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SUBGRADE SCRAPING MACHINE

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2 Sheets-Sheet 1

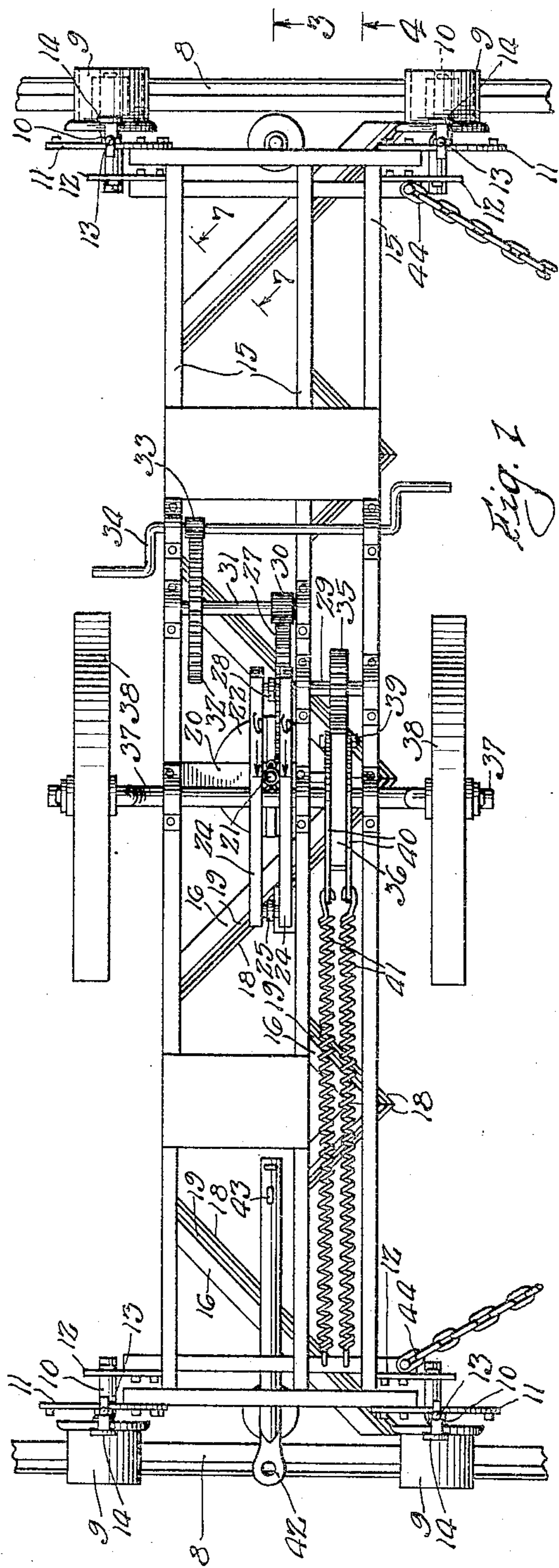


Fig. 1

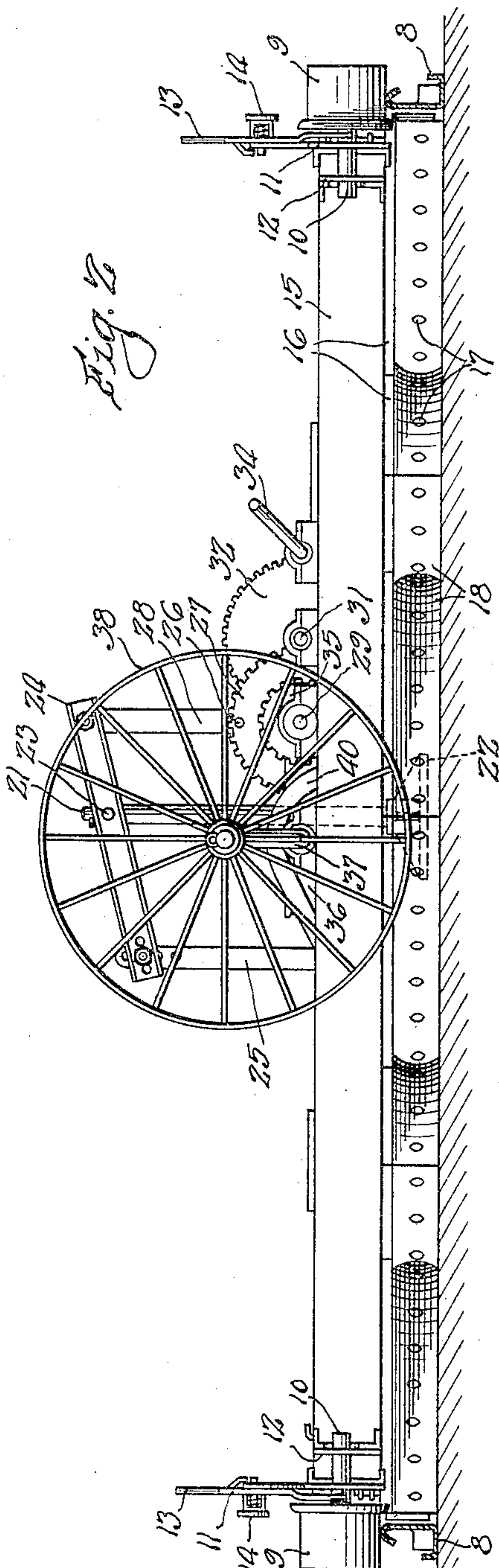


Fig. 2

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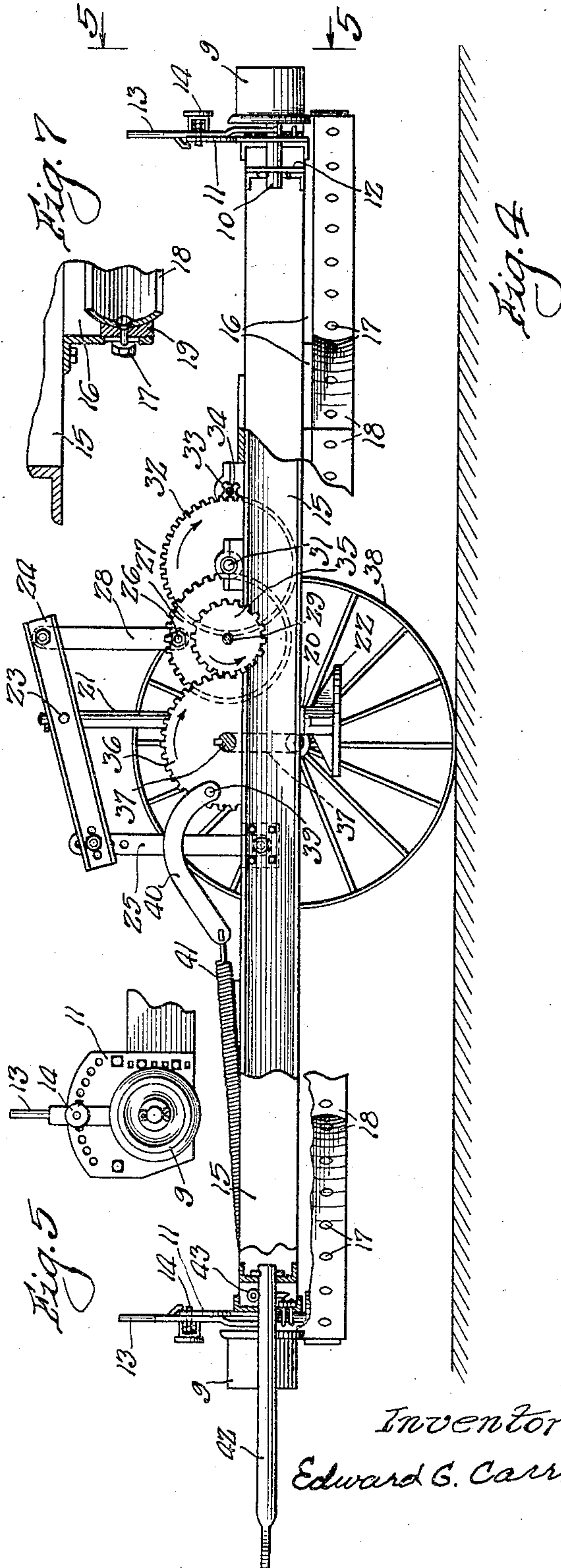
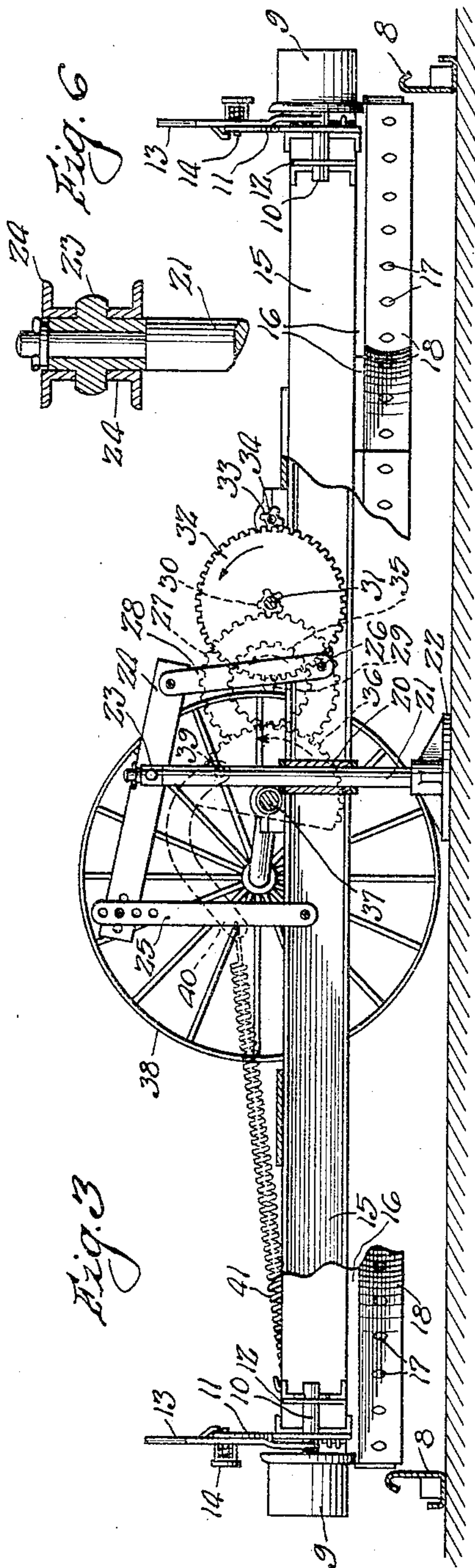
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

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SUBGRADE SCRAPING MACHINE

Application filed September 14, 1931. Serial No. 562,760.

The machine herein described is of the general type which runs on forms or side rails set to a predetermined grade and limiting the edge of a concrete road to be laid, and is for cutting away the earth between such side rails to a proper depth and contour to form a mould in which to cast a concrete slab for the roadway defined by said forms or side rails.

10 The machine spans a road when in working position and is on supporting rollers which run on the guide rails or forms. The rollers are suited only to be utilized in moving the machine on the rails or forms. As
15 the machine when at work is pulled sideways, its length spanning the whole of a roadway, it is necessary to turn it endways in a roadway in order to let trucks, rollers, or tractors pass. It is likewise advantageous in transporting a machine from place to place that it
20 be pulled endways in order to pass other vehicles on the road. It is also advantageous to be able to turn the machine completely around and to set it down again on the same
25 guide rails to take a second cut over the surface previously travelled over.

In the past, scraper blades have been adjusted by sliding them on vertical or on sloping plates, with their top edge attached
30 against the plate. This arrangement has left a seam or angle where the blade is attached to the plate which would start the accumulation of sticky material collected from the dirt displaced by the machine which inter-
35 feres with the rolling of the earth as pushed up and back along the blade. This arrangement also does not permit of reversing the blade without changing its vertical position.

40 The present invention relates to and has for its objects an improved mechanism for raising, turning, and transporting such a machine, and an improved blade and blade holder adjusting mechanism.

45 The embodiment of the invention here illustrated is shown on a subgrade scraper similar to that disclosed in my patent, Re-issue Number 15,615. In the accompanying two sheets of drawings:

50 Figure 1 is a plan view of a machine em-

bodiment of the invention resting on side forms or guide rails;

Figure 2 is a front elevation of the machine in Figure 1 in the same position;

Figure 3 is an elevation of the machine 55 resting on its turntable, certain parts being removed for the sake of facilitating illustration, the figure being on line 3—3 of Figure 1;

Figure 4 is an elevation of the machine resting on its transportation wheels, certain 60 parts removed for the sake of clarifying illustration, the figure being on line 4—4 of Figure 1;

Figure 5 is a detail of one of the machine supporting rollers with offset shaft, lever, 65 quadrant and latch, the figure being taken on line 5—5 of Figure 4;

Figure 6 is a detail of the turntable shaft taken on the line 6—6 of Figure 1; and

Figure 7 is a detail of a cutting blade taken 70 on the line 7—7 of Figure 1.

Reference should now be had to the said drawings which accompany this specification, and which form a part thereof, and in which like reference numbers are used to designate the same parts wherever they may appear in the specification and in each of the views.

The number 8 is used to designate forms or side rails limiting and defining the sides 80 of a proposed concrete road. Wheels or rollers 9 are adapted to move on the rails 8 and support the subgrade scraping machine, there being on said machine offset or crank axles 10 on which said wheels 9 rotate. Each axle 85 10 passes through plates 11 and 12. The part of the axle 10 which is journalled in the plates 11 and 12 is offset or eccentric with the part of the axle on which the wheels 9 rotate.

Secured to each axle 10 is a hand lever 13 90 which has a spring actuated pin 14 engaging holes in the plate 11 so that when the axle 10 is rotated by the hand lever 13 there will be a relative vertical movement between the roller 9 and the frame of the machine. The pin 95 14 when inserted in one of the holes in the plate 11 will hold the wheel 9 in a selected adjusted position.

The frame of the machine consists principally of three suitable cross members 15 with 100

end members and suitable bracing which support angles 16 slotted to receive the blade bolts 17 used to hold scraper blades 18 to a saddle 19 in adjustable position on the angles 16. Near the center of the machine, jour-
 5 nalled through a cross member 20, is a vertical shaft 21 with a shoe 22 secured to its lower end and with its upper end turned to receive a lug 23. The lug 23 is free to turn
 10 on shaft 21 and is held thereon by washer and pin or by other suitable means.

A rocking beam 24 engages the lug 23 and is secured to the frame by a link 25 and to a pin 26 in a gear 27 by link 28. The gear 27
 15 is keyed to a shaft 29 which is journaled on the frame. The gear 27 meshes with a gear 30, which is keyed on a shaft 31 and is journaled on the frame.

A gear 32 is keyed to the shaft 31 and
 20 meshes with a gear 33, the latter being keyed to a hand crank shaft 34. Keyed to the shaft 29 is a gear 35 which meshes with a gear segment 36, which is welded or keyed to a crank axle 37. The center of the crank
 25 axle 37 is journaled to the frame near its center, the ends of the axle being offset so as to give relative vertical movement to the wheels 38 when the axle 37 is rotated.

The gear 36 has a pin 39 to which are at-
 30 tached arched links 40. To the latter are attached coil springs 41, the other end of the springs being attached to an end member of the frame. The pitch diameter of gear 36 is approximately twice that of the gear 35.

It is now obvious that when the chain of
 35 gears is rotated by the hand crank shaft 34, the gear 27 will bring the pin 26 to the position shown in Figure 3 with one-half revolution of the shaft 29. In this position, the
 40 shoe 22 will be pushed down until it engages the ground, whereupon the rollers 9 will be raised clear of the forms 8. In this position the machine may be easily revolved on the
 45 turntable shoe 22 with the wheels 38 in close proximity to the ground so that should the machine tip sideways by uneven sinking of the shoe 22, one of the wheels 38 would en-
 50 gage the ground and stop further tipping without interfering with the rotation of the frame on the turntable shoe 22.

By further rotation of the chain of gears,
 55 the pin 26 will be brought back to its original position shown in Figure 2, while wheels 38 will be brought to the position shown in Figure 4, raising the machine to a suitable posi-
 60 tion to be transported on the wheels 38.

I have provided a tractor pole 42 which
 65 slides in the frame and may be extended outwardly when desired and held in position by a pin 43. By attaching a tractor to this pole, the machine may be moved from place to
 70 place, pulled off to one side of the road or brought back up into the center of the road where work is to be done. Then, by reversing the direction of the chain of gears, the
 75 machine can be let down onto the turntable

shoe 22, the tractor disconnected from the pole 42, and the machine swung around into the position shown in Figure 3 so that further rotation of the chain of gears would set the machine down on the side rails or forms and
 80 raise the turntable clear of the ground.

It will be noted that I have placed the turntable shoe 22 behind diagonal cutter blades on the machine so that the ground
 85 under the shoe would generally be level with the bottom of the cutter blades.

To the frame is secured cable or chain shackles 44 so that the machine may be pulled
 90 along the roadway by a tractor or any suitable means.

It will be noted that when the gear 36 is in the position shown in Figure 2 the coil springs 41 will be extended. When the gear 36 is revolved in the direction shown by the
 95 arrows in Figure 3, the pin 39 will come above the center of the crank axle 37 whereby the pull of the springs will aid in the further turning of the chain of gears, counter-balancing the weight of the machine whether on the turntable shoe 22 or the wheels 38.

It will be further noted that I have provided the link 25 with a plurality of holes where it engages the rocking beam 24 so that
 100 different vertical relative positions can be had between the shoe 22 and the wheels 38. I have also provided the rocking beam 24 with a plurality of holes lengthening or shortening that portion of the beam between the lug 23 and the link 25 whereby the relative speed of motion may be varied between
 105 the shaft 21 and the wheels 38.

What is claimed as new is:

1. The combination in a subgrade scraping machine of a frame supporting cutting blades, rollers supporting the frame on guide
 110 rails, transportation wheels near the center of the frame, a turntable shoe near the center of the frame, a single means for operating in unison the transportation wheels and the turntable shoe, and springs for aiding in the
 115 lifting of the frame, said operating means being adapted to lower the transportation wheels while lifting the machine on the turntable shoe, and lifting the turntable shoe while elevating the machine on the transportation wheels.

2. The combination in a subgrade scraping machine of a frame supporting cutting blades, rollers supporting the frame on guide rails, transportation wheels near the center of the
 120 frame, a turntable shoe near the center of the frame, a single means for operating in unison the transportation wheels and the turntable shoe, said operating means being adapted to lower the transportation wheels while
 125 lifting the machine on the turntable shoe, and lifting the turntable shoe while elevating the machine on the transportation wheels.

3. The combination in a subgrade scraping machine having wheels for riding on forms, 130

of transportation wheels, a turntable support, and unitary means to first elevate the machine on said turntable support, to next bring the transportation wheels into useful position, and to next lift the turntable support from the ground.

4. The combination in a subgrade scraping machine having form engaging members, transportation wheels, and a turntable support, of means for operating said wheels and support and adapted to lower said turntable support and auxiliary wheels, said means first lowering the support beneath the wheels, and then lowering the wheels beneath said support.

5. In a subgrade scraper, a frame, form engaging wheels therefor, transportation wheels suitably disposed thereon, and an elevating support upon which said frame is rotatable in horizontal plane.

6. In a subgrade scraper, a frame, transportation wheels on said frame, an elevating mechanism independent of said transportation wheels, and unitary means for concurrently positioning said transportation wheels and actuating said elevating mechanism.

7. In a subgrade scraping device, a frame, wheels for supporting said frame upon rails, other wheels for transporting said frame, and means for lifting the device from the supporting rails, said lifting means permitting of rotary displacement of the frame in a horizontal plane.

8. In a subgrade scraping device, a frame, wheels for supporting said frame upon rails, other wheels for transporting said frame independent of said rails, means for lifting said frame from its rail support, and means concurrently actuating said frame lifting means and operably positioning said transporting wheels thereunder.

9. The combination in a subgrade scraping device, of a frame, end wheels for engaging rail supports, transportation wheels, a turntable support having a ground engaging end, and means for lowering said turntable support and said transportation wheels to operable positions beneath said frame the transportation wheels being inoperable when said frame is on rail supports and having the lowest points of their peripheries in substantially the same horizontal plane as the ground engaging end of said turntable support when the latter is in use.

10. In subgrade scraper, a frame, form engaging wheels disposed thereon, transportation wheels, means for lifting the frame from its supporting forms, and means for operatively positioning said transportation wheels after said frame has been elevated by said lifting means.

11. In a subgrade scraping device, a frame, wheels for supporting said frame upon forms, other wheels for transporting the device in a direction different from to its direc-

tion of travel on forms, and means independent of said transportation wheels for lifting the device from its form support, there being intermediate said lifting means and said frame a mechanical connection permitting of rotary displacement of the frame relative to said lifting means.

12. The combination in a subgrader scraping machine of a frame supporting cutting blades, rollers supporting the frame on guide rails, transportation wheels near the center of the frame, a turntable shoe also near the center of the frame, means for lowering and elevating said turntable shoe, means operable in unison with the means for lowering and raising said turntable shoe for lowering the transportation wheels and operable while the turntable shoe is being lowered to lift the machine, and springs for aiding the lifting of the frame, said means for lowering the transportation wheels also being operable during the elevation of the turntable shoe.

13. The combination in a subgrader scraping machine of a frame supporting cutting blades, rollers supporting the frame on guide rails, transportation wheels near the center of the frame, a turntable shoe also near the center of the frame, means for lowering and elevating said turntable shoe, and means operable in unison with the means for lowering and raising said turntable shoe for lowering the transportation wheels and operable while the turntable shoe is being lowered to lift the machine, said means for lowering the transportation wheels also being operable during the elevation of the turntable shoe.

14. The combination in a subgrader scraping machine of a frame supporting cutting blades, rollers supporting the frame on guide rails, transportation wheels near the center of the frame, a turntable shoe also near the center of the frame, means for lowering and elevating said turntable shoe, means operable in unison with the means for lowering and raising said turntable shoe for lowering the transportation wheels and operable while said turntable shoe is being lowered to lift the machine on the turntable shoe, said means for lowering the transportation wheels being operable while the turntable shoe is being raised, and means for varying the relative movement of the transportation wheels and the turntable shoe.

15. The combination in a subgrader scraping machine of a frame supporting cutting blades, rollers supporting the frame on guide rails, transportation wheels near the center of the frame, a turntable shoe also near the center of the frame, means for lowering and elevating said turntable shoe, means operable in unison with the means for lowering and raising said turntable shoe for lowering the transportation wheels and operable while the machine is being lifted on the turn-

table shoe, said means for lowering the transportation wheels also being operable while the turntable shoe is being raised, and means for varying the relative speed of the movement between the turntable shoe and the transportation wheels.

16. The combination in a subgrader scraping machine of a frame supporting cutting blades, rollers supporting the frame on guide rails, transportation wheels near the center of the frame, a turntable shoe also near the center of the frame, means for lowering and elevating said turntable shoe, means operable in unison with the means for lowering and raising said turntable shoe for lowering the transportation wheels and operable while the machine is being lifted on the turntable shoe, said means for lowering the transportation wheels also being operable while the turntable shoe is being raised, and means for varying the operable relation of the transportation wheels and the turntable shoe whereby to vary the relative speed of movement between said turntable shoe and said transportation wheels.

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