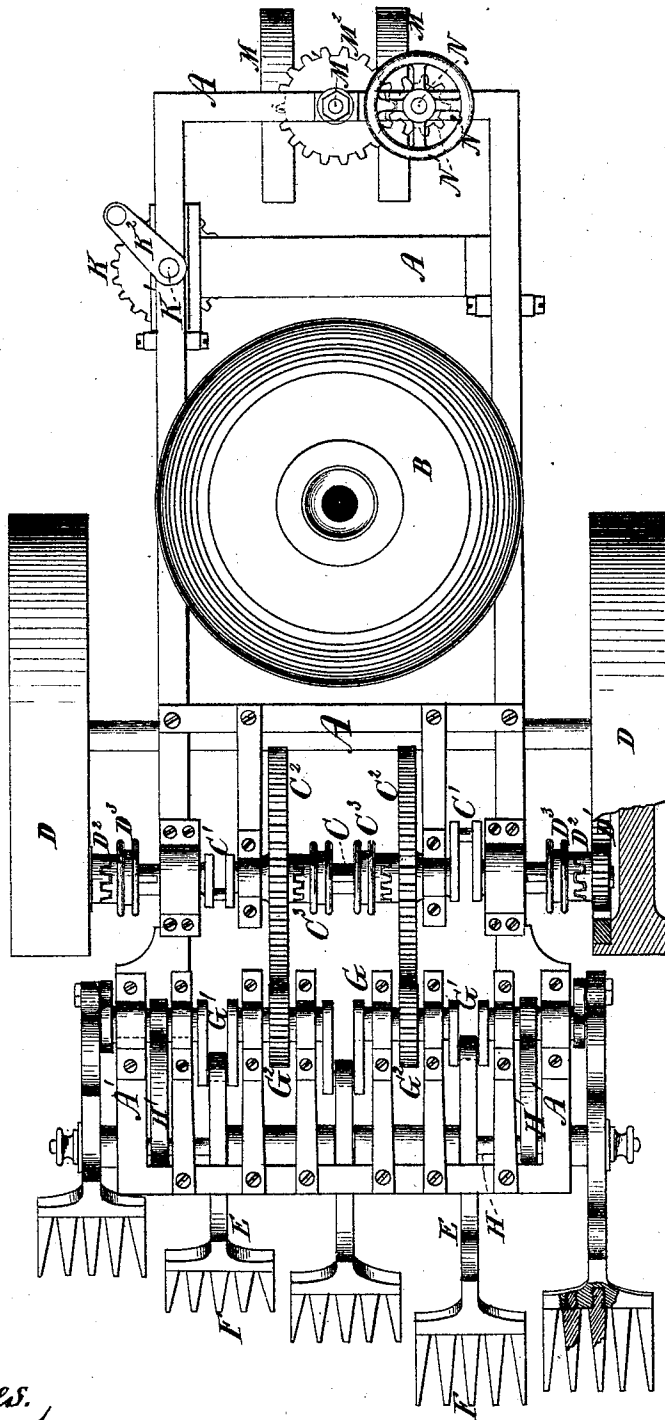


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No. 147,122.

Patented Feb. 3, 1874.

Fig. 1.



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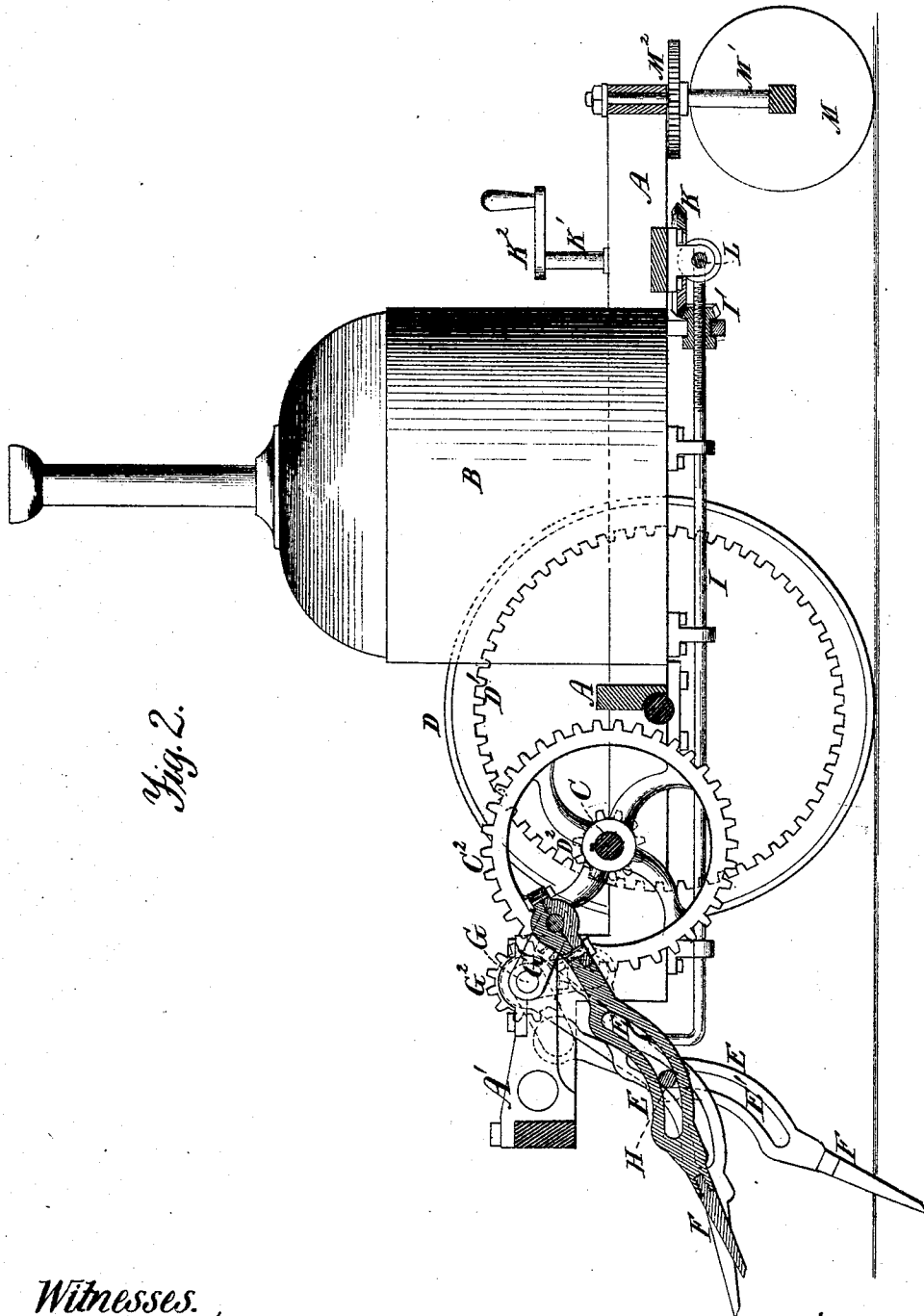


Fig. 2.

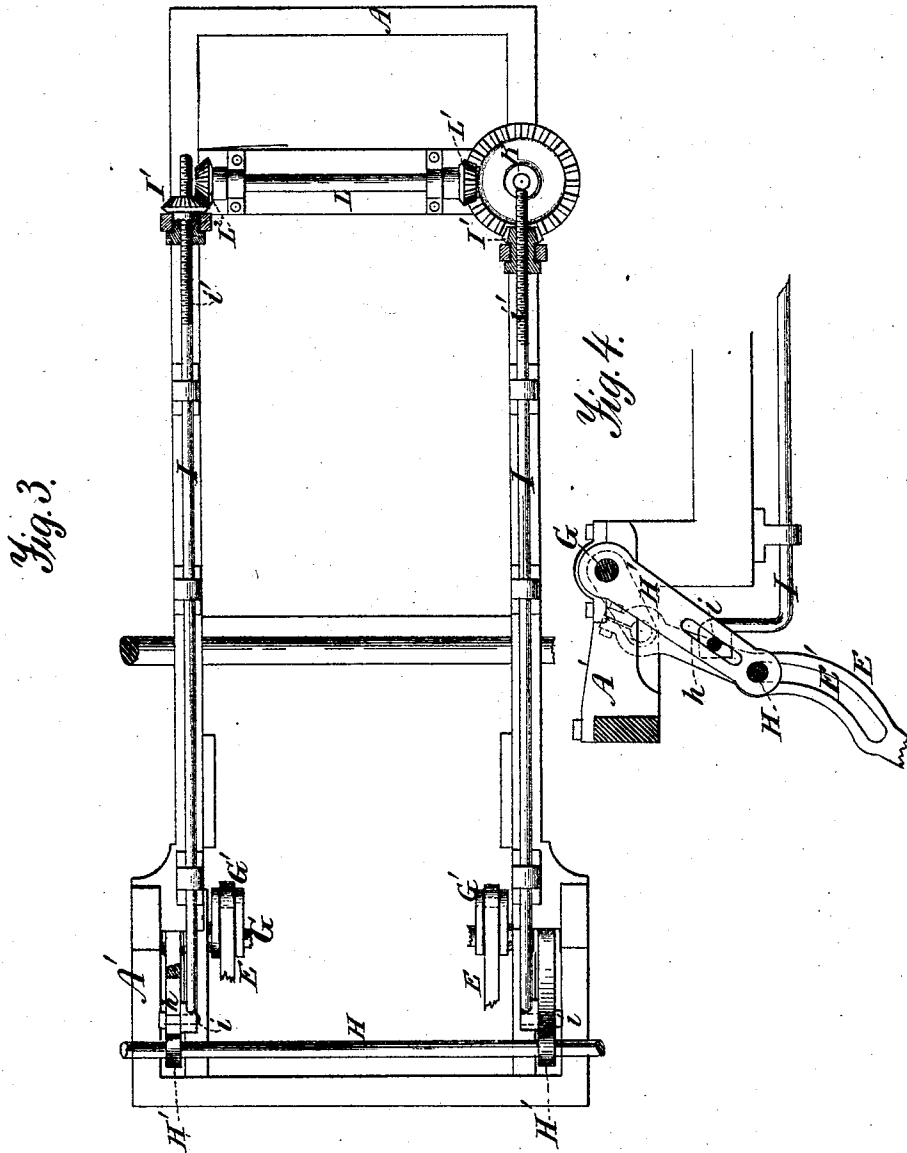
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UNITED STATES PATENT OFFICE.

JORDAN GILES, OF LOUISVILLE, KENTUCKY.

IMPROVEMENT IN SPADING-MACHINES.

Specification forming part of Letters Patent No. **147,122**, dated February 3, 1874; application filed September 24, 1873.

To all whom it may concern:

Be it known that I, JORDAN GILES, of Louisville, in the county of Jefferson and State of Kentucky, have invented certain Improvements in Spading-Machines, of which the following is a specification:

The nature of my invention consists, first, in so hanging the spades or diggers that they will be moved rearward, on descending into the earth, a distance precisely equal to that of the forward progression of the machine during their cut, so that all dragging while in the ground will be prevented; secondly, in a novel mechanism, hereinafter fully explained, for raising and lowering the spades or diggers.

In the annexed drawings, Figure 1 is a plan view of my improved machine. Fig. 2 is a vertical longitudinal section. Fig. 3 is a sectional bottom view more particularly designed to show the mechanism for adjusting the elevation of the spades. Fig. 4 is a detail view of the lifting and guide bar and immediate connections.

The same letters of reference are used in all the figures in the designation of identical parts.

The machine illustrated is driven by steam, a generator, B, being mounted upon the frame A, intended to supply a pair of engines, whose piston-rods are to be coupled, respectively, to the cranks C¹ C¹ of the transverse driving-shaft C, the overhung ends of which carry loose pinions D² D² meshing into the internal gears D¹ D¹ of the traction-wheels D D. Sliding clutches are placed on the driving-shaft adjacent to the pinions, as at D³ D³, by means of which the pinions may be locked to the shaft to turn with it. The handles E of the spades F are, at their extreme upper ends, pivoted to cranks G¹ of the counter-shaft G, which is mounted upon the rear elevated end A' of the frame, carrying two fixed pinions, G² G², which mesh into the spur-wheels C² C², hung loosely on the main or driving shaft C, and controlled by sliding clutches C³ C³. A spading action is imparted to the spades by compelling the handles to move on a transverse bar, H, suspended by arms H' from the counter-shaft G. In the example shown this bar passes through slots E' in the handles; but the same result can be effected by passing the handles through holes in the bar.

It is obvious that the progression of the machine tends to drag the spades while descending into the earth. To obviate this, I impart to the spades a compensating retrograde motion through the medium of the bar H, by curving the slots E' in the handles, in the manner clearly illustrated in Figs. 2 and 4, or by simply curving the handles in like manner where they play through holes in the bar, as hereinbefore explained. The depth of the cut of the spades is regulated by adjustment of the bar H—that is, swinging it to a higher or lower elevation by the suspension-arms H', which are to this end controlled by sliding rods I I, laterally projecting studs or rollers *i i* of which extend into slots *h h* in said arms. The rods I rest in hangers suspended from the side bars of the frame, and extend to near the forward end thereof. Each rod is provided with a long screw-thread, *i'*, at its end adapted to a thread cut in the eye of a pinion, I'. These pinions are bevel-wheels, and one of them meshes into a large bevel-wheel, K, carried on the lower end of the vertical spindle K¹, which is operated by means of a crank, K², or a hand-wheel. The other pinion I' is driven at the same speed through the intermediate wheels L¹ and L² on the transverse shaft L. By turning the wheel K in one direction or the other, the rods I are either drawn forward, lowering the bar H, or pushed rearward, elevating the bar.

The machine is guided by the guide-wheels M, whose axle is fixed to the vertical spindle M¹, which carries a spur-wheel, M², and is operated by the pinion N¹ on the spindle N. The hand-wheel N² on this spindle is in close proximity to the crank K² for convenience in operating them.

In starting the machine, the pinions D² remain unclutched, while the wheels C² are clutched to the driving-shaft. The spades, at the time elevated, so as not to touch the ground when depressed, are then set in motion, and the bar H gradually lowered until the point is reached which will give the desired depth of cut. The pinions D² are then clutched to the main shaft, when the machine at once begins to move forward. The traction-wheels are loose on their axle, and in turning a corner the pinion operating the inside wheel will be

unclutched, to permit said wheel to turn independently of the other, as is required. The arrangement of the cranks G^1 is such that the spades will dig successively, and the width of the row of spades is, preferably, somewhat greater than the area spanned by the traction-wheels, so that the latter may always travel on unbroken ground. The bar H may be raised and lowered by a single sliding rod, I; but the use of two is preferable on many accounts.

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

1. The combination of the bar H and spade-

handles E, the latter being constructed with a curved slot, E' or its equivalent, and connected to the bar H, substantially as and for the purpose specified.

2. The combination of the spade-handles E, bar H, arms H' h, and sliding rods I i, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JORDAN GILES.

Witnesses:

B. EDW. J. EILS,

A. RUPPERT.