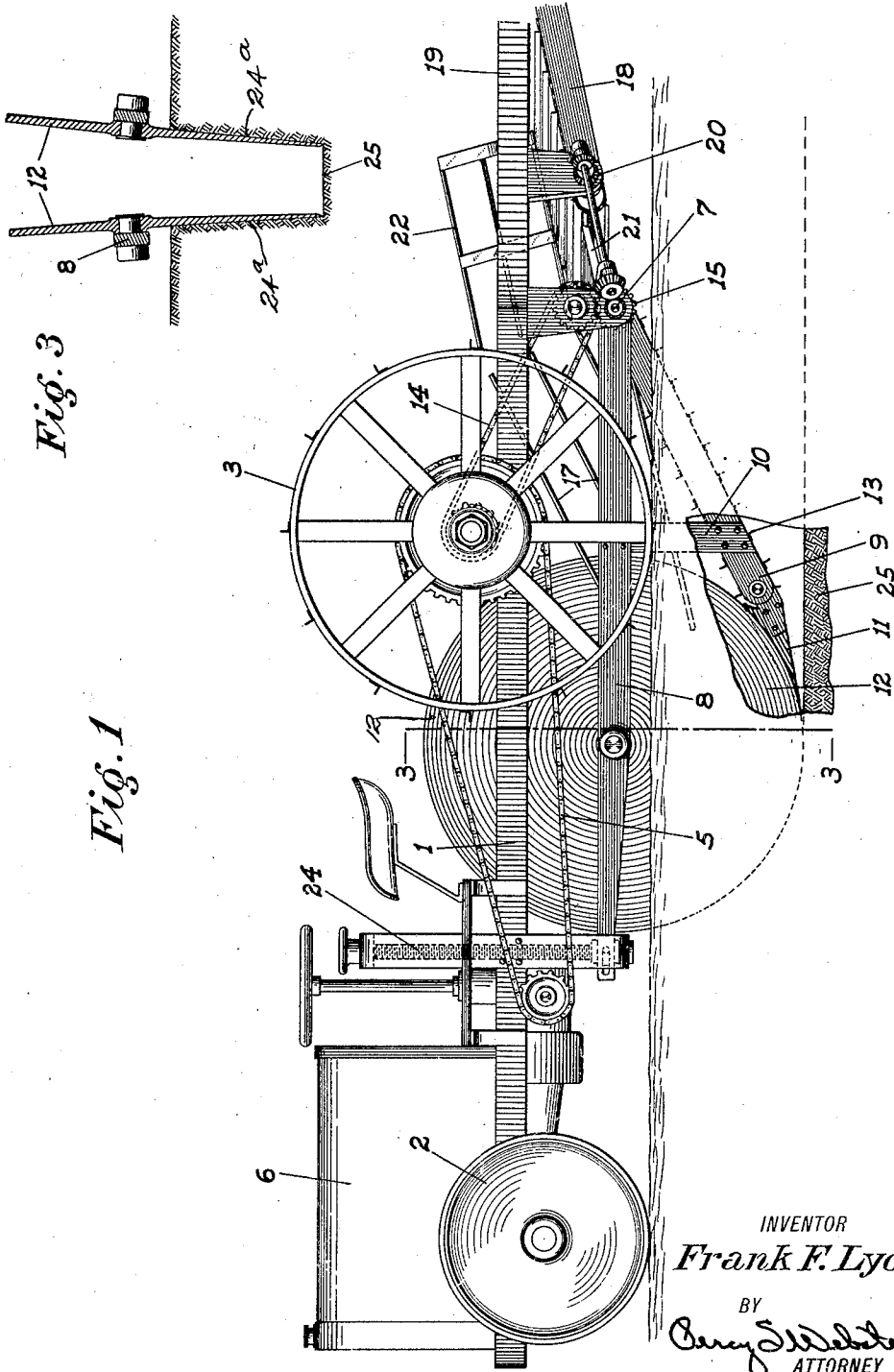


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APPLICATION FILED MAR. 3, 1919.

1,343,734.

Patented June 15, 1920.
2 SHEETS—SHEET 1.

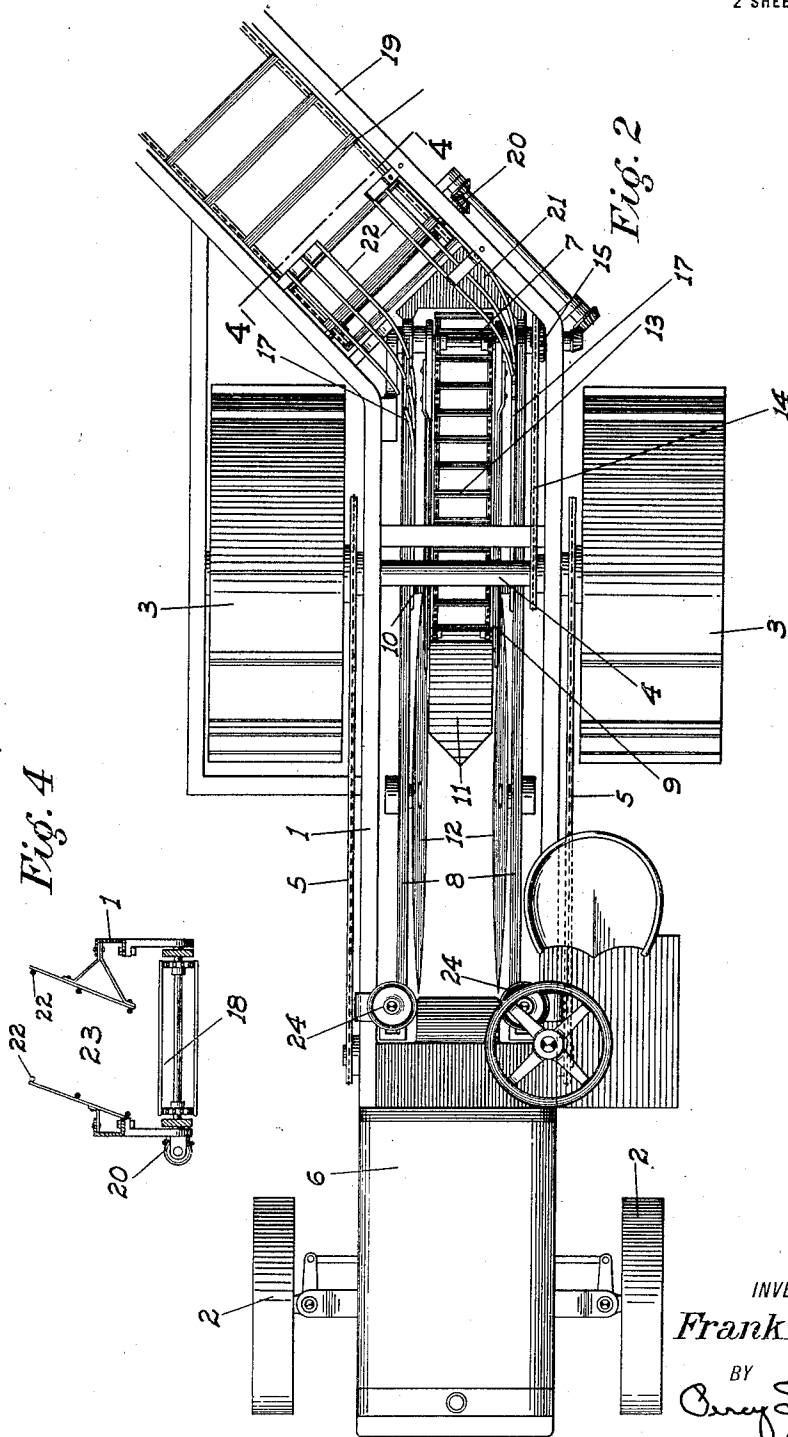


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UNITED STATES PATENT OFFICE.

FRANK F. LYONS, OF STOCKTON, CALIFORNIA.

DITCH-DIGGING MACHINE.

1,343,734.

Specification of Letters Patent. Patented June 15, 1920.

Application filed March 3, 1919. Serial No. 280,278.

To all whom it may concern:

Be it known that I, FRANK F. LYONS, a citizen of the United States, residing at Stockton, in the county of San Joaquin, State of California, have invented certain new and useful Improvements in Ditch-Digging Machines; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in ditch digging machines, and particularly to a type adaptable for use in peat lands to dig comparatively small ditches such as are used for irrigating between rows of growing crops.

The composition of the peat land referred to is of a heavy and closely adhering nature in which quantities of roots are entangled, adding to the adhesive qualities of the land.

These qualities I take into account in my invention, in which the principal object is to provide a machine which will cut the sides and bottom of the ditch and remove the entire material therefrom in a solid unit as the machine progresses and deposit it to one side of the ditch all in one operation.

A second object is to arrange the digging parts or cutters so that different depths of ditches may be dug by adjusting the depth to which the cutters may operate in a simple and easily performed manner.

As a third object I have produced a simple and inexpensive machine and yet one which will be extremely efficient for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

On the drawings, similar characters of reference indicate corresponding parts in the several views.

Figure 1 is a side elevation of my improved ditch digging machine shown in the position of excavating or digging a ditch.

Fig. 2 is a top plan view thereof.

Fig. 3 is a fragmentary cross section taken relatively on a line 3—3 of Fig. 1, showing the side cutters in position in a ditch, and outlining the shape of the ditch being dug.

Fig. 4 is a fragmentary section taken on a line 4—4 of Fig. 2 showing a means for upsetting the unit material after being

taken from the ditch and prior to its being deposited on the ground alongside.

Referring now more particularly to the figures of reference on the drawings, the numeral 1 indicates the main frame of the machine which is supported on steerable wheels 2 at the forward end and wide-faced bull or drive wheels 3 toward the rear end mounted on an axle 4. These wheels are driven by some such means as a chain drive 5 from a power plant 6.

Pivoted to the frame 1 below the same and to the rear of the wheels 3 on a cross shaft 7 are spaced frames 8, between which and sloping down and forward from said pivoted shaft 7 are additional frames 9 suitably braced to the frames 8, as at 10. To the lower end of the frames 9 is secured a wedge and V-shaped cutter 11 preferably removably secured to the frames for replacement or regrinding.

Turnably mounted between and to the frames 8 are sharp edged disks or colters 12, similar to the colters used on plows and other agricultural machinery. The diameter of these disks is such that their lower edges are slightly lower than the cutting edge of the member 11, the center line of the disks being preferably just forward of the edge of the cutter 11.

These disks slope outwardly from the bottom up, as shown in Fig. 3, to give the proper shape to the ditch and also to enable the dirt to be raised therefrom without clinging to the cut sides, the spacing of the disks at the bottom being just enough more than the width of the cutter 11 to give proper clearance therebetween.

These disks may, if desired, be connected to the wheels 3 to turn therewith, but I do not consider this necessary. Positioned between the frames 9 is a conveyer 13 extending from the cutter 11 to and around the pivotal shaft, being operatively connected with the shaft 4 at that point by a means such as a chain drive 14. Gears 15 interposed between the chain drive and the shaft 7 serve to turn said shaft and the conveyer 13 in the opposite direction to the wheels 3.

Secured to the frames 8 are a plurality of guide bars 17, having a slope equal to that of the conveyer frames 9.

Leading from the upper termination of the conveyer 13 but independent therefrom is a second conveyer 18 of considerably

greater width than the cutter 11 and set at an angle to the frame 1 to which it is rigidly secured. The frame 1 turns in the same direction as said conveyer 18, as shown at 19, in order to form a stiff supporting means for the conveyer over its entire length.

This conveyer is geared to the shaft 7 as shown at 20 to turn therewith.

A platform 21 bridges the space in the angle between the two conveyers, this platform being secured to the frame of either one as desired.

Secured to the angled portion 19 of the frame 1 are guide bars 22, which meet the line of the bars 17, but whose adjacent ends are spaced somewhat therefrom to permit of free upward movement of the bars 17 on the movable frames 6. These bars are positioned to form an angle on a vertical plane with the conveyer 18, forming a parallel slanting passageway therebetween, as shown at 23, on Fig. 4, the greater width of the conveyer 18 relative to the conveyer 13 being all to one side of the latter, the slope of the bars 22 being toward this portion of greater width, for a purpose that will appear.

The frames 8 and all the parts connected thereto are raised about the pivotal shaft 7 by means of a screw adjustment means 24 secured to the frame 1 or some such similar mechanism. This adjustment means has sufficient travel to permit of the cutting members to be raised entirely clear of the ground when desired. The operation of the device is as follows:

Supposing the digging mechanism to be positioned to dig a ditch of the depth shown at 25 in Fig. 3. With the forward movement of the machine, the disks 12 cut the sides 24^a of the ditch to the entire depth at one operation at the desired slope. The disks being circular, cut into the ground gradually and take less power to pull than straight vertical cutters would. The cutter 11, following closely, cuts the bottom 25 and starts to lift the entire wedge shaped mass of material thus cut, which, as previously stated, on account of the physical properties of the land in which this machine is designed to operate, will cohere in a solid mass.

This material is then raised by the conveyer 13 to the conveyer 18 and is then deposited a suitable distance to one side of the ditch.

As soon as the mass of material, which is considerably higher than it is wide, reaches the conveyer 18, it is upset by bearing against the slanting guide bars 22, and thus lies on its side while traveling on the conveyer 18. This insures the materials lying on the ground evenly and without the danger of toppling over. Should it be de-

sired to use this machine in looser ground, sides may take the place of the bars 17 and 22, and the conveyers be fitted with flexible bottoms, so as to remove the loose material without its falling off the conveyers.

From the foregoing description, it will be readily seen that I have produced such a device as substantially fulfills the object of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

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

1. A ditch digging machine for peat land comprising a wheel supported frame, a second frame adjustably and pivotally suspended from the first named frame and adapted to be always above the ground level, large cutting disks spaced apart and each independently pivoted in the suspended frame and adapted to extend to the bottom of a ditch, the space therebetween being clear, a horizontal cutting member secured to the latter frame and positioned at the bottom of and between the disks with its cutting edge substantially at right angles to the plane thereof, whereby the sides and bottom of the ditch will be cut to its entire depth at one operation; and means for conveying the dirt from the horizontal cutter.

2. A ditch digging machine for peat land comprising a wheel supported frame, a second frame adjustably and pivotally suspended from the first named frame and adapted to be always above the ground level, large cutting disks spaced apart and each independently pivoted in the suspended frame and adapted to extend to the bottom of a ditch, and sloping outwardly from each other from the bottom, the space therebetween being clear, a wedge shaped horizontal cutting member between the disks sloping upwardly from the lowest cutting edges thereof and having its cutting edge substantially at right angles to the plane of the disks, whereby the bottom and sides of the ditch are cut at one operation and the cut material immediately raised and freed from contact with the disks; and means for conveying the mass so raised to one side of the machine.

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

FRANK F. LYONS.

Witnesses:

STEPHEN N. BLEWETT,
BERNARD PRIVAT.