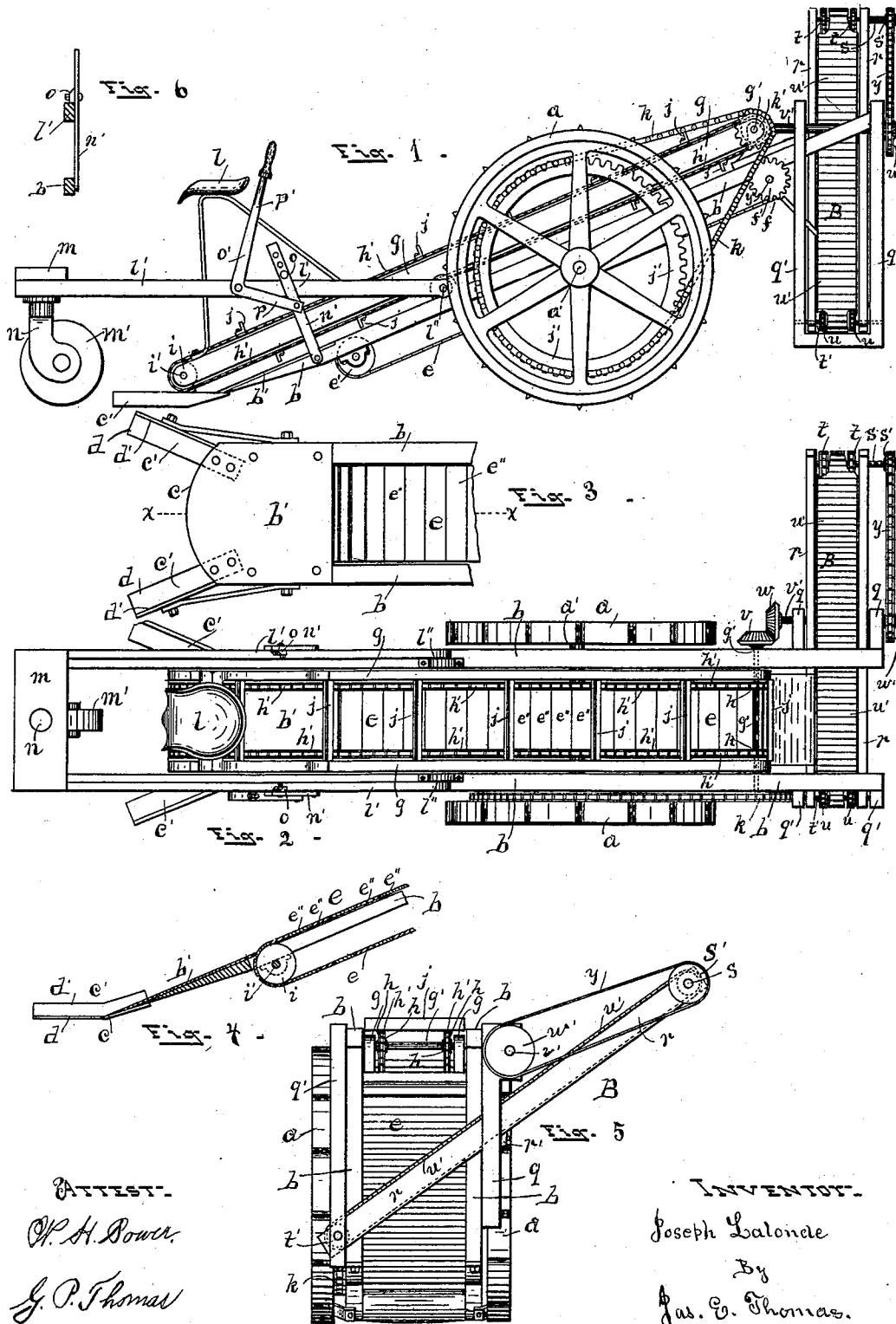


(No Model.)

J. LALONDE. DITCHING MACHINE.

No. 400,859.

Patented Apr. 2, 1889.



ATTTEST-

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JOSEPH LALONDE, OF ESSEXVILLE, MICHIGAN.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 400,859, dated April 2, 1889.

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To all whom it may concern:

Be it known that I, JOSEPH LALONDE, a citizen of the United States, residing at Essexville, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Ditching-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in ditching-machines; and the invention consists in devices for loosening the dirt and for elevating and depositing the same upon the ground outside of the ditch, and in the combination and arrangement of the several devices and elements which are used in the construction of the machine, and which I hereinafter more fully describe, and specifically point out in the claim.

The objects of my invention are to provide a ditching-machine of simple and easy construction, whereby a ditch of uniform size may be easily and neatly constructed without the use of hand labor, and to provide a means of manipulating the several portions of the machine, whereby the operation thereof is rendered more simple and effective. The devices I employ to attain these objects are illustrated in the accompanying drawings, in which the same letters of reference indicate the same parts throughout the several views.

Figure 1 is a side view, in elevation, of my improved ditching-machine. Fig. 2 is a plan view of the same. Fig. 3 is a plan view of the shovel detached. Fig. 4 is a section of the same taken at *x x*. Fig. 5 is a rear view of the machine. Fig. 6 is a view of the regulating-pieces detached, with transverse section of side pieces and side levers.

a represents driving-wheels, of any suitable construction, and mounted upon the opposite ends of the axle *a'*.

b b are side pieces, which are secured upon and supported by the axle *a'*, near their middle, with their front ends secured to a shovel-blade, *b'*, which is provided with a forwardly-projecting edge, *c*.

c' are shearing-blades secured by one end

to the opposite end of the shovel-blade and extending obliquely forward of the blade, and are braced and supported in a suitable manner. These blades are provided with the horizontal cutting-edges *d* for shearing up the ground, and with the vertical rear sides for deflecting the loose earth toward the shovel-blade *b'*.

Between the side pieces, *b*, is placed an endless carrier or apron, *e*, beginning just in rear of the shovel-blade and extending to some distance in rear of the axle *a'*, the front end of the apron being supported by a suitable roller, *e'*, while the rear end is supported by a roller, *f*, and upon the outer end of the shaft which carries the roller *f* is mounted a sprocket-wheel, *f'*. This apron *e* is formed of the sections *e''*, secured to endless chains or other convenient flexible connecting devices, so that the sections will form a moving table or platform on their upper surfaces and pass easily over the rollers which support the end thereof.

Above the pieces *b* are placed the pieces *g*, and are pivotally secured thereto at their rear ends, preferably by a driving-shaft, *g'*, which is provided on its end with a driving sprocket-wheel, *k'*, and is supported in suitable boxes secured to the side pieces, *b*, and between the pieces *g* upon the shaft is mounted the sprocket-wheels *h*, which carry the endless chains *h'*, the opposite ends of the chain being carried by the sprocket-wheels *i*, which are mounted on a shaft, *i'*, supported by the forward end of the piece *g* at a point over the shovel-blade *b'*.

Secured by each end to the chains *h'* at intervals are a series of scrapers, *j*, arranged so that the outer edges of the scrapers move upon the surface of the shovel-blade and upon the surface of the apron *e*.

j' is a sprocket-wheel secured upon the axle or to one of the wheels *a*, and *k* is a chain belt passed over the sprocket-wheel *j'* and over the sprockets *f'*, and also over the sprocket-wheel *k'*. The chain *k* is designed to convey the rotary motion from the driving-wheels *a* to the shaft *g'* and the roller *f*; but gear-wheels or any other suitable means may be used instead of the chain for imparting the motion, if desired.

l is a seat for the driver, secured by braces above and resting upon the forward end of

the side pieces *g*, so that the weight of the driver will assist in keeping the shovel and side scrapers in position for cutting into the earth, and *l'* are levers pivoted by their rear ends at *l''* to the side pieces *b*, in rear of the seat, and to the forward end of these levers *l'* is secured the cross-piece *m*, and a wheel, *m'*, is arranged with a "caster" or crank-bearing, *n*, pivotally secured to the cross-piece *m*, to which also the team is hitched for propelling the machine.

n' and *n'* are regulating-pieces secured to the lower side pieces, *b*, and extended upwardly above the side levers, *l'*, and are provided with the movable gage-pieces *o*, secured to the portions above the side levers, *l'*, so that as the shovel-blade, which is set at an incline forwardly, dips into the earth the depth of its cut may be gaged by the pieces *o*, resting upon the upper sides of the pieces *l'*, so that the depth of cut may be increased or diminished, as desired, by moving the gage-pieces *o* in the proper direction. The pieces *o* rest upon the upper side of the levers *l'*, however, and do not prevent the shovel from rising upwardly should any stone or small obstruction be met.

o' is an elbow-lever pivoted at its angle to one of the levers *l'*, and has its short horizontal arm *p* pivoted to one of the upright pieces *n'*, while its longer arm, *p'*, extends upward in a convenient position to be grasped by the driver from the seat, and which, on being borne forward by the operator, raises the shovel from its cut and allows the machine to proceed without engaging the shovel with the earth.

A side conveyer, *B*, is provided at the rear portion of the machine by securing at the rear ends of the side pieces *b* the upright pieces *q* and *q'*, and between these pieces are placed the inclined side pieces *r*, the lower ends of the pieces *r* being pivotally secured to the supporting-pieces *q'*, while the middle portions of the side pieces rest upon movable supports *r'*, which are secured to the pieces *q*, while upon the upper ends of the side pieces *r*, which extend considerably beyond and above the main portion of the machine, is mounted a shaft, *s*, carrying a pulley or sprocket wheel, *s'*, and suitable sprockets, *t*, and the lower ends of the side pieces *r* are also provided with a shaft, *t'*, and sprocket-wheels *u*, and upon the sprockets *t* and *u* is mounted a link or other suitable belt, carrying the sections *w'*, which form an inclined apron or carrier; or, if preferred, a platform may be arranged between the side pieces *r* and scrapers or flights used upon the chains instead of the apron.

Upon one end of the shaft *q'* is mounted a miter-gear-wheel, *v*, and a shaft, *v'*, is mounted upon the supports *q* and provided with a miter gear-wheel, *w*, intermeshing with the gear *v* and with a sprocket, *w'*, over which and over the sprocket-wheel *s'* is placed a link-belt, *y*.

The operation of the machine is that when the team is hitched to the cross-piece *m* and

the machine moved forward the side-scrappers cut into and remove the earth in their path to the shovel-blade, which also cuts into, loosens, and lifts the earth in front, at the same time the drive-wheels, revolving by the forward movement of the machine, actuate the link-belt *k* and impart thereby a rotary movement to the shaft *g* and the roller *f*, which propel the upper run of the apron *e* and the lower run of scrapers *j* toward the rear, and the series of scrapers moving rearwardly over the shovel-blade carries the loosened earth from the shovel-blade to the apron *e*, which, moving together with the scrapers, carries the earth over the rear end of the apron, from which it falls to the side conveyer, *B*, which, being actuated by the miter-gear *v* and the belt *y*, carries the earth over its upper end and deposits the same on the ground outside of the ditch. The shovel-blade and side-scrappers are arranged to cut to such a depth as will permit the team to pull the machine, the depth of the cut being gaged by the pieces *o*, being adjusted upon the pieces *n'*, and the machine is drawn over the route until the ditch has been excavated to the required depth.

It will be seen that the entire machine, except, of course, the upper end of the conveyer *B*, will pass between the opposite sides of the ditch, the side shearing-blades, *c'*, removing the earth to a width beyond the driving-wheels, so that the ditch may be formed as deep as desired by passing the machine repeatedly over the ground, so that a ditch, especially on low and swampy land, may be easily and cheaply constructed, the scrapers *j'* and the endless apron *e* being especially designed to remove wet earth, as the apron carries dry earth and mud with equal facility and without clogging.

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

The combination, in a ditching-machine, of the side pieces, *b*, supported at an incline by the axle *a'* and driving-wheels *a*, and provided on their front ends with a shovel-blade, *l'*, and the endless apron *e*, in rear of the shovel-blade, and devices, as described, for imparting a rearward movement to the upper run of the apron, with the levers *l'*, with their rear ends pivoted at *l''* to the side pieces, *b*, and provided on their front ends with a cross-piece, *m*, the wheel *m'*, having a caster-bearing, *n*, secured to the said cross-piece, and the regulating-pieces *n'*, with their lower ends secured to the side pieces, *b*, and provided with the gage-stops *o* above the levers *l'*, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH LALONDE.

Witnesses:

JAS. E. THOMAS,

G. P. THOMAS.