

H. OGARD.
ROAD GRADING AND DITCHING MACHINE.
APPLICATION FILED FEB. 28, 1905.

3 SHEETS—SHEET 1.

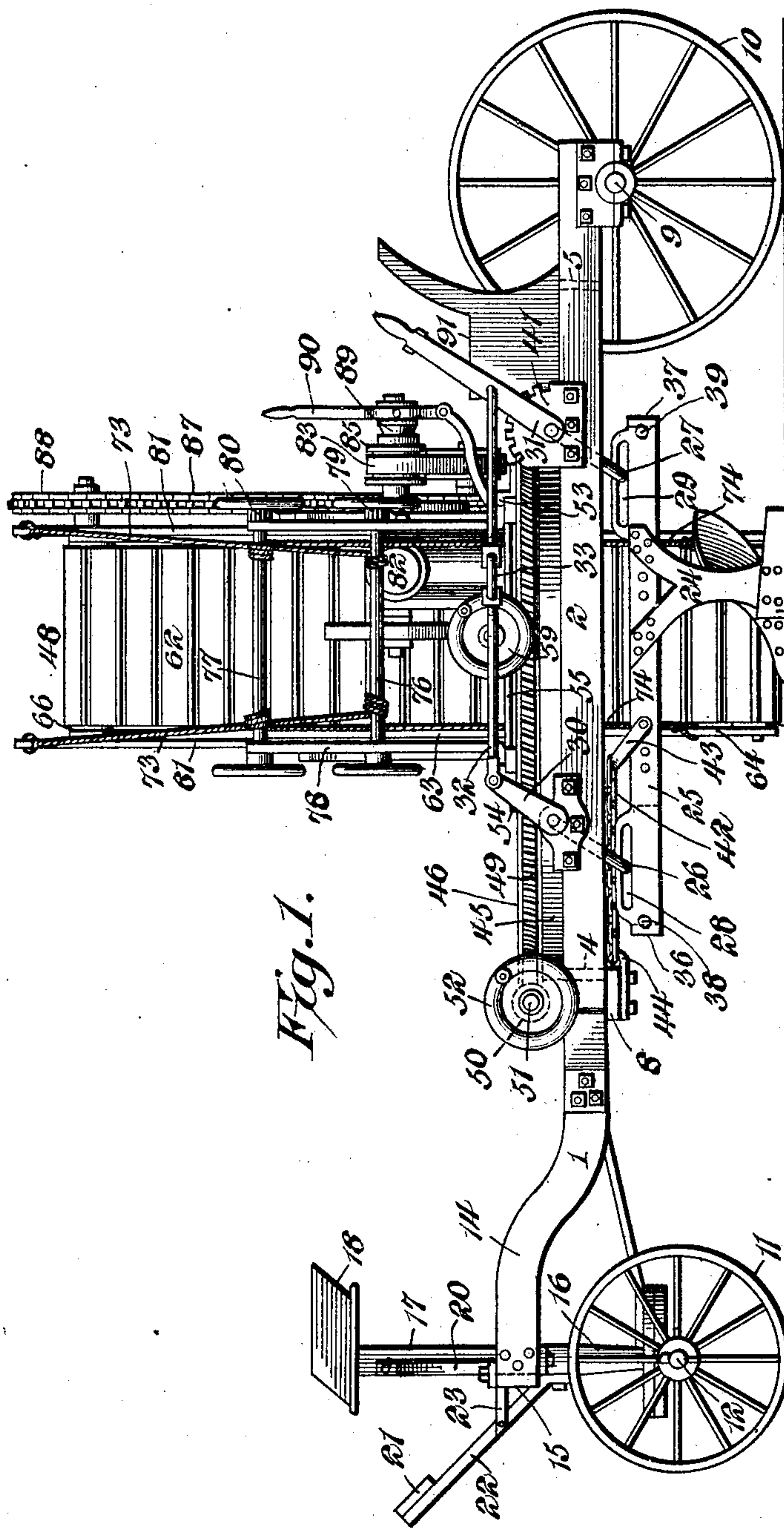


Fig. 1.

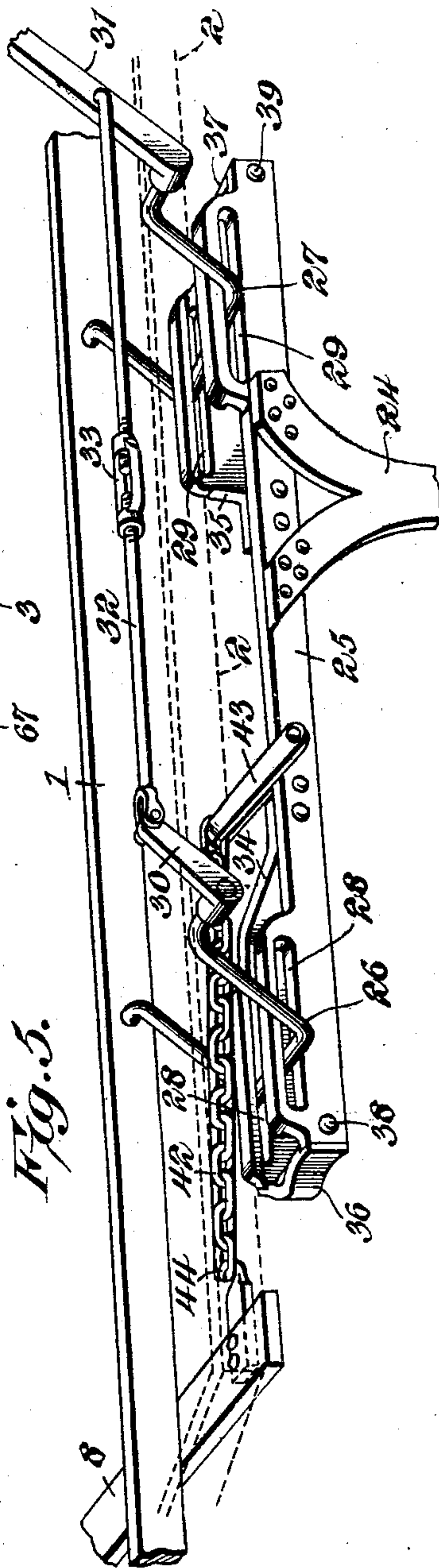


Fig. 5.

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By

E. G. Siggers

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Witnesses

Howard D. Orr.
J. F. Riley

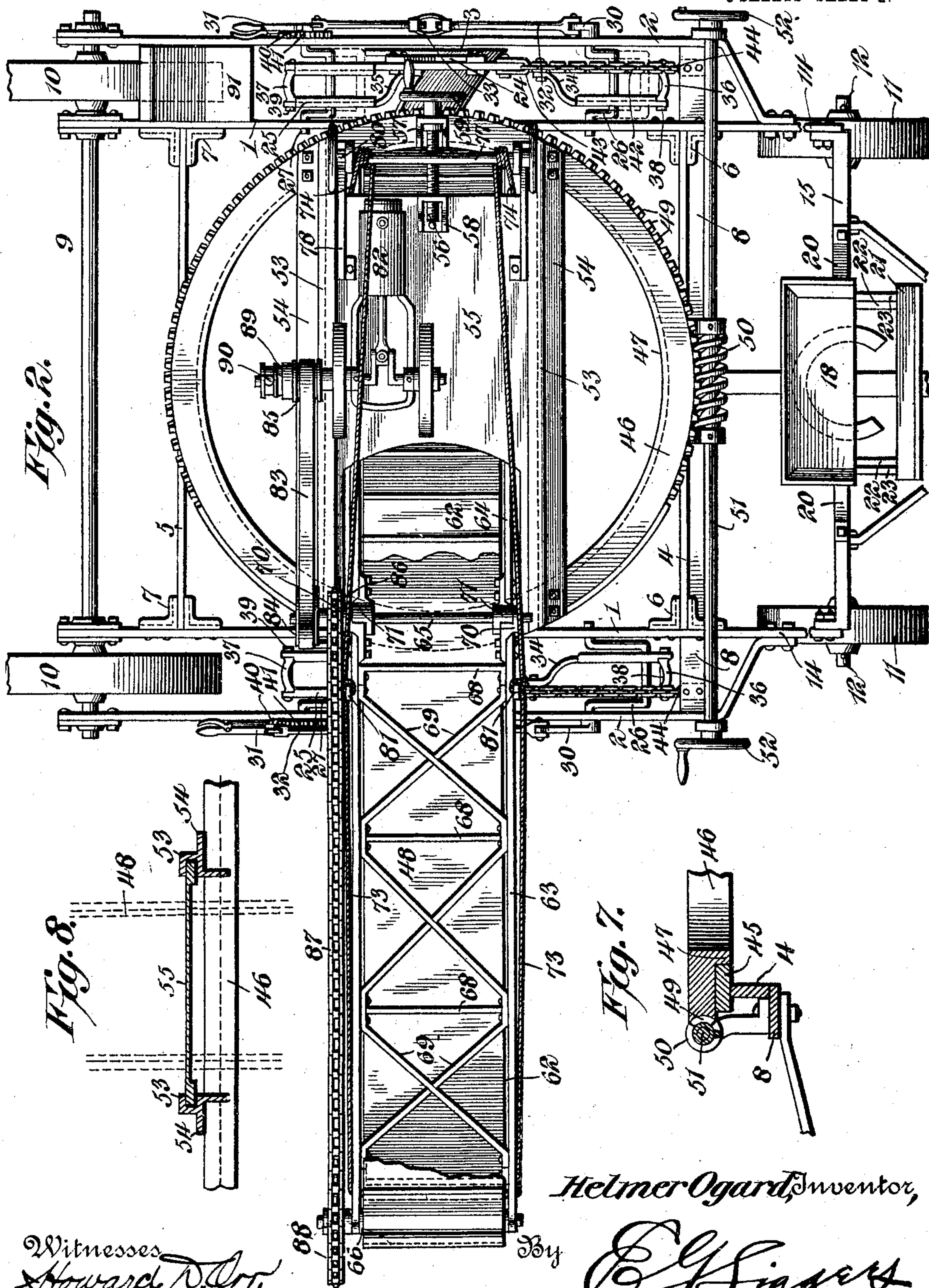
No. 795,728.

PATENTED JULY 25, 1905.

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3 SHEETS—SHEET 2.



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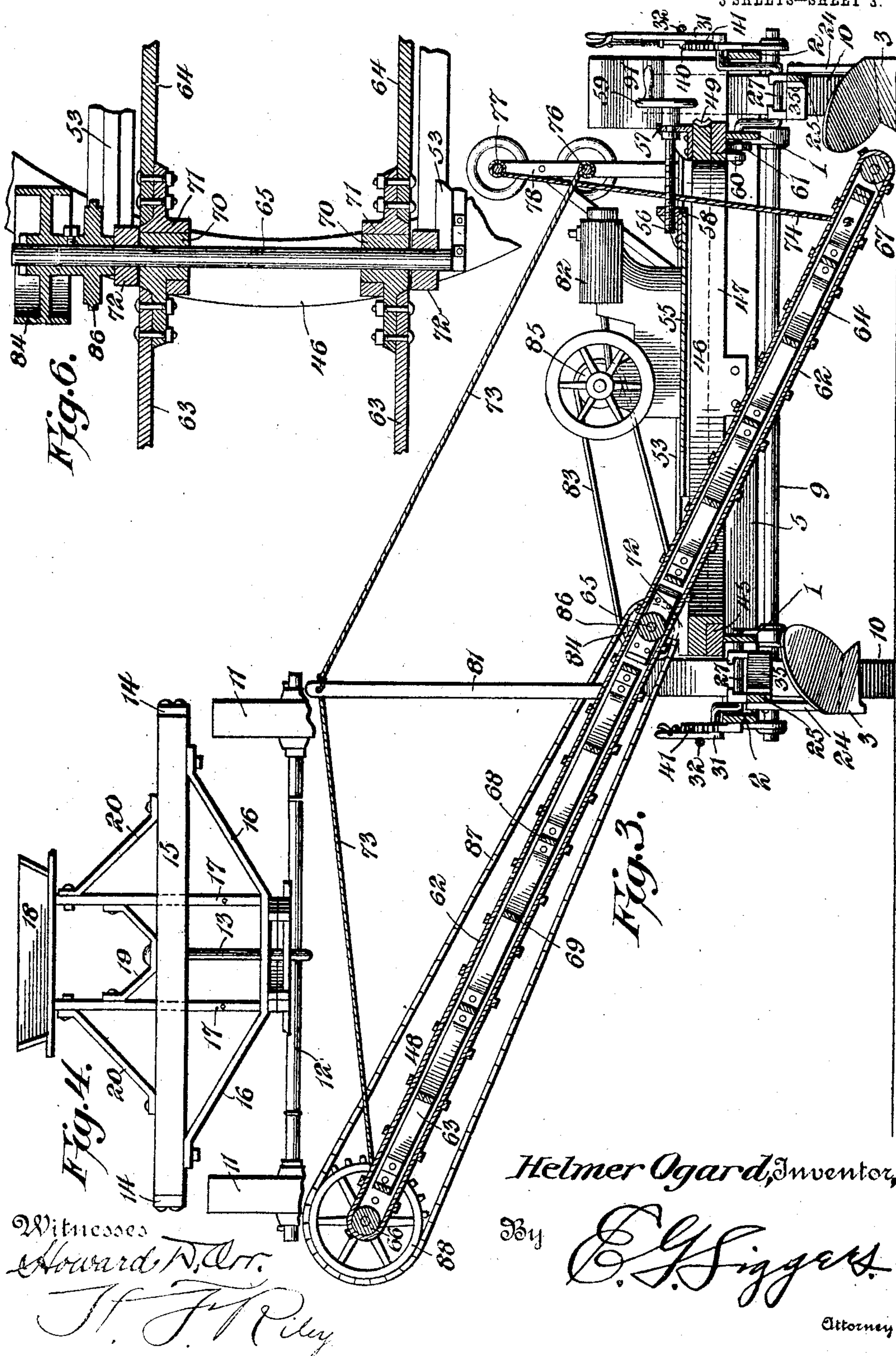
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3 SHEETS--SHEET 3.



UNITED STATES PATENT OFFICE.

HELMER OGARD, OF ADA, MINNESOTA, ASSIGNOR OF ONE-HALF TO
THEODORE IVERSON, OF BELTRAMI, MINNESOTA.

ROAD-GRADING AND DITCHING MACHINE.

No. 795,728.

Specification of Letters Patent.

Patented July 25, 1905.

Application filed February 28, 1905. Serial No. 247,739.

To all whom it may concern:

Be it known that I, HELMER OGARD, a citizen of the United States, residing at Ada, in the county of Norman and State of Minnesota, have invented a new and useful Road-Grading and Ditching Machine, of which the following is a specification.

The invention relates to improvements in road-grading and ditching machines.

The object of the present invention is to improve the construction of road-grading and ditching machines and to provide a simple and comparatively inexpensive one of great strength and durability designed for use on ordinary highways for making turnpikes and capable of being readily operated on either side of a turnpike and in any direction.

A further object of the invention is to provide a machine of this character having a plow at each side and provided also with an adjustable sod and dirt elevator capable of being operated with minimum horse-power and adapted to operate with either plow.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a side elevation of a road-grading and ditching machine constructed in accordance with this invention. Fig. 2 is a plan view of the same, the endless apron of the elevator being partly broken away to illustrate the construction of the frame of the latter. Fig. 3 is a transverse sectional view. Fig. 4 is an elevation, partly in section, illustrating the construction of the front of the machine. Fig. 5 is an enlarged detail perspective view illustrating the manner of mounting the adjustable plows. Fig. 6 is an enlarged detail sectional view illustrating the construction of the hinge-joint of the elevator. Fig. 7 is a detail sectional view illustrating the arrangement of the worm for operating the rotary frame or turn-table. Fig. 8 is an enlarged detail sectional view illus-

trating the manner of slidably mounting the adjustable platform on the rotary frame.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

The main frame of the road-grading and ditching machine is provided at opposite sides with inner and outer parallel longitudinal bars 1 and 2, spaced apart to receive mechanism for raising and lowering a pair of plows 3 or other excavating devices, which are located at opposite sides of the machine, as clearly shown in Fig. 3 of the drawings, and which are arranged to throw the sod and dirt inwardly. The outer longitudinal bars 2 have their front ends bent inwardly and secured to the inner longitudinal bars 1, which are connected at the front and back of the frame by cross-bars 4 and 5, preferably secured to the bars 2 by means of angle-plates 6 and 7, arranged in pairs and bolted or otherwise fastened to the bars 1 and 4; but the parts may be connected in any other desired manner, as will be readily understood. The bars 1 and 2 are also connected at the front of the frame by a transverse bottom bar 8, and they are provided at the back of the frame with suitable bearings for a rear axle 9, on which are mounted hind wheels 10. The latter may be of any desired construction and may also be mounted on the rear axle in any desired manner.

The front of the main frame of the machine is supported by front wheels 11, arranged on the journals of a front axle 12, which is pivotally connected with the front portion of the frame of the machine by a king-bolt 13. The front portions 14 of the inner longitudinal side bars are bent upwardly, as clearly shown in Fig. 1 of the drawings, and they are connected by a front cross-bar 15. The upper member of the fifth-wheel is connected with the cross-bar 15 by a transverse brace 16, provided with a central horizontal portion and having inclined side portions, the central horizontal portion being secured to the fifth-wheel, as clearly shown in Fig. 4 of the drawings. Rising from the fifth-wheel is a pair of vertical spaced bars or uprights 17, which support a seat 18 for the accommodation of the driver. The bars are connected at their upper portions by a central brace 19, and they are strengthened by outer inclined braces 20, extending downwardly from the

upper portions of the bars or supports 17 and secured at their outer ends to the cross-bar 15. The central brace 19 is composed of inclined sides and a central horizontal portion, which is provided with an opening for the king-bolt. The cross-bar 15 may be of sufficient thickness to be conveniently pierced by the fastening devices for securing the braces to it, or it may be provided with projecting lugs or ears or any other suitable means for enabling the braces to be conveniently attached to it. An inclined foot board or rest 21 is mounted on the upright bars 17, as clearly shown in Fig. 1 of the drawings. The foot board or rest may be constructed in any desired manner, and it is provided with inclined side bars 22, secured at their lower ends to the vertical bars or supports 17 and connected with the same between their ends by braces 23. Any suitable means may be employed for the attachment of the draft-animals.

The hind wheels are arranged in the spaces between the parallel side bars, and the plows are located in advance of the hind wheels, each plow having its moldboard arranged at the inner side. The standard 24 of each plow is secured to a horizontal beam 25, which is movable vertically through the space between the inner and outer side bars for adjusting the plow and for throwing the same into and out of operation. The plow-beam is raised and lowered and maintained throughout its movement in a horizontal position by means of swinging crank-links 26 and 27. The swinging crank-links 26 and 27, which are located at the ends of the horizontal plow-beam and which operate in horizontal slots or openings 28 and 29 thereof, consist of crank-bends of rock-shafts, the upper ends of the sides of the bends or links 26 and 27 being bent outwardly to form journals which are arranged in suitable bearings of the inner and outer longitudinal side bars of the main frame. The outer journals of the swinging crank-links are extended and have mounted on them front and rear arms 30 and 31, which are connected together, the rear arm 31 being extended upward to form an operating-lever. The connection 32 between the arms 30 and 31 consist of two rods and a turnbuckle 33, engaging the adjacent threaded ends of the rod for adjusting the connection to position the swinging crank-links properly with relation to each other for maintaining the plow-beam in a horizontal position. By adjusting the connection between the arms of the swinging crank-links the plow may be properly positioned to run smoothly, and any tendency of the plow either to run too deep or too shallow may be corrected. Each plow-beam is provided at its front and back with spaced parallel portions having upward extensions provided with the said slots 28 and 29. These par-

allel portions are formed by the ends of the beam and inner longitudinal side bars or pieces 34 and 35, having their inner ends bent at an angle and secured to the beam 25, and the outer ends of the side bars or pieces 34 and 35 are connected by end pieces 36 and 37, the parts being secured together by transverse bolts 38 and 39. When the operating arm or lever 31 is oscillated, the crank-links swing in unison, and the plow may be raised or lowered to throw it into and out of operation and also to adjust it to the desired depth. The operating arm or lever is secured in its adjustment by means of a spring-actuated detent 40, slidably mounted on the operating arm or lever and arranged to engage a toothed segment 41. The spring-actuated detent is controlled by the usual latch-lever arranged adjacent to and adapted to be grasped simultaneously with the grip or handle of the operating arm or lever. The toothed segment consists of a plate bolted or otherwise secured to the outer longitudinal bars 2; but it may be mounted on the main frame in any other desired manner.

Each plow-beam is supported by a stay-chain 42, connected at its rear end with the plow-beam near the center thereof by a clip 43 and engaging at its front end a hook 44, having a flat plate secured to the said transverse bottom bar 8. The clip 43, which is U-shaped to straddle the beam 25, is linked into the chain, and its sides are bolted or otherwise secured to the beam.

Mounted upon the main frame is a circular track 45, preferably consisting of a metal ring supported at the sides and front and back of the main frame by the inner longitudinal side bars and by the front and rear cross-bars 4 and 5. The circular track receives a rotary frame or turn-table 46, also consisting of a metal ring arranged on the circular track and provided at the inner edge thereof with a depending flange 47, adapted to prevent the rotary frame or turn-table from sliding horizontally on the track. In the accompanying drawings for convenience of illustration the rotary frame or turn-table is arranged directly upon the circular track; but in practice any form of antifriction device may be employed and interposed between the rotary frame or turn-table and the circular track.

The rotary frame carries an inclined elevator 48 and is adapted to be rotated to arrange the elevator to operate in conjunction with either plow for carrying the sod and dirt turned by the plow away from the road or turnpike. The rotary frame is provided at its periphery with teeth 49 to form a worm-gear which meshes with a worm 50 of a transverse shaft 51. The teeth extend around the rotary frame a sufficient distance to enable the same to be rotated approximately one-half a revolution to transfer the lower end of the inclined elevator from one

side of the machine to the other, and the transverse shaft, which is provided at its ends with suitable hand-wheels 52, may be operated by any suitable means. If desired, the transverse shaft may be connected by suitable gears with the rear axles, so that the elevator may be reversed as the machine is drawn from one spot to another. The transverse shaft is journaled in suitable bearings of the main frame and when rotated its worm engages the teeth 44 and actuates the rotary frame or turn-table.

The rotary frame or turn-table is provided with parallel ways 53, spaced apart and located at opposite sides of the center and consisting of angle-supporting bars 54, provided with L-shaped longitudinal flanges which form grooves for the reception of the side edges of a slidable platform 55. The slidable platform 55, which carries the inclined elevator, is adjusted by means of a screw 56 for arranging the lower end of the inclined elevator in proper position to receive the sod and dirt turned by the plow. The adjusting-screw, which is journaled in a suitable bearing of a bracket 57 of the rotary frame, engages a threaded opening of a bracket 58, mounted on the slidable platform at one end thereof. The screw is provided at its outer end with a hand-wheel 59, having a crank-handle and adapted to be rotated for sliding the platform backward and forward. If desired, suitable antifriction devices may be employed for enabling the platform to be moved freely in the parallel ways of the rotary frame.

The inclined elevator extends a suitable distance beyond the machine for discharging the sod and dirt at one side of the roadway or turnpike, and in order to prevent the rotary frame or turn-table from tilting under the weight of the elevator it is provided with a depending flange or ear 60, forming a support for an antifriction roller or wheel 61, which engages the lower face of the circular track at a point diametrically opposite the outer or extended portion of the elevator. The depending ear or portion 60 preferably consists of an extension of the depending annular flange 47, and the antifriction roller or wheel may be mounted on it in any desired manner.

The endless apron 62 of the inclined elevator may be constructed in any desired manner, and the frame of the elevator is composed of upper and lower sections 63 and 64, hinged together at their adjacent ends by a transverse shaft 65 and provided at their outer ends with suitable bearings for the reception of upper and lower rolls 66 and 67. The upper and lower rolls receive the endless apron, and the upper and lower sections of the elevator-frame are supported by transverse and diagonally-arranged braces 68 and 69, which may be secured together and to the sides

of the sections of the elevator-frame in any desired manner. The adjacent ends of the sections of the elevator-frame are provided with aligned eyes 70 and 71, arranged on the transverse shaft 65, which forms a pintle for the sections. The eyes consist of tubular members or castings having extensions, which are bolted or otherwise secured to the sides of the sections of the elevator-frame. The eyes 70 of the upper section of the elevator-frame are arranged directly on the transverse shaft and fitted within the eyes 71 of the lower section of the elevator-frame, as clearly illustrated in Fig. 6 of the drawings. The transverse shaft 65 is mounted in suitable brackets 72 or supports and forms a fixed pintle, on which the sections of the elevator-frame are adapted to swing freely. The hinge-joint permits the lower portion of the inclined elevator to be swung upward and downward to arrange it in proper position with relation to the plow and also to swing it upward clear of obstructions when the machine is not in operation. The upper portion of the inclined elevator is foldable and is adapted to be swung inward over the main frame when the machine is not in use. This will enable the machine to be driven through an ordinary gateway.

The upper and lower portions of the inclined elevator are adjusted by means of cables 73 and 74 or other suitable connections, such as chains, and the said cables extend from the upper and lower portions of the inclined elevator to windlass-shafts 76 and 77, journaled in suitable bearings of a vertical support or frame 78 and held against retrograde rotation by pawl-and-ratchet devices 79 and 80. The windlass-shafts are provided with crank-wheels or other suitable means for rotating them, and the upper section of the frame of the elevator is provided with arms 81, which offset the upper cables from the elevator and enable the upper portion to be readily swung upward by the windlass-shaft 76.

The endless elevator is operated by a suitable motor or engine 82, preferably of the gasoline type, to render the machine as light as possible, and owing to the particular construction and arrangement of the machine much less horse-power is required for operating it than has ordinarily been employed. Motion is communicated from the gasoline-engine by a belt 83 and pulleys 84 and 85 to sprocket-gearing which is connected with the inclined elevator. The pulley 84 is fixed to a sprocket-pinion 86, which receives a sprocket-chain 87, that is also arranged on a sprocket-wheel 88, connected with and arranged at one end of the upper roll of the elevator. The pulley 85 is loose and carries one member of a friction-clutch and is adapted to be engaged by a sliding member 89 thereof, whereby the elevator may be thrown into

and out of operation. The friction-clutch may be operated by a lever 90 or other suitable means.

A seat 91 may be mounted on the rear portion of the main frame for the accommodation of the operator. The seat 91 is composed of two sides and connecting transverse portions, the sides being mounted on the adjacent inner and outer longitudinal side bars, as clearly shown in Fig. 2 of the drawings. The seat is located in advance of the adjacent hind wheel, and it forms a mud-guard for the protection of the operator.

The machine is designed for grading and ditching, and it is adapted to be operated at either side of a road or turnpike, and it may be worked in any direction. The elevator is adapted to discharge the sod and dirt at a point beyond the road or turnpike, and it may be readily reversed to enable it to operate with either plow. The plows may be readily thrown into and out of operation and are capable of adjustment to arrange them at the desired depth. As the machine moves forward the plow in use will loosen and turn the soil, which will be conveyed away by the inclined elevator.

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

1. In a machine of the class described, the combination with opposite excavating devices, of means for carrying away the loosened or excavated earth, and means for reversing the said means for enabling the same to operate in conjunction with either excavating device.

2. In a machine of the class described, the combination with opposite plows, of an elevator for conveying away the loose earth, and means for reversing the elevator for enabling the same to operate with either plow.

3. A machine of the class described embodying plows located at opposite sides of the machine, a reversible elevator arranged to operate with either plow, and means for throwing the plows into and out of operation.

4. A machine of the class described, embodying a frame having a circular track, a rotary frame or turn-table mounted on the track, plows mounted at opposite sides of the machine independently of the rotary frame or turn-table, and an elevator carried by the rotary frame or turn-table, whereby it is adapted to operate with either plow.

5. A machine of the class described embodying a frame having a circular track, a rotary frame or turn-table mounted on the track, plows mounted at opposite sides of the machine independently of the rotary frame or turn-table, an elevator carried by the rotary frame or turn-table, whereby it is adapted to operate with either plow, and gearing for rotating the frame or turn-table.

6. A machine of the class described em-

bodimenting a frame having a turn-table provided with a worm-gear, opposite excavating devices mounted on the frame, an elevator carried by the turn-table, and a worm-shaft meshing with the worm-gear for rotating the turn-table.

7. In a machine of the class described, the combination of a plow having a beam, swinging links connected with and arranged to raise and lower the beam, and means for operating the links.

8. In a machine of the class described, the combination of a plow having a beam, swinging links connected with and arranged to raise and lower the beam, an adjustable connection between the links, and means for operating the links.

9. In a machine of the class described, the combination of a plow having a beam provided with longitudinal slots or openings, pivotally-mounted links engaging the slots or openings, and means for swinging the links in unison.

10. In a machine of the class described, the combination of a plow-beam having spaced slotted portions, swinging crank-links operated in the slotted portions of the plow-beams, and operating mechanism for actuating the crank-links.

11. In a machine of the class described, the combination of a frame provided at opposite sides with spaced bars forming openings, swinging links operating in the openings of the frame, plows having beams carried by the swinging links, and means for actuating the links for adjusting the plows and for throwing the same into and out of operation.

12. In a machine of the class described, the combination of a frame, opposite excavating devices, a turn-table mounted on the frame, an elevator carried by the turn-table and adapted to operate with either excavating device, and means for moving the elevator bodily on the turn-table for adjusting the former toward and from the excavating devices.

13. In a machine of the class described, the combination of a main frame, a rotary frame or turn-table, a slidable platform carried by the rotary frame or turn-table, opposite excavating devices mounted on the main frame, and an elevator carried by the platform in its sliding movement.

14. In a machine of the class described, the combination of a main frame, a rotary frame or turn-table, a slidable platform carried by the rotary frame or turn-table, opposite excavating devices mounted on the main frame, an elevator carried by the platform in its sliding movement, and an adjusting-screw connected with the rotary frame or turn-table and with the platform for sliding the latter.

15. In a machine of the class described, the combination of a main frame having a

circular track, a turn-table mounted on the track, an elevator carried by the turn-table and extending beyond the track, and an anti-friction device also carried by the turn-table and located opposite the extended portion of the elevator and engaging the track.

16. In a machine of the class described, the combination of a main frame having a turn-table, an excavating device mounted on the main frame, and an elevator carried by the turn-table and composed of adjustable upper and lower portions hingedly mounted, the upper portion being adapted to be folded over the machine, and the lower portion being adapted to be swung upward.

17. In a machine of the class described, the combination of a main frame, an elevator having upper and lower portions hinged together, flexible connections attached to the upper and lower portions of the elevator, and means for adjusting the flexible connections.

18. In a machine of the class described, the combination of a frame, a fixed shaft, an elevator having a frame composed of sections provided at their adjacent ends with eyes arranged in pairs, the members of each pair being fitted on each other and arranged on the said shaft, and means for adjusting the said sections.

19. In a machine of the class described, the combination of a main frame, a rotary frame or turn-table, an inclined elevator mounted on the turn-table and extending above and below the same, the upper and lower portions of the elevator being adjustable, arms extending from the upper portion of the elevator, and adjusting means pro-

vided with flexible connections attached to the upper and lower portions of the elevator and to the said arms.

20. In a machine of the class described, the combination of a frame, a plurality of excavating devices, a rotary frame or turn-table, and an elevator mounted on the rotary frame or turn-table and adapted to be carried by the same to the said excavating devices for operating in conjunction with the same.

21. In a machine of the class described, the combination of a main frame, an excavating device, a rotary frame or turn-table having an opening, and an elevator extending through the opening of the rotary frame or turn-table and having its lower portion arranged in juxtaposition to the excavating device, the upper portion of the elevator being extended beyond the rotary frame or turn-table.

22. In a machine of the class described, the combination of a main frame, wheels supporting the same, a rotary frame or turn-table, and a combined seat and wheel-guard mounted on the main frame and arranged adjacent to the rotary frame or turn-table, said combined seat and wheel-guard being located in advance of one of the wheels and composed of opposite sides and transverse connecting portions.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HELMER OGARD.

Witnesses:

GEO. HELLAND,
U. T. MOERS.