

(No Model.)

3 Sheets—Sheet 1.

G. MEADER.  
DITCHING MACHINE.

No. 281,099.

Patented July 10, 1883.

Fig. 1.

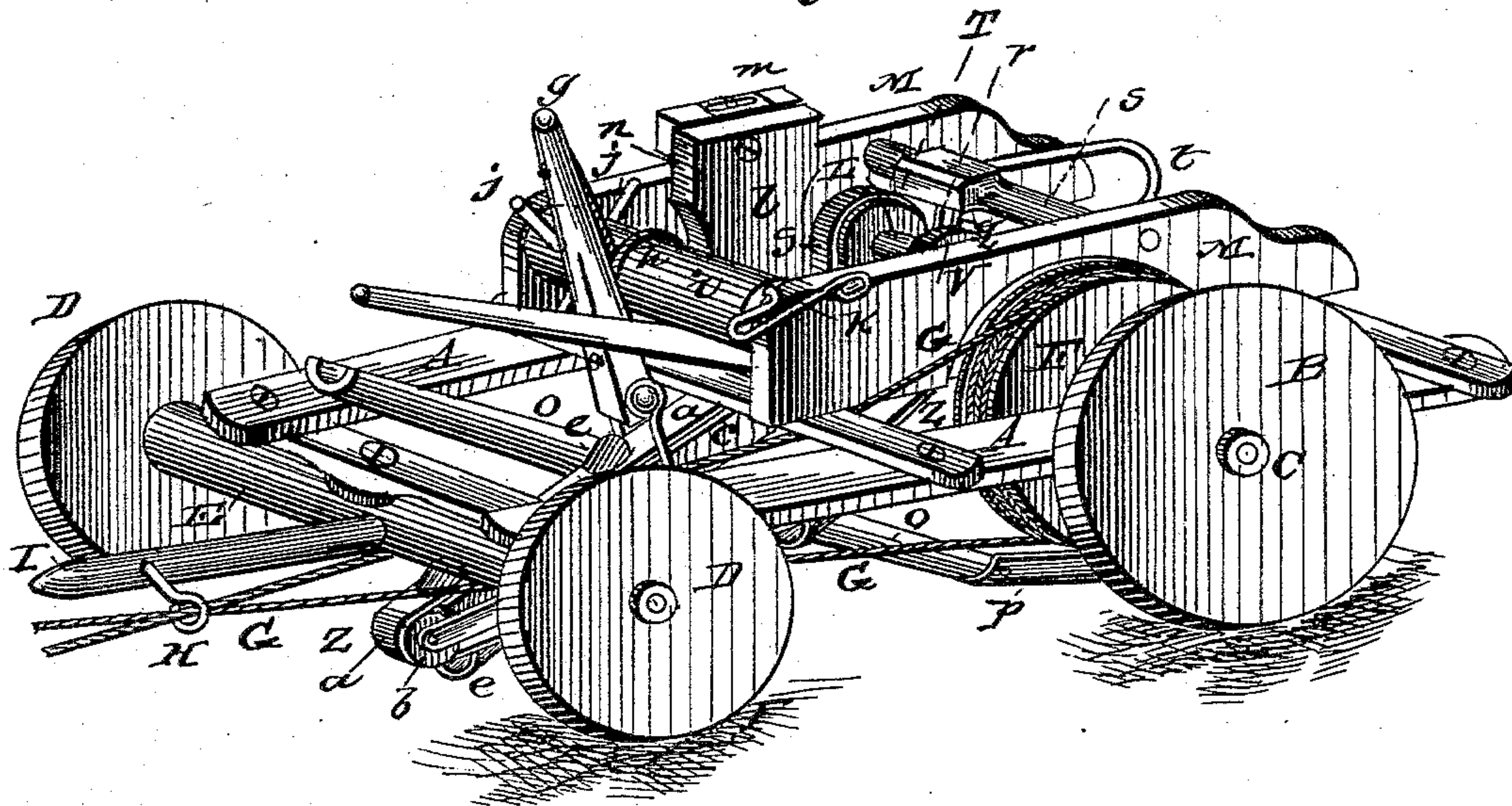
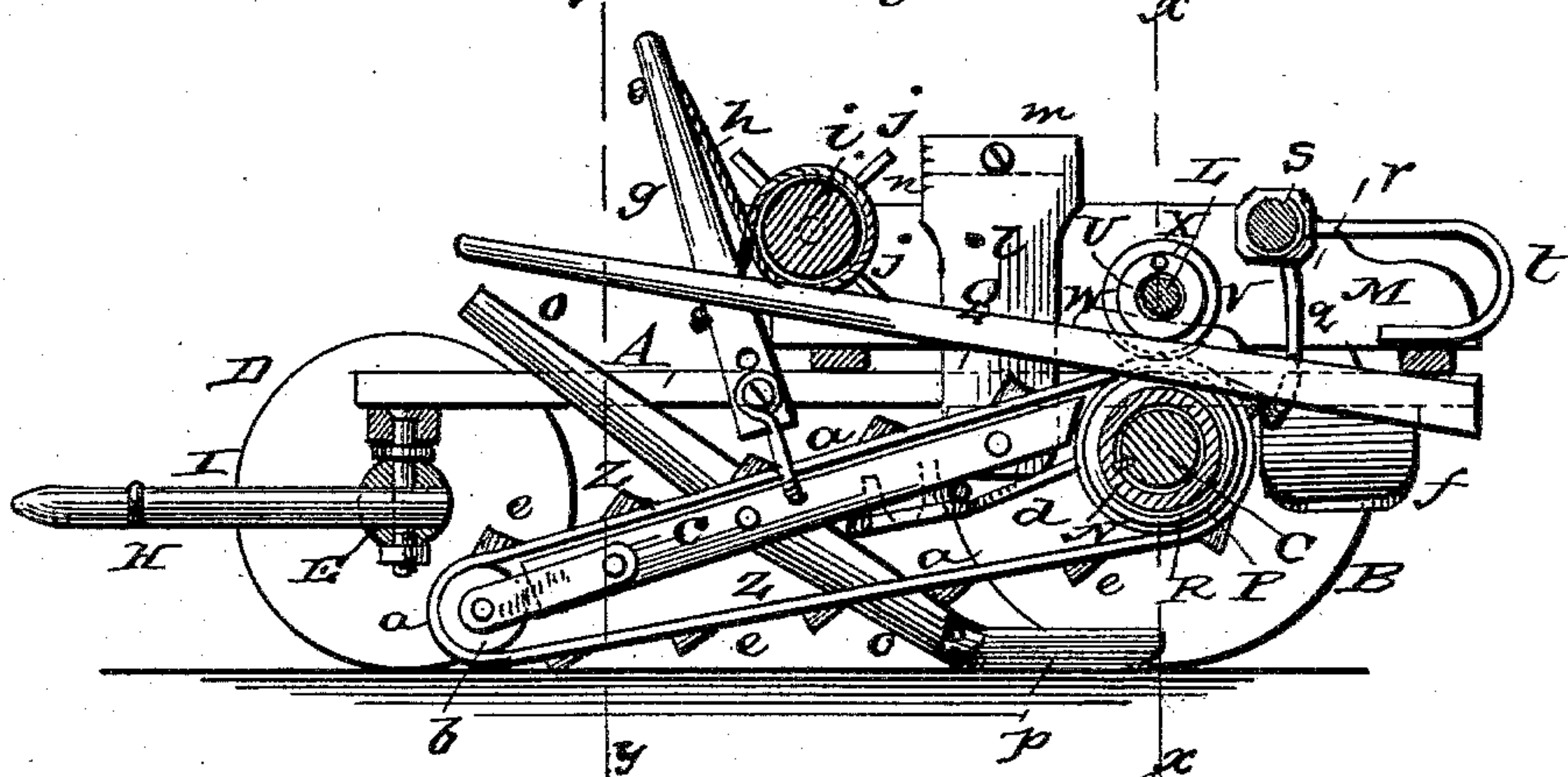


Fig. 2.



Witnesses:

Phil Dietrich  
G. Pfeiffer

Inventor:

George Meader  
by Louis Ragger & Co.  
Attorneys

(No Model.)

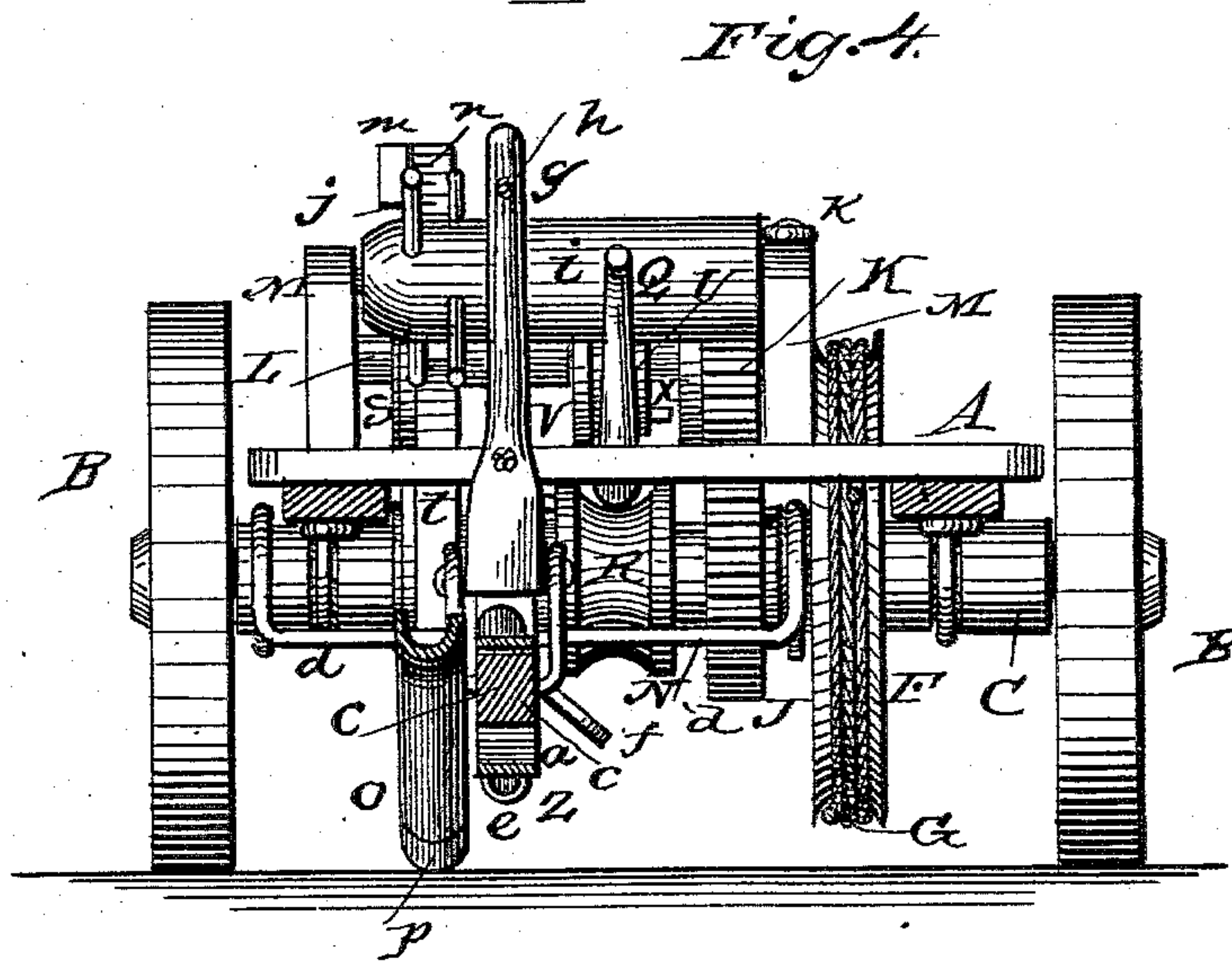
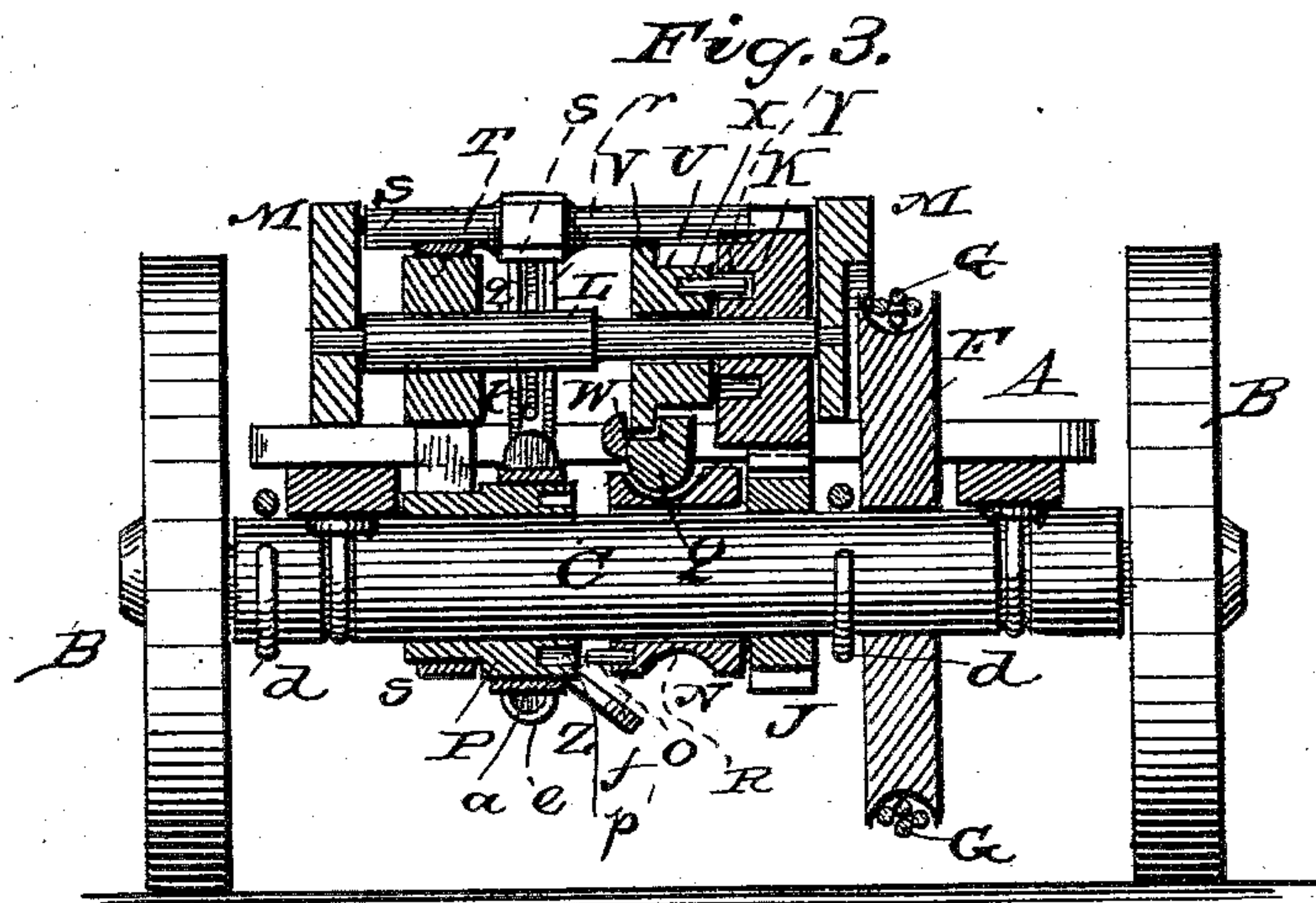
3 Sheets—Sheet 2.

G. MEADER.

DITCHING MACHINE.

No. 281,099.

Patented July 10, 1883.



Witnesses:

*Phil. Dietrich*  
*Yves Lecher*

Inventor:

*George Meader*  
by *Louis Bagger & Co.*  
Attorneys.



(No Model.)

3 Sheets—Sheet 3.

G. MEADER.

DITCHING MACHINE.

No. 281,099.

Patented July 10, 1883.

Fig. 5.

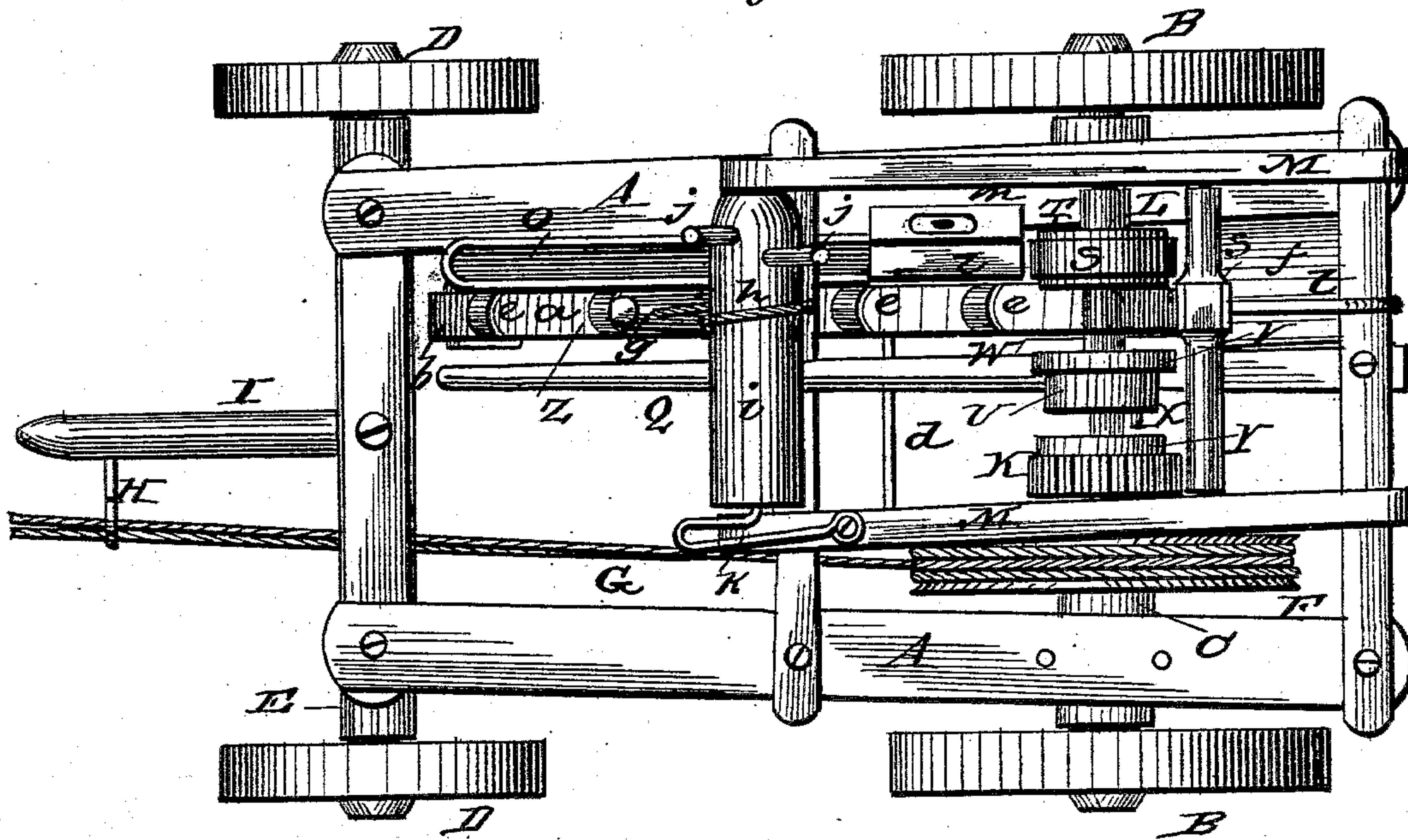


Fig. 6.

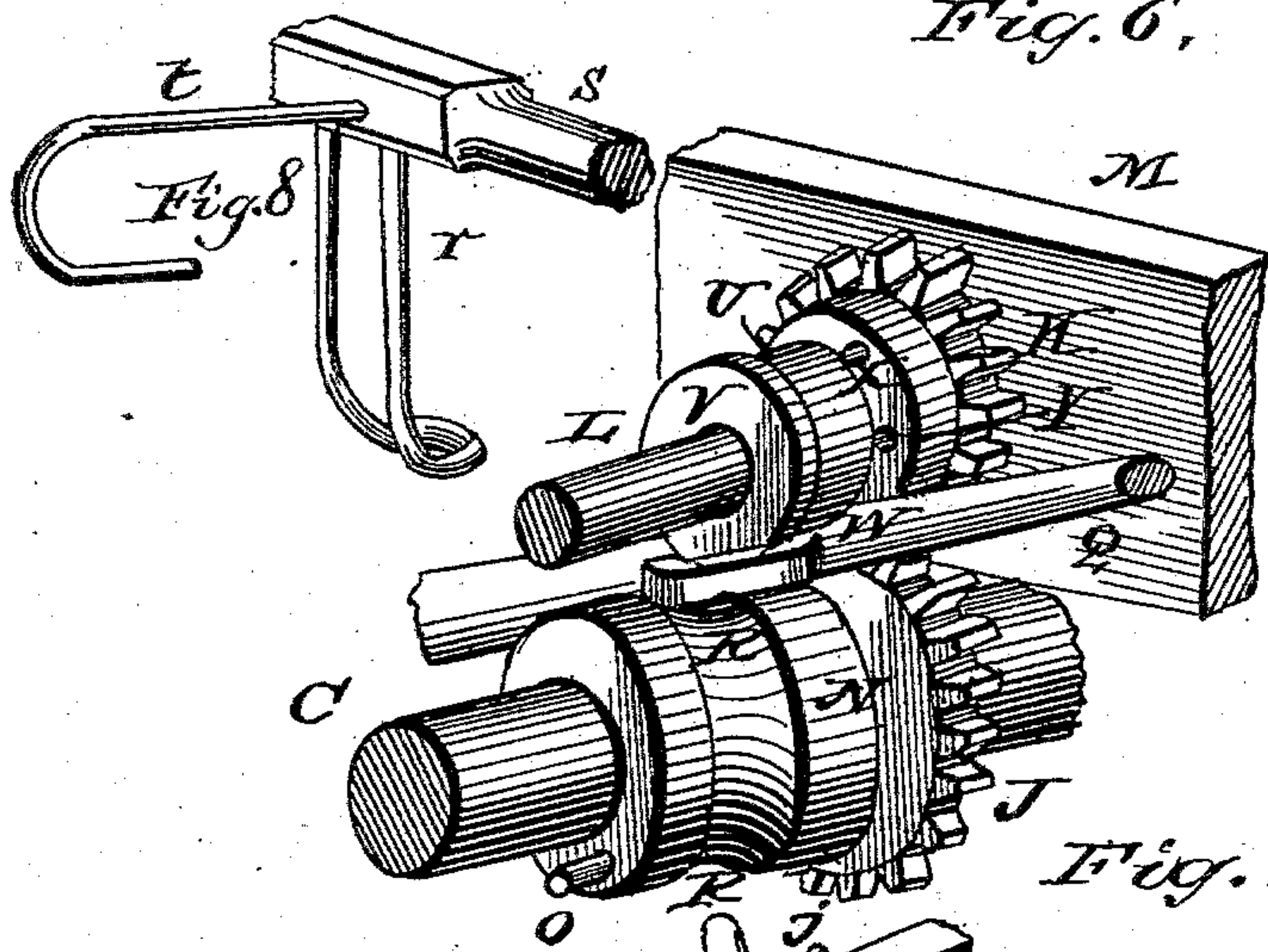
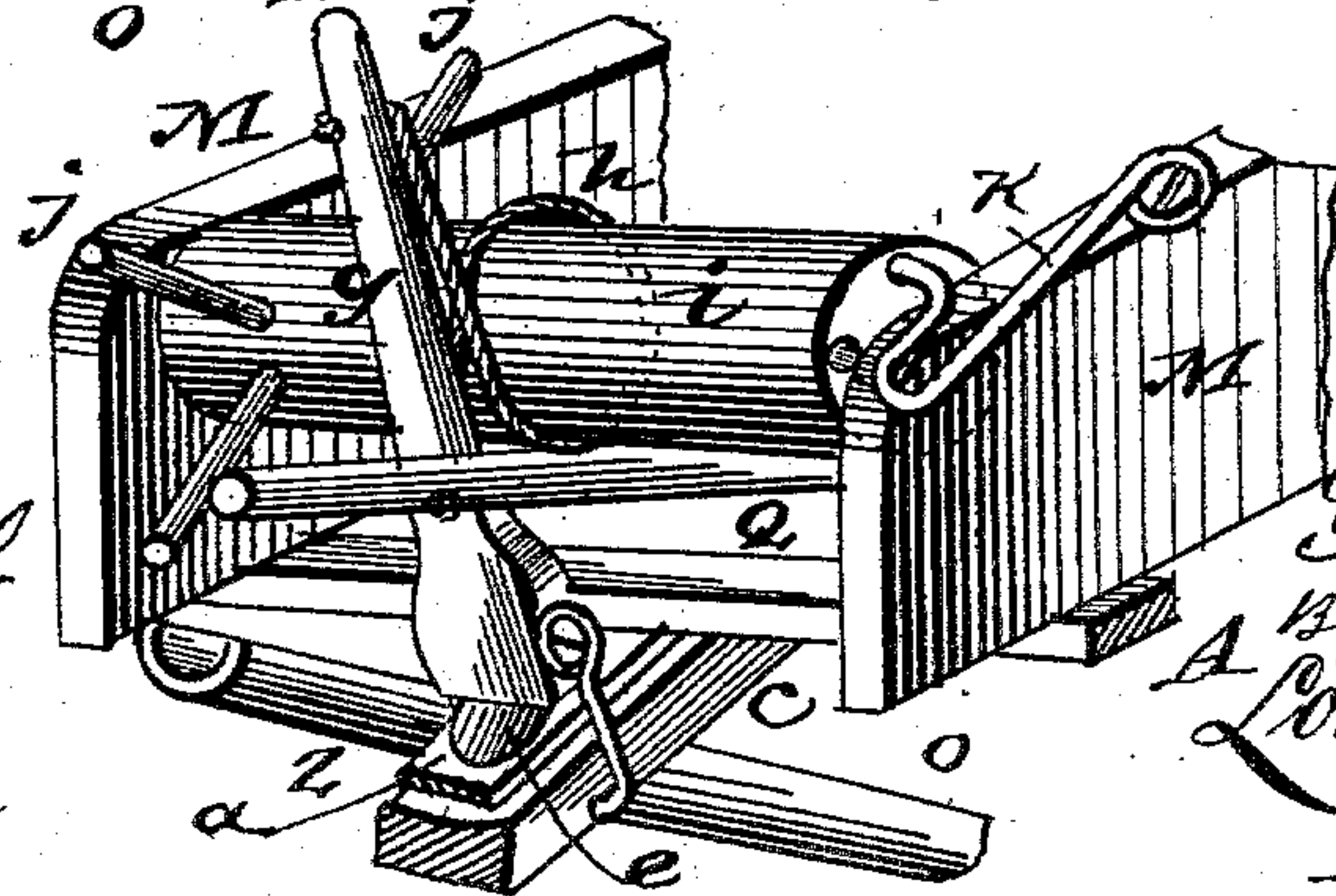


Fig. 7.



Witnesses:

Phil C. Ditzel

Ym. Lecher

Inventor:

Geo. Meader

By A. Louis Baggerly

Attorneys.



# UNITED STATES PATENT OFFICE.

GEORGE MEADER, OF FOWLER, INDIANA.

## DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 281,099, dated July 10, 1883.

Application filed March 23, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE MEADER, of Fowler, in the county of Benton and State of Indiana, have invented certain new and useful Improvements in Ditching-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of my improved tile ditching and laying machine. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a cross-section on line *x x*, Fig. 2. Fig. 4 is a similar view on line *y y*, same figure. Fig. 5 is a top view of the machine. Fig. 6 is a detail view of the clutch shifting device. Fig. 7 is a similar view of the windlass for raising and lowering the conveyer, and Fig. 8 is a perspective detail view of the scraper.

Similar letters of reference indicate corresponding parts in all the figures.

My invention has relation to tile ditching and laying machines; and it consists in the improved construction and combination of parts of the same, as hereinafter more fully described and claimed.

In the accompanying drawings, the letter A indicates a frame, mounted upon two large hind wheels, B, journaled upon the ends of a shaft or axle, C, turning in bearings in the side pieces of the frame, and upon two smaller front wheels, D, journaled upon an axle, E, swiveled under the forward end of the frame. The hind wheels turn freely upon the ends of the shaft C independently of the direction in which the shaft is rotated, and a grooved and flanged wheel or drum, F, is fastened upon the shaft, and is rotated by means of a rope or chain, G, passing over it. This rope or chain is fastened at its middle to the periphery of the wheel or drum and wound around it in such a manner that, when draft is applied to the end of the one half of it, it will wind the other half upon the drum while it is unwound, both halves passing out at the forward end of the machine through an eye, H, extending from a tongue, I, upon the front axle, in such a manner that the machine will be guided by

the rope passing through the eye as it progresses.

A cog wheel or pinion, J, is fastened upon shaft C inside wheel F, and engages another pinion, K, which turns upon a shaft, L, journaled in bearings in the side pieces of a frame, M, fastened above frame A. Inside pinion J is a sleeve, N, which slides upon and turns with shaft C, and which is provided with a half-clutch, O, upon its end, which engages a corresponding half-clutch, *p'*, upon a double pulley, P, which turns freely upon shaft C. The lower edge of a lever, Q, which is pivoted at its outer end upon the rear cross-piece of frame A, projects into an annular groove, R, in the surface of sleeve N, and serves to throw it in and out of engagement with the half-clutch upon pulley P, over the larger face of which the conveyer travels, while a belt, S, travels over the smaller face of pulley P and up over a pulley, T, upon the upper shaft, L. A flanged sleeve, U, slides upon and turns with this shaft, the projecting flange V of which fits into and rotates in a longitudinal groove, W, in the upper edge of lever Q, so that the sleeve is moved upon the shaft from one side to another by the lever, and one end of the said sleeve forms a half-clutch, X, which engages another half-clutch, Y, upon the inner side of pinion K. It will be seen that the half-clutches upon the sliding sleeves face in opposite directions, so that when the lever is moved to either side it will throw one sleeve into engagement with its corresponding half-clutch, and throw the other sleeve out of engagement at the same time. In this manner the conveyer-pulley may be rotated in the same direction, operating the dirt-conveyer, while the drive wheel or drum is alternately rotated in either direction, so that when the drive-wheel is rotated with its upper rim moving in a forward direction the sleeve on the lower axle is thrown out of engagement with the clutch upon the conveyer-pulley, which throws the upper sleeve into engagement with the upper pinion, rotating the upper shaft in the opposite direction, and through the connecting-belt rotating the conveyer-pulley in that direction, while when the drive-wheel is rotated with its upper rim moving in a rearward direction the lower clutch-sleeve is thrown into engagement with the conveyer-



pulley, rotating it in the same direction as the drive-wheel.

The conveyer Z consists of an endless belt, *a*, traveling over the larger face of the double pulley P and over a pulley, *b*, in the end of an arm or beam, *c*, which projects forward, and is hinged upon the rear axle by means of two arms, *d*, fastened to the under side of said beam.

A series of cutting or digging cups or buckets, *e*, consisting of an elliptic piece of metal curved to form the outer part of a cup, are fastened upon the endless belt *a*, with their outer sharp edges facing in the direction in which the belt is revolved, and serve to cut the ditch, the dirt being conveyed over pulley P to the rear of the machine, where it is dropped upon a removable inclined plate, *f*, which slides the dirt down at the side of the ditch.

The conveyer may be raised or lowered to the depth in which it is desired to cut by means of an upright bar, *g*, hinged to the beam *c*, to the upper and lower ends of which bar a rope or chain, *h*, is fastened, which is passed around a windlass, *i*, journaled in the side pieces of the upper frame, M. This windlass is operated by means of handles *j*, inserted into the face of the same, and a dog or catch, *k*, which is hinged upon the upper edge of one of the side pieces of the upper frame, may be brought to engage one of a series of holes in the end of the windlass, holding the same, and through it the conveyer, at the desired depth.

An upright board, *l*, the upper edge of which is parallel with the surface of the ground when the end of the conveyer rests upon the ground, is fastened at its lower end to the conveyer, and has a spirit or plumb level, *m*, pivoted upon one side, the lower edge of which points upon a scale, *n*, upon the forward edge of the board *l*, so that as the conveyer is lowered and the upright board tilted forward the lower edge of the level, which remains in a level position turning upon its pivot, will indicate the depth of the ditch upon the scale.

When it is desired to lay the tile at the same time the ditch is cut, a half-round trough, *o*, is fastened upon the side of the conveyer, the upper end of which trough reaches up to the frame of the machine, where the operator stands upon a suitable platform adapted to hold a convenient amount of tile. The lower end of the trough *o* is provided with a metallic plate or shoe, *p*, which slides in the bottom of the ditch, laying the tile as they are slid down in the trough, care being taken to keep the tiles close upon each other in the trough, so that when they slide off the shoe they will lie close to each other, preventing dirt from entering the joints.

When the laying attachment is used, the inclined plate *f* is removed, allowing the dirt to fall into the ditch, covering the tile after it is laid, thus finishing the ditching, laying, and covering at one operation.

A double bent metallic rod, *q*, the doubled end of which is curved and flattened to form a scraper, *r*, projects from a bar, *s*, pivoted between the side pieces of frame M, and serves to remove the dirt from the conveyer-cups when the machine is working in sticky ground, and an arm, *t*, projects from bar *s* at right angles to the scraper, resting upon the rear cross-piece of the frame when the scraper is in contact with the conveyer, while it may be raised and thrown forward when the scraper is not needed, resting upon shaft L.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a tile-ditching machine, the combination of the shaft C, having drive-wheel F and pinion J, grooved sliding sleeve N, having half-clutch O, double-faced pulley P, having half-clutch *p'*, shaft L, having pulley T, belt S, sliding flanged sleeve U, pinion K, lever Q, having longitudinal groove W in its upper edge, and the dirt-conveyer Z, traveling over pulley P, and having means for adjusting it to the desired depth, as and for the purpose shown and set forth.

2. In a tile-ditcher, the combination of the endless conveyer projecting forward and having means for revolving it and adjusting it, and having the concavo-convex cutter-cups, with the doubled, flattened scraper projecting from the bar, pivoted in the end of the frame, and having the handle to raise it, the curved flattened portion of the said scraper adapted to enter and clean out the excavator-cups, as and for the purpose shown and set forth.

3. In a tile ditching and laying machine, the combination and arrangement of the frame A, wheels B D, shaft C, drive-wheel F, rope G, pinions J, sleeve N, double pulley P, belt S, shaft L, pinion K, flanged sleeve U, pulley T, frame M, conveyer Z, scraper *r s t*, inclined plate *f*, upright *g*, rope or chain *h*, windlass *i*, upright board *l*, having scale *n*, level *m*, tile-conveyer *o*, and shoe *p*, all constructed to operate as and for the purpose shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

GEORGE MEADER.

Witnesses:

ISAAC H. PHARES,  
S. J. M. FOWLER.