

(No Model.)

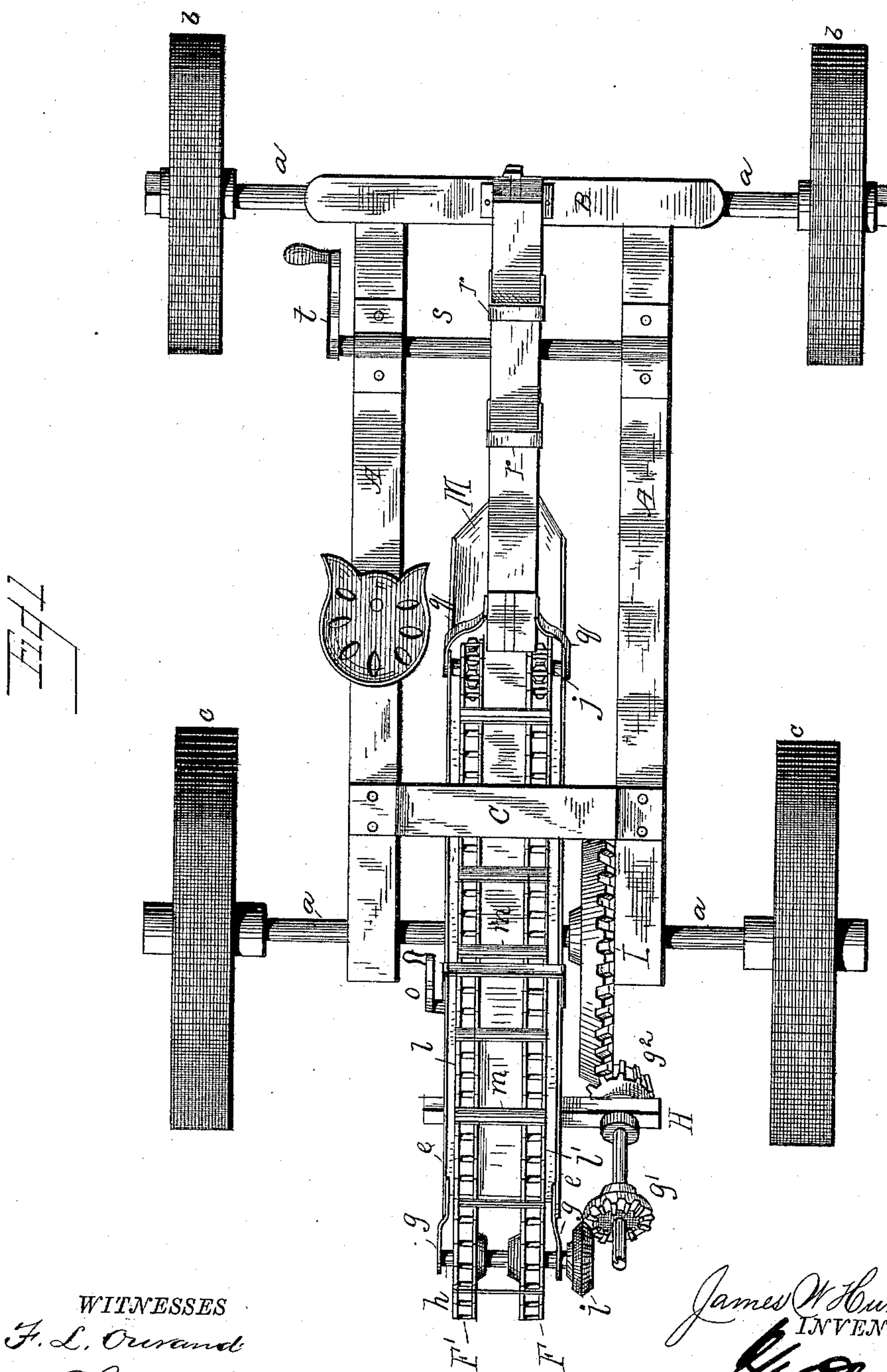
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J. W. HUMPHREYS.


DITCHING MACHINE.

No. 330,331.

Patented Nov. 10, 1885.



WITNESSES
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Fig. 2.

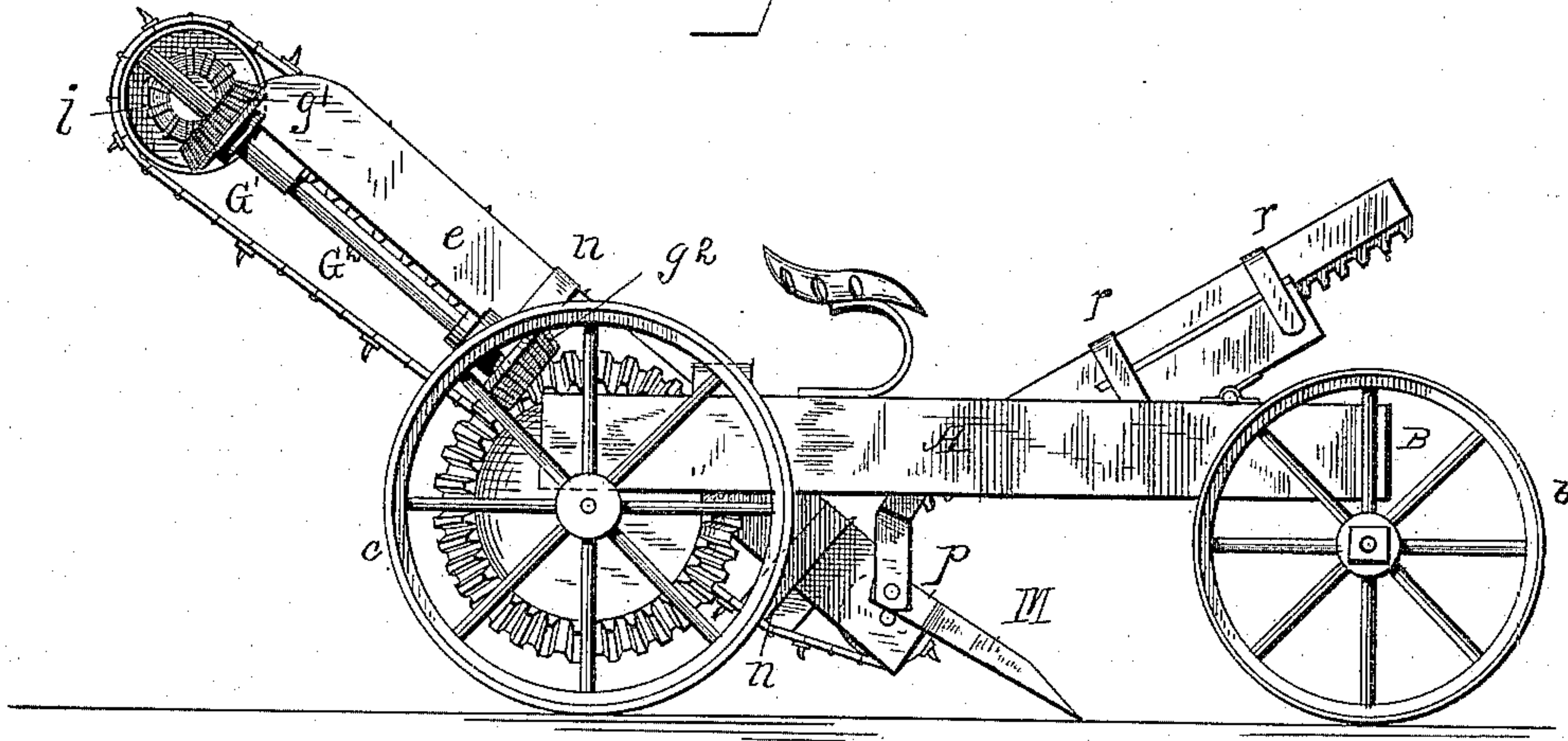
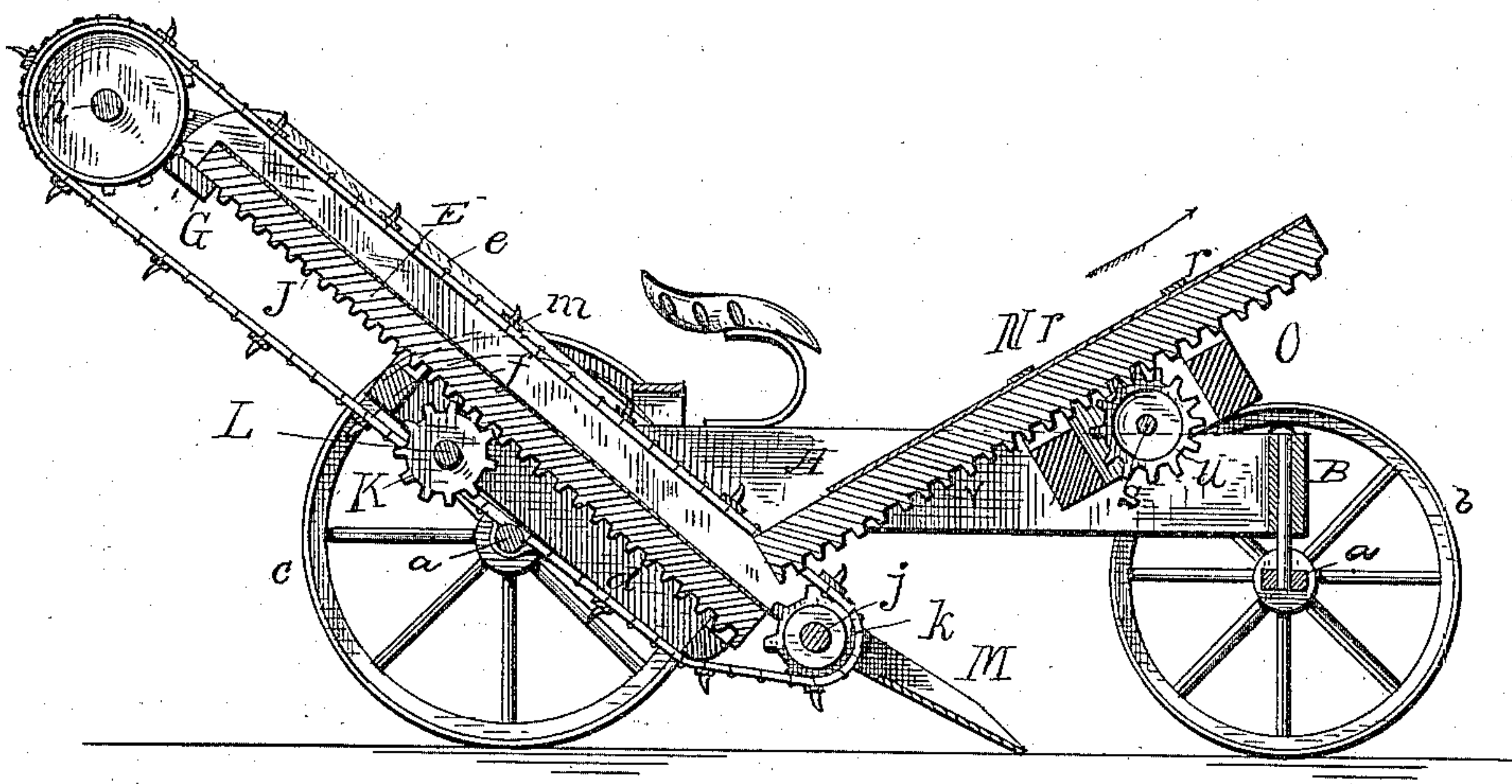


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES WM. HUMPHREYS, OF IROQUOIS, ILLINOIS.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 330,331, dated November 10, 1885.

Application filed June 14, 1884. Serial No. 134,882. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. HUMPHREYS, a citizen of the United States of America, residing at Iroquois, in the county of Iroquois and State of Illinois, have invented certain new and useful Improvements in Ditching-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention has reference to ditching-machines; and it consists in the improvements and combinations of devices hereinafter fully designated and explained, whereby a ditching-plow may be readily operated to cut any depth of ditch and at any desired angle.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of my improved machine. Fig. 2 is a side elevation. Fig. 3 is a central longitudinal section of the same.

The supporting-frame of the machine, consisting of side bars, A, front bar, B, and cross-plate C, is mounted and swiveled upon axles *a*, upon the ends of which turn the front and rear carrying-wheels, *b c*.

A beam, E, has secured thereto near its forward end a block, *d*, which is perforated transversely for the passage of the rear axle, *a*, upon which axle the said beam is pivoted, as shown in Fig. 3. A metallic plate, *e*, is secured at each side and extends the entire length of the beam E, and presents vertical side flanges at either side of the said beam, as indicated in Fig. 3. A plate, *f*, secured upon the upper face of the beam E, forms a metallic sheathing for the same. Metallic ears are secured at the upper end and on the outer sides of the plates *e*, and are perforated to form bearings for a stub-shaft, *h*, upon one end of which is keyed a beveled gear-wheel, *i*. Sprocket-wheels F F' are keyed on the said shaft *h* between the ears *g*, as shown in Fig. 1.

A bar, G, is secured on the under face of the beam E, at the upper end thereof, and at one end carries a loop, G', in which bears one

end of a stub-shaft, G², the upper end of which carries a beveled pinion, *g'*, which meshes with the beveled pinion *i* of the shaft *h*, while the lower end of said shaft G² bears in a perforation formed in a bar, H, secured on the under side of the beam E, about the center thereof. A beveled pinion, *g''*, keyed on the extremity of said shaft G², meshes with and is driven by a cog-wheel, I, keyed on the rear axle, *a*.

A stub-axle, *j*, bears transversely in the lower portions of the plates *e* and has keyed thereon two sprocket-disks, *k*, around which sprocket-disks and the sprocket-wheel F F' pass link-belts *l l'*. These belts *l l'* are connected together by means of a series of bars, *m*, to which may be also attached the usual elevator scoops or buckets.

It will be understood that the beam E is independent of the block *d*, close contact of these parts being maintained by means of bails or bands *n*, which are secured to the sides of the block *d* and extend over and embrace the plates *e*.

Secured longitudinally and centrally on the under side of the beam E is a rack-bar, J, with which meshes a pinion, K, keyed on a shaft, L, turning in bearings in the block *d* and having one projecting end bent to form a crank, *o*.

A shovel or scoop, M, has rear extensions, *p*, which embrace and are secured to the sides of the forward ends of the plates *e*.

Arms *q* are pivotally secured at their lower ends to the sides of the forward part of the plates *e*, and extending up are bent for the pivotal attachment to the rear end of a bar, N, which plays through loops formed by straps *r*, secured to a block, O, pivoted on a shaft, *s*, having its bearings on the upper side of the bars A of the frame and carrying at one end an operating-crank, *t*. The block O is recessed, as shown in Fig. 3, to contain a gear-pinion, *u*, which is keyed on the shaft *s* and engages the projecting teeth of a rack-bar, *v*, centrally and longitudinally embedded in the bar N.

The operation of the machine is as follows: Upon the rotation of the rear axle, *a*, by reason of the forward movement of the machine, the cog-wheel I imparts motion to the shaft G² and its pinions *g' g''*, which effect the rota-

tion of the sprocket-wheels F F', and thereby effects the movement of the elevating belt or carrier composed in part of the chains l l'. The bar H is secured to the block d. The shaft L being revolved by means of its crank o and its pinion K, meshing with the rack on the under side of the beam E, the said beam is moved forward or rearward, according to the direction of rotation. The forward movement of the said beam causes pinion i and the bar G to move relative to the shaft G², the pinion g' being provided with a spline or feather located in the groove formed longitudinally in the shaft G², so that said pinion can slide freely upon said shaft, but necessarily turns therewith. Should it be desired to move the scoop or shovel from the ditch without changing or disturbing the adjustment of the beam E, it is only necessary to rotate the shaft s by means of its crank t, and thereby cause the pinion u to move the bar N in the direction indicated by the arrow, and thereby lift the forward end of the beam E out of the ditch, the block d being moved on the pivotal bearing afforded by the axle a. Inasmuch as the driving-gear wheel I is concentric with said pivotal movement, the pinion g² will move concentrically with regard to the axle a and remain in gear with the said wheel I.

It will be apparent that the beam N can be so operated as to regulate the inclination or angle at which the beam E sets to effect the ditching operation.

I claim—

1. The combination, in a ditching-machine, of a supporting-frame mounted upon carrying-wheels, a block suitably pivoted, an elevator-frame supported and sliding on said block and carrying the ditching plow or shovel at its forward end, devices for effecting the movement of said elevator-frame with respect to said block, a second block suitably pivoted on said carrying-frame, a bar supported and sliding upon said block and connected at one end to the forward end of the elevator-frame, and means for effecting the movement of said bar

with respect to its block, substantially as set forth.

2. The combination, in a ditching-machine, of a supporting-frame mounted upon carrying-wheels, a block suitably pivoted on one of the axles of the said frame, an elevator-frame supported and sliding on said block and carrying the ditching plow or shovel at its forward end, and devices for effecting the movement of said elevator-frame with respect to said block, and means for moving said frame and block on the said pivotal bearing, substantially as set forth.

3. The combination, in a ditching-machine, of a supporting-frame mounted upon carrying-wheels, a block suitably pivoted thereon and provided with guide loops or straps, an elevator-frame supported upon said block and sliding through said loops or straps and carrying the ditching plow or shovel at its forward end, and devices located on said supporting-frame for effecting the movement of said elevator-frame with respect to said block, and means for conjointly moving said frame and block on their pivotal bearing, substantially as set forth.

4. The combination, in a ditching-machine, of a supporting-frame, a block suitably pivoted on the rear axle thereof and carrying a shaft, K, provided with a pinion, L, a beam supported on said block and having a rack longitudinally located on its under side, with which meshes said pinion L, side plates, e, secured to said beam and supporting the endless carrier or elevating belt, devices for driving said belt from the rear axle of the machine, a ditching plow or shovel secured on the forward portions of the plates e, and devices for effecting the movement of said beam with respect to said block, and means for conjointly moving said beam and block on their pivotal bearing, substantially as set forth.

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

JAMES WM. HUMPHREYS.

Witnesses:

ARTHUR T. CROZIER,
SAMUEL F. NOSKER.