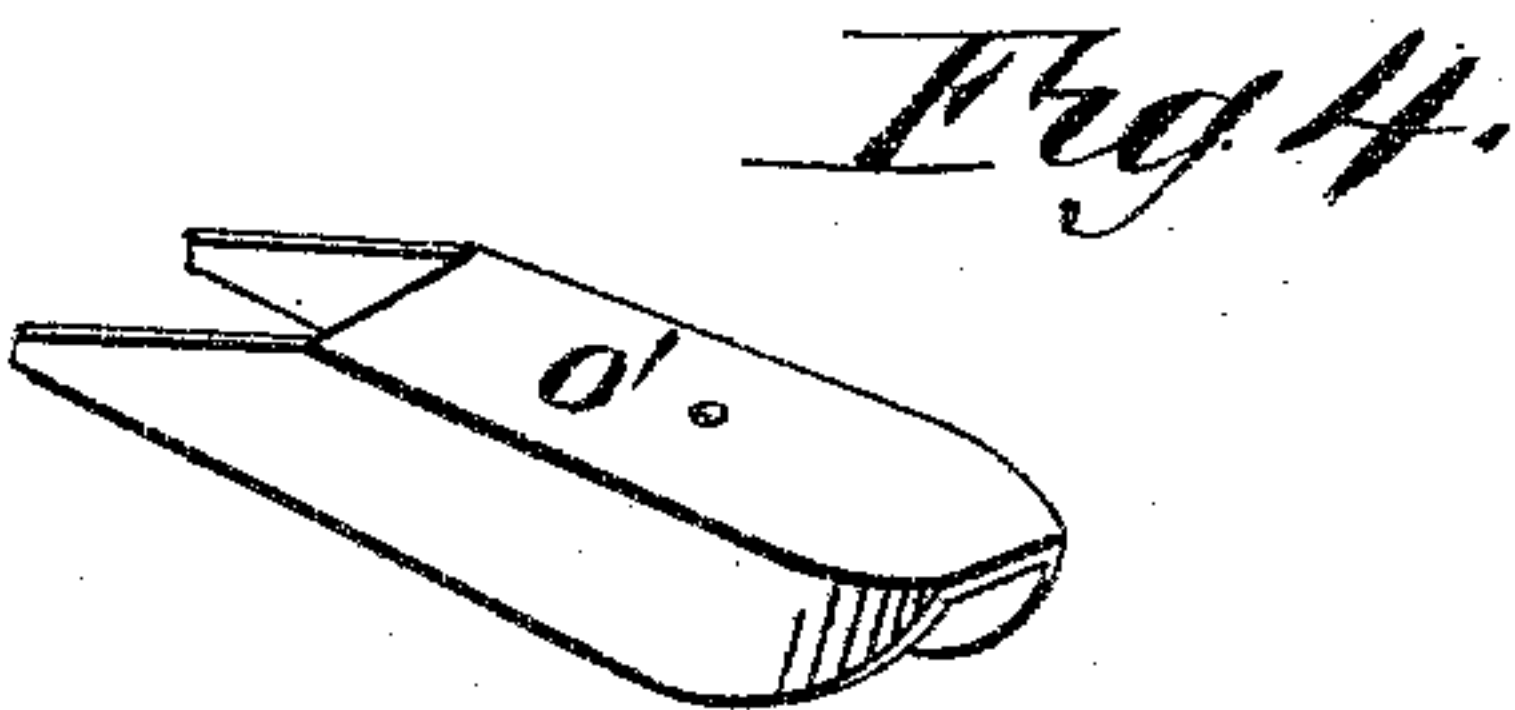
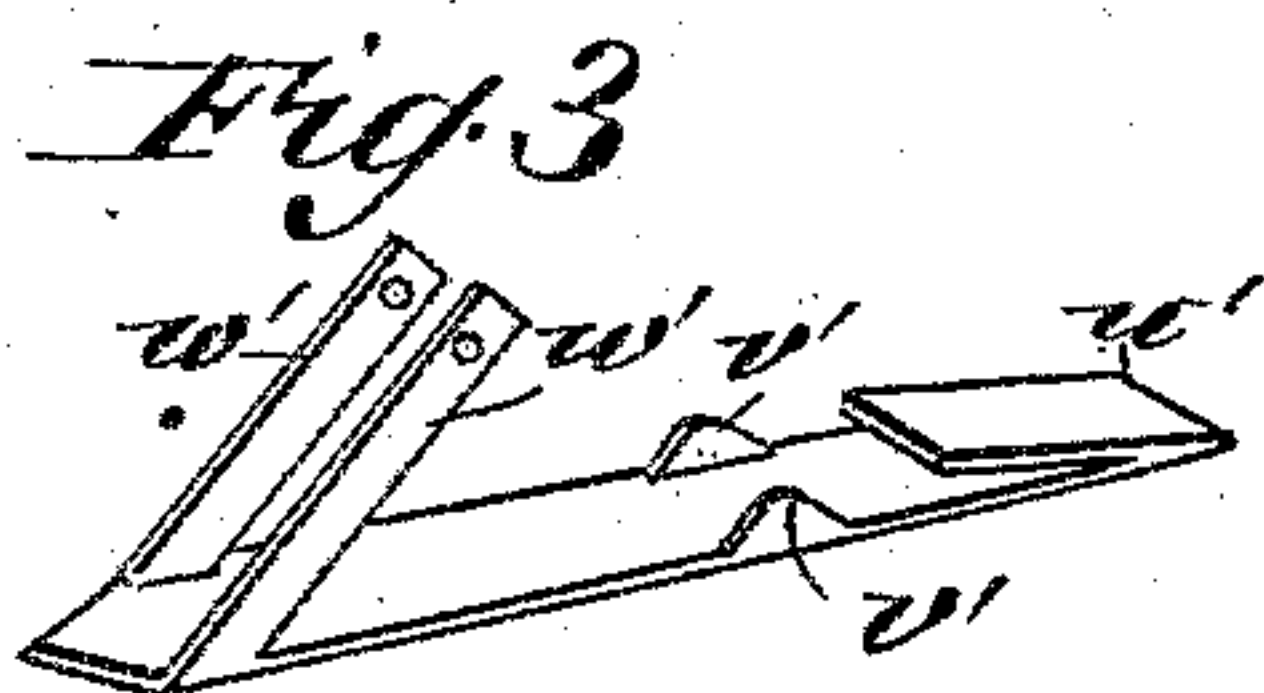
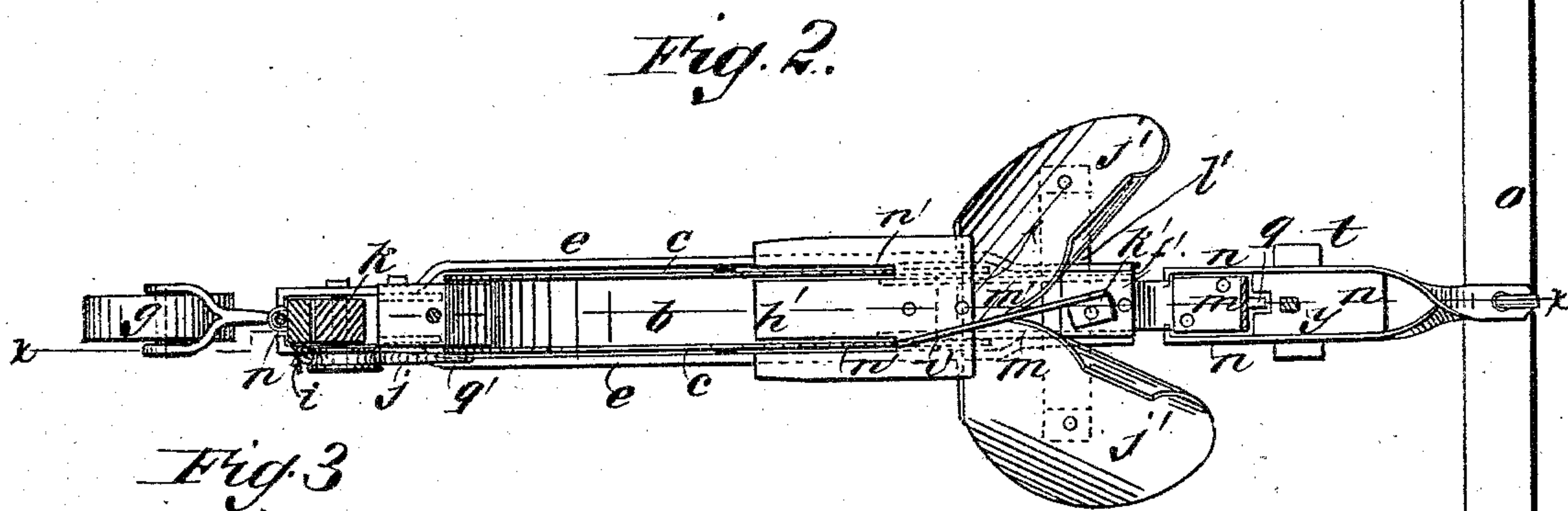
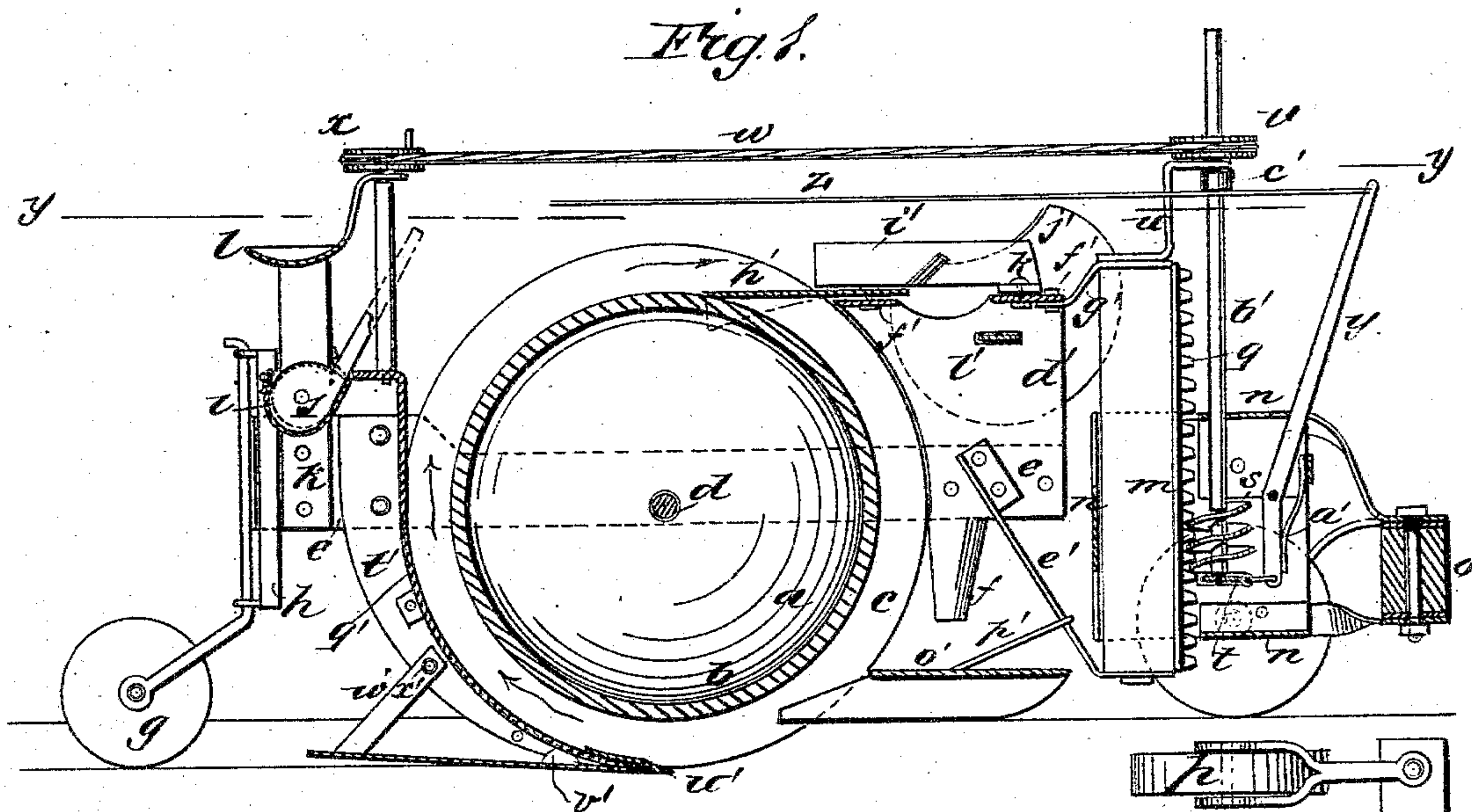


(No Model.)

A. PURCELL.
DITCHING MACHINE.

No. 295,281.

Patented Mar. 18, 1884.



WITNESSES:

Francis McArdle.
C. Sedgwick

INVENTOR:

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UNITED STATES PATENT OFFICE.

ALONZO PURCELL, OF MONTICELLO, ILLINOIS.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 295,281, dated March 18, 1884.

Application filed June 30, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALONZO PURCELL, of Monticello, in the county of Piatt and State of Illinois, have invented a new and Improved Ditching-Machine, of which the following is a full, clear, and exact description.

The invention will first be described in connection with the drawings, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of my improved machine, taken on the line *x x* of Fig. 2. Fig. 2 is a horizontal section on the line *y y* of Fig. 1. Fig. 3 is a perspective view of the point and wearing-shoe of the plow, and Fig. 4 is a perspective view of a guide for the plow.

I make a wheel consisting of two disks, *a*, and a rim, *b*, said rim being set back of the edges of the disks suitably to make flanges *c*, of about the width that the wheel is to cut into the ground, and the disks are placed as far apart on a shaft, *d*, as the desired width of the ditch, and they are made concave on the outside, so that they will only touch on the walls of the ditch near their outer edges.

The shaft is mounted in two thin metal frame-bars, *e*, for its bearings, which bars may be thickened a little along the concavities of the disks for providing as much width for the journal-bearings as may be had with such thin frame-bars, which are employed to enable them to run in the upper portion of the ditch, to allow the machine to work deeper than half the diameter of the wheel, the ditch being widened a little by side scrapers, *f*, at the front of the wheel, and projecting downward from said frame-bars to scrape off the banks. This frame *e* is supported at the rear end on a caster-wheel, *g*, the spindle of which is pivoted in a vertical bar, *h*, fitted to the end of the frame to shift up and down thereon, and connected by a cord or chain, *i*, with an eccentric lever, *j*, for raising and lowering it. The lever is pivoted to a post, *k*, attached to the frame, and supporting the driver's seat *l*, whereon the driver has command of the lever

to raise the ditching-wheel at any time when it may be desired to do so. The front end of the frame terminates in a vertical toothed bar, *m*, on which a frame, *n*, of the front bar, *o*, is fitted to be supported by the caster-wheels *p* of said bar, the connection being such that the main frame can be shifted up and down on the wheel-bar frame for adjusting the ditching-wheel, and the bar *m* has a toothed rack, *q*, in which a worm, *s*, gears, that is supported on a cross-bar, *t*, of frame *n*, the shaft *b'* of the worm extending upward and having a bearing in a bracket, *u*, and a grooved pulley, *v*, for working the worm by an endless cord, *w*, and a pulley, *x*, at the driver's seat, for enabling him to adjust the height of the wheels *p* with relation to the ditching-machine while at work. The bar *t*, on which the worm rests, is arranged to shift the worm *s* out of gear with the rack *q* by a lever, *y*, from which a rod, *z*, extends back to the driver's seat, for enabling him to disconnect the worm when the machine is being driven out of and into the ditch, to allow the parts to be self-adjusting to the variations which then take place, and to which the driver cannot attend. A strong spring, *a'*, is employed to keep the worm in gear, except when held out at these times by the driver. The shaft *b'* is to be capable of sliding up and down along the bracket *u* as the frame *n* slides on the rack-post *m*, and it may be fitted to slide freely through the pulley *v*, which may have a hollow hub, *c'*, which is fitted to turn in the bracket, and is held by it against moving along with the shaft. The post *m* is connected to frame *e* by bracket *g'* and plates *d'*, connecting the upper end, and braces *e'*, connecting the lower end. The plates *d'*, which rise up from frame-bars *e* at the front of the ditching-wheel to about the level of the top of the rim *b*, are connected by cross-bars *f'*, for staying the frame, also for connecting bracket *g'* and for the support of the shovel *h'*, by which the earth is to be scraped off the front rim, *b*, and also for the support of the adjusting guide-board *i'*, by which the earth is to be discharged to either side, according to which way it is set over the chutes *j'*, said guide-board being pivoted to cross-bar *f'* at *k'*, and the chutes being attached

to a bar, l' , which is supported in slots of the plates d' , allowing them to shift as the guide-board shifts, in order to maintain the proper connection of their sides at m' with the guide-board. The shovel-plate h' is wider than the space between the flanges c , and has slits n' for them to run in, for being wide enough back of where the flanges run to carry the earth into the chutes j' without spilling it over the edges.

For guiding the ditching-wheel at the beginning, I use a device represented at o' , consisting, essentially, of a pair of sled-runner-shaped plates of thin metal, suitably connected together and hitched by a cord or wire, p' , to the braces e' , the said device to be loaded with weights, if necessary, to run loosely in the furrow after one slice has been taken out, the wheel-flanges c to straddle the rear end. It will then slide along in the furrow and guide the cutting-wheel exactly to the furrow, said device to be used until the ditch is deep enough for the wheel to be guided by said ditch, or until a guide-roller attached to the lower end of the post m , which I propose to employ for that purpose when required, will serve the purpose better.

The plow by which the earth is to be raised consists of a curved plate, q' , attached to frame e a little back of the ditching-wheel, and extending down under the rim b about on the circle of the flanges c , but preferably converging a little to the rim, and being strongly supported by flanges t' at the back, to resist the back thrust of the earth upon it. The lower end is re-enforced with the point u' , consisting of a thin plate of steel bent over said end for connection to it, and sharp at the point, and extending backward tangentially to the plow for a wearing-shoe. Said shoe has ear-points v' projecting against the back of the plow between the flanges t' , and the rear end has braces w' , that connect with flanges t' by a pin, x' , that may be taken out to release the shoe for taking it off when required. This plow q' extends up along the back of the wheel a suitable distance above the center to confine the furrow-slice until it passes high enough to remain on the wheel the rest of the course to the top.

The machine is to be run along the ditch, successively cutting the depth of the flanges each time, until the required depth is reached.

I am aware that it is not new for the front supporting-frame of a ditcher to be provided with vertically sliding and adjustable bars, or to combine a cam-lever, rack-bar, and worm for its adjustment; but

What I do claim as new and of my invention is—

1. The combination, in a ditching-machine, of the wheel $a b c$, plow q' , shovel h' , and the shifting-board i' , substantially as described.

2. The combination, in a ditching-machine, of the wheel $a b c$, plow q' , shovel h' , adjusting-board i' , and the mold-board chutes j' , substantially as described.

3. The mold-board chutes j' , attached to bar l' , and connected to adjusting-board i' at m' , to shift bar l' with said board to discharge at either side of the ditch, substantially as described.

4. The combination of the point and shoe-plate u' with the plow q' , said plate being hooked onto the end of the plow q' , and secured to it detachably by the ear-points v' , braces w' , and the pin x' , substantially as described.

5. The combination of the guide o' with the plow-wheel, consisting of disks a , rim b , and the flanges c , substantially as described.

6. The combination, with the bars e , of the cord i , the eccentric lever j , the post k on said bars, the driver's seat L , and the vertical bar h , carrying a spindle with caster-wheel at the end, as shown and described.

7. The frame n of the wheel-beam o , having adjusting-screw s , in combination with the toothed post m of the ditching-machine frame, substantially as described.

8. The worm s and frame n , in combination with rack $q m$, said worm being fitted adjustably with relation to rack q , and having lever y and spring a' , substantially as described.

ALONZO PURCELL.

Witnesses:

DANL. H. MILLER,
WILLIAM W. GRAY.