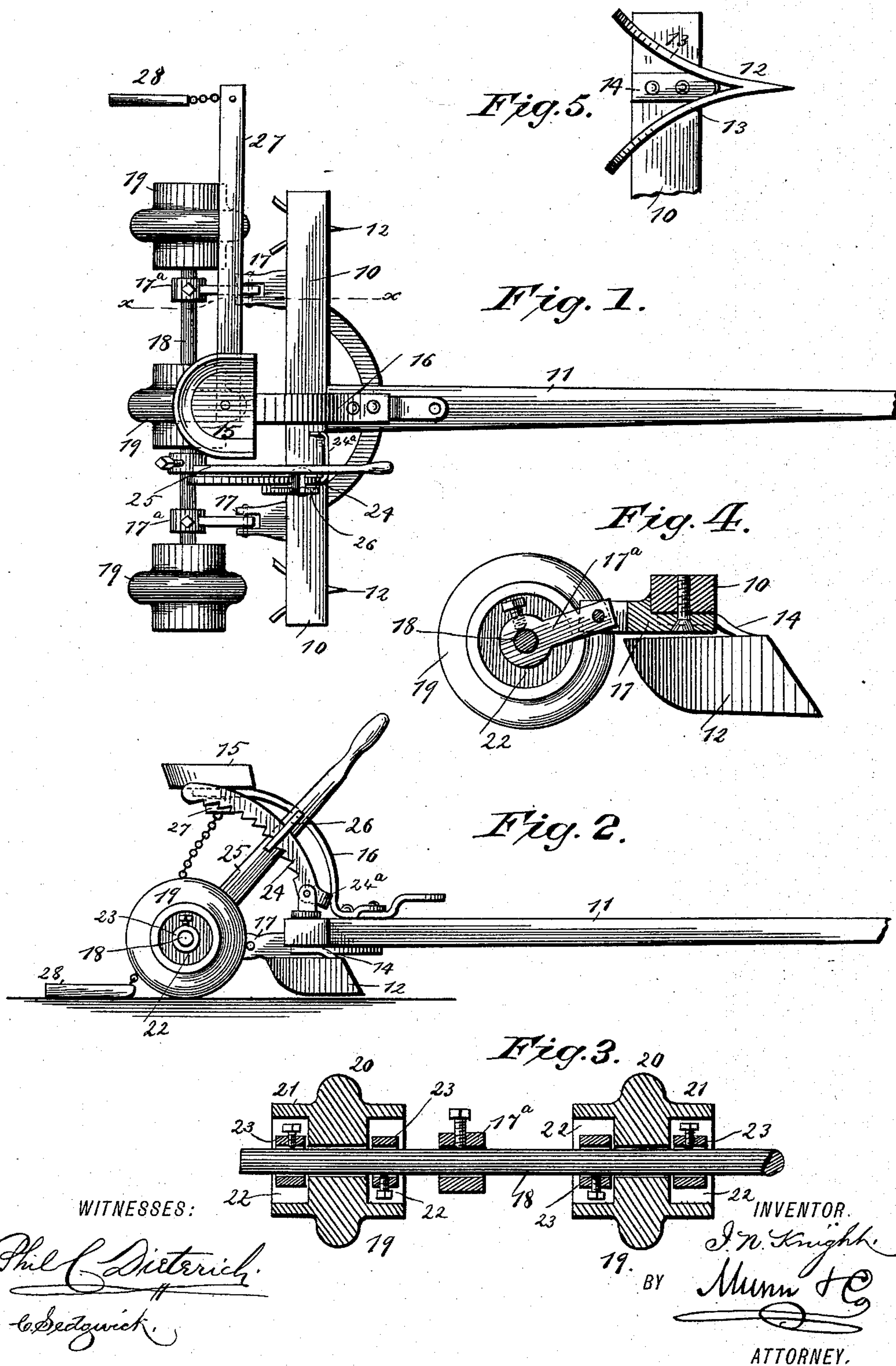


(No Model.)

I. N. KNIGHT.  
DITCHING MACHINE.

No. 388,566.

Patented Aug. 28, 1888.





# UNITED STATES PATENT OFFICE.

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## DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 388,566, dated August 28, 1888.

Application filed April 10, 1888. Serial No. 270,154. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC N. KNIGHT, of Boisé City, in the county of Ada and Territory of Idaho, have invented a new and Improved Ditching-Machine, of which the following is a full, clear, and exact description.

My invention relates to an improved ditching-machine, and has for its object to provide an implement whereby two or more furrows or ditches may be made at the same time, adapted to receive water for the purpose of irrigation, and whereby the said furrows or ditches may be made of any desired depth; and a further object of the invention is to provide a means for cracking or hardening the bottoms of the ditches, leaving the sides in condition to quickly absorb the moisture.

The invention consists in the construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

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

Figure 1 is a plan view of the implement. Fig. 2 is a side elevation. Fig. 3 is a longitudinal vertical section through the rollers. Fig. 4 is a transverse section on line *x x* of Fig. 1, and Fig. 5 is a bottom plan view of one of the plows.

In carrying out the invention a beam, 10, is attached to the end of a tongue, 11, at right angles to the latter, which beam is adapted to carry a series of plows, 12. The plows, when three are employed, are located one at each end and one in the center of the beam, attached thereto at the under side; but I do not limit myself to any particular number of plows, as the number may be multiplied or decreased, as desired.

The plows 12 consist of two mold-boards, 13, which are united at the front to form a cutting-edge, and extend rearward in opposite directions, as best shown in Figs. 1 and 5. The said plows are attached to the beam 10 in any approved manner, preferably by means of a shank, 14, which shank is detachably secured to the beam, as it may become necessary to shift the position of the plows upon said beam.

The driver's seat 15 is supported by a spring-strap, 16, which strap is secured to the tongue preferably at the intersection of the said tongue with the beam 10, whereby the weight of the driver is added to the weight of the beam and tends to facilitate the bearing of the plows in the ground.

From the rear of the beam 10 forked arms 17 are projected, in which the ends of arms 17<sup>a</sup>, rigidly attached to a shaft, 18, are hinged, and upon said shaft rollers 19 are held to turn. The rollers correspond in number with the number of plows, one roller aligning each of the said plows, as fully illustrated in Fig. 1. The arms 17<sup>a</sup> are provided at their outer ends with apertures which receive the shaft 18, and are held thereto by means of set-screws.

The rollers 19 may be hollow, if so desired, but are preferably made with a solid or heavy central portion, 20, and deeply-recessed hubs 21 at each side of said central portion, the rollers being secured or held in position upon the shaft 18 by means of collars 23, located upon the shaft within the roller-recess 22 at each side of the central portion, 20, as best illustrated in Fig. 3. It will thus be seen that the position of the rollers upon the shaft may be changed, and when the position of said rollers is changed the positions of the plows are likewise changed to correspond. This change of position is made when it is desired to increase or decrease the distance between the ditches.

Upon the upper surface of the plow-beam 10, at one side of the driver's seat, preferably to the right, a segmental rack, 24, is projected upward and rearward, said rack being pivoted to said beam and provided beyond its pivot-point with a foot-piece, 24<sup>a</sup>. Upon the shaft 18 a lever, 25, is rigidly attached, which lever is provided with a keeper, 26, through which the rack 24 passes, as best shown in Fig. 2, the said keeper being adapted for engagement by its lower edge with the toothed surface of the rack.

The rack and lever are purposed to control and regulate the depth of the furrows or ditches. Thus, when the lever 25 is carried downward in the direction of the plow-beam 10, the beam is lowered and the plows permitted to work more deeply in the ground, and when the said lever is carried upward to



the rear the beam is raised, whereby the plows and the plow-beam are elevated. The beam is held elevated by the engagement of the keeper with the rack, and when it is desired to lower the beam the rack is raised from engagement with the keeper by pressing on the foot-piece 24<sup>a</sup>.

The object of the rollers following the plow is not only to smooth the furrows, but to break the clods and make the furrows or ditches clean in order to save shoveling, and by pressing the bottom of the furrow or ditch it hardens the same, so that the water will not be absorbed too fast, leaving the ground upon each side soft and mellow. The rollers may be made wide or narrow, as desired, and the size of the plows may be decreased or increased.

A marker-beam, 27, is pivoted beneath the seat, which beam extends parallel with the shaft 18, upon which the rollers revolve a distance beyond one end of the shaft equal to the space between the furrows, and a marker, 28, is projected from the extreme outer end of the marker-beam, which marker may consist of a chain only, or a chain and drag. The purpose of the marker is to permit the operator to delineate the next purposed furrow, thus making all the furrows an equal distance apart. As the marker beam is pivoted to the seat, it is adjustable and may be readily carried over from one side to the other, as may be found most convenient.

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

1. The combination, with a plow-beam provided with a series of plows upon the under side, of a shaft held parallel with said beam, rollers mounted to revolve upon said shaft in alignment with the plows, and a means, substan-

tially as described, for raising and lowering the beam relatively to the shaft, as and for the purpose specified.

2. The combination, with a plow-beam having plows attached to the under side, of a shaft parallel with the plow-beam, held in hinged connection therewith, rollers mounted to revolve upon said shaft in alignment with said plows, a rack pivoted upon said beam, and a lever upon said shaft, whereby the beam and plows may be raised or lowered, as and for the purpose specified.

3. The combination, with a plow-beam having plows adjustably attached to the under side thereof and a shaft supported by hinge-connections to and parallel with the plow-beam, of adjustable rollers mounted to revolve upon said shaft, a segmental rack pivoted to said beam, and a lever engaging said segmental rack fast upon the shaft, substantially as and for the purpose specified.

4. The combination, with a plow-beam, of plows secured to the under side of said beam, a shaft provided with arms and held parallel with the plow-beam by hinged connections, a segmental rack pivoted to said beam, a lever held to the shaft and engaging said rack, rollers journaled upon the said shaft in alignment with the plow, a seat projected upward and rearward from the plow-beam, a marker-beam pivoted beneath the seat extending longitudinally and parallel with the shaft beyond the end of the same, and a marker attached to the extremity of said marker-beam, substantially as and for the purpose specified.

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Witnesses:

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