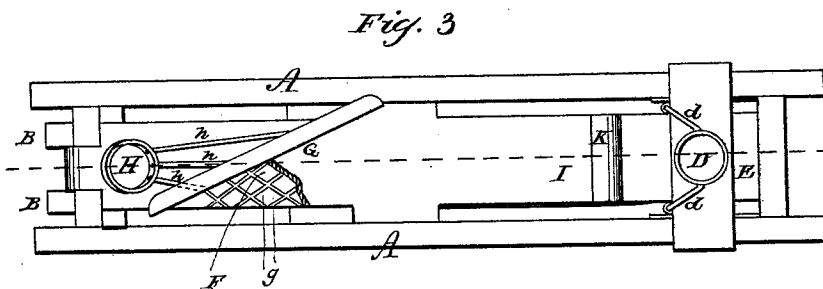
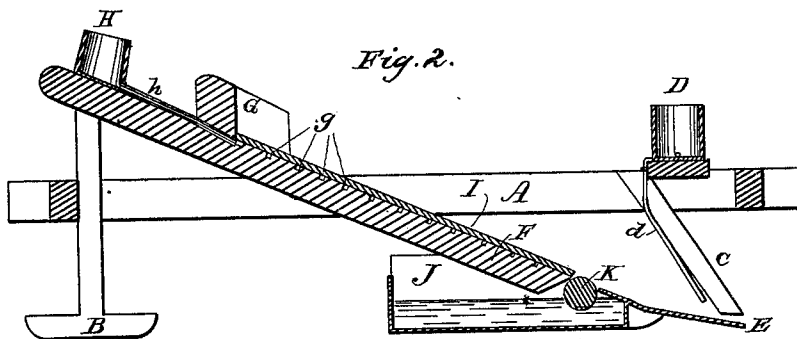
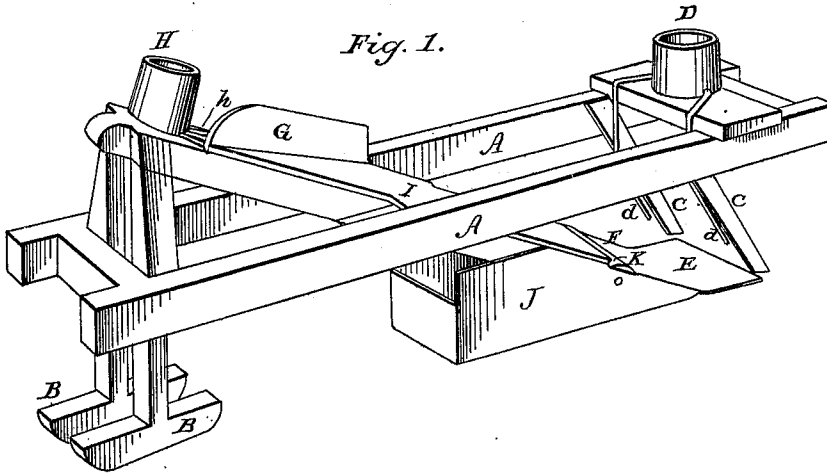


F. L. DELFER.
DITCHING-MACHINE.

No. 175,275.

Patented March 28, 1876.



Attest:
C. Clarence Poole
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UNITED STATES PATENT OFFICE.

FRANK L. DELFER, OF BURLINGTON, IOWA.

IMPROVEMENT IN DITCHING-MACHINES.

Specification forming part of Letters Patent No. **175,275**, dated March 28, 1876; application filed February 19, 1876.

To all whom it may concern :

Be it known that I, FRANK L. DELFER, of Burlington, in the county of Des Moines and State of Iowa, have invented an Improvement in Ditching-Machines, of which the following is a specification :

The object of my invention is, first, to prevent clogging the water-trough with mud; second, to provide for the ready removal of sediment and mud from the water-trough while the machine is in operation; third, to provide a uniform lubrication of the earth ascending along the chute; fourth, to reduce friction by covering the chute with a surface-coating of plaster-of-paris, or other material, to which the earth will but slightly adhere; fifth, to facilitate lubrication by crossing the interior of the chute with a network of shallow channels for the water distribution. It therefore consists, first, in a mud-trough, wherein the sediment and mud may settle which may dissolve from the bottom of the ascending mass of earth while exposed to the action of the water to be removed from time to time, as may be necessary, by the use of a long-handled shovel. There may be an auxiliary water-tank or an independent pipe from the tank on top of the chute, connecting with the mud-box, to insure a regular supply, so that the water may always be kept at a regular height. Second, in a water-roller to take up water from the mud-box and deliver it to the earth-jaw beginning to slide up the chute, and thereby commence its lubrication. Third, in a surface-coating of plaster-of-paris, or other substance, to which the earth will have slight adherence as it moves over it. Fourth, in a reticulated network of shallow channels in the surface below the plaster to effect a uniform distribution of water beneath the plaster, through the pores of which it will penetrate to continuously lubricate the ascending earth.

That others may fully understand my improvement, I will particularly describe it, having reference to the accompanying drawings, wherein—

Figure 1 is a perspective view of my machine. Fig. 2 is a longitudinal section, and Fig. 3 a plan of the same.

A A are the timbers of the main frame,

which, when in use, rest and slide upon the ground; or, if it is not desirable to cut so deep, rollers or runners of any kind may be placed beneath the frame A to determine the depth of cut. The runners B B, for which the rollers may be substituted under the rear end of the frame A, slide upon the bottom of the trench, and regulate the height of the rear end of said frame to correspond with the depth of cut at the front end. At the front end of the frame, and securely bolted thereto, are two cutters, C C, which project downward and penetrate the ground to the depth of the cut. These cutters separate the soil at either side, and forms the sides of the ditch. Small pipes *d d* lead from a water-tank, D, on the frame A, and discharge water into the cut immediately in rear of each cutter C C. This water has the effect of lubricating the edges of the slice separated by the cutters, and immediately thereafter separated at the bottom and raised by the share-cutter E, which projects forward and cuts the slice clear along the bottom. The cutter E is horizontal, or very nearly so, for a short distance back from the front edge, and then curved upward slightly, and is continued upward and backward by the chute F to a point above the frame A, where it is pushed off sideways by the oblique guide G.

When it is desirable to level the earth some distance from the edge of the ditch, a suitable extension of the chute may be made. Lubrication of the dirt or earth slice by means of water has been found to greatly facilitate the operation of raising said slice along the chute. By the means heretofore in use the water-trough was liable to become filled and choked with dirt after a little while, so as to prevent the passage of water, when, of course, the lubrication would cease.

To obviate this difficulty, I provide the mud-trough J, in the bottom of which all the particles will settle which may become detached from the bottom of the moving mass of earth in its passage over the opening of the trough and over the roller K.

If the machine is to work in very sticky soil, where wooden or steel chutes would clog, I provide a layer on the chute of some per-

vious material or substance, through which water will penetrate, and to which earth will but slightly adhere.

A substance possessing these qualities is plaster-of-paris. Generally, the water which the dirt absorbs in passing over the roller will be sufficient to make it glide all the way up, but for greater safety I place at the upper end of the chute, or in some other suitable locality, a water-tank, H, and by suitable tubes *h* leading therefrom water is conducted from said tank to a series of small channels, *g g*, cut zig-zag or crosswise of the surface of chute F. The surface of the said chute is covered with a layer, I, of plaster-of-paris mixed to the consistency of mortar, so that while the channels *g g* will aid in attaching said layer to the chute, they will not be filled and obstructed by said mortar, and the water which enters from the tubes *h* will find its way down said channels, keeping the layer I of plaster-of-paris constantly wet and lubricated.

The surplus water, if there is any, finds its way into the mud-box J. In the top of the mud-box I place a roller, K, the upper side of which projects slightly above the surface of the chute, and said roller serves to take up water from the mud-box, and moisten the under side of the earth-slice, and also to facilitate the passage of said slice.

The mud-box J is open at its rear end, and the sediment and mud therein may be removed by a long-handled shovel or hoe while the machine is in motion.

In places where the soil is tough and impervious to water, and water for lubrication easy to be obtained, a mud-box may be formed by merely dragging or otherwise attaching a piece of wood cut to the shape of the ditch, behind the machine in the bottom of the ditch. The sides and bottom of the ditch will then form the sides and bottom of

the box, and the ascending earth will absorb the water which is to be poured in from behind. Loose earth thrown inside that box against that tail-board will fill up the cracks between the wood and sides of ditch, and make the box water-tight. When the ditch is to be unusually deep it may be desirable to use an endless band or belt to elevate the earth, and such belt may be lubricated by a roller in the same manner. The roller K may be covered by cloth or any other absorbent material that may be convenient, to enable it to carry up a larger quantity of water than would otherwise be the case.

Having described my invention, what I claim as new is—

1. The cutters and chute of a ditching-machine, combined with a mud-box, J, near the forward or lower end of said chute, to catch and retain the mud and sediment.

2. The mud-box J constructed with its rear end open and accessible, for the removal of the mud and sediment therefrom while the machine is in motion.

3. The chute of a ditching-machine and the mud-box J attached thereto, in combination with the roller K, to take up water from said box, and deliver it to the moving earth upon the chute to lubricate the same.

4. A ditching-machine chute, provided with a surfacing layer of some substance, to which earth will but slightly adhere, such as plaster-of-paris, substantially as set forth.

5. A ditching-machine chute, provided with numerous water-channels, *g*, combined with a surface-layer, I, of plaster-of-paris, and a water-tank, H, as set forth.

F. L. DELFER.

Signed in the presence of—

I. A. CHAMBERS,
JOSEPH FERREL.