

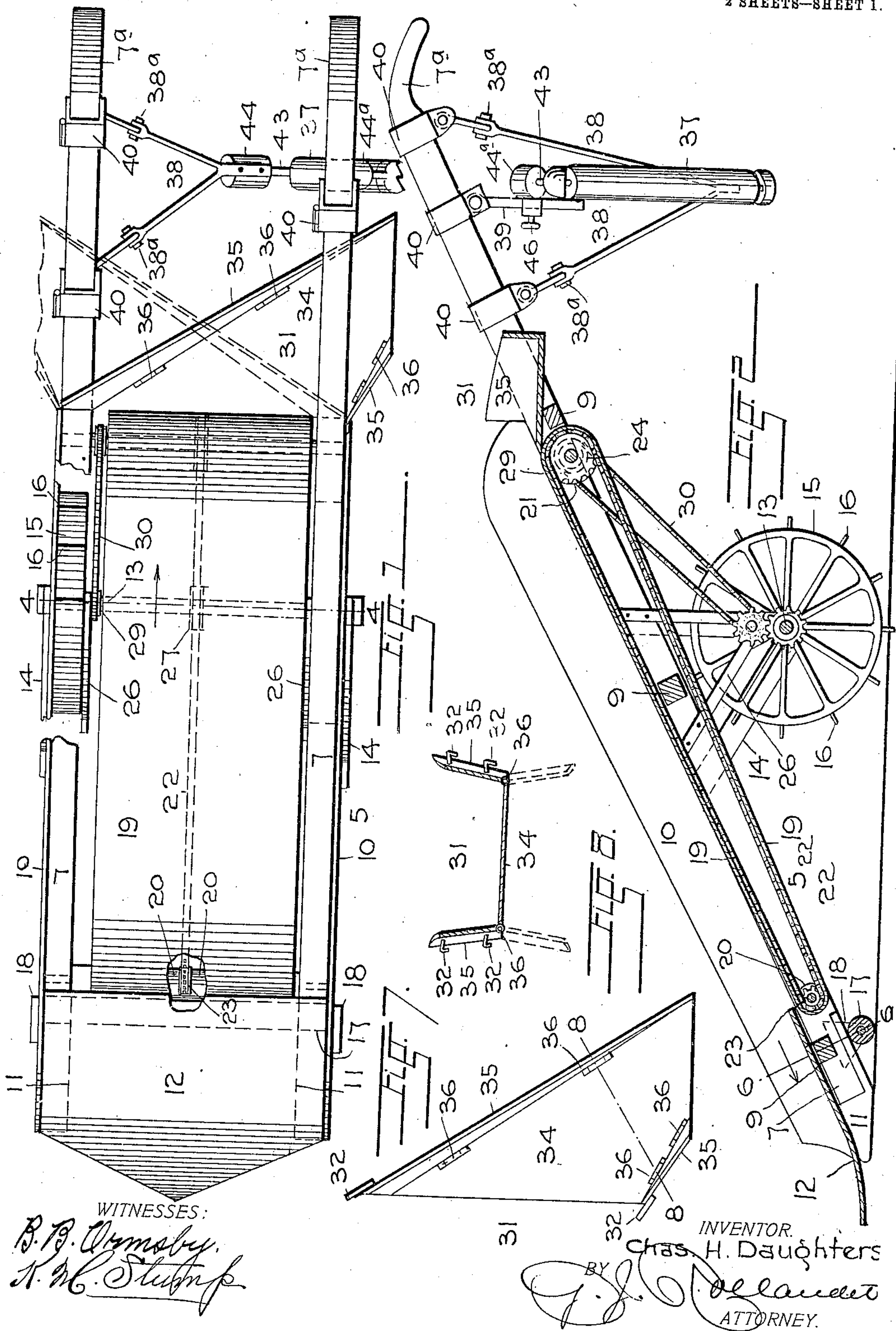
No. 828,537.

PATENTED AUG. 14, 1906.

C. H. DAUGHTERS.
DITCHING MACHINE.

APPLICATION FILED MAR. 19, 1906.

2 SHEETS—SHEET 1.



No. 828,537.

PATENTED AUG. 14, 1906.

C. H. DAUGHTERS.
DITCHING MACHINE.
APPLICATION FILED MAR. 19, 1906.

2 SHEETS—SHEET 2

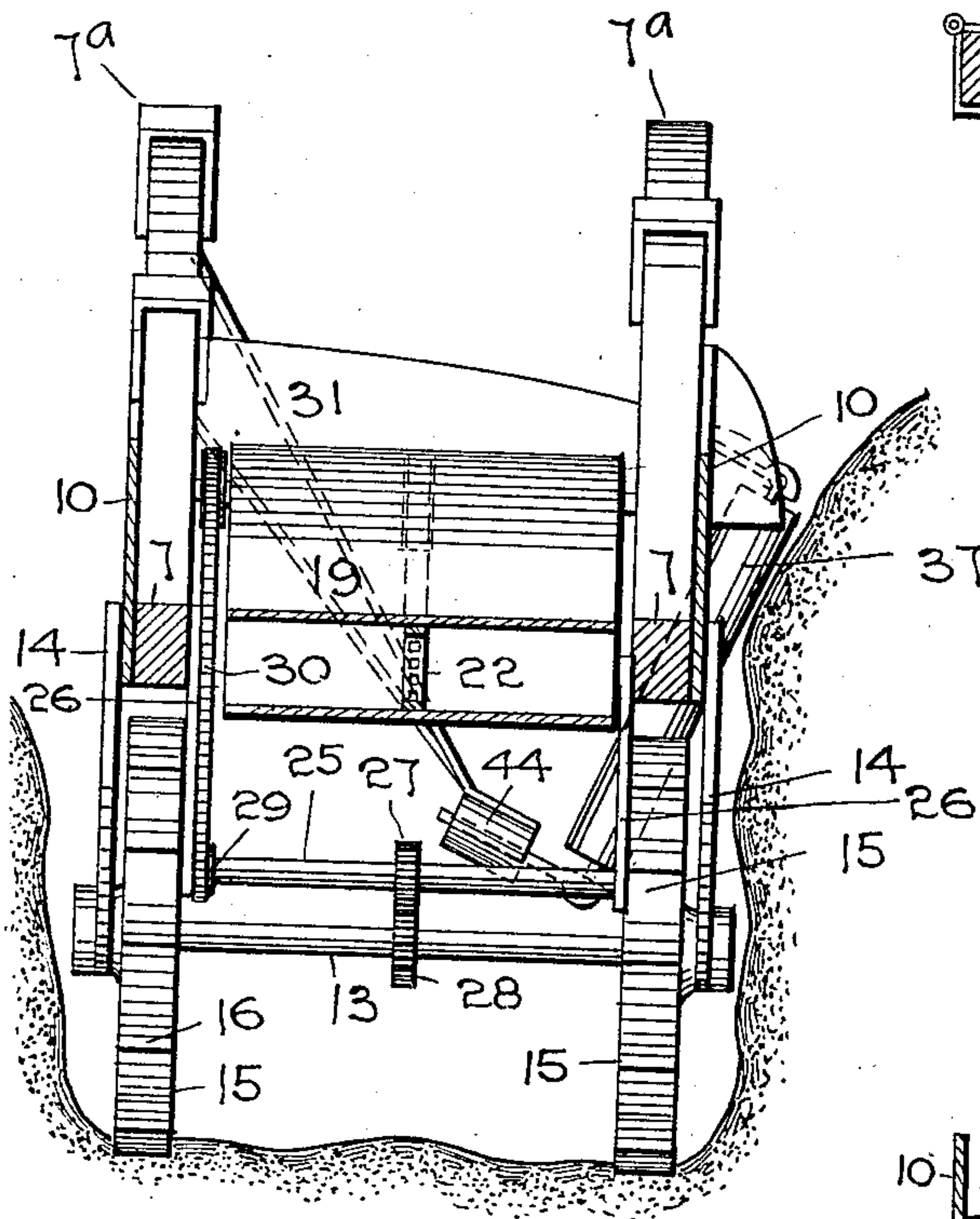
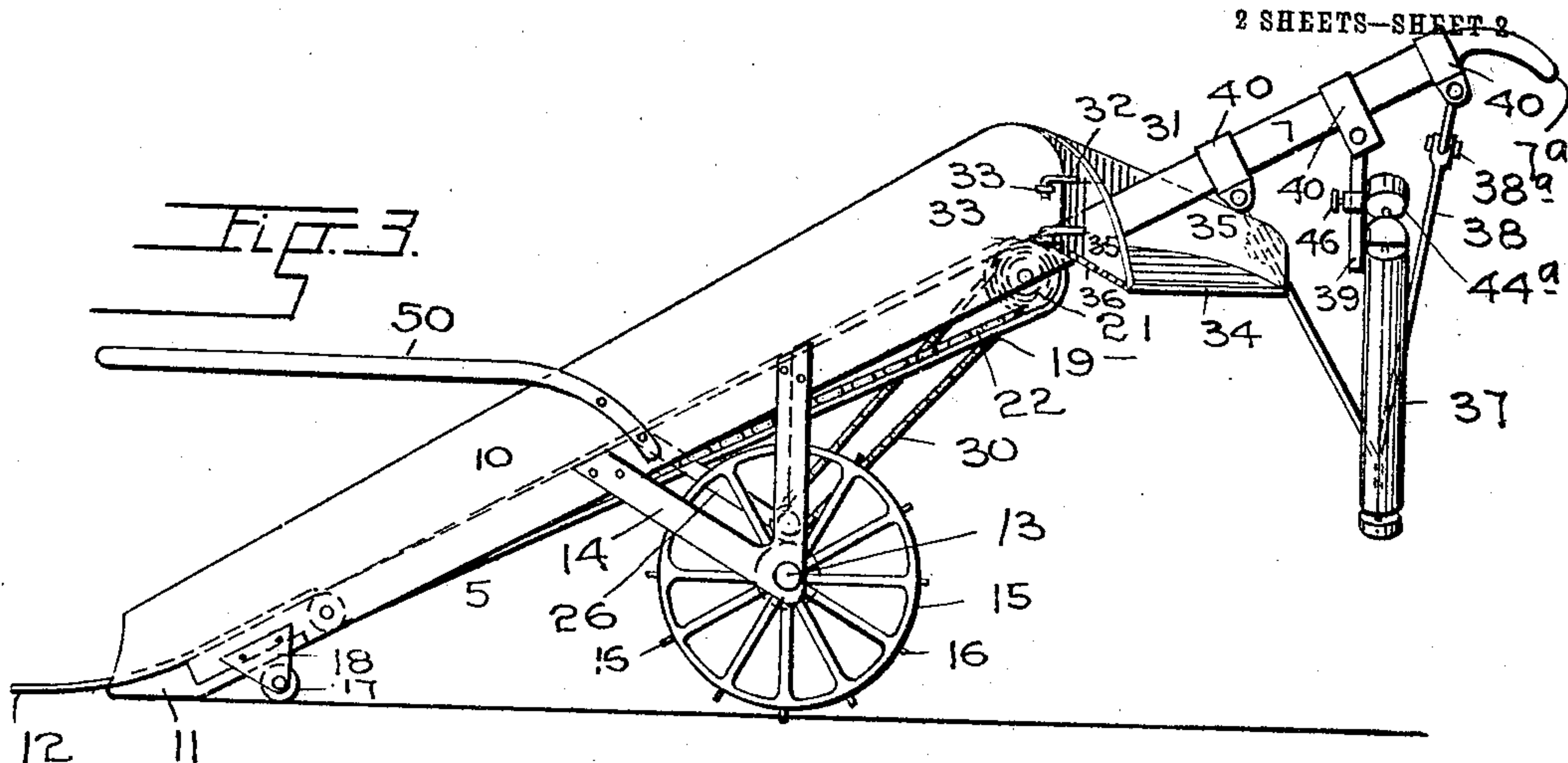


Fig. 4.

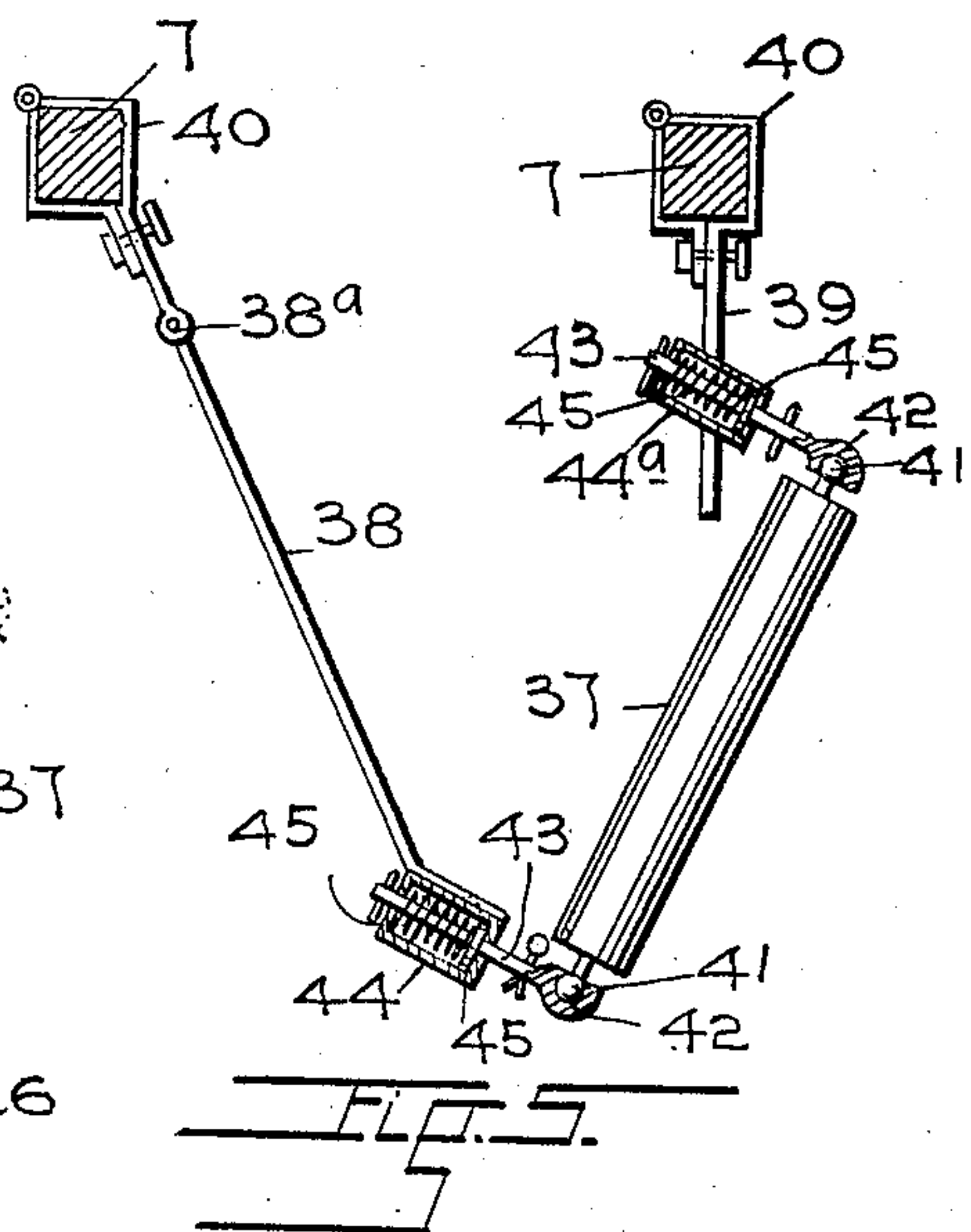
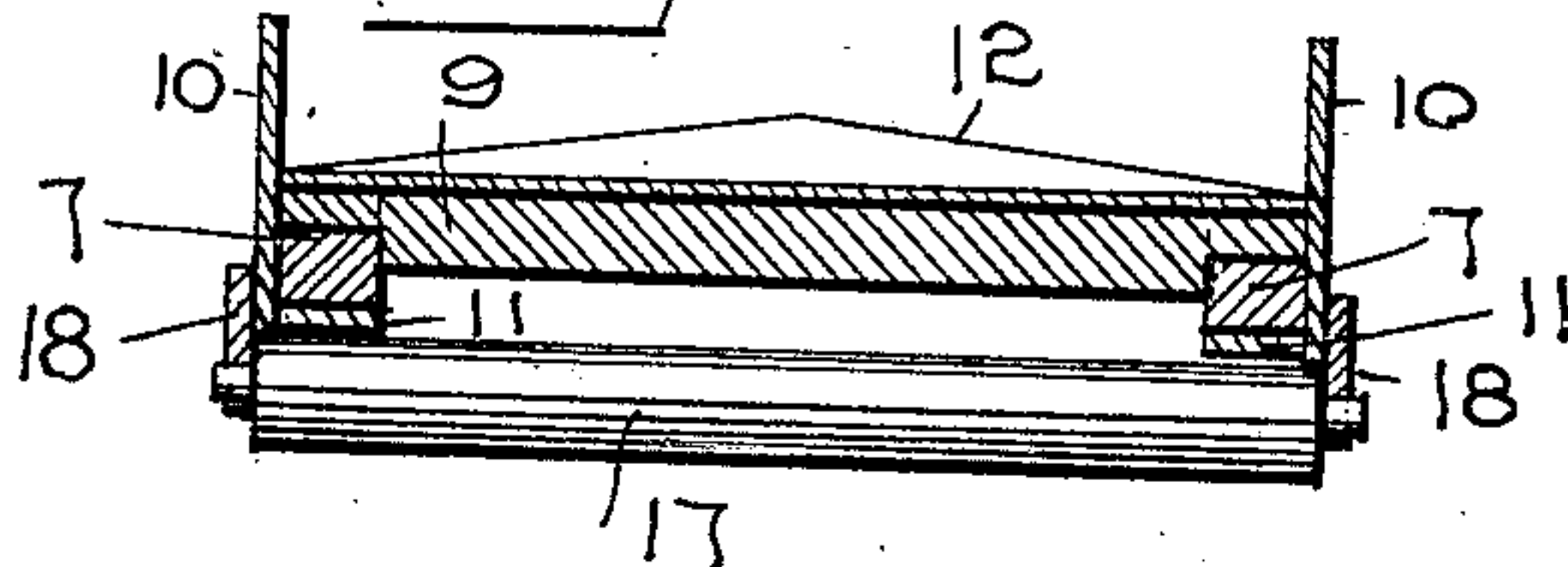


Fig. 5.



WITNESSES:

B. B. Dymally
W. M. Stump

INVENTOR
Chas. H. Daughters

BY *[Signature]*
ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES H. DAUGHTERS, OF DENVER, COLORADO.

DITCHING-MACHINE.

No. 828,537.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed March 19, 1906. Serial No. 306,835.

To all whom it may concern:

Be it known that I, CHARLES H. DAUGHTERS, a citizen of the United States of America, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Ditching-Machines, of which the following is a specification.

This invention relates to machines for excavating ditches for irrigating and other purposes, and has for its object to produce a simple and effective device which, traveling inside the excavation while operating, is especially adapted to be used on hillsides and on uneven or densely-timbered surfaces and which will form and finish the embankments along the sides of the ditch. I attain these objects by the mechanism illustrated in the accompanying drawings, in the various views of which like parts are similarly designated, and in which—

Figure 1 represents a plan view of the device; Fig. 2, a longitudinal vertical section therethrough; Fig. 3, a side elevation drawn to a reduced scale; Fig. 4, a vertical cross-section taken along a line 4 4, Fig. 1; Fig. 5, a cross-section through the handles, showing the arrangement of the bank-forming roller; Fig. 6, a cross-section along a line 6 6, Fig. 2; Fig. 7, a plan view of the reversible delivery-chute; and Fig. 8, a section along the line 8 8, Fig. 7.

The device consists of a normally inclined truck-frame 5, comprising the parallel longitudinally-extending beams 7, the upper extremities of which are formed into handles 7^a and which are connected by suitable cross-beams 9. Beams 7 are provided with vertical upwardly-extending side boards 10 and at their lower extremities with suitably-formed shoes 11, which in practice support the transversely-disposed excavating or scraper blade or shovel 12. Frame 5 is mounted upon the transverse axle 13 by means of downwardly-extending supports 14, the lower extremities of which are provided with apertures through which axle 13 projects. The ground-wheels 15 are mounted on the axle underneath the longitudinal beams 7 of the frame, so that the distance between their outer sides does not exceed the width of the latter or of the thereto-secured blade 12. They are preferably provided with a plurality of peripheral ribs 16 to prevent slipping and to insure equable movement of

the conveyer employed on the device. The frame is furthermore supported at its lowermost end by a transversely-disposed roller 17, which is revolubly mounted in brackets 18 on the sides of beams 7.

19 represents the endless belt conveyer, which, extending between beams 7, is stretched over the transverse revoluble rollers 20 and 21. The equable movement of the conveyer is insured by a centrally-located sprocket-chain 22, which is attached to the belt at its inner side and which engages sprocket-wheels 23 and 24 on rollers 20 and 21. Belt 19 is operated during movement of the device through instrumentality of an auxiliary transverse shaft 25, revolubly mounted above axle 13 in brackets 26, which extend downwardly from the inner sides of beams 7. Shaft 25 is operatively connected with axle 13 by means of gear-wheels 27 and 28 and is provided near one of its extremities with a sprocket-wheel 29, which in practice is alined with a corresponding wheel on the uppermost roller 21 of the conveyer. A chain 30, stretched over the two sprocket-wheels, is instrumental in conveying the rotary movement of shaft 25 to the endless apron 19.

The dirt which is elevated by the conveyer is discharged into a delivery-chute 31, which, extending below the upper end of belt 19, is detachably secured to the sides 10 of the frame by means of hooks 32 engaging corresponding eyes 33. Chute 31 is composed of a bottom plate 34 and sides 35, which are connected with the former by means of hinges 36. The laterally-extending chute delivers the dirt along one side of the excavation made by the machine and may readily be arranged to discharge at the opposite side by reversing the position of the sides 35 in relation to bottom 34, as shown in broken lines in Fig. 8.

The device is furthermore provided with an obliquely-disposed roller 37, which, being mounted at the upper extremities of beams 7, is adapted to engage the dirt deposited through spout 31 and which forms or finishes the embankments of the ditch. Roller 37 is resiliently mounted on arms 38 and 39, which are secured to the beams 7 by hinged clasps 40. Its outer extremities are provided with spherical trunnions 41, which extend in correspondingly-shaped sockets 42 at the ends of rods 43, the opposite extremities of which extend through cylinders 44 and 44^a, which

are respectively secured to the above-named arms 38 and 39. Spiral springs 45 inside the cylinders engage pistons 45', secured to rods 43, and are arranged to retain roller 37 in resilient contact with the bank of the ditch. The upper cylinder 44^a is adjustably secured to the downwardly-extending rod 39 by means of a set-screw 46, while the lowermost cylinder is fastened to the bifurcated brace 38. Arm 39 is in practice secured to one of the beams 7, intermediate the delivery-spout 31 and handle 7^a, while the extremities of brace 38 are fastened to the opposite beam. By loosening clasps 40 and reversing their positions on beams 7 roller 37 may readily be arranged to engage the opposite bank of the ditch. Joints 38^a in the arms of brace 38 permit the adjustment of the uppermost cylinder 44^a on arm 39 for the purpose of accommodating the roller to the varying slopes of the embankments.

The operation of the device is simple. It is impelled by means of a draft-animal hitched to a bifurcated up and forwardly extending arm 50, which is preferably secured to the sides of the frame in front of axle 13, as indicated in Fig. 3, while the course of the machine is governed by the operator by manipulation of handles 7^a. When the machine is moved along the previously-plowed ground, shovel 12 gathers the dirt and delivers it upon the upwardly-moving conveyer 19, which elevates it and discharges it into the chute 31 to be deposited along the side of the excavation. Roller 37, engaging the piled dirt, subsequently forms and finishes the embankment. By alternately reversing the position of the delivery-spout and of the roller the banks are formed on both sides of the ditch, it being necessary to traverse the plowed ground repeatedly before the ditch is finished.

The construction of the machine as shown and described adapts it especially for use on hillsides or for excavating uneven and densely timbered surfaces by reason of the fact that the truck-frame and the shovel secured thereto are in width equal to or exceed the distance between the outermost sides of the two ground-wheels, which arrangement permits the machine to travel within the excavation, and thus at all times maintain its upright position.

Having thus described my invention, what I claim is—

1. A ditching-machine comprising in combination an inclined frame, a scraper-blade fixed transversely upon and beyond its lower extremity, a conveyer-belt on the frame, a rotatable support beneath the blade and ground-wheels revolubly mounted substantially in a plane with the outer sides of the frame and within its width.

2. A ditching-machine comprising in combination an inclined frame including two lon-

gitudinal, parallel girders, a scraper-blade fixed transversely upon and beyond their lower extremities, a conveyer-belt between the girders, a rotatable support on the frame beneath the blade and ground-wheels revolubly mounted beneath the girders substantially within their width.

3. A ditching-machine comprising in combination an inclined frame, a scraper-blade fixed transversely upon and beyond its lower extremity, an axle revolubly mounted on the frame, ground-wheels on the axle within the width of the frame, parallel rollers on the frame, a belt engaging the rollers, a transverse counter-shaft geared with the axle and means to transmit its rotary motion to the rollers.

4. A ditching-machine comprising in combination an inclined frame including longitudinal parallel girders, a scraper-blade fixed transversely upon and beyond their lower extremities, ground-wheels mounted beneath the girders within the width of the frame, rollers on the girders carrying sprocket-wheels disposed centrally and below their circumferential surface, an endless chain engaging the sprocket-wheels, an endless belt secured thereto and means to transmit the movement of the ground-wheels in reverse direction to one of the said rollers.

5. A ditching-machine comprising in combination, a frame, ground-wheels revolubly mounted thereon, a conveyer-belt on the said frame, a scraper-blade arranged to gather the earth and to deliver it onto the belt, and a detachable chute arranged to discharge the earth delivered to the belt and comprising a bottom plate and reversible side plates.

6. A ditching-machine comprising in combination, an inclined frame, ground-wheels revolubly arranged thereon, a scraper-blade across its lower extremity, a conveyer-belt arranged to elevate the dirt gathered by the blade, a delivery-chute adapted to deposit dirt discharged from the belt along a side of the excavation and an obliquely-disposed roller arranged to engage the deposited dirt.

7. A ditching-machine comprising in combination an inclined frame, ground-wheels revolubly arranged thereon, a scraper-blade across its lower extremity, a conveyer-belt arranged to elevate the dirt gathered by the blade, a delivery-chute adapted to deposit dirt discharged from the belt, along a side of the excavation, and an obliquely-disposed roller arranged to resiliently engage the deposited dirt.

8. A ditching-machine comprising in combination, an inclined frame, ground-wheels revolubly arranged thereon, a scraper-blade across its lower extremity, a conveyer-belt arranged to elevate the dirt gathered by the blade, a delivery-chute adapted to deposit dirt discharged from the belt, along a side of the excavation and an obliquely-disposed

roller revolubly and adjustably mounted on the frame and arranged to resiliently engage the deposited dirt.

9. A ditching-machine comprising in combination an inclined frame, ground-wheels
5 revolubly arranged thereon, a scraper-blade across its lower extremity, a conveyer-belt arranged to elevate the dirt gathered by the blade, a delivery-chute adapted to deposit
10 dirt discharged from the belt, along a side of

the excavation and an obliquely-disposed, adjustable roller, detachably mounted on the frame and arranged to resiliently engage the deposited dirt.

In testimony whereof I have affixed my 15 signature in presence of two witnesses.

CHARLES H. DAUGHTERS.

Witnesses:

G. J. ROLLANDET,
K. M. STUMP.