S. F. Jones.

Excavator.

No. 49,276. Patented Aug. 8, 1865.

Fig. 1.

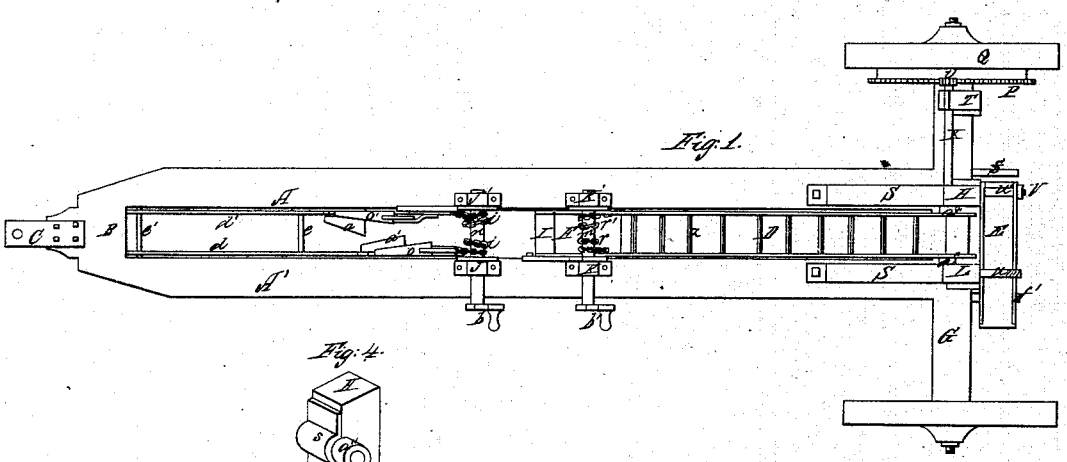


Fig. 4.

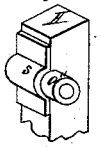
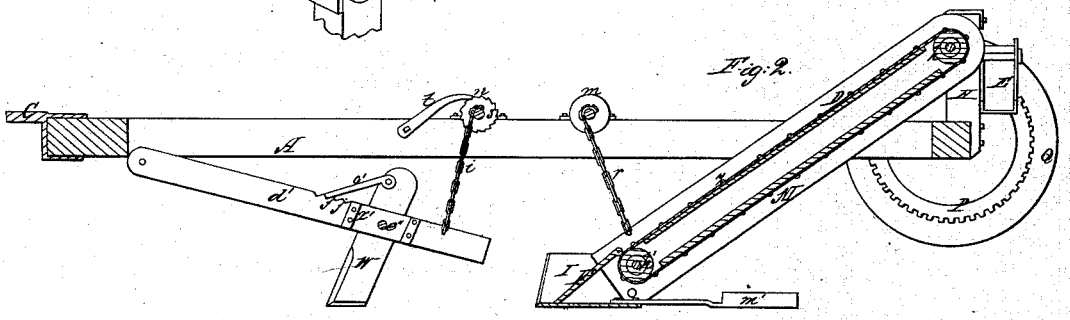
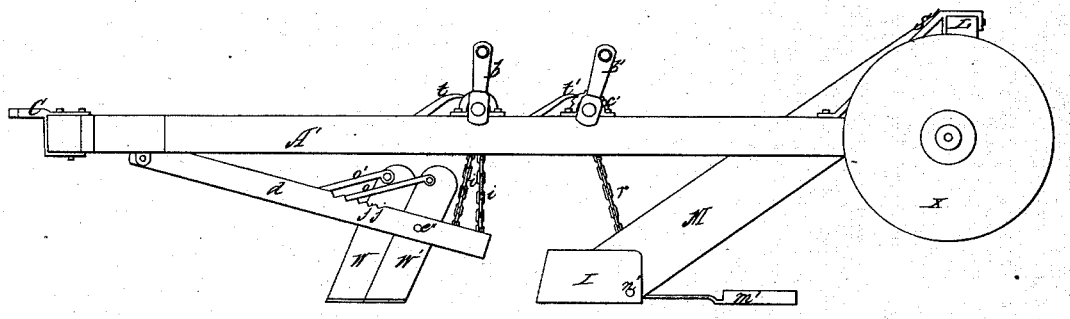


Fig. 2.





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UNITED STATES PATENT OFFICE.

SAMUEL F. JONES, OF ST. PAUL, INDIANA.

IMPROVED DITCHING-MACHINE.

Specification forming part of Letters Patent No. **49,276**, dated August 8, 1865.

To all whom it may concern:

Be it known that I, SAMUEL F. JONES, of St. Paul, in the county of Decatur and State of Indiana, have invented a new and Improved Ditching-Machine; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a plan or top view. Fig. 2 is a longitudinal elevation. Fig. 3 is a side elevation. Fig. 4 is a detail drawing, showing the projected box *a''*.

The nature of my invention consists in the construction and arrangement of the drag-bars *d d'*, adjustable colters W W', the self-adjusting scoop I and apron F; also, the method of hanging the upper end of the trough M on the inner ends of the boxes *a'' a''* in the posts H L, thus avoiding the necessity of changing the length of the band D when the front end of the trough is let down or raised up.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A A' are parallel timbers with the tongue-piece B secured between their front ends. The rear ends are framed into the axle G, Fig. 1. To the front end of the tongue-piece B the coupling C is attached. The drag-bars *d d'*, Fig. 1, are secured to the under side and inner edge of the timbers A A', allowing them a hinge motion, and that they may be raised up between the timbers. Near the back ends of the drag-bars *d d'*, and on the inside, the pieces *x'*, Fig. 2, are bolted, being bent in such a manner as to form mortises or slots, through which the colters W W are passed and held in place by bolts *e''*. These bolts form fulcrums for the colters, which admit of their being adjusted back and forth, as may be desired. The colters are held in whatever position required by means of the braces *o o'*, Fig. 3, which are secured to the upper ends of the colters in such a manner as to allow them a hinge motion. The lower ends are provided with an oblique notch in the outside corner, and fit into corresponding notches, *jj'*, Figs. 2 and 3, which are cut in the upper edges of the drag-bars in front of the colters. The inside corner of the braces, at the lower end, extends below the notches in the bars. This prevents the lower ends of the braces from slipping out. The colters W W', Fig. 3, are bent in such a manner as to bring the outside of the colters below the drag-bars in line with the outside of the bars. The lower ends of the colters are turned inward and form horizontal cutters *a a'*, Fig. 1, which are designed to break up the middle of the ditch. One of these colters should be placed its width in advance of the other, for the purpose of making the cutting easier.

The spool *n*, Fig. 1, has its bearing J J on the upper side of the timbers A A' in the rear of the drag-bars. Said spool is turned by means of the crank *b*, and is held in position by the ratchet *s'* and pawl *t*, Fig. 2. Two chains, *i i*, Figs. 1 and 3, are attached to the spool *n*, with one end of each attached to the rear end of the drag-bars, as shown.

The posts H L, Figs. 1 and 2, are secured to the back part of the axle G, and extend up to receive the bearings *g*, Fig. 4, of the shaft X, Fig. 1, and are stayed at the top by the braces S S. The boxes *a'' a''*, Figs. 1 and 4, are round. The inner ends of each are projected beyond the inside of the posts H L, as shown at *a''*, Fig 4, far enough for the upper ends of the sides of the trough M to hang on. The shaft X is passed through said boxes and through the pulley *h*, Fig. 2, which is placed in the upper end of the trough M, and between the projected ends of the boxes *a'' a''*, Fig. 1.

Pulley *h*, Fig. 2, is secured in the lower end of the trough. The sides of the trough are nailed to the edges of a partition-board, the upper side of which is even with the top side of the pulleys, so that the carrying-band D, Fig. 1, will pass, with its load, from one pulley to the other without swaying. A uniform length of the carrying-band is attained by hanging the upper end of the said trough on the projected ends of the said boxes, with the driving-pulley between them. Then in whatever position the lower end of the trough may be placed the lower pulley bears the same relation to the upper one. The said carrying-band is provided with scrapers Z, Figs. 1 and 2. Said scrapers are to prevent the dirt from slipping back as it is being carried up. The scoop I is slipped over the lower end of the trough M Fig. 3. The bolt *n'* is passed through the scoop and through the lower corners of the trough. This allows the front end of the scoop to play up and down. Said scoop is rendered self-adjusting by means of the weighted lever *m'*, the front end of which is se-

cured to the bottom of the scoop. Said lever keeps the scoop in a proper position to scoop up the loose earth, whether the trough is raised up or let down. The lever extends back under the trough, with its weighted end resting on the bottom of the ditch.

The upper end of the apron F, Fig. 2, is supported by a small rod, which is passed through the sides of the trough far enough above the pulley *h'* to allow the carrying-band and scrapers to pass under it. The front end of the apron lies loose on the bottom of the scoop. As the plowed earth is gathered by the scoop it is forced up over the apron on the carrying-band.

The spool *m*, Fig. 1, has its bearings K K' on the upper side of the timbers A A', and over the front end of the trough. It is operated by means of the crank *b'*, and held in position by the ratchet *c'* and pawl *t'*, Fig. 3. Two chains, *r r'*, Fig. 1, are attached to this spool, with one end of each attached to the sides of the trough, near the upper edge. By these chains the scoop is raised up or let down. The pins *w w'*, Fig. 1, are secured to the back of the posts H L, on which the upper end of the spout E is hung, with its lower end resting on the pins *f f'*. Said spout is held in its place by the tap V. The dirt is thrown off the carrying-band into this spout and conveyed down on the ground at one side of the ditch. The spout may be changed to throw the dirt on either side of the ditch. It may become necessary in a sticky subsoil to use an endless band in said spout, similar to the carrying-band D, to prevent the clay from sticking to the spout and filling it up. The post T, Fig. 1, is secured to the back of the axle G, near the right-hand end, and extends up and forms a bearing for the outer end of the shaft X. The cog-wheel P is secured to the inside of the wheel Q, and gears into the small cog-wheel *v*, which is on the outer end of the shaft. The colters W W' should be set to cut a little wider than the scoop, so that the scoop and trough would not bind in the ditch.

The operation of my machine is as follows: The machine is coupled to the axle of the front wheels of a common wagon, to which the team is then attached and driven to the place of beginning. The colters W W' are then let down by means of the spool *n* and chains *i i'*, to cut whatever depth the team is capable of drawing, and is held in that position by the ratchet *s* and pawl *t*. The colters are adjusted to a cutting, *x*, by the braces *o o'*. The lower end of the trough is let down until the scoop I is low enough to gather up the plowed earth. The front end of the trough is held at a proper depth by means of the chains *r r'*, ratchet *c'*, and pawl *t'*. As the trough M is being let down the front end of the scoop I strikes the ground. With the aid of the weighted lever *m'* it will adjust itself to a proper position. As the front end of the scoop turns up in settling to its position the lower end of the apron F slips forward and keeps itself in a proper position for the dirt to pass up over it onto the carrying-band D. The colters plow up the earth in the bottom of the ditch. The scoop gathers it up and passes it up over the apron on the carrying-band, which delivers it into the spout E, which conveys it down on the ground at one side of the ditch. When the operator has gone as far as he wants to ditch, the drag-bars *d d'* and scoop I are drawn up between the timbers A A', and when the machine is returned for a second cut the colters are adjusted to a proper position by placing the lower end of the braces *o o'* one notch forward on the drag-bars. Then the colters and scoop are let down to cut as much lower than they did before as the operator may see fit. This operation is continued until the ditch is cut as deep as may be required.

The object of this invention is to obtain a ditching-machine that will cut an open ditch any depth required, suitable for laying tiling for the purpose of draining wet land.

Having thus fully described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The drag-bars *d d'*, with adjustable colters W W', and braces *o o'*, when arranged as shown and described, for the purpose set forth.

2. The self-adjusting scoop I, apron F, and weighted lever *m'*, when arranged substantially as shown and described, for the purpose set forth.

3. The method of hanging the upper ends of the sides of the trough M on the projected ends of the boxes *a'' a''*, whereby a uniform length of the carrying-band is obtained, independent of the position of the lower end of the trough.

4. In combination with the colters W W', scoop I, apron F, projected boxes *a'' a''*, the spools *n m*, chains *i i'* and *r r'*, carrying-band D, scrapers Z, and conveying-spout E, when arranged as shown and described, for the purpose set forth.

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