

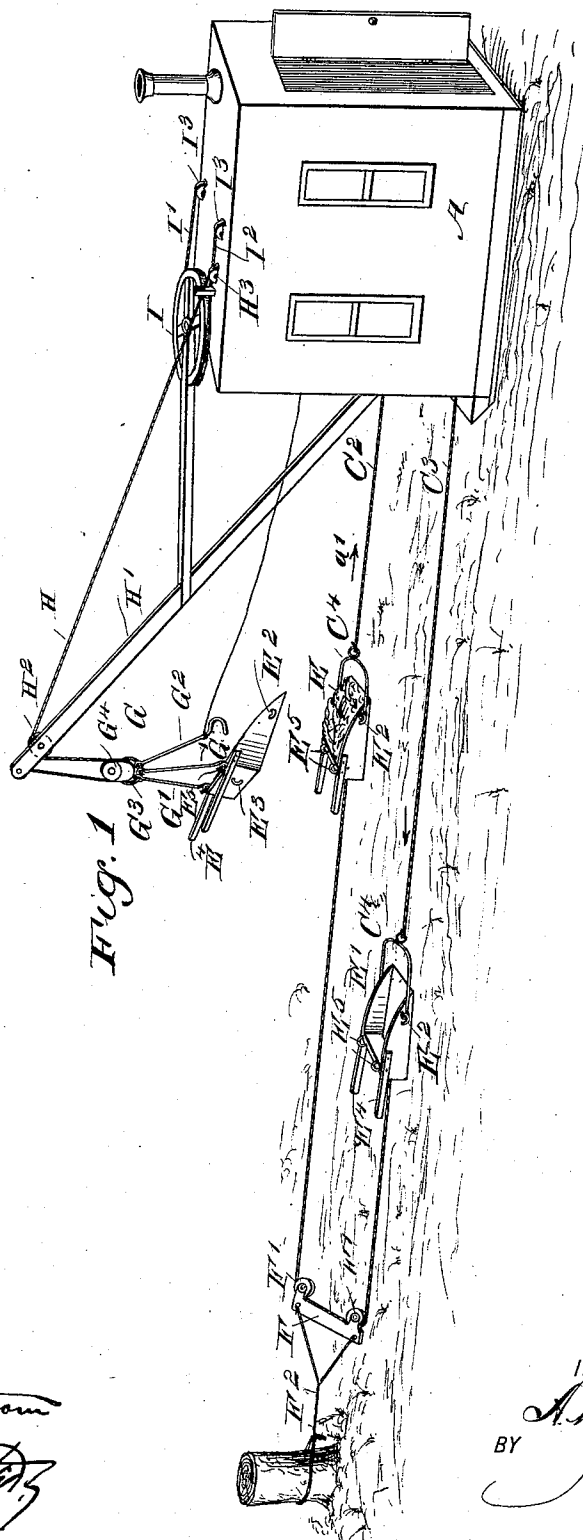
(No Model.)

2 Sheets—Sheet 1.

A. MANN.
DITCHING MACHINE.

No. 543,257.

Patented July 23, 1895.



WITNESSES:
John A. Bergstrom
Thos. J. Postley

INVENTOR
A. Mann
BY
Munn & Co.
ATTORNEYS.

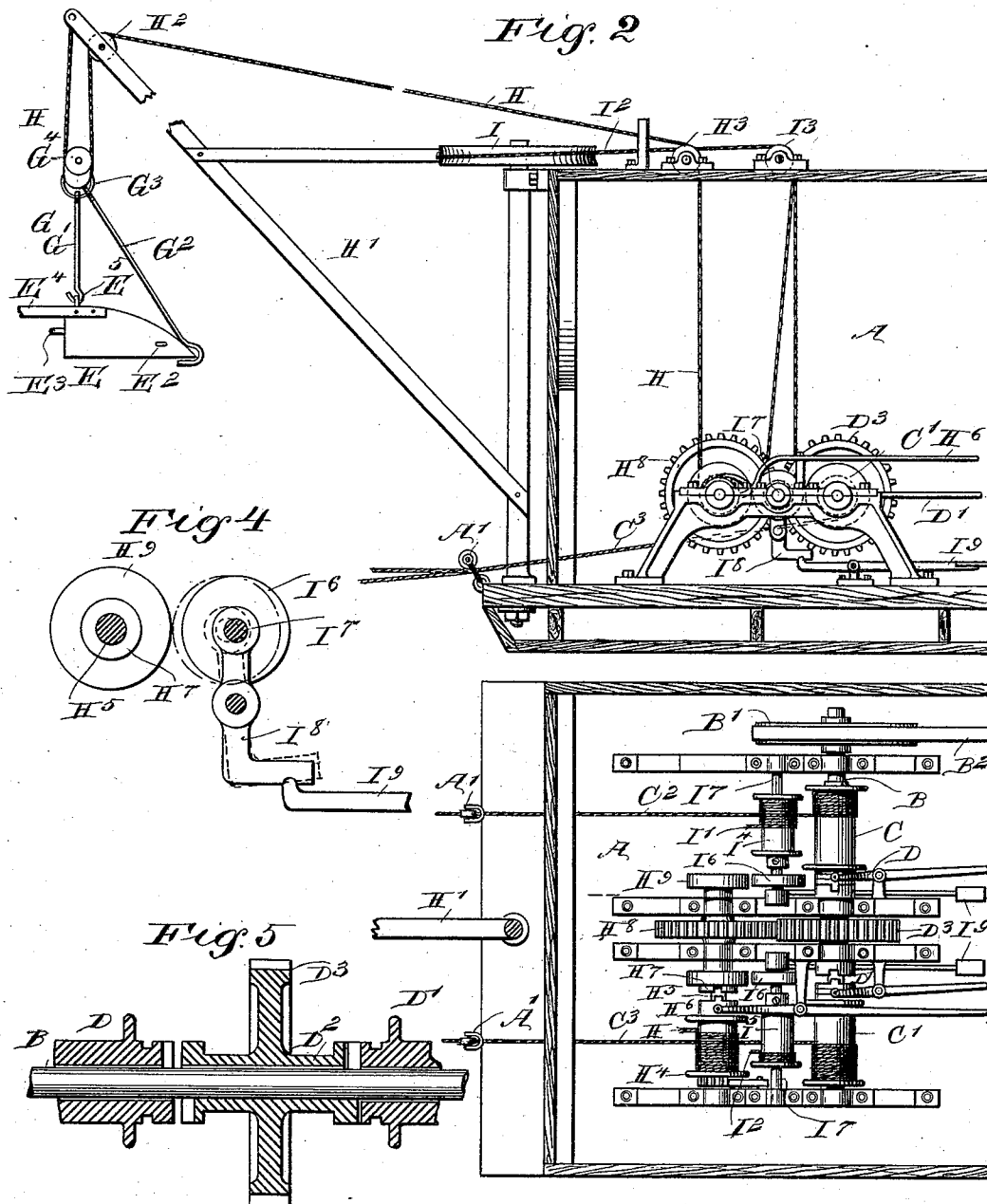
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Fig. 3

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UNITED STATES PATENT OFFICE.

ALEXANDER MANN, OF BERKSHIRE, MICHIGAN.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 543,257, dated July 23, 1895.

Application filed May 1, 1894. Serial No. 509,671. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER MANN, of Berkshire, in the county of Sanilac and State of Michigan, have invented a new and Improved Ditching-Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved ditching-machine, which is comparatively simple and durable in construction, very effective in operation, and arranged to readily dig up the ground and transport the same to a desired place for dumping.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of the improvement. Fig. 2 is an enlarged sectional side elevation of the same. Fig. 3 is a sectional plan view of the same. Fig. 4 is an enlarged sectional side elevation of a friction-clutch, and Fig. 5 is an enlarged transverse section of the main driving-shaft and clutch mechanism.

The improved ditching-machine is provided with a portable housing A, adapted to be placed on the ground to be ditched, and in this housing is journaled a main driving-shaft B, carrying at one end a pulley B', over which passes a belt B², also passing over a pulley on the main driving-shaft of an engine or other suitable motor located in the housing A. On the shaft B are mounted to rotate loosely the two winding-drums C and C', on which wind the ends of the runs C² and C³ of a carrier-rope or chain, extending through the front end of the housing A to pass beneath guide pulleys A' on the housing A, and thence along the place to be ditched, as plainly illustrated in Fig. 1. The winding-drums C and C' are adapted to be thrown into and out of gear with the hub D² on and rotating with the main driving-shaft B by suitable clutch-mechanisms D and D', respectively, under the control of the operator in charge of the machine.

In the runs C² and C³ of the carrier-rope or chain are arranged and supported scrapers

E and E', respectively, both alike in construction and adapted to scrape up the ground so as to form the ditch, as hereinafter more fully described. The outer end of the carrier-rope or chain passes over pulleys F' held on a cross-bar F, connected by a rope F², a chain, or other means, with a stump or other post or projection at the outer end of the ditch to be formed. (See Fig. 1.)

In order to permit of removing the scrapers E and E' from the runs C² and C³ of the carrier-rope or chain, I provide each run with a U-shaped bail C⁴, adapted to be hooked into eyes E² arranged on opposite sides of the scraper and at the front end thereof, as plainly illustrated in the drawings. The eye E³ on the back of the scraper connects with a hook on the respective run, so that the scraper is readily moved forward or backward, according to the direction in which the corresponding run C² or C³ is traveling. Each scraper E and E' is provided with suitable handles E⁴, adapted to be taken hold of by the operator, so that when the corresponding scraper is on its forward movement the operator tilts the scraper to carry the front end downward. Then this end passes into the ground, scrapes up the dirt, and when the scraper is filled in this manner the operator releases his hold on the handles E⁴ to let the scraper be carried forward with its load.

Now, it will be seen that when the several parts mentioned are in the position shown in Figs. 1, 2, and 3, and rotary motion is given to the main driving-shaft B, then the drum C will wind up its run C², while the other drum C', on account of being disconnected from the shaft B, permits its run C³ to unwind. Thus the scraper E moves inward toward the housing A, and at the beginning of the operation the operator manipulates the scraper so as to fill the same, as above described, and after it is filled it travels inward in the direction of the arrow a'. At the same time the other empty scraper E' moves outward in the inverse direction of the arrow a' to be returned to the place for filling the scraper on changing the position of the clutches D and D'. When the inwardly-moving filled scraper arrives near the housing A, then the said scraper is detached from its run of the carrier-rope by unhooking the bail C⁴ and also unhooking the

end of the run at the eye E³, and an empty scraper is inserted in said run. A crane is now brought into use so as to lift the filled scraper and to swing the same to one side of the housing or to the rear thereof, or over a boat, car, or other suitable vehicle, to dump the contents of the said scraper. As shown in the drawings, I provide a hoisting device G, having the hooks G', adapted to hook onto eyes E⁵ on the top of the back of the respective scraper, as plainly shown in Figs. 1 and 2. A third hook G² extends forwardly and engages the front scraping-edge of the scraper to support the latter in a horizontal position without raising and moving it to one side of the housing. The three hooks G' and G² are held at their upper end in a ring G³, supported on a sheave G⁴ hung in a hoisting-rope H fastened at one end to the boom H' and passing over a pulley H² journaled in the said boom near the upper end. The boom H' is journaled on the front end of the housing A, as plainly shown in the drawings. The hoisting-rope H, after leaving the pulley H², passes over a pulley H³ on the top of the housing A, and then the hoisting-rope passes downward through the top of the housing into the latter and to a hoisting-drum H⁴ mounted to rotate loosely on a transversely-extending shaft H⁵ journaled in suitable bearings within the housing A. A clutch mechanism H⁶ is adapted to connect the said hoisting-drum with a sleeve or hub H⁷ journaled in suitable bearings and secured on the said shaft H⁵, the said hub carrying a gear-wheel H⁸ in mesh with the gear-wheel D² secured on the hub D² previously mentioned, the said hub rotating with the main driving-shaft B, as above described. (See also Fig. 5.) Thus the rotary motion of the main driving-shaft B is transmitted by the gear-wheels D³ and H⁸ to the hub H⁷. When the clutch mechanism H⁶ is engaged with the said sleeve, then the hoisting-drum H⁴ is rotated to wind up the hoisting-rope H, so as to pull on the hoisting device G and raise the corresponding supported scraper E or E' off from the ground.

Now, in order to swing the boom H' so as to move the hoisted and loaded scraper to one side, the following device is provided: On the upper end of the vertical shaft of the boom H' is secured a wheel I, connected on opposite sides of its rim with the ropes I' and I² passing over pulleys I³ into the interior of the housing A, the said ropes winding on drums I⁴ and I⁵, respectively, each secured on a shaft I⁷, having a friction-wheel I⁶ adapted to be thrown in frictional contact with a friction-wheel H⁹ on the sleeve or hub H⁷, so that rotary motion is imparted to the corresponding shaft I⁷ from the continuously-rotating hub H⁷. Each shaft I⁷ has one end journaled in suitable fixed bearings erected in the casing A, while the other end of the shaft is

journaled in a lever I⁸, (see Fig. 4,) adapted to be actuated by a treadle I⁹ under control of the operator. Now it will be seen that when the operator presses the treadle I⁹ for either the drum I⁴ or I⁵, then the corresponding friction-wheel I⁶ of this drum is thrown in frictional contact with the corresponding friction-wheel H⁹ to cause a rotary motion of this drum to wind up the rope I' or I². It will be seen that when one drum is thus rotated and its rope wound up the other loosened drum revolves freely in an opposite direction to permit its rope to unwind. Now the rope I' or I², in being wound up, causes a pull on the wheel I so that the latter is rotated either to the right or to the left, according to which rope is wound up. The movement of the wheel causes a swinging of the boom H', so as to move the load to one side of the housing A.

It will be seen that this machine is very simple and durable in construction, is readily manipulated, and fully under the control of the operator.

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

1. A ditching machine, comprising winding drums, a carrier rope having its ends secured to the drums, a scraper detachably secured in each run of the carrier rope, and a hoisting device provided with hooks for engaging the front and rear of the scrapers when detached from the carrier rope, substantially as described.

2. In a ditching machine, the combination with the winding drums, of a carrier rope provided with a bail and a hook, and a scraper provided with eyes on the sides of its front and with which the bail engages and with an eye on its back with which the hook engages, substantially as described.

3. In a ditching machine, the combination with winding drums, a carrier rope, and scrapers carried by the said rope and provided with eyes on its back, of a hoisting device provided with three hooks, one to engage the front edge of the scraper and the other two the eyes on the scraper, substantially as described.

4. In a ditching machine, the combination with a pair of winding drums, a carrier rope, and scrapers detachably secured in the runs of the rope, of a pivoted boom, a hoisting rope carried by the boom and provided with means for engaging the scrapers, a wheel on the pivot of the boom, a second pair of winding drums, a rope secured to the wheel and having its ends secured to the last named drums, and means for operating both pairs of drums, substantially as described.

ALEXANDER MANN.

Witnesses:

JAMES MCCAREN,
S. H. COCHRAN.