

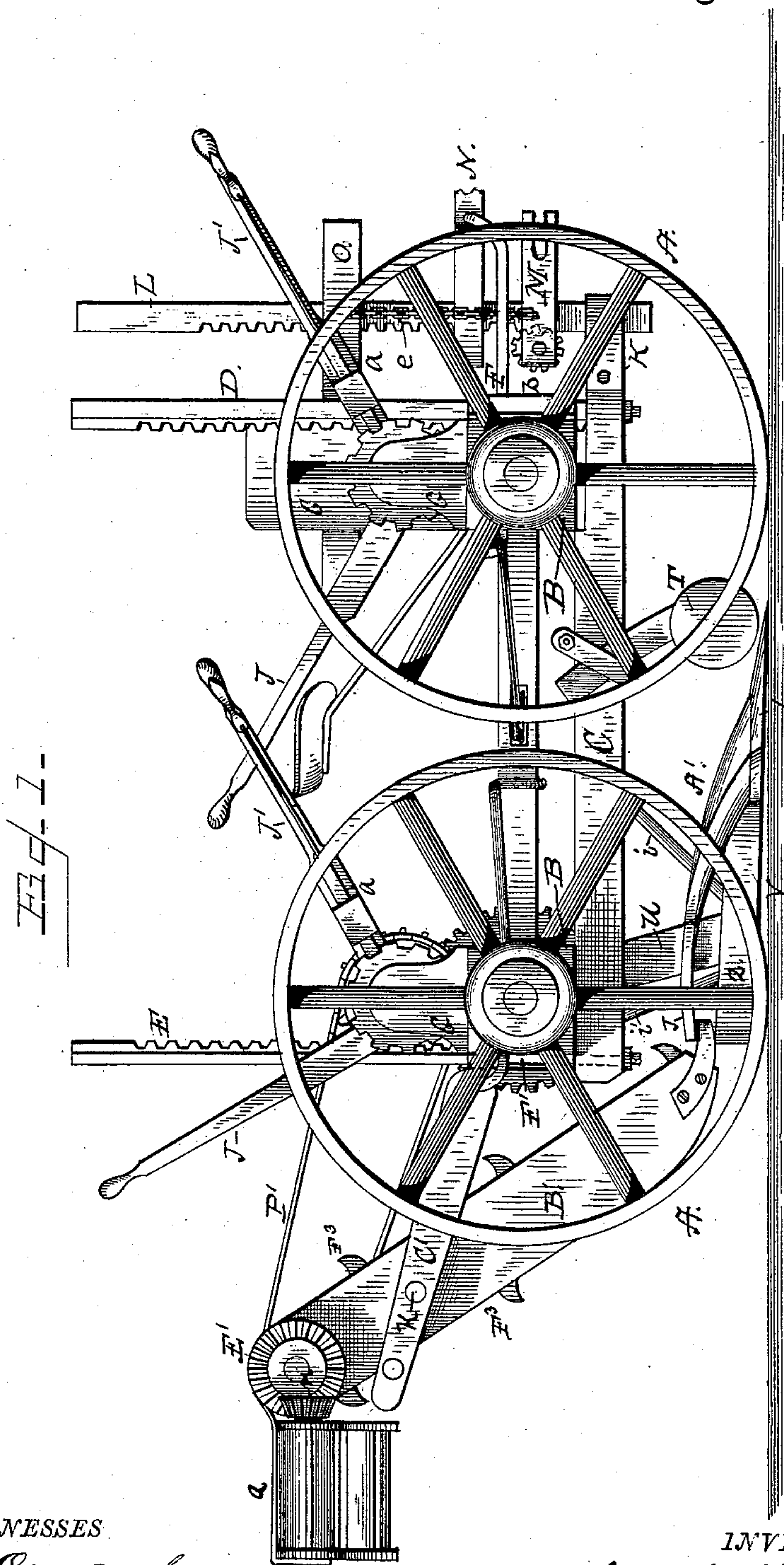
(No Model.)

3 Sheets—Sheet 1.

G. H. KAMMAN.  
DITCHING MACHINE.

No. 324,328.

Patented Aug. 11, 1885.



WITNESSES

*J. L. Ourand*

*E. A. Pritchard*

INVENTOR

*Geo. H. Kamman.*

*by A. G. Hyman.*

*Attorney.*

(No Model.)

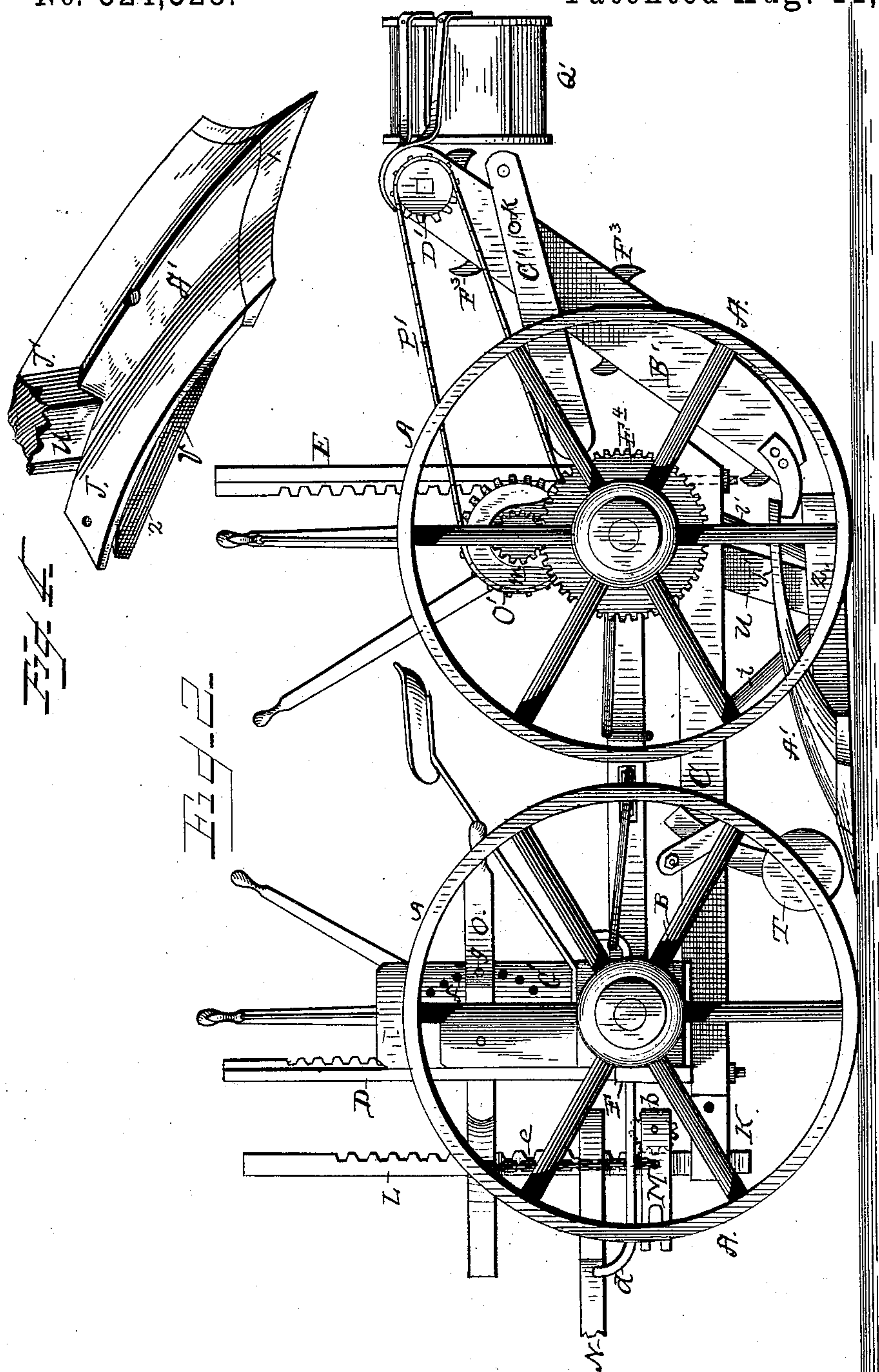
3 Sheets—Sheet 2.

G. H. KAMMAN.

DITCHING MACHINE.

No. 324,328.

Patented Aug. 11, 1885.



WITNESSES

A. L. Curand

E. J. Pritchard

INVENTOR

Geo. H. Kamman.

by A. G. Heylman.

Attorney.



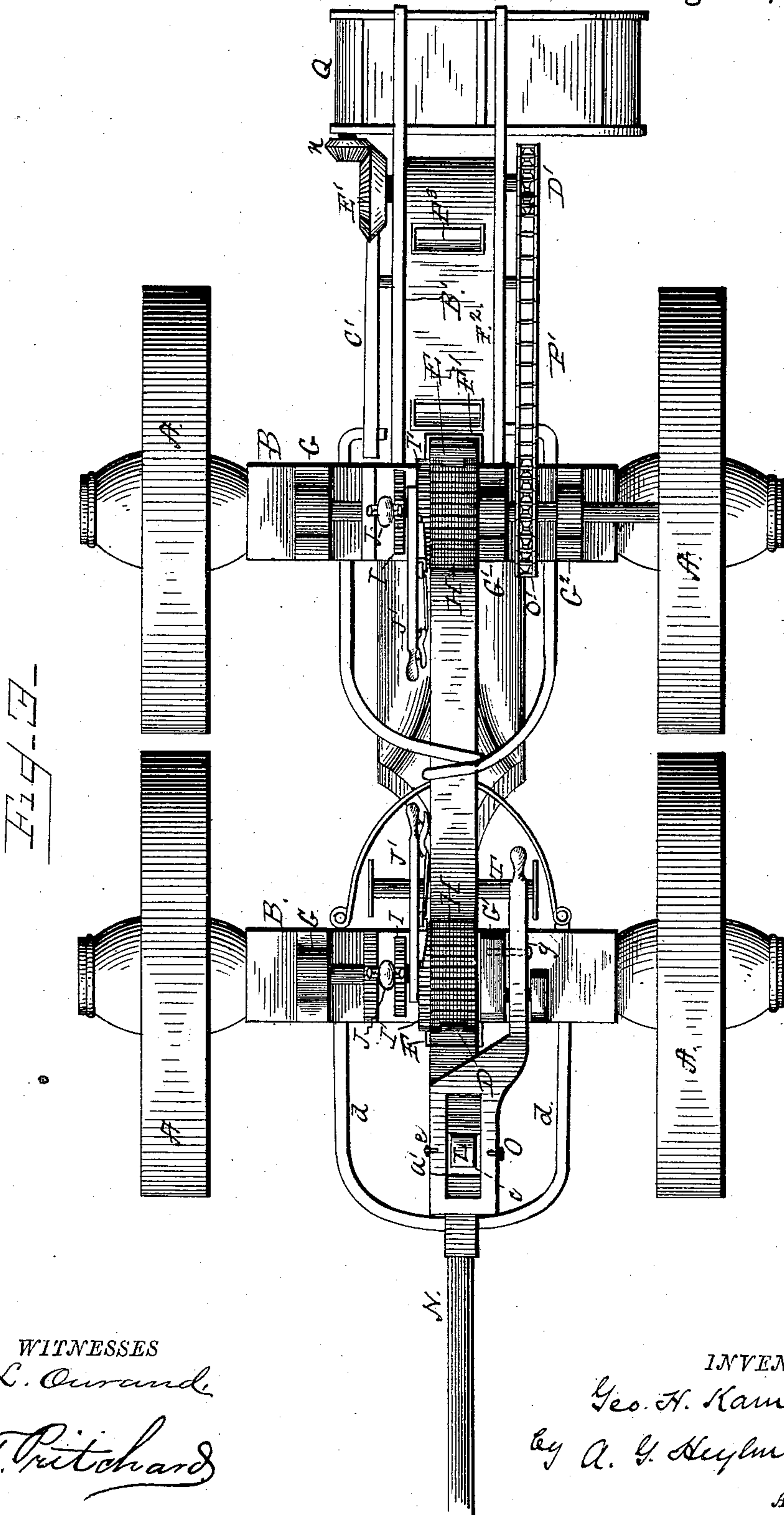
(No Model.)

3 Sheets—Sheet 3.

G. H. KAMMAN.  
DITCHING MACHINE.

No. 324,328.

Patented Aug. 11, 1885.



WITNESSES  
F. L. Ourand,  
E. J. Pritchard

INVENTOR  
Geo. H. Kamman  
by A. G. Heylman,  
Attorney



# UNITED STATES PATENT OFFICE.

GEORGE H. KAMMAN, OF CHAMPAIGN, ILLINOIS.

## DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 324,328, dated August 11, 1885.

Application filed February 16, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE H. KAMMAN, a citizen of the United States of America, residing at Champaign, in the county of Champaign, in the State of Illinois, have invented certain new and useful Improvements in Ditching-Machines, of which the following is a specification.

My invention has relation to improvements in that class of ditching-machines consisting of a wheeled carriage carrying the ditching-plow, and having mechanism attached for elevating the dirt and discharging it at the side of the ditch.

The object of my invention is to make a machine of the kind named which will accomplish the purpose intended with certainty, and to so arrange and construct the mechanism effecting the purpose that it may be adjusted with ease to any desired depth of ditch and operate with all needed power. I accomplish these objects by means of the mechanism illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of the machine. Fig. 2 is a side view the reverse of that shown in Fig. 1. Fig. 3 is a top plan view. Fig. 4 is a perspective view of the plow.

In the drawings similar parts are identified by like letters of reference.

The letters A designate the wheels of the carriage, sustaining the axles B. The carriage is made wide enough to straddle the furrow or ditch, and the axles are made of sufficient dimensions to conveniently afford room for the machinery fixed to them, and to perform the work and bear the strain without liability of breaking.

The coupling-pole or reach of the carriage may be of any desired make, it being essential that it be of such strength as to securely keep the carriage in connection.

The letter C designates the plow-beam. This consists of a substantial piece of timber or metallic bar of such length that the respective ends shall project a short distance beyond the front face of the front axle and the rear face of the hind axle, and to each end of the beam is secured an upright rack-bar or standard, D E, and firmly fixed in such position. These rack-bars or standards are held in connection with the axles of the carriage by

means of metallic sleeves F F', strongly and firmly secured to the front and rear face of the respective axles.

On the upper face of each axle are rigidly set standards G G' G<sup>2</sup>, formed with bearings, in which is disposed a shaft carrying a cog-wheel, H, and ratchet-wheels I I'. The cog-wheels H engage with the upright rack-bars on the ends of the plow-beam, and are turned by means of the hand-levers J J', which are pivotally attached to the shaft, and are provided with spring pawls or bolts a, to set within the ratchets. The operation of this mechanism raises or lowers the beam of the plow, and also sets the same, so that the plow may run at any desired depth.

The letter K designates the clevis, which is connected to the front end of the plow-beam, and also fastened to the lower end of a rack-bar standard, L. The post or standard G' on the front axle is made larger than the other standards thereon appearing, and has pivotally secured to it the lever O, which is formed with an opening, a', in its weight end, from the sides of which are suspended chains or bars e, the lower ends of which are secured to the double-tree clevis M. This double-tree clevis is formed with forward extensions to connect with the double-tree, and with backward arms, between which is journaled a small gear-wheel, b, which meshes with the rack-bar L.

The letter N designates the tongue, protected against side displacement by braces d, the bar of which is passed through the tongue, and serves as a bearing and support, and extends therefrom to the axle of the carriage, where the ends are suitably fastened; or they may be carried through the axle and have the ends formed into eyes or staples, substantially as shown. In the rear end of the tongue is formed an aperture, c, substantially as shown. The rack-bar L is passed through the opening in the double-tree clevis, thence through the opening in the rear end of the tongue, and thence through the opening in the arm of the lever O.

Secured to the post G' is a ratchet-bar or a series of holes, f, made therein, in which engages the bolt of a ratchet or spring-catch, g. The purpose of this mechanism is to operate and adjust the line of draft with the set of



the plow. As it will be seen, by raising the lever the double-tree is also raised or lowered and maintained in a set position by setting the lever-latch in the notches or holes provided for that purpose.

The letter T designates the cutters, which consist of three cutting-disks fitted to a shaft, and having upward-extending arms detachably and adjustably secured to the plow-beam.

The letter U designates the plow-standard, to the foot of which is secured the share V. This share consists of the arrow-head double share 1, formed with an extended shank, 2, having a mortise, in which the foot of the standard sets and is firmly held.

The letter A' designates the mold-board, the forward end of which is formed to set within and behind the wings of the double share, and is thereto secured. The rear end is slotted to receive the plow-standard, the extended sides J J' of the slotted portion passing beyond the rear of the standard, as shown. Longitudinally the mold-board is somewhat arched, and in cross-section has the upper face raised in the center and its sides or edges turned upward, so as to form longitudinal depressions on each side of the central elevation. The depressions or grooves tend to retain the broken dirt on the mold-board and deliver it to the elevator. The central elevation is flared in direction of the plow-point and contracts rearward to the plow-standard, where its base is of about the width of the standard. From thence the side extensions are flattened. This formation tends to throw the broken dirt or furrow inwardly in the direction of the mouth of the elevator. The arch form of the mold-board breaks up the soil, and thus makes the progress of the plow easier.

The letters i i' represent braces extended from the beam to the shank of the share.

The letter B' designates the elevator, the frame of which is pivotally attached to the extended sides of the slotted mold-board, and is sustained in an inclined position by means of rods C', pivotally secured to the hind axle of the carriage, and provided in their outer ends with a series of perforations, through which are passed the lugs k, fixed in the sides of the elevator. A spool is journaled in the lower end of the elevator-frame, and in the upper end is journaled a shaft with spool, and having on one end a sprocket-wheel, D', and on the other end of this shaft is fixed a gear-wheel, E'. The endless apron F<sup>2</sup> is arranged about the spools at the lower and upper ends of the elevator-frame, and provided with a series of buckets, F<sup>3</sup>, which receive the dirt from the plow and convey it to the spout, from whence it is delivered to the side of the ditch.

One of the hind wheels of the carriage has secured to it a gear-wheel, F<sup>4</sup>, which meshes with a small gear-wheel, m, on a shaft, m', which latter carries a sprocket-wheel, O', on

which the chain P' is placed, and extends from that to the small sprocket-wheel D'.

Suspended from and secured to and across the upper end of the elevator is a spout, Q. This spout is so arranged in connection with the elevator that the dirt raised by the buckets shall be deposited in the spout, and, descending, shall be thrown to the side of the ditch. The spout is set at an incline, and is provided in its upper end with a shaft carrying a gear-wheel, n, which meshes with the gear-wheel E', fixed to the shaft in the upper end of the elevator. This connection gives to the spout a vibratory or slight shaking motion, which expedites the passage of the dirt down the spout.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with the front and hind axles of the carriage, provided with vertical sleeves, and having gear-wheels mounted on journals on the top of the carriage-axles provided with actuating-levers, the plow having the beam formed or provided with upright rack-bars projected through the sleeves on the axles and meshing with the said gears, substantially as set forth.

2. In combination, the lever pivoted to a standard on the front axle of the carriage and formed with an aperture in the front end, and having means for holding it to the standard in a desired position, a double-tree clevis suspended from the weight end of the lever and formed with a vertical slot having a cog-wheel journaled therein, and a rack-bar projected through the slot in the double-tree clevis and through the aperture in the actuating-lever, substantially as set forth.

3. In combination with the front axle of the carriage and the plow-beam, the lever pivoted to the standard on the front axle, and formed with an aperture in its weight end, the tongue formed with an aperture in its rear end and having a bearing and support on the braces d, a double-tree clevis suspended from the actuating-lever and having a gear-wheel journaled in its rear end, and a rack-bar having its lower end connected to the plow-beam and projected through the apertures of the double-tree clevis, the tongue, and the actuating-lever, substantially as described.

4. The mold-board for a ditching-plow, the plate whereof is arched longitudinally, and in cross-section has its upper face raised in the center and its sides turned up, forming longitudinal depressions on each side of the central elevation, and having its rear end slotted to receive the plow-standard, substantially as described.

5. The plow herein described, consisting of the beam provided with upright rack-bars secured to each end thereof, the standard having secured thereto the double share having elongated shank, and the mold-board, the plate whereof is arched longitudinally, and in cross-section has its upper face raised in the center, and its side edges turned up, forming



longitudinal depressions on each side of the central elevation, and having its rear slotted to receive the plow-standard, substantially as described, and for the purpose set forth.

5 6. In combination, the carriage provided with a driving gear-wheel on one of the hind wheels, a shaft carrying a gear-wheel on one end to mesh with the gear on the carriage-wheel, and a sprocket-wheel fixed to the other end and mounted on bearings fixed on the upper face of the hind axle of the carriage, the plow adjustably secured to the carriage, the elevator having its lower end journaled to the rear extensions of the mold-board and provided with a shaft in its upper end carrying a sprocket-wheel on one end, connected by a sprocket-chain to the sprocket-wheel on the

axle of the carriage, and a gear-wheel on the other, and supported by bars having their ends pivotally secured to the rear face of the hind axle of the carriage, and the delivering spout or trough secured across the upper end of the elevator in an inclined position, and the journal of its upper spool extended and provided with a gear-wheel to mesh with the gear on the elevator, substantially as described.

In witness whereof I have hereunto subscribed my name in the presence of two attesting witnesses.

GEORGE H. KAMMAN.

Attest:

ALBERT NICHOLS,  
JOHN H. SMITH.