

No. 633,402.

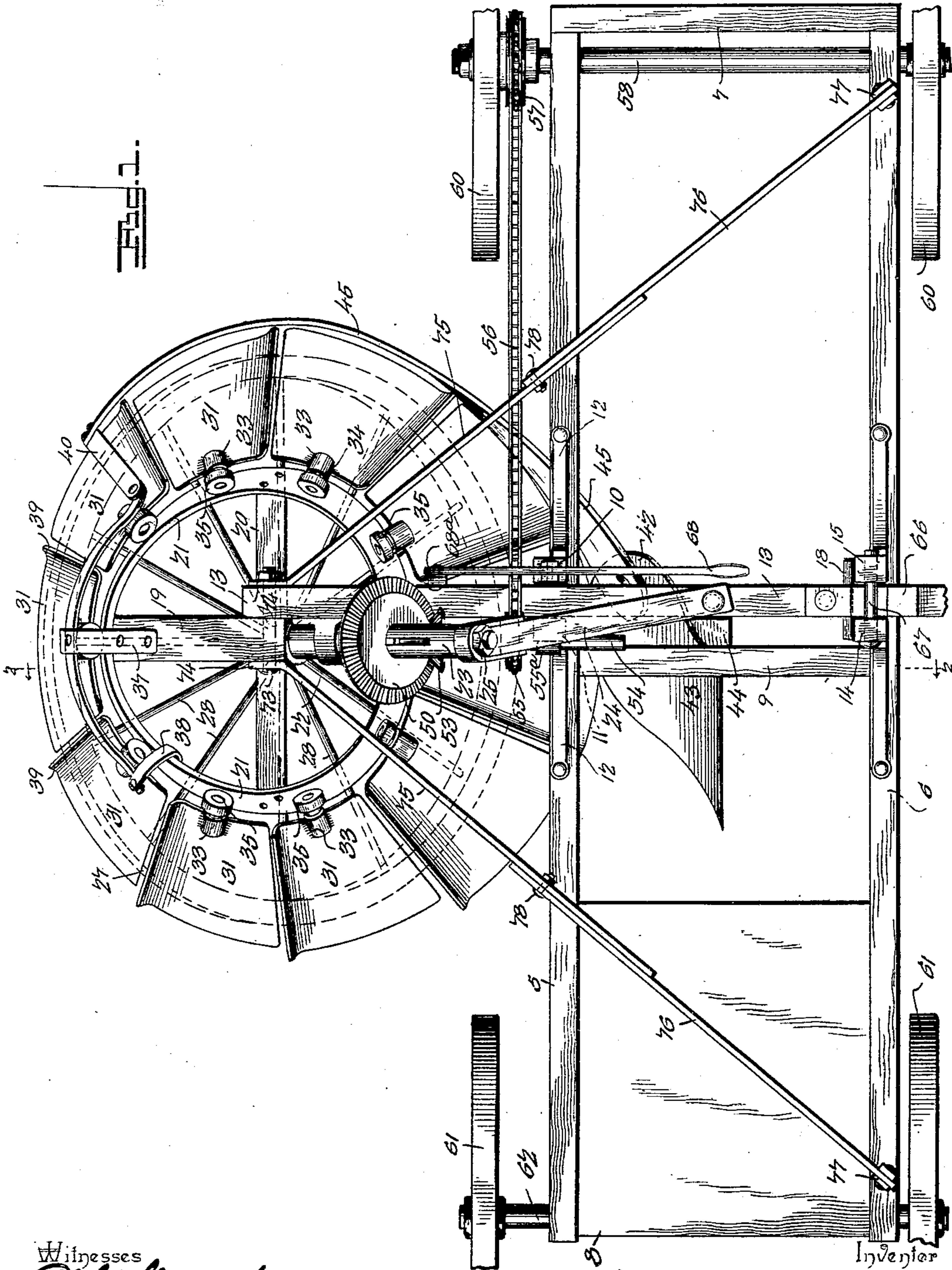
Patented Sept. 19, 1899.

T. THOMAS.  
DITCHING MACHINE.

(Application filed June 7, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
*E. F. Stewart.*  
*Geo. H. Chumaker.*

By *W. D. S.* Attorneys.

*Thomas Thomas*  
Inventor

*C. A. Snow & Co.*

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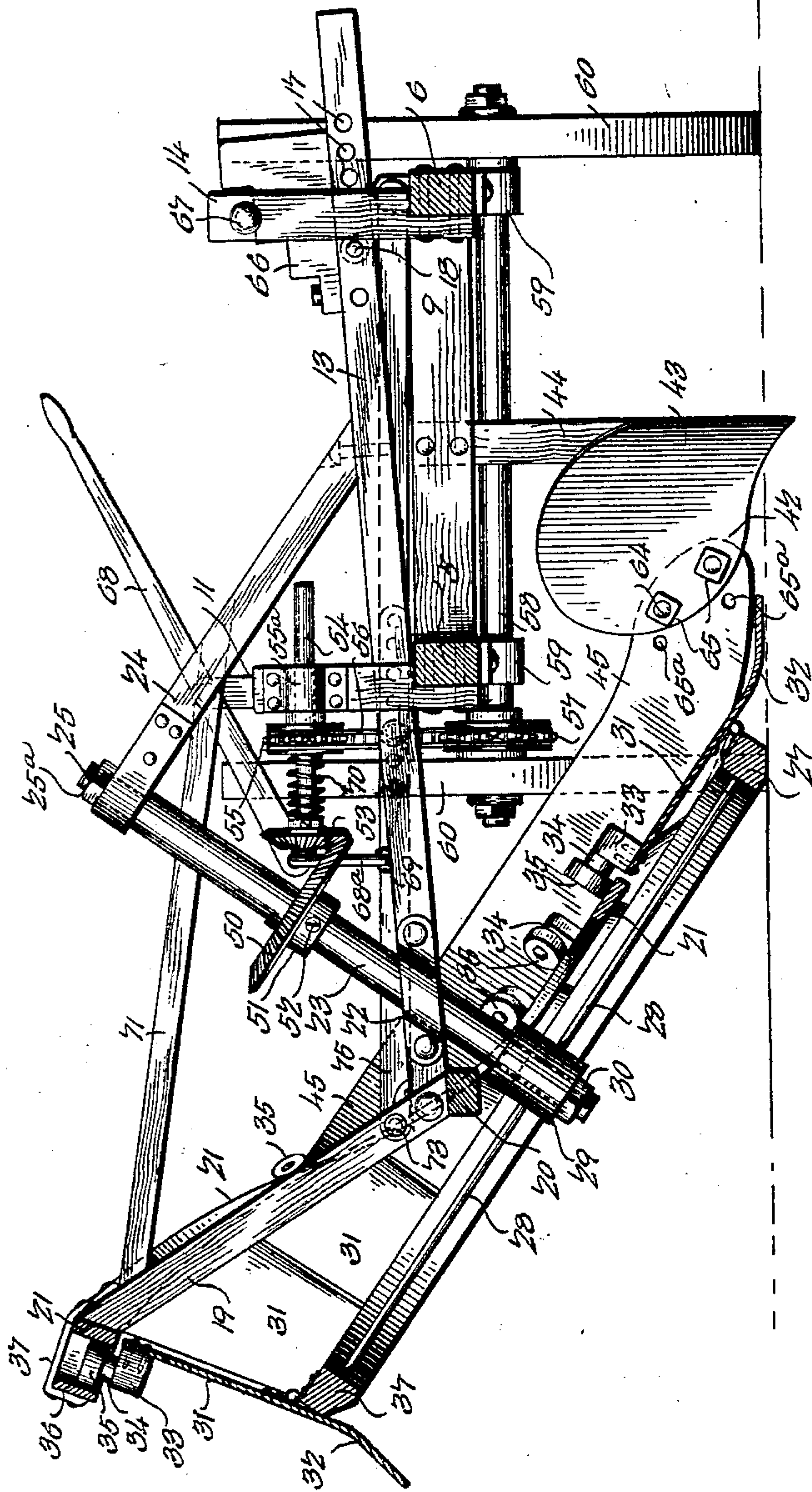
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Witnesses  
*E. C. Stewart*  
*Geo. H. Chandler*

*Thomas Thomas* Inventor  
By *W. S. Snow* Attorneys,  
*C. A. Snow & Co.*



# UNITED STATES PATENT OFFICE.

THOMAS THOMAS, OF ROANOKE, LOUISIANA.

## DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 633,402, dated September 19, 1899.

Application filed June 7, 1899. Serial No. 719,710. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS THOMAS, a citizen of the United States, residing at Roanoke, in the parish of Calcasieu and State of Louisiana, have invented a new and useful Ditching-Machine, of which the following is a specification.

This invention relates to ditching-machines; and it has for its object to provide such a machine comprising a vehicle which may be readily drawn in its operation and which will turn a furrow and after so doing will scoop up the dirt and convey it transversely of the furrow and deposit it in a line as the machine advances.

A further object of the invention is to provide a simple and efficient structure of the scooping and conveying means and also mechanism for adjusting the parts of the machine correlatively.

The invention consists of a vehicle having a bed or frame from which are extended supporting-beams carrying an adjustable ditching and conveying mechanism, the vehicle having suitable supporting-wheels, through the medium of which it may be readily drawn along the line of the ditch and will effectively dig out the ditch and deposit the dirt at a suitable point.

In the drawings forming a portion of the specification, and in which similar numerals of reference designate similar parts in both views, Figure 1 is a plan view of my machine. Fig. 2 is a section on line 2 2 of Fig. 1, the furrow-turning plow being shown in full lines.

Referring now to the drawings, this machine consists of a vehicle comprising side sills 5 and 6 and end pieces 7 and 8, a transverse brace 9 being arranged intermediate the end pieces. Mounted upon the sill 5 are uprights 10 and 11, having suitable braces 12, said uprights being separated by an interspace, in which is loosely seated a beam 13, extending outwardly and beyond the sill 5 at one end, the other end lying transversely of the frame and beyond the sill 6, passing through an interspace between uprights 14 and 15 upon the sill 6. In order to prevent longitudinal movement of the beam 13, I form transverse openings 17 adjacent the rear end thereof, and through which openings is adapted to pass a retaining bolt or pin

18, which bolt may be arranged at either side of the uprights 14 and 15 to bear thereagainst, or, if desired, one of said bolts may be disposed at each side of said uprights. Connected with the end of the beam 13, projecting beyond the sill 5 and extending upwardly therefrom at an obtuse angle thereto is a support 19, which carries, in connection with a transverse support 20, connected with the same end of the beam 13, a track 21, which track is bent into such a position that its inner portion adjacent the sill 5 will lie at substantially right angles to the outer portion, the intermediate portions fading gradually from one limit to the other.

Journalled in a bearing 22 on the beam 13 and slidable with respect to said bearing is a shaft 23, which extends upwardly and inwardly at an acute angle to said beam, the upper end of said shaft having a bearing also at the outer end of a brace 24, extending upwardly and outwardly and in a vertical plane with the beam 13. The upper end of the shaft 23 is threaded, as shown at 25, for the reception of a retaining-nut 25<sup>a</sup>, which holds the said shaft against downward movement with respect to the beam 13 and brace 24.

At the lower end of the shaft 23 and below the track 21 is fixed a wheel comprising a rim 27 and spokes 28, which latter lead to a retaining-hub 29, which latter is mounted directly upon said shaft and is held against longitudinal displacement by means of a retaining-nut 30, engaging the screw-threaded end of the shaft.

Hingedly connected with the upper edge of the rim 27 is a series of shovels or scoops 31, which are adapted to lie parallel with the face of the wheel at times and to be moved on their hinge connections to positions substantially at right angles to the plane of said wheel, the outer edges of said shovels being curved slightly upwardly, as shown at 32, and projecting beyond the periphery of the wheel when said shovels are in a position parallel with the face of the latter.

The wheel comprising the rim 27 is adapted for movement with the shaft 23, and in order to gradually move the shovels from their reclining positions to their upright positions in their travel from a point adjacent the vehicle-frame to the outer limit of their movement I



form a lug 33 upon the upper face of each shovel and adjacent its inner edge, in which lug is mounted the axle 34 of a roller 35, projecting in a plane parallel with the upper surface of the shovel and extending therefrom a suitable distance to cause the periphery of said roller to engage the track 21. It is of course understood that the track 21 is stationary, and hence if the shovel-carrying wheel be rotated to move the rollers 35 along the track said track will have the effect of gradually lifting the roller ends of the shovels to move said shovels successively into vertical positions and then to allow them to assume their original positions. As shown in Fig. 2 of the drawings, the track 21 lies close to the face of the shovel-carrying wheel at that portion adjacent to the vehicle, while the other edge of said track, lying at substantially right angles to the inner portion 21, is separated from the adjacent portion of the rim 27 by an interspace substantially equal to the distance from the hinge of a shovel to the edge of the latter, adjacent which the roller is journaled, as clearly shown in Fig. 2 of the drawings.

In order to prevent outward movement of the rollers 35 from the substantially vertical portion of the track 21, a supplemental track 36 is arranged parallel with the outer portion of the track 21 and is held in place by means of a brace 37, connected therewith and extending to and connected with the brace 19, additional braces 38 being connected with the adjacent end of the supplemental track 36 and with the track 21.

In order to prevent material upon the shovels passing rearwardly thereof, the rear ends of said shovels are curved upwardly, as shown at 39, forming backs for the shovels and acting as stops for the dirt.

Extending from the rear end of the supplemental track 36 is a brace 40, which projects outwardly over the path of the shovel and is connected with an apron or guard, which is curved to conform to the curvature of the outer edges of the shovels in their adjusted positions at the rear side of their carrying-wheel, said apron being extended from the inner edge of the wheel to connect with the moldboard 42 of a plow 43, carried by an upright 44, extending downwardly from the cross-piece 9. This plow 43 is disposed substantially midway of the sills 5 and 6 and is adapted to engage the earth to make a furrow, the moldboard 42 thereof turning the dirt over and upon the shovels 31, the dirt being guided in its passage upon the shovels by the apron or guard 45, above referred to.

The shovels in their movement with their carrying-wheel travel upwardly and outwardly and are gradually tilted, as before explained, the said guard 45 acting to prevent the dirt sliding from the shovels before it reaches the brace 40, which is at a point substantially at the outer limit of movement of the shovel.

The shovels in their engagement with the dirt from the plow 43 travel in a direction opposite to that of movement of the vehicle, this movement of the shovels being given through the medium of a bevel-gear 50, splined upon the shaft 23 and having a collar 51, through which is passed a set-screw 52, adapted to prevent longitudinal movement of said gear upon the shaft and to hold the gear in different adjusted positions. Engaging the gear 50 is a second bevel-gear 53, carried by a shaft 54, slidably mounted in a bearing 55<sup>a</sup> on the upright 11. This shaft 54 has splined thereto a sprocket 55, carrying a chain 56, engaging a second sprocket 57 upon the rear axle 58 of the vehicle. The axle 58 is journaled in suitable bearings 59 upon the sills 5 and 6, and carried by said axle and movable therewith are supporting-wheels 60, through the medium of which the axle 58 will be rotated as the vehicle is moved. Additional supporting-wheels 61 are arranged at the opposite end of the vehicle-frame and may be mounted in any manner upon an axle 62, carried by the frame.

The guard 45 is removably connected with the moldboard 42 of the plow through the medium of bolts 64 and attaching-nuts 65, adapted to engage any pair of a series of pairs of perforations 65<sup>a</sup> in the adjacent ends of the guard. In order to raise and lower the shovels and their connecting mechanisms, the loose arrangement of the beam 13 between the uprights on the sills is provided and in order to prevent the rear end of the beam 13 from rising, due to the weight of the shovels and their mechanisms, a step-block 66 is provided, which is adapted to enter the interspaces between the uprights 14 and 15 and to engage with its proper step a cross-bar 67, passed through said uprights. To raise the shovel end of the beam 13, I have pivotally mounted upon the upright 10 a lever 68, the work end of which is pivotally connected with the beam 13 through the medium of a link 68<sup>a</sup>, the ends of which are connected directly with the lever 68 at one end and with an eye 69, secured to the beam. Thus it will be seen that in order to adjust the step-block 66 the upward pressure of the beam 13 thereagainst may be relieved by downward pressure upon the lever 68, which action shifts the fulcrum of said beam to the eye 69. The block 66 may be then withdrawn to a lower step or may be pushed farther forward to a higher step, as desired. Before the upward movement of the outer end of the beam 13 it is of course necessary to shift the bevel-gear 50 downwardly upon the shaft 23, which shifting may be performed after the set-screw 52 has been loosened. If the block 66 be then adjusted to a higher step to hold the shovel end of the beam at a higher elevation, the bevel-gear 50 will be shifted to a point below its previous rotation, while its periphery will project inwardly in the direction of the vehicle-frame to a point beyond its previous



projection. This will necessitate a corresponding retrograde movement of the bevel-gear 53, and to provide for this movement the slidable mounting of the shaft 54 in its bearing 53 is arranged, the spline connections of the sprocket 55 with said shaft enabling the maintenance of said sprocket in alignment with the sprocket 57. The shaft 54 being slidably journaled, it is of course necessary to prevent accidental movement of said shaft to draw the gear 53 away from the gear 50, and this I accomplish by encircling the shaft intermediate said gear and the sprocket 55 with a helical spring 70, which bears at opposite ends against the adjacent faces of said gear and sprocket. Thus it will be seen that the gear 53 will adjust itself readily to the position of the gear 50 in its different positions upon the shaft 23.

A tie-bar 71 is connected with the outer end of the brace 19 and with the brace 24 to prevent outward movement of said brace 19, which latter is secured to the beam 13 by means of a transverse bolt 73, which latter forms a means of attachment of the outer end 74 of adjustable braces comprising elements 75 and 76, of which elements 76 have their rear ends pivotally connected to ears 77, carried by the sills 6. The adjustment of the elements 75 and 76 is secured through the medium of a series of perforations carried by the overlapping ends of said elements and which are adapted to align and to receive a retaining-bolt 78.

It will thus be seen that in the movement of the vehicle in a direction to cause the plow 43 to cut a furrow the dirt from said plow will be deposited upon the shovels 31 as they successively pass through that portion of their paths at the limit of their inward movements, which said shovels will be gradually tilted, and that when they have passed beyond the guard 45 they will deposit their contents in a continuous line. It will also be seen that the mechanism may be adjusted vertically for various conditions of use and that the entire mechanism presents a cheap and effective construction which may be easily operated with a minimum of energy applied.

Suitable draft appliances of any style may be provided for the vehicle, whether it be drawn by horses or other power, and it will be readily understood that the apparatus may be employed for any purpose for which it is adapted and that the specific construction and arrangement herein shown and described may be varied without departing from the spirit of the invention.

Having thus described the invention, what is claimed is—

1. A ditching-machine, comprising a vehicle, a plow carried by the vehicle, a rotatable shovel-carrier carried by the vehicle, a plurality of shovels pivoted upon the carrier and adapted to move adjacent to said plow and receive dirt therefrom, a track engaging the shovels and adapted to tilt them, a supple-

mental track adapted for engagement by the shovels to return them, and means for rotating the carrier.

2. A ditching-machine comprising a vehicle, a plow connected with the vehicle, a plurality of shovels pivotally and rotatably mounted adjacent the plow, a guard connected with the plow and extending part way around the shovels and adapted to guide the material from the plow to and hold it upon the shovels from their point of reception to their point of discharge of dirt, and means for rotating the shovels.

3. A ditching-machine comprising a vehicle, a plow connected with the vehicle, a rotatable shovel-carrier carried by the vehicle, a plurality of shovels pivoted upon said carrier and adapted to move adjacent said plow and receive dirt therefrom, means for engaging said shovels to tilt them, means for engagement by the shovels to return them and means for rotating the carrier.

4. A ditching-machine comprising a vehicle, a plow connected with the vehicle, a rotatable shovel-carrier carried by the vehicle, a plurality of shovels pivoted upon said carrier and adapted to move adjacent said plow and receive dirt therefrom, a continuous track adjacent the path of said shovels, means carried by the shovels in constant engagement with the track to tilt the shovels, a supplemental track for returning the shovels and means for rotating the carrier.

5. A ditching-machine comprising a vehicle, a plow connected with the vehicle, a rotatable shovel-carrier carried by the vehicle and adapted to rotate in a plane at an angle to the plane of travel of the plow, a plurality of shovels pivoted upon said carrier and adapted to move adjacent said plow and receive dirt therefrom, a track adjacent the path of said shovels, a roller journaled upon each shovel and engaging the track to tilt the shovel, a supplementary track adapted to tilt the shovels in opposite directions, means for guiding the material from the plow to the shovels and for retaining the material thereon for a portion of the rotation of each shovel, and means for rotating the carrier.

6. A ditching-machine comprising a vehicle, a plow connected with the vehicle, a rotatable shovel-carrier adjustably connected with the vehicle, means for holding said carrier at different points in its adjustment, a plurality of shovels pivotally connected with the carrier and adapted to move adjacent said plow and receive dirt therefrom, a supporting-frame for said carrier, a guide connected with the plow and extending adjacent the periphery of the carrier to prevent displacement of material from the shovels, and adjustable means for rotating the carrier.

7. A ditching-machine comprising a vehicle, a plow connected with the vehicle, a supporting-frame adjustably connected with the vehicle and adapted for longitudinal and pivotal adjustment with respect thereto, a shaft



journalled in said frame, a rotatable shovel-carrier mounted on said shaft, shovels carried by said carrier and adapted for movement adjacent the plow to receive material therefrom, means for tilting said shovels, means for returning said shovels to their former positions, and adjustable means for rotating the carrier.

8. A ditching-machine comprising a vehicle, a supporting-frame carried by the vehicle and adjustable longitudinally and pivotally thereof, means for holding said frame in its adjusted positions, a shaft mounted in said frame and having adjustable rotating means, a shovel-carrier fixed to said shaft, a plurality of shovels pivoted to the carrier and each having a roller journalled adjacent its rear edge, said shovels being adapted to lie, parallel with the face of the carrier when at the inner limit of their movement, a track engaging said rollers

and adapted to move them with their shovels into a tilted position, a supplemental track engaging said rollers and adapted to limit the outward movement thereof and move them initially to lie parallel with the face of the carrier, a plow carried by the vehicle, and a guard adjustably connected with the plow and extending adjacent the shovel-carrier and adapted to guide material from the plow to the shovels and retain it upon the shovels throughout a portion of the movement of the latter.

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

THOMAS THOMAS.

Witnesses:

F. F. MORSE,

W. B. ANDERSON.