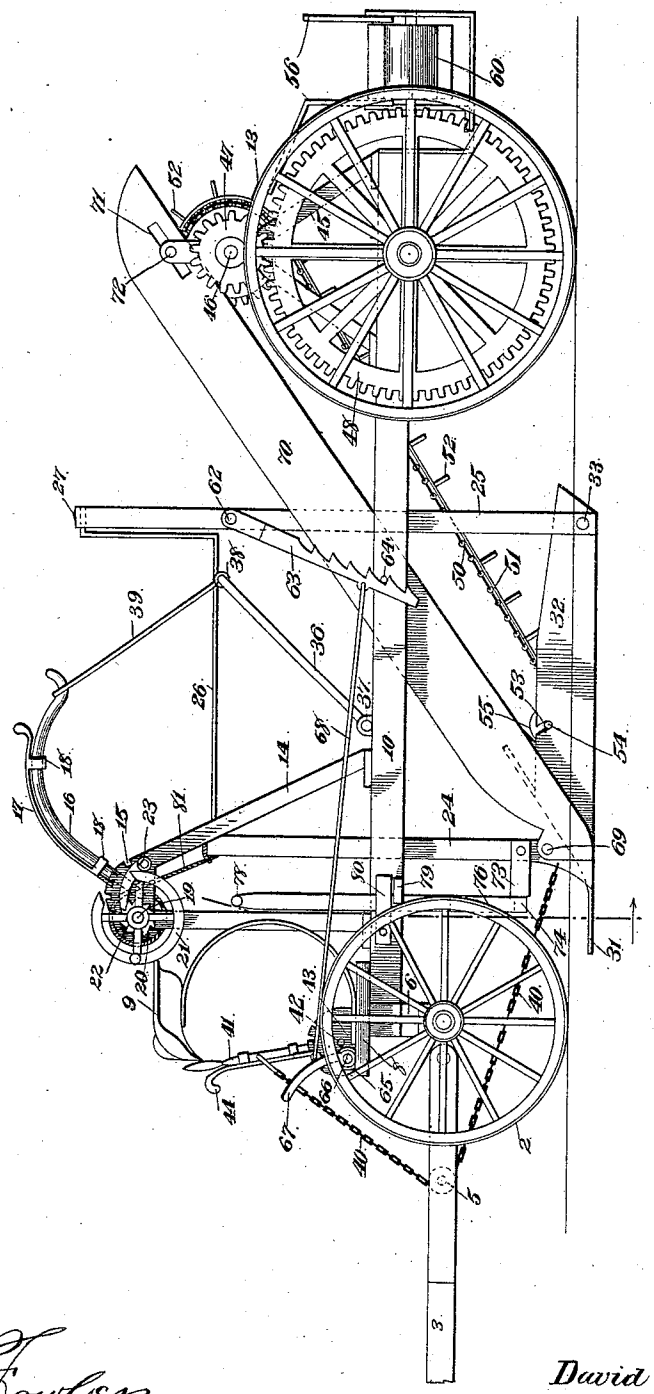
(No Model.) 3 Sheets—Sheet 1.

D. W. SCOTT.

DITCHING MACHINE.

No. 473,023. Patented Apr. 19, 1892.

Fig. 1.



Witnesses:
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W. S. Duval

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

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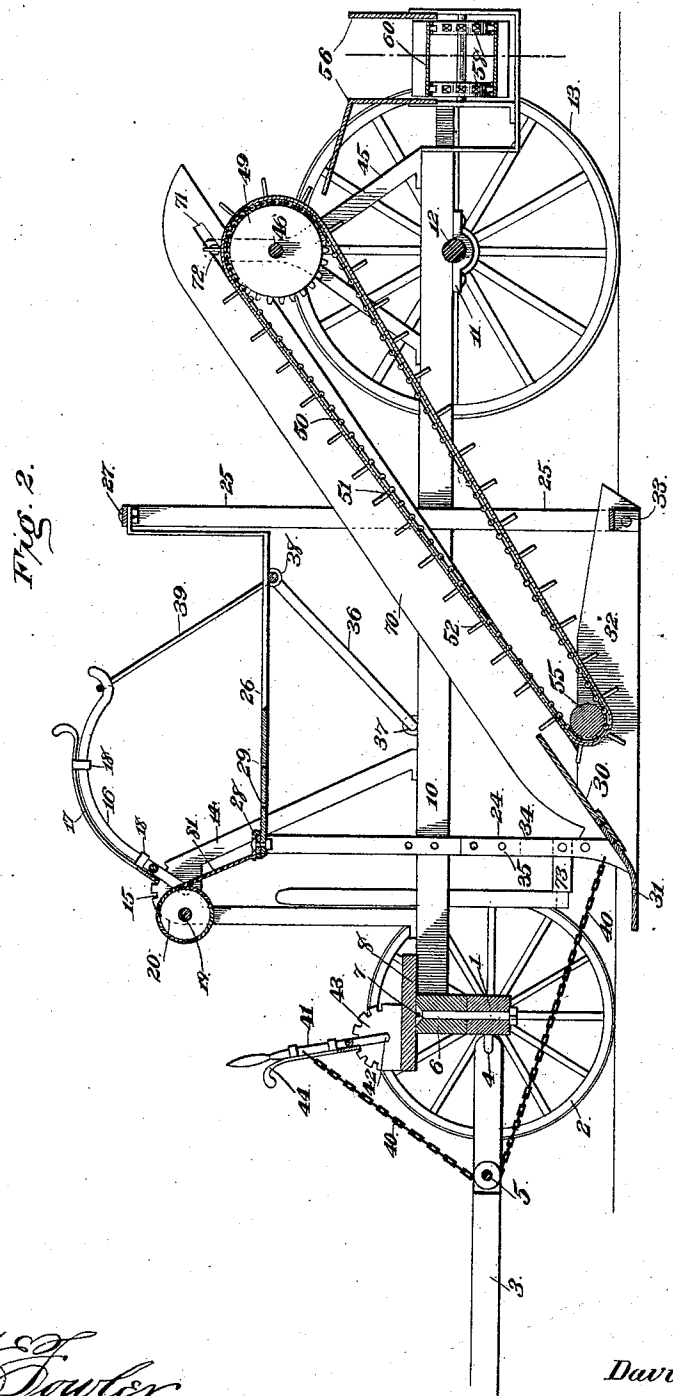
Fig. 2.



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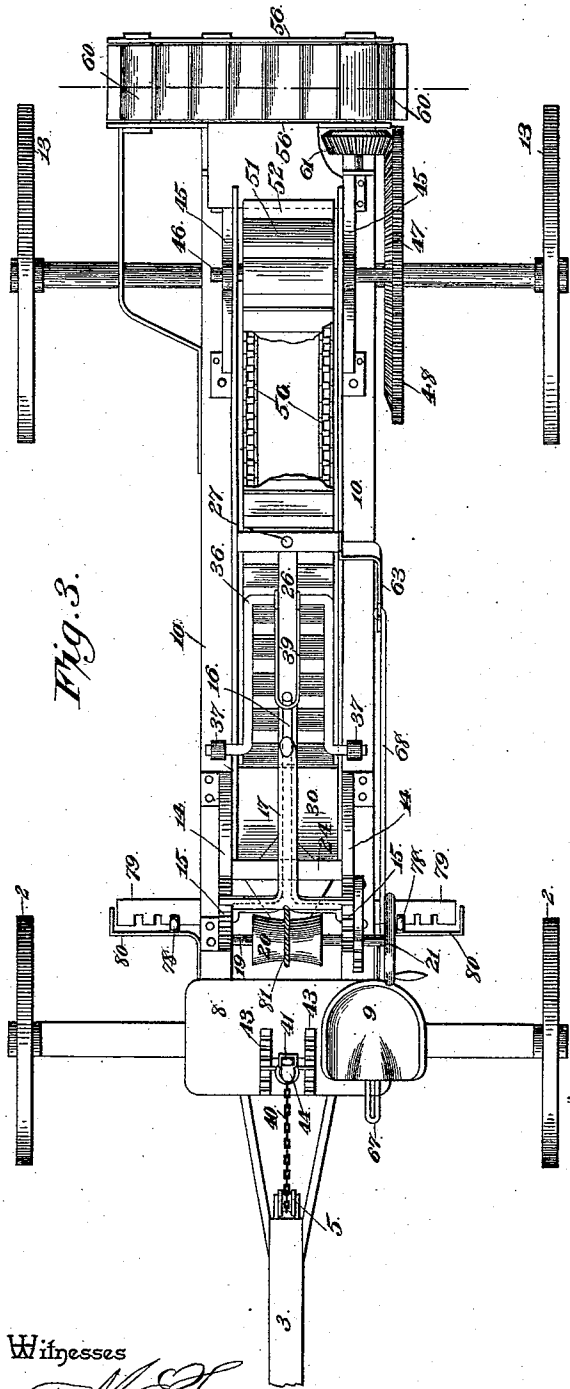

Fig. 3.

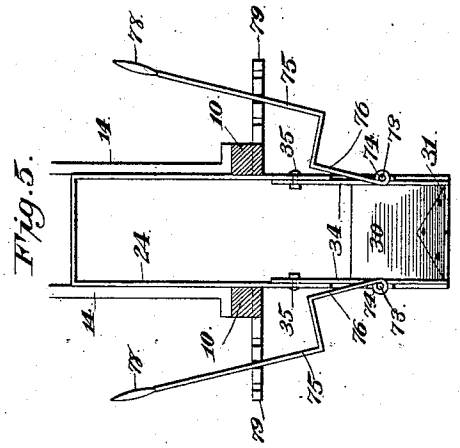

Fig. 5.

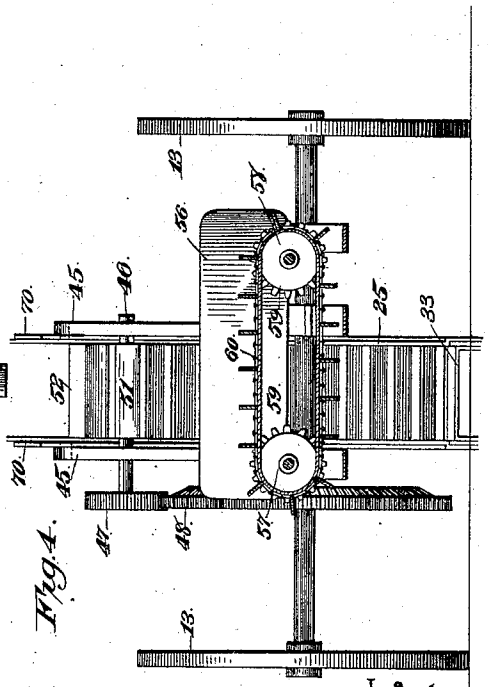

Fig. 4.

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UNITED STATES PATENT OFFICE.

DAVID W. SCOTT, OF COZAD, NEBRASKA.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 473,023, dated April 19, 1892.

Application filed November 27, 1891. Serial No. 413,308. (No model.)

To all whom it may concern:

Be it known that I, DAVID W. SCOTT, a citizen of the United States, residing at Cozad, in the county of Dawson and State of Nebraska, have invented a new and useful Ditching-Machine, of which the following is a specification.

My invention relates to improvements in ditching-machines, the objects in view being to provide a machine of this class of cheap and simple construction, all parts of which are readily adjustable, thus adapting it to form various depths and widths of ditches for any purpose whatever—for instance, such as gutters at the sides of roads, irrigating-channels, &c.

Various other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of a ditching-machine constructed in accordance with my invention, the ditching-shovel being lowered as for operation. Fig. 2 is a vertical longitudinal central section thereof. Fig. 3 is a plan view of the same. Fig. 4 is a rear end elevation. Fig. 5 is a vertical transverse section, the section being taken immediately in front of the ditching-shovel.

Like numerals of reference indicate like parts in all the figures of the drawings.

1 designates the front axle of the machine, and at the ends of the same the usual ground-wheels 2 are mounted for rotation. To the front of the axle the draft tongue or pole 3 is loosely connected, as at 4, and between the rear bifurcated ends of the same a pulley 5 is mounted for loose rotation.

6 designates the bolster of the machine, which, through the medium of the usual king-bolt 7, is pivotally mounted upon the axle 1. The bolster carries a platform 8, upon which is mounted the seat 9 for the driver. Secured at their front ends to the bolster is a pair of parallel side beams 10, whose under sides near their rear ends have bolted thereto bearing-boxes 11 for the accommodation of the rear axle 12, carrying at its ends the rear wheels 13.

Upon the side beams 10, immediately in rear of the platform 8, there is bolted a pair of triangular standards 14, the upper ends of which are curved, as shown, and provided with teeth 15. A lever 16 has its lower end bifurcated and its bifurcations diverged, as shown, for journaling in the standards concentric with and below the curved toothed upper ends thereof. A loose gravity-pawl 17, designed to slide upon the lever and retained in position by keepers 18, embracing the said lever, is at its lower end adapted for engagement with any pair of the teeth.

In bearings formed in the standards a shaft 19 is journaled for rotation, the same carrying at its center a drum 20. At one end the shaft is provided with a hand-wheel 21 within easy reach of the hand of the driver when the latter is perched upon his seat. A ratchet-wheel 22 is also mounted on the shaft and is locked against retrogression by a loosely-pivoted gravity-pawl 23.

24 designates an inverted-U-shaped stirrup located immediately in rear of the drum-supporting standards 14, and 25 a similar, though longer, stirrup located in rear of the stirrup 24. These stirrups, as before stated, are of inverted-U shape and their vertical terminals take loosely between the side bars 10 of the machine. A reach 26, having a general L shape, is bolted, as at 27, to the center of the rear stirrup, while the front end of said reach is adjustably connected to the front stirrup 25 by a set-bolt 28, that may be passed through any one of a series of perforations 29, with which the reach near its front end is provided.

30 designates the ditching-shovel, which has bolted thereto the ditching-point 31 and at its opposite sides the wings 32, whose disposition is rearward. The lower ends or terminals of the stirrup 25 are pivoted, as at 33, to the rear extremities of the wings, while from the front extremities thereof standards 34 rise. The standards 34, like the terminals of the front stirrup, are provided with perforations, and overlapping the same are shortened and lengthened, or, in other words, adjusted by set-bolts 35.

A bail of inverted-U shape and designated by the numeral 36 has its terminals laterally disposed and loosely bearing in eyes 37, mounted upon the beams or side bars 10, midway the stirrups 24 and 25. The upper end of the bail takes under the reach 26, that connects

the stirrups, and is embraced loosely at opposite sides of the reach by the bent ends 38 of an inverted-U-shaped link 39, whose forward end engages with the lever 16. A draft-chain 40 is connected at its lower rear end to the opposite standards 34 of the ditching-shovel, and its opposite end, after having been passed forwardly and partially around the pulley 5 of the draft-pole, is upwardly and rearwardly disposed and connected loosely with a hand-lever 41, fulcrumed, as at 42, in a segmentally-toothed standard 43. This lever is provided with a gravity locking-pawl 44, designed at its lower end to engage the teeth of the standard, and both the lever and pawl are within easy and convenient grasp of the hand of the driver.

Opposite standards 45, bolted to the rear ends of the beams 10, serve as a support for a rotatable shaft 46, mounted in the upper ends of the standards. This shaft extends beyond one of its bearings directly over the rear axle, and at said extended end is provided with a small gear 47, by which the shaft is operated through the medium of a master-gear 48, having peripheral and side teeth, the former engaging the gear 47. Upon the shaft 46 sprocket-wheels 49 are mounted, one near each of the bearing-standards 45, and a sprocket-belt 50 is mounted upon each of the wheels. These chains carry a belt or elevator 51, provided at intervals with blades 52. The upper edges of the wings 32 are provided with inclined open bearing-slots 53, and in the same is mounted the transverse shaft 54, carrying a roll 55, supported directly in rear of the shovel 30 and slightly below the upper end thereof. Over this roll the lower end of the endless carrier, constructed in the manner described, travels.

A pair of inclined side bars 56 are supported transversely at the rear end of the machine and are connected at their ends by transversely-disposed shafts 57 and 58, each of which carries a pair of sprocket-wheels 59, and are connected by a belt-carrying sprocket-chain 60, located at one end immediately under the upper rear end of the endless carrier 51 and adapted to receive the dirt from said end as the carrier elevates the same. The shaft 57 is extended beyond its front bearing and is there provided with a beveled gear 61, the teeth of which are engaged by the inner facial teeth of the master-gear 48, through the medium of which this rear discharging-carrier is operated.

Pivoted at 62 to one of the side terminals of the rear stirrup 25 is a loosely-depending rack-bar 63, the rear face of which is provided with a series of inclined teeth upwardly disposed and adapted to engage by gravity with a pin 64.

In a segmentally-toothed standard 65, mounted upon the platform under the driver's seat, there is fulcrumed, as at 66, a foot-lever 67. This lever is loosely connected to the rack-bar 63 by means of a connecting-rod 68.

Bolted pivotally at their front ends to the wings 32 of the shovel, as indicated at 69, is a pair of sides 70, which at their upper ends are slotted, as at 71, for loose connection by means of bolts 72 with the upper ends of the rear standards 45.

Brackets 73, reduced at their front ends, are bolted rigidly to the short vertical standards 34, and upon their reduced front ends are mounted the eyes 74, in which a pair of L-shaped scrapers 75 terminate. These scrapers are provided near their lower ends with the blades 76, while their upper ends terminate in handles 78 at each side of the machine. Toothed bars 79 extend from the opposite side beams 10, vertically above the brackets 73, and into any of the teeth of said bars the scrapers at their upper ends may be swung, so that the scrapers are maintained at any desired inclination or distance from the machine. The scrapers are locked in the notches of the bars by means of a pair of flat spring-plates 80, that extend laterally from the bars 10 directly in front of the locking-bars 79, and are sufficiently yielding to permit, when force is applied, to the withdrawal of the upper ends of the scrapers from engagement with any of the notches of the locking-bar, whereby a re-engagement and adjustment of the scrapers may take place.

The operation of the machine and the functions of the various parts will be obvious from the foregoing description, when considered in connection with the accompanying drawings, and also in connection with the following brief statement: The driver, perched upon the seat, reaching back manipulates the lever 16, so as to lower as a whole the scraping mechanism, he having previously, however, liberated the locking-pawl 17 from engagement with the teeth of the locking-segment. As the mechanism descends to a point below the surface of the ground, the locking-bar 63 rides loosely over the pin 64 and at a convenient point or notch engages therewith. The draft-chain-adjusting lever 41 is now loosened or thrown forward and the driver, by manipulating the crank-wheel 21, raises or lowers the point 31 of the ditching-shovel through the medium of the cable 81, which connects the front stirrup with the drum 20. The lever 41 is now readjusted, so as to give a proper draft-tension upon the chain 40. If it be desired to form a ditch with opposite parallel vertical sides, the scraping-levers 75 are swung inwardly until engaged with the inner notches of their locking-bars 79, and hence their blades 76 brought in parallelism with the ditching-shovel. If, however, it is desired to form ditches with inclined or upwardly-diverging side walls, the same may be accomplished to a desirable degree simply by inclining the levers 75 and readjusting them in any of the outer notches of the locking-bars 79. The dirt removed by the shovel is carried up over the same, drops upon the endless carrier 51, and is delivered by the lat-

ter at its rear end upon the transverse carrier 60, and from thence to one side of the ditch upon the ground. It will thus be seen that I have succeeded in providing a machine combining strength, simplicity, and durability of construction, which is easily operated and will successfully and with facility form ditches of various depths, widths, and formations, and, furthermore, that all the various means of adjustment thereof are within easy reach and adapted to be manipulated by the driver, whereby but one man need be employed in the operation of the machine.

Having described my invention, what I claim is—

1. In a ditching-machine, the combination, with the frame-work, of a pair of inverted-U-shaped stirrups, a ditching-shovel connected to the lower ends of the same, an adjustable reach connecting the upper ends of the stirrups, means for raising and lowering the stirrups conjointly, and means for independently raising and lowering the front stirrup and point of the shovel, substantially as specified.

2. In a ditching-machine, the combination, with the frame-work, the front and rear inverted-U-shaped stirrups, and the shovel connected at the lower ends of the same, of a reach connecting the upper ends of the stirrups, a pair of standards, a lever fulcrumed in the standards, a drum-shaft fulcrumed in the standards, means for locking the lever and shaft, a cable connecting the drum-shaft with the front stirrup, an inverted-L-shaped bail fulcrumed on the frame and taking against the under side of the reach, and an inverted-U-shaped link connected with the lever and the bail, substantially as specified.

3. In a ditching-machine, the combination, with the opposite side bars 10, the front and rear stirrups 24 and 25, the same being of inverted-U shape and mounted between the side bars, the ditching-shovel 30, having the point 31, the wings 32, pivoted at their rear ends to the rear stirrup and at their front ends having the standard 34 adjustably connected with the terminals of the front stirrup, and the reach 26, adjustably connected to the upper ends of the stirrups, of the triangular standards 14, terminating at their upper ends in the segmentally-toothed locking-heads, the curved lever 16, journaled in the heads, the sliding pawl 70, mounted on the lever and adapted to engage the teeth of heads, the bail 36, pivoted, as at 37, to the side beams 10 and taking under the reach, the link 39, connecting the bail with the lever 16, the drum-shaft 19, carrying the drum 20, journaled in the standards 14, the hand-wheel mounted on the end of the drum-shaft, the pawl for locking the hand-wheel, and the cable mounted upon the drum and connected to the front stirrup, substantially as specified.

4. In a ditching-machine, the combination, with the opposite side bars and the shovel-supporting vertically-adjustable stirrups, of means for raising and lowering the stirrups, a pin on the side bar, and a toothed rack-bar for engaging the pin, substantially as specified.

5. In a ditching-machine, the combination, with the opposite side bars and the shovel-supporting vertically-adjustable stirrups, of means for raising and lowering the stirrups, a pin on the side bar, a foot-lever pivoted to the frame-work, a rack-bar having upwardly-disposed teeth pivoted to the shovel-supporting stirrup, a pin on the frame for engaging the same, and a connecting-rod between the foot-lever and rack-bar, substantially as specified.

6. In a ditching-machine, the combination, with the frame-work, the adjustable shovel, and the supporting-stirrups for the same, of brackets extending from one of the supporting-stirrups, blades terminating at their upper ends in levers pivotally engaging the front ends of the brackets, a pair of notched locking-bars extending from the frame and adapted to engage the levers, and a pair of spring-plates for yieldingly pressing the levers into such engagement, substantially as specified.

7. In a ditching-machine, the frame-work provided with the stirrups 24 25 and a reach 26, connecting the stirrups, the ditching-shovel pivoted to the stirrups 25, and means for raising and lowering the stirrups, substantially as specified.

8. In a ditching-machine, the L-shaped scrapers 75, provided with blades 76, the handles 78, and locking means for the scrapers, in combination with the ditching-shovel, whereby the scraping-levers may be operated so as to bring their blades into parallelism with the shovel, as set forth.

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

DAVID W. SCOTT.

Witnesses:
M. H. BROWN,
L. P. OWEN.