S. P. McKelvey,

Excavator.

No. 101,640. Patented Apr. 5. 1870.

Fig. 1.

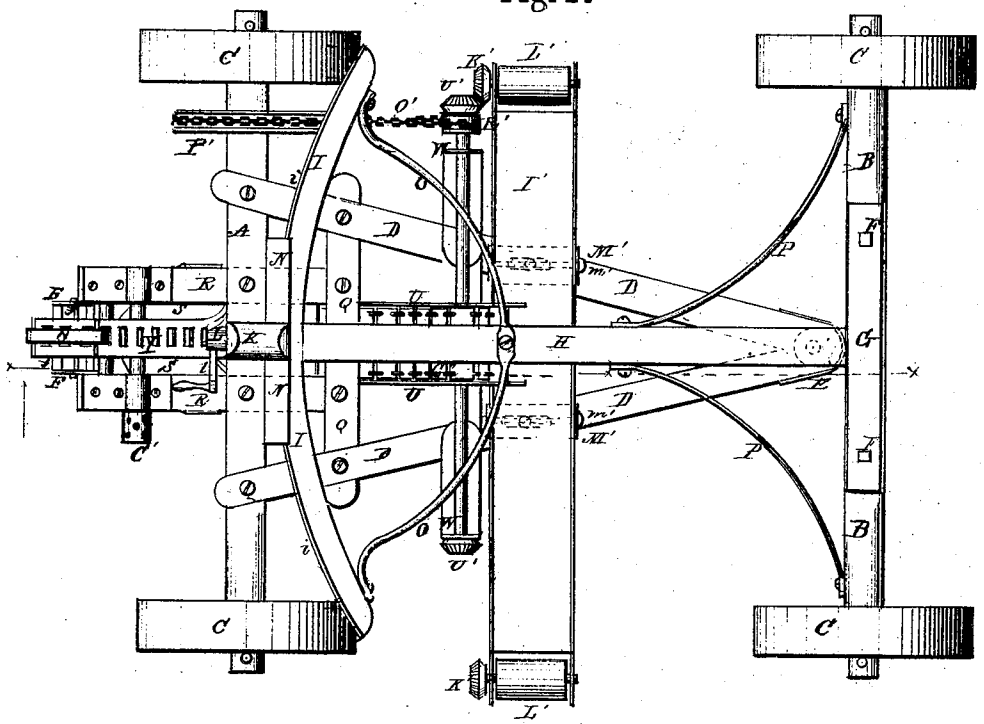
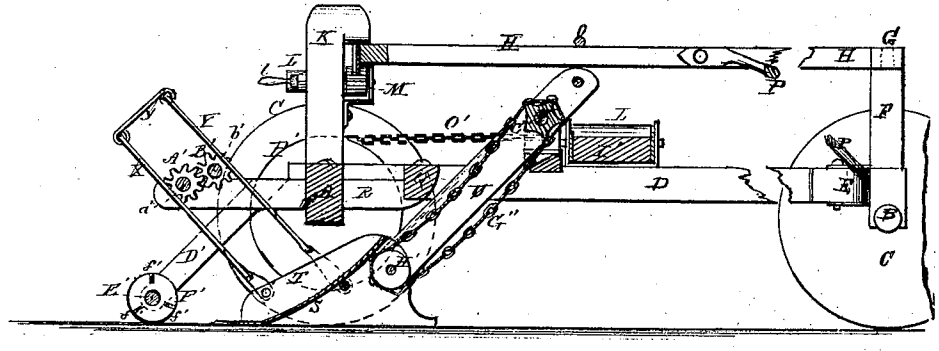


Fig. 2.



Witnesses.

A. Deschmale

C. W. Schreiner

Inventors.

S. P. McKelvey

by Brindle & Dyer

his Attys.

UNITED STATES PATENT OFFICE.

S. P. McKELVEY, OF FARMER CITY, ASSIGNOR TO HIMSELF AND G. W. SNOOK, OF SAYBROOK, ILLINOIS.

IMPROVEMENT IN DITCHING-MACHINES.

Specification forming part of Letters Patent No. **101,640**, dated April 5, 1870.

To all whom it may concern:

Be it known that I, S. P. McKELVEY, of Farmer City, in the county of De Witt and in the State of Illinois, have invented certain new and useful Improvements in Ditching-Machines; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a plan view of the upper side of my device; and Fig. 2 is a vertical longitudinal section of the front portion of the same on the line *x x* of Fig. 1.

Letters of like name and kind refer to like parts in each of the figures.

My invention has for its object the forming of surface-ditches by horse or other power; and to this end it consists, principally, in the peculiar construction and attachment of the plow, and in the means employed for securing the relative adjustment of the same upon the frame, as is hereinafter set forth.

It further consists in the employment of a revolving colter in front of the ditching-plow, as is hereinafter specified.

It further consists in the construction and arrangement of the devices by means of which the excavated soil is elevated, conveyed to either side, and dumped, as is hereinafter shown.

It further consists in the means employed for connecting the rear axle to the frame, and rendering it relatively adjustable therewith, as is hereinafter described.

It finally consists in the construction and arrangement of the frame, and of the various parts of the whole device, substantially as and for the purpose set forth.

In the annexed drawing, A and B represent the front and rear axles, respectively, having journaled upon their outer ends ground-wheels C of usual form. Secured to and extending rearward and inward from the front axle A are two rails, D, which unite together at their rear ends E, and furnish a bearing for the rear axle B, which is suitably pivoted thereto, and may be turned in a horizontal plane, so as to have any desired angle with said front axle A. Extending upward from the axle B are two short posts, F, having their upper ends connected together by means of a cross-bar, G, from the center of which projects forward a reach, H, having secured upon its front end a bar, I, curved in the form of a segment of a circle, of which the pivot E is the center. Secured to and extending upward from the center of the axle A is a post, K, journaled within which is a short shaft, L, having upon its forward end a crank, *l*, and upon its rear end a pinion, M, the latter of which meshes with teeth formed upon the lower edge of a metal band, *i*, secured upon and projecting downward from the forward face of the segmental bar I, so that by revolving said shaft and pinion said segmental bar will be moved to the right or left of the central line of draft, and the relative positions of the front and rear axles correspondingly varied. The upper end of the post K projects to the rear, and supports a metal bar, N, which extending horizontally to either side, immediately over the segmental bar I, keeps the latter in position vertically, and thus prevents the toothed band *i* from becoming disengaged from the pinion M. A curved metal brace, O, extending from near the outer ends of the segmental bar I to and across the reach H, and two other curved braces, P, extending from near the center of said reach outward and downward to the rear axle, complete this portion of the device, by means of which the course of the machine can be directed at will. The frame of the machine is completed by the addition of a cross-bar, Q, secured to the rails D in rear of and parallel with the front axle A, and by two short rails, R, attached at their rear ends to said cross-bar, from whence they pass forward through and beyond said axle.

The shovel used with this device is partially formed of a plate of sheet metal, S, pointed at its front end, from whence it extends horizontally rearward for a short distance, and from thence inclines at a suitable angle. Secured upon either side of and supporting the inclined plate S are two metal plates, T, having the form shown in Fig. 2, which are placed in a vertical position, so as to form the sides of the ditch, while the inclined plate S forms the bottom of the same, and raises the soil therefrom.

The shovel is connected to the machine

and rendered vertically adjustable thereon by means of the following described devices: Pivoted upon the outer sides of the plates T at their upper rear ends are the lower ends of two metal bars, U, which are in turn pivoted near their upper ends upon a shaft, V, resting within suitable bearings W attached to the frame. To the center lengthwise, and to the forward end of each plate T, are pivoted the lower forked ends of two open rack-bars, X and Y, respectively, which from thence incline upward and forward at an angle of about forty-five degrees, and are loosely connected together at their upper ends by means of a link-bar, *y*.

Two pinions, A′ and B′, attached to short shafts *a′* and *b′*, suitably journaled upon the projecting ends of the rails R, are caused to mesh with each other and with the rack-bars X and Y, so that if said pinions are caused to revolve said rack-bars and the shovel will be correspondingly elevated or depressed. The shaft *b′* projects outward at one end sufficiently to permit of the attachment thereon of a hub, C′, in which is provided a number of radial holes for the reception of the end of a bar for operating said shaft and the pinions; but, if desired, any other equivalent means may be employed for accomplishing this result. By this arrangement the shovel can not only be adjusted to any desired depth, but also, by uncoupling the upper ends of the rack-bars, adjusting either up or down upon its pinion, and again coupling said bars, a greater or less amount of draft can be given to said shovel.

Journaled within the ends of two bars, D′, secured to, and projecting downward and forward from the rails R, is a short shaft, E′, upon which is a rotary colter, composed of three circular metal disks, F′, placed at the center and near the ends of said shaft, and connected together by means of three straight bars, *f′*, placed parallel with said shaft at equidistant points upon the periphery of said disks. The edges of the disks F′ and bars *f′*, forming the colter, being sharpened, and said colter adjusted so as to cut into the ground, it will be seen that the effect will be to effectually cut the sod and loosen the soil in front of the shovel, and thereby lessen the work of the latter.

In order that the earth raised by the shovel may be deposited at a sufficient distance from the ditch, so as to prevent all liability to its being washed back again, the following described devices are employed.

A chain-wheel, C′, corresponding in length to the space between the bars U, is secured upon the shaft V between said bars, and supports the upper portion of a linked metal apron or belt, G″, the lower end of which passes around a suitable roller, H′, pivoted to or within the rear portion of the slide-plates T of the shovel, so that if said shaft be caused to revolve, a continuous upward and rearward motion will be imparted to said apron, by means of which any soil raised by the plow and deposited thereon will be carried over the shaft. Immediately in rear of shaft V is a frame, I′, having a length equal to the breadth of the machine over the wheels, in each end of which is suitably journaled a short shaft, having upon their forward ends bevel-pinions K′, and upon that portion between the bearings rollers L′. Two ⊔-shaped metal pieces, M′, secured to the upper sides of the rails D, furnish a means for securing the frame I′ in place, the latter being suspended between the vertical portions of the former by means of suitable pins *m′* passing horizontally through both pieces and frame, so that if a canvas band were stretched around the rollers it would have a sufficient space beneath the frame to enable it to move freely. Two sets of holes are provided in and through the frame, so as to permit it to be adjusted with either end projecting laterally beyond the machine. A bevel-pinion, U′, corresponding with those upon the roller-shafts, being provided upon the outer ends of the shaft V, so as to mesh with one of the pinions K, and said shaft connected to one of the driving-wheels by means of a chain, O′, passing around a large pulley, P′, secured upon said wheel, and around a small pulley, R′, secured upon shaft, the device is complete, and its operation is as follows:

The machine being driven forward, and the shovel adjusted to the desired depth by means of the rack-bars X and Y, and the pinions A′ and B′, the rotary colter cuts the sod and loosens the soil, which is immediately thereafter raised by the plow and deposited upon the linked belt G″; from thence carried upward and dropped upon the belt operated by the rollers L′, (not shown in the drawing,) and by means of said belt deposited entirely beyond the track of the wheels.

In this machine are obtained ease and thoroughness of operation, simplicity of construction, strength and durability of parts, without rendering the device more expensive than those of less capacity in ordinary use.

Having thus fully set forth the nature and merits of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The plow formed of the inclined plate S and side plates T, connected to, and rendered adjustable upon, the frame by means of the pivoted bars U′, the rack-bars X and Y, and the pinions A′ and B′, substantially as and for the purpose specified.

2. In combination with the above-described plow the shaft V, the chain-wheel G′, the linked belt G″, the frame I′, the pinions K′ and U′, the rollers L′, the chain O′, and the pulleys P′ and R′, all constructed and arranged to operate substantially as and for the purpose specified.

3. The employment of the revolving colter F′ and *f′* in front of the ditching-plow, substantially as shown, and for the purpose set forth.

4. The means employed for connecting the rear axle to the frame, and rendering it relatively adjustable therewith, consisting of the pivot-hinge E, the posts F, the cross-bar G, the reach H, the curved bar I, the post K′, the shaft L, the pinion M, and the toothed metal band *i*, substantially as shown, and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of November, 1869.

S. P. McKELVEY.

Witnesses:
BETHUEL G. STARK,
EZEKIEL F. CAMPBELL.