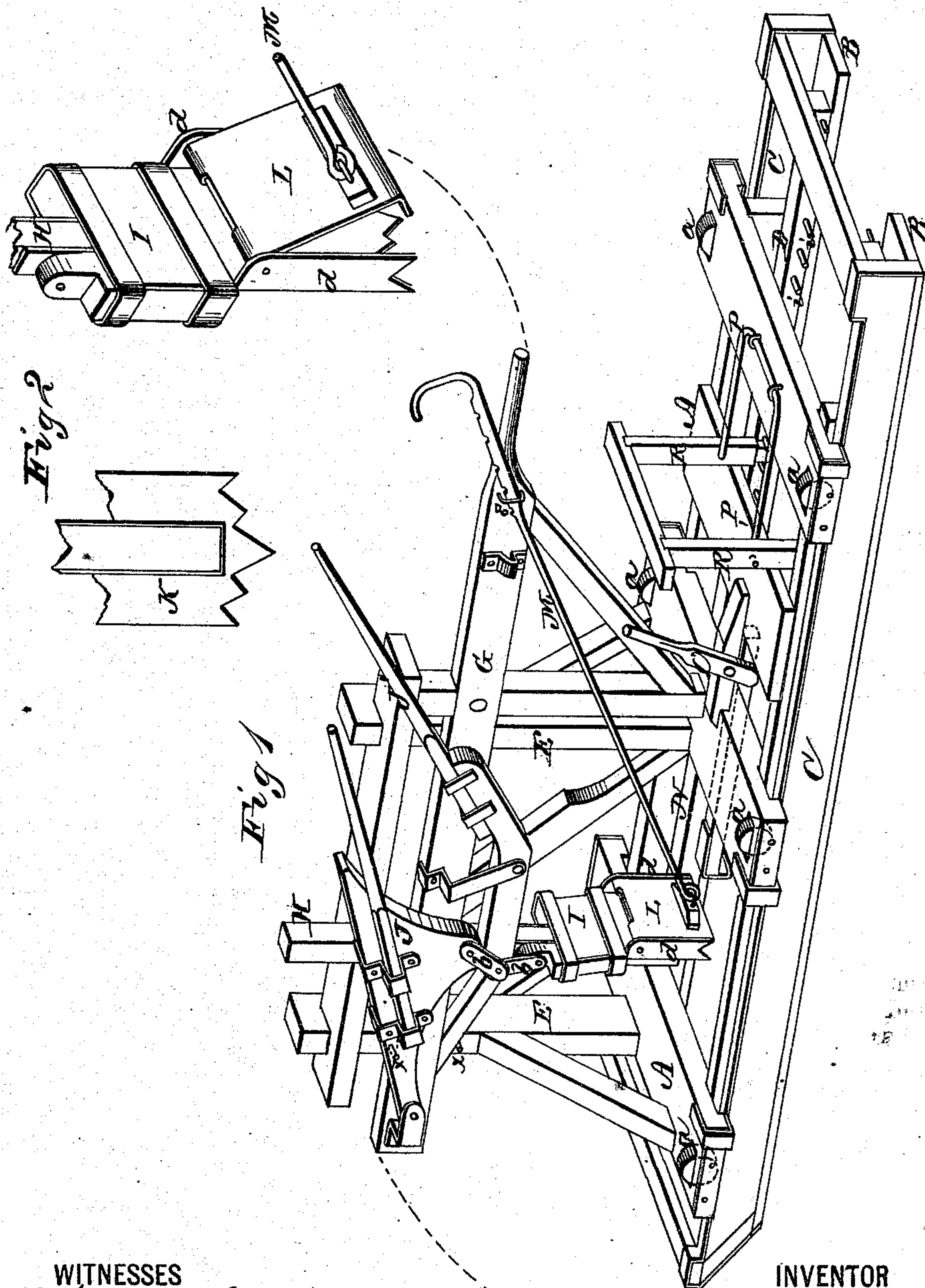


H. H. GRAY.
Ditching-Machines.

No. 158,701.

Patented Jan. 12, 1875.



WITNESSES
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UNITED STATES PATENT OFFICE.

HENRY H. GRAY, OF MIDDLEVILLE, MINNESOTA.

IMPROVEMENT IN DITCHING-MACHINES.

Specification forming part of Letters Patent No. 158,701, dated January 12, 1875; application filed December 15, 1874.

To all whom it may concern:

Be it known that I, HENRY H. GRAY, of Middleville, in the county of Wright and in the State of Minnesota, 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 drawings and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a machine for ditching in marshes, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a perspective view of my machine, and Fig. 2 is an enlarged perspective view of the spade.

A represents a frame of any suitable dimensions, some of the cross-bars of which project beyond the side beams, and carry wheels or rollers *a a*. These wheels or rollers run on a track composed of two parallel bed-pieces, B B, having each, along its outer edge, a rail, C, and along the inner edge a bar, D, the side beams of the frame A fitting between the rails C and bars D, and the wheels or rollers *a* running upon the rails C C. On the frame or carriage A is erected a vertical frame, E, running longitudinally therewith, and at one end of the same is pivoted a derrick, G, in which is a vertical beam, H, projecting a suitable distance above and below the horizontal beam of the derrick. On this vertical beam H is a sliding head, I, connected, by means of toggle-joints *b b*, with two levers, J and J', which are pivoted to the derrick, and so arranged thereon that the head will be moved up and down by pressing down upon said levers. By pressing down the lever J the head I is lowered, and by pressing down the lever J' the head is raised. The outer end of the horizontal beam of the derrick is steadied by means of pins *x x*, as shown, while moving the head up and down. At the lower end of the head I is fastened the spade K, the lower end of which is toothed, the better to penetrate the

ground. It is made longer in the center than at the sides, as shown in Fig. 2, so that the center tooth will strike the ground first, and then the side teeth, one after the other, whereby the entrance of the spade into the ground is rendered very easy. The spade is provided with backward-projecting flanges *d d* along its sides, and between the upper ends of said flanges is hinged or pivoted a grappler, L, the lower edge of which is bent inward to form, as it were, a bottom for the box formed by the flanged spade and grappler. From the grappler L projects a lever, M, which extends toward the rear, and passes through a staple, *e*, attached to the derrick, as shown. The lever is notched at intervals to catch on said staple. On the under side of the carriage is arranged a follower, N, operated by means of a lever, O.

The operation of the machine is substantially as follows: The derrick being thrown in against the vertical frame E, and the horizontal beam of the derrick held between the pins *d d*, the lever J is pressed down, which lowers the head I and presses the spade K into the ground. The lever or rod M having been caught on the staple *e* by one of its notches *x*, the grappler L is opened by the downward movement of the spade. When this movement is completed the grappler is closed by means of the lever or rod O, operating the follower N to force the grappler forward against the spade, thus retaining the muck or soil in the spade. By means of the lever J' the spade is now raised, when the derrick is thrown outward and the rod M pulled to open the grappler and empty the spade outside of the ditch.

The machine is moved along the track by means of a lever-frame, R, hinged to the carriage A by a bail, P, and worked in pins or teeth *i i* projecting from the inner sides of the bars D D of the track; or it may be moved or drawn by a rope, connecting it to a capstan.

The two sides of the track are connected by suitable cross-bars, and made in sections of any desired length. One of such sections only may be used, in which case it may be moved along by a rope and capstan. Where the marsh has no water, two or more sections may be used by running the machine from one to the other, and then moving the rear section to the front again, and so on.

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

1. The spade K, having its lower edge toothed and made longer in the center than at the sides, substantially as and for the purposes herein set forth.

2. The combination of the toothed spade K, provided with side flanges *d d*, and the grapple L, hinged between the upper ends of said flanges, substantially as and for the purposes herein set forth.

3. The combination of the swinging derrick G with vertical beam H, sliding head I with spade K, toggle-joints *b b*, and levers J J', all constructed and arranged to operate substantially as and for the purposes herein set forth.

4. The combination of the track B C D with pins *i i*, carriage A with wheels or rollers *a a*, lever-frame R, and bail P, all as and for the purposes herein set forth.

5. The follower N and lever O, in combination with the hinged grapple L on the flanged spade K, for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of December, 1874.

HENRY H. GRAY.

Witnesses:

D. B. FARMER,
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