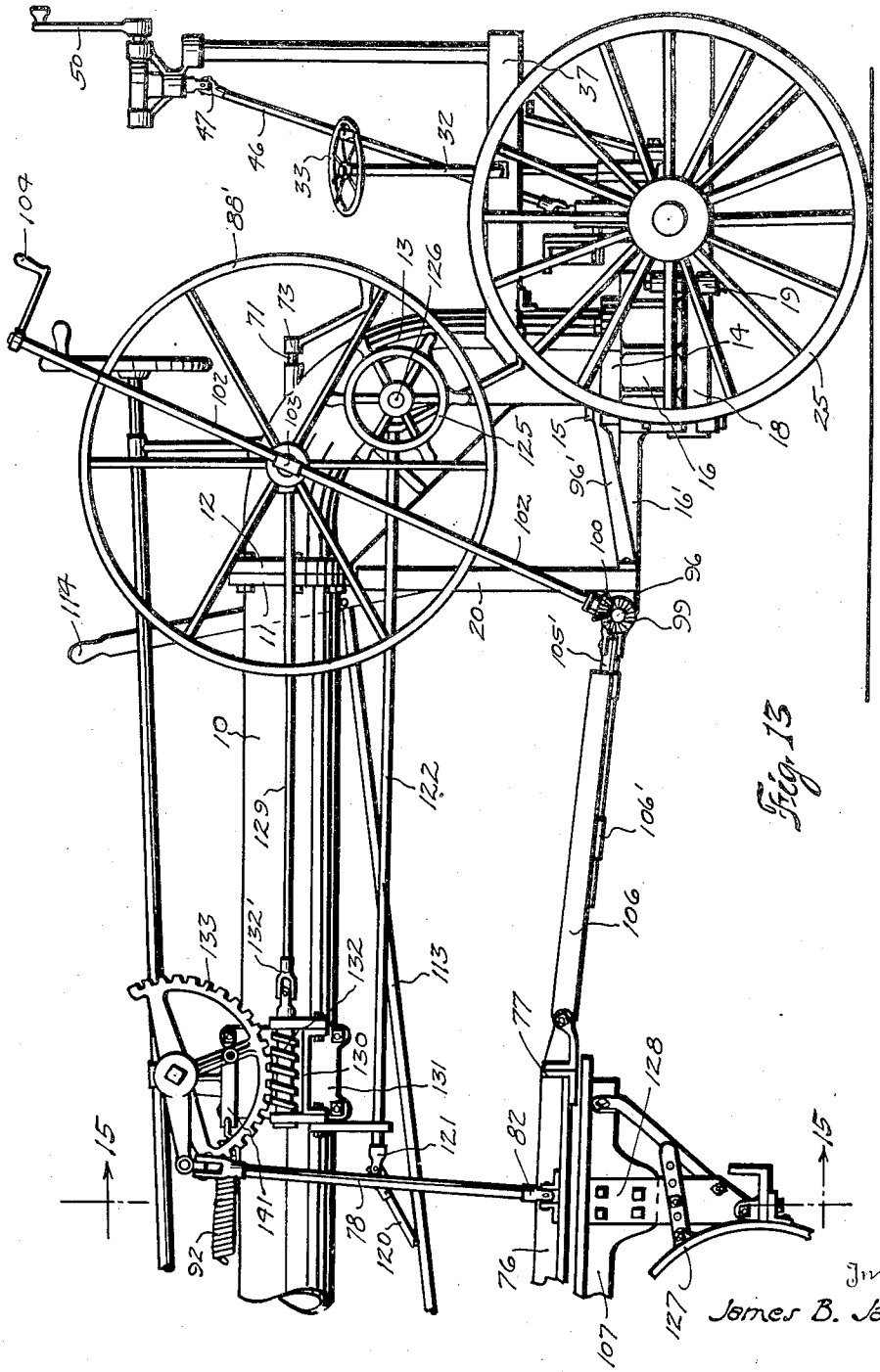


Fig. 13

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ROAD MACHINE

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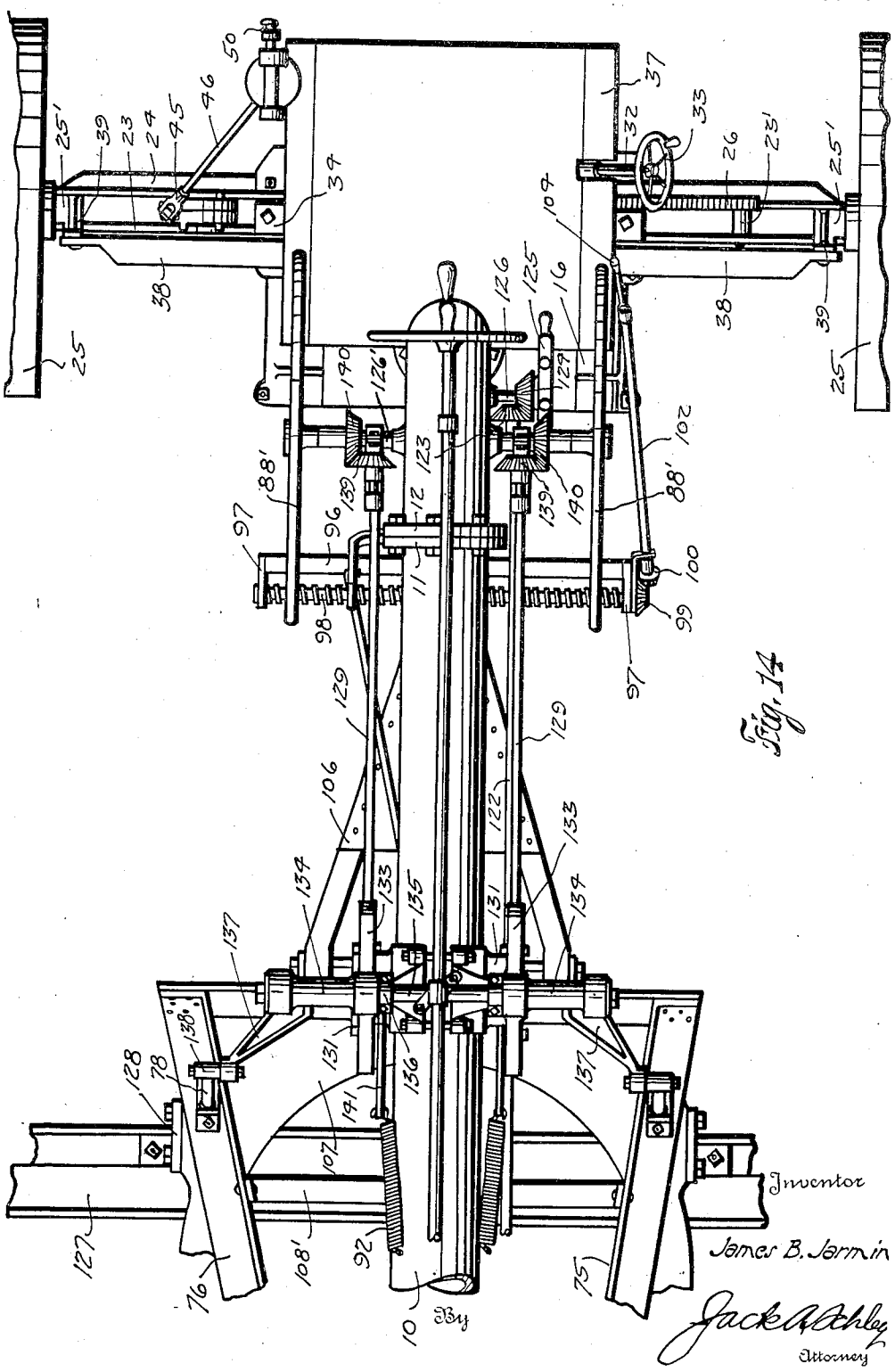


Fig. 14

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ROAD MACHINE

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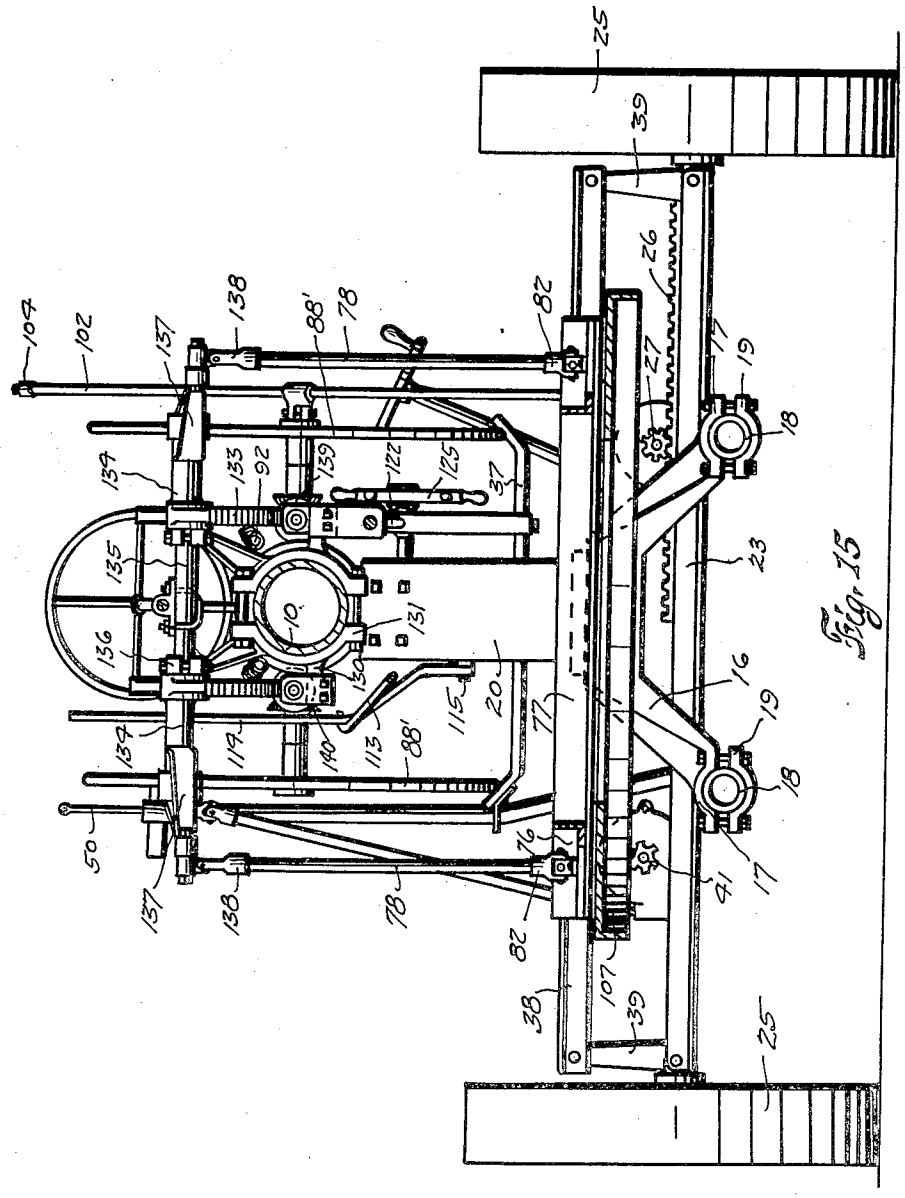


Fig. 15

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Patented July 4, 1933 1,916,222

UNITED STATES PATENT OFFICE

JAMES B. JARMIN, OF DALLAS, TEXAS, ASSIGNOR TO SERVIS EQUIPMENT COMPANY, OF DALLAS, TEXAS, A CORPORATION OF TEXAS

ROAD MACHINE

Application filed March 28, 1932. Serial No. 601,532.

This invention relates to new and useful improvements in road machines.

One object of the invention is to provide a road machine of the type shown in my Letters Patent No. 1,812,342 issued June 30, 1931, and involving certain improvements making for increased efficiency, ease of operation, reduction in cost of maintenance, longevity of the machine, and more stability.

Another object of the invention is to simplify the various adjustments, thus tending to reduce the number of parts, as well as to effect a saving in the cost of manufacture.

Still another object of the invention is to provide housings for certain of the gearings and to locate such gearings at the rear end of the machine, whereby improved vision is obtained and a better structure provided.

An important object of the invention resides in an improved elbow and rear axle mechanism, whereby the machine is more efficiently braced against twisting strains and working adjustments are more easily performed.

A further object of the invention is to utilize the central reach or connecting member as a housing for the long adjusting shaft for the front wheels, thus getting said shaft out of the way and improving the appearance of the machine.

A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Figure 1 is a side elevation of a road machine constructed in accordance with the invention,

Figure 2 is a plan view of the same,

Figure 3 is a front elevation of the machine,

Figure 4 is a rear elevation of the machine,

Figure 5 is an enlarged transverse vertical sectional view showing a portion of the machine and taken on the line 5—5 of Figure 1, looking in the direction of the arrows,

Figure 6 is an enlarged view of the rear portion of the machine, partly in section and partly in elevation,

Figure 7 is a detail of the hanger frame adjusting means,

Figure 8 is a sectional detail of the front wheel adjusting means,

Figure 9 is a vertical sectional view taken on the line 9—9 of Figure 2,

Figure 10 is a detail of the shifting means,

Figure 11 is a horizontal cross-sectional view taken on the line 11—11 of Figure 1,

Figure 12 is an enlarged longitudinal sectional view of the ring locking means and taken on the line 12—12 of Figure 11,

Figure 13 is an elevation of the rear half of another form of road machine constructed in accordance with the invention,

Figure 14 is a plan view of the same, and

Figure 15 is a transverse vertical sectional view taken on the line 15—15 of Figure 13.

In the drawings, the numeral 10 designates a main connecting member or reach 10 which connects the front and rear axles and constitutes the backbone of the machine. It is preferable to use for this reach a length of pipe of comparatively large diameter, but any structure suitable for the purpose may be used.

The reach 10 is provided with an annular flange 11 at its rear end, which is bolted to the flange 12 of an elbow 13. The elbow has a base flange 14 (Fig. 6) which is secured by bolts 15 to an arched support or bridge 16, (Fig. 5). This bridge carries longitudinal saddles 17 (Fig. 6) which rest on the forward ends of stub shafts 18 and are rigidly held thereto by clamps 19. The bridge has a forward extension 16′ bolted to an upright channel bar 20, the upper end of which is secured by bolts 21 (Fig. 6) to a skirt 22 depending from the flange 11 at the rear of the reach 10. The upright channel bar and the bridge with its extension, constitute a brace, whereby the elbow 13 is protected against twisting strains in a vertical plane.

The rear axle consists of two angle bars 23 and 24, rigidly connected by bolts 23′. These angle bars have their ends pivotally connected to the spindles 25′ of rear ground wheels 25. The rear angle bar carries a

gear rack 26, which is engaged by a pinion 27 mounted on a shaft 28 (Figs. 4 and 6). The other end of this shaft carries a housed worm gear 29 which is driven by a worm 30. The worm is operated through a universal joint 31 connected to a rod 32, having a hand wheel 33. The rear axle carries the shafts 18 and is held against upward displacement therefrom by keepers 34 carried by the rear ends of the saddles 17, and also by a transverse angle bar 35. It will be seen that the shafts 18 are suspended from the axle by the keepers 34 and clamps 35′ and said axle is slidable transversely of the shafts. An operator's platform 37 fastened on the rear side of the elbow 13 is supported by legs 36. When the hand wheel 33 is turned the entire rear axle is slid between the keepers 34 and angle bar 35, and shifted to either side of the shafts 18.

For tilting the ground wheels 25, a bridle bar 38 is pivotally connected to arms 39 rigid with and extending upwardly from the spindles 25′ of the ground wheels 25. The bar 38 carries a gear segment 40 (Fig. 4) which meshes with a pinion 41 mounted on a shaft 42, having a worm gear 43 at its other end. The gear 43 is housed and engaged by a worm 44. This worm is operated, through the medium of a universal 45 connected to a rod 46. The upper end of the rod has connection through a universal 47 (Fig. 1) with a bevel gear 48 which is engaged by another bevel gear 49 operated by a crank handle 50. As the crank is turned the gear segment is swung and the angle bar 38 is shifted, whereby the ground wheels are tilted due to the bar's connection with the spindles 25′ of the ground wheels.

At the forward end, the reach pipe 10 is carried by a post 51 (Figs. 1, 3 and 9) having a saddle 52 at its upper end. A cap 53 is secured to the saddle by bolts 54, and the forward end of the pipe is rigidly secured in the saddle by the cap.

A front axle consists of two angle bars 55 and 56 pivotally connected to spindles 57 and supported in ground wheels 57′. An arched member 58 is securely fastened to the angle bars 55 and 56. The post 51 has a rounded bottom 59 which rests on a turntable 59′ on the member 58. A pivotal connection is obtained between the post and the turnatable by means of a vertical shaft 60 which extends from within the pipe downwardly through the post and member 58. This shaft has connection, by means of a universal joint 61, with a worm 62. The worm engages a worm gear 63 mounted on a shaft 64. A pinion 65, on the other end of the shaft 64, engages a gear segment 66 carried by a bridle bar 67 which is pivotally connected at its ends to arms 68 extending upwardly from the spindles 57 of the ground wheels.

The upper end of the shaft 60 carries a bevel gear 69. The gear 69 meshes with another bevel gear 70 fastened on a control shaft 71 supported by a bracket 72 within the pipe 10 (Fig. 9). The control shaft 71 extends rearwardly within the pipe and has its rear end projecting from the rear of the elbow 13, and provided with a crank handle 73. The shaft 71 is thus housed within the pipe and kept out of the way.

When the crank 73 is turned, the shaft 71 rotates the shaft 60 which drives the worm 62 to turn the gear 63 and pinion 65. This swings the gear segment 66 to shift the bridle bar 67 thereby tilting the front ground wheels 57′.

A clevis plate 74 is loosely mounted on a bearing 74′ within the post 51 and has its rear end rigidly fastened to the front end of a longitudinal hanger frame 75, which underlies the reach 10. This frame, by reason of the pivotal mounting of said plate, may be raised or lowered at its rear end, or swung in a transverse arc on its longitudinal axis. The frame is composed of two side angle members 76 (Fig. 2) which extend rearwardly from the plate 74 and diverge from each other. The rear ends of the frame members are connected by a cross angle bar 77.

In order to support the rear end of the hanger frame, hangers 78 (Figs. 1, 5 and 7) are suspended by means of universal joints 79 from arms 80 clamped on the forward ends of shafts 81. Each hanger has its lower end connected through a universal 82 to the rear end of a respective member 76 of the hanger frame.

The shafts 81 extend longitudinally on each side of the reach 10 and are journaled at their forward ends in brackets 83 diverging from a collar 84 rigidly secured on the reach pipe 10. A gear 85 is fastened on the rear end of each shaft 81 (Fig. 6) and this gear is engaged by a worm 86 secured on a shaft 87. Each gear 85 and worm 86 are mounted in a housing 85′ and these housings are fastened to each side of the upper end of the elbow 13. These housings support the rear ends of the shafts 81.

Each shaft 87 carries a hand wheel 88 at its outer end. It is seen that when the wheels are turned, the shafts 87 and 81 are rotated and the arms 80 are raised or lowered thus raising or lowering the rear end of the hanger frame.

In order to counter-balance the hanger frame and make for easy adjustment of the arms 80, cables 89, securely fastened to said arms, are passed over guides 89′ fastened on the arms and then over pulleys 90 journaled on a bracket 91, secured on the pipe 10. Each cable is extended forwardly and secured to the rear end of a coiled spring 92. The springs are connected to the ends of a cable 93 which passes over a pulley 94 journaled in a bracket 95 secured to the reach 10. By

means of the cable 93 the springs are equalized when either arm 80 is swung.

The springs are constantly under tension and when the arms 80 are swung to lower the hangers 78, the springs are further tensioned, and thus when the operation is reversed to raise the hangers, the springs assist in elevating the load.

On the front side of the upright channel bar 20 and near its bottom, I mount a transverse channel bar 96 (Fig. 6). Forwardly extending brackets 97 (Fig. 11) are secured to the ends of the bar 96 and support an elongated worm screw 98. The bar 96 is stiffened by braces 96'. The worm screw carries a bevel gear 99 at one end. This gear is engaged by another bevel gear 100, which has connection through the medium of a universal joint 101 with a vertical shaft 102 (Fig. 10). The shaft 102 is supported near its upper end by a bracket 103, and has a crank handle 104 at its upper end.

A traveling nut or collar 105 is threaded on the worm screw 98 and is securely fastened to a telescoping shaft 105'. The shaft 105' is suspended from a carriage 106 by loops 106'. The carriage has its forward end pivotally connected to the rear end of the hanger frame. When the crank 104 is turned the collar 105 travels along the worm screw 98, whereby the carriage 106 is shifted laterally, thus resulting in a lateral shifting of the rear end of the hanger frame 75, because of the pivotal suspension of said frame at its forward end. It is noted that the hanger frame may be shifted laterally to any position by the crank 104 and the inclination and elevation of said frame is controlled by the hand wheels 88.

A flanged blade ring 107 is suspended from the hanger frame 75. The rear portion of the ring is supported by hangers 108, depending from a transverse bar 108', engaging under the flange of the ring. The forward end of the ring rests on a bracket 109 depending from a cross member 109' (Fig. 12). A spring pressed plunger 110, carried by the member 109', engages in openings 111 in the ring 107, to hold said ring against rotation. To release the ring, a pin 110 is slidable through a wedge 112, said wedge being supported by the cross member 109'. The wedge is pivotally connected to the forward end of a longitudinal rod 113. The rear end of the rod has a pivotal connection with a hand lever 114 (Fig. 5). The lever is pivoted at 115 to the side of the upright channel bar 20. When the hand lever is pulled rearwardly, the wedge is slid rearwardly to disengage the plunger 110 from the openings 111 in the ring. After the ring is released, it may be adjusted to any position by means of a pinion 116 (Figs. 1, 2 and 12) which meshes with a ring gear 117 on the underside of the ring. The pinion is mounted on a shaft 118 carried by hangers 118' depending from the cross member 109'. The shaft 118 has connection, by means of a universal 119 with a rod 120.

The rod 120 is connected, through a universal 121, with a rearwardly extending adjusting shaft 122. The shaft 122 carries a bevel gear 123 (Fig. 6) at its rear end, and this gear is engaged by another bevel gear 124, mounted on the shaft 126 of a hand wheel 125. The shaft 126 is mounted in one side of the elbow 13. A scraping blade 127 is suspended from the ring 107 by standards 128 and it is obvious that the blade may be swung to any desired angle by rotating the hand wheel 125.

In Figures 13, 14 and 15, I have shown another means for elevating and swinging the hanger-frame 75. Instead of shafts 81, I provide a pair of worm shafts 129 which extend longitudinally on each side of the reach pipe 10. Each shaft has its forward end connected to a universal joint 132' which in turn is connected with a worm 132 journaled in a bracket 130 secured to one side of a collar 131 fastened around the pipe 10. Each worm meshes with and drives a segmental worm gear 133 provided with an extended hub 134. The gears and their hubs are journaled on a transverse shaft 135 which is fastened in brackets 136 extending upwardly from the collar 131, between the gears 133.

Arms 137 extend forwardly and outwardly from the outer ends of the hubs 134 of the segmental gears 133, and have their forward ends connected by universals 138 to the hangers 78 of the frame 75. The rear end of each shaft 129 carries a bevel gear 139 which is engaged by another bevel gear 140 journaled on a shaft 126' mounted on one side of the elbow 13. Each gear 140 is secured to a hand wheel 88' also journaled on said shaft.

By revolving either hand wheel, the shaft 129 thereof is rotated, whereby the segment 133 is rocked and the corresponding end of the hanger-frame is adjusted. For equalizing the raising and lowering of the frame, the coiled springs 92 have their rear ends secured to bars or straps 141 pivoted on the inner side of each center spoke of the segmental gears 133.

Various changes in the size and shape of the different parts, as well as modification and alterations, may be made within the scope of the appended claims.

Having illustrated and described preferred forms of the invention, what I claim, is:

1. In a road machine, a longitudinal pipe reach, a front axle mounted in ground wheels, a support carried by the front axle and secured to the front end of the reach, a surface working tool carried by the reach, an elbow secured to the rear end of the reach, a support rigidly secured to the lower end of the elbow, a rear axle connected with the support, rear ground wheels carrying the rear

axle, and a platform connected to the elbow above the support and the rear axle.

2. In a road machine, a longitudinal pipe reach, a front axle mounted in ground wheels, a support carried by the front axle and secured to the front end of the reach, a surface working tool carried by the reach, a rearwardly extending connecting member secured to the rear end of the pipe reach and extending downwardly therefrom, rigid supports at the lower end of the connecting member extending rearwardly, a rear axle connected with said rearwardly extending supports, rear ground wheels carrying said axle, and a platform attached to the connecting member and spaced above the rear axle.

3. In a road machine, a longitudinal pipe reach, a front axle mounted in ground wheels, a support carried by the front axle and secured to the front end of the reach, transverse hangers carried by the reach, links adjustably carried by the hangers, a blade carrier connected with said links, a blade carried by said carrier, an upright connecting member secured to the rear end of the reach and extending downwardly, a pair of rigid supports extending rearwardly from the connecting member, a rear axle mounted on said supports, rear ground wheels supporting said axle, and a support for the operator above the pair of supports.

4. In a road machine, an upright front support mounted on ground wheels, an elongated pipe member clamped to the front support, a blade hanger suspended from the pipe member, a connecting member secured to the rear end of the pipe member for elevating the latter, a rigid support carried by the connecting member and extending rearwardly therefrom, a transverse rear axle adjustably connected with the support, means for shifting said rear axle, ground wheels supporting said rear axle, and a platform above the rigid support.

5. In a road machine, an upright front support mounted on wheels, an elevated elongated pipe member secured to the front support, a hanger frame having its forward end pivoted to the front support, a hanger mounted on the pipe member and adjustably supporting the rear end of the frame, an upright elbow having its upper end connected to the pipe member, a rear axle, rigid means extending forwardly from the rear axle to the lower end of the elbow, means for transversely shifting the rear axle, ground wheels supporting the rear axle, and a platform at the elbow.

6. In a road machine, a front axle, a front support carried by the axle and extending upwardly therefrom, front wheels supporting the axle, a single central longitudinal pipe reach having its front end fastened to the front support, an elbow secured to the rear end of the pipe reach, an arched support secured to the lower end of the elbow, a brace extending from the upper to the lower portion of the elbow, supports extending rearwardly from the arched support, a rear axle slidably connected with said supports, and ground wheels supporting said rear axle.

7. In a road machine, an elevated longitudinal pipe reach, a rear axle supported in ground wheels, means carried by the rear axle for supporting the elevated rear end of the pipe reach, a front axle mounted in ground wheels, a front support carried by the front axle and connected to the elevated front end of the pipe reach, means for tilting the front wheels, means for operating the tilting means including a shaft extending upwardly of the front support, an elongated shaft journaled in the pipe reach, gears connecting the elongated shaft and the upright shaft, and means at the rear end of the pipe reach connected with the elongated shaft for operating the same.

8. In a road machine, an elevated longitudinal pipe reach, a rear axle supported in ground wheels, means carried by the rear axle for supporting the elevated rear end of the pipe reach, a front axle, front wheels supporting said axle and arranged to tilt, a front support carried by the front axle and connected to the front end of the pipe reach, means mounted on the front axle and the front support for tilting the front wheels, an elongated shaft extending through the pipe reach and operably connected with the tilting means at its front end, and means for rotating said shaft mounted at the rear end of the pipe reach and connected with said shaft.

9. In a road machine, a longitudinal reach pipe, a front wheel support therefor, a rear axle supported in ground wheels, an upright support between the rear axle and the reach, a collar fastened around the pipe, a rigid support extending upwardly from the collar, a transverse shaft fastened at its mid-portion on said collar support, segmental gears journaled on the shaft on each side of the support, hubs extending from said gears outwardly on the shafts and journaled thereon, arms extending from and rigid with the hubs, a blade carrying frame under the reach pipe, means for suspending the frame from the arms, brackets carried by the collar, shafts supported by the brackets along each side of the pipe, and worms mounted on said shafts and engaging said gears.

10. In a road machine, the combination of a wheel supported pipe reach, a collar fastened around the reach, a pair of divergent brackets extending from the collar, shafts extending longitudinally of the reach and having their front ends journaled in the ends of the brackets, hanger arms fastened on the front ends of said shafts, hangers having their upper ends pivoted to the outer

ends of the arms, a blade carrying frame suspended from the lower ends of the hangers, housings rigidly mounted on the rear end of the reach, worm gears in the housings fastened on the shafts, and hand wheels having operating connection with said worm gears.

11. In a road machine, the combination of a wheel supported pipe reach, a collar fastened around the reach, a pair of divergent brackets extending from the collar, shafts extending longitudinally of the reach and having their front ends journaled in the ends of the brackets, hanger arms fastened on the front ends of said shafts, hangers having their upper ends pivoted to the outer ends of the arms, a blade carrying frame suspended from the lower ends of the hangers, housings rigidly mounted on the rear end of the reach, worm gears in the housings fastened on the shafts, hand wheels having operating connection with said worm gears, curved guides mounted on the arms, cables attached to the arms and passing over the guides, pulleys supporting the cables, and tension springs carried by the reach and attached to the cables.

In testimony whereof I affix my signature.

JAMES B. JARMIN.