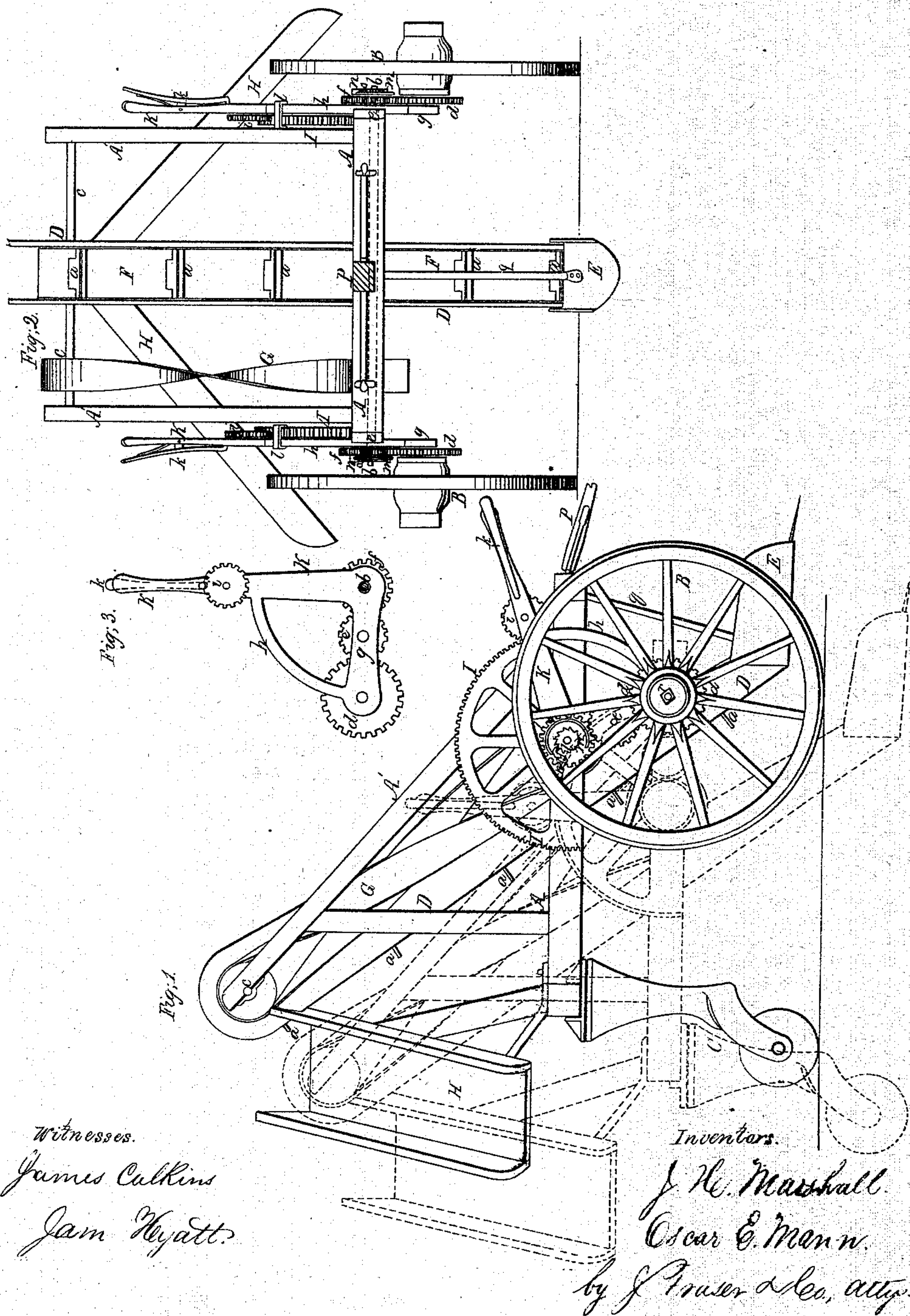


Marshall & Mann

Excavator

Nº 60,026.

Patented Nov 27, 1866.



Witnesses.
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United States Patent Office.

IMPROVED DITCHING-MACHINE.

J. H. MARSHALL, OF LOCKPORT, AND O. E. MANN, OF SOMERSET, NEW YORK.

Letters Patent No. 60,025, dated November 27, 1866.

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, JOSEPH H. MARSHALL, of Lockport, and OSCAR E. MANN, of Somerset, both in Niagara county, and State of New York, have invented a certain new and improved Ditching and Excavating Machine; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of our improved machine.

Figure 2, a front elevation of the same; and

Figure 3 is a detached inner view of one of the levers, K, and some of the connecting parts and gearing, by which the excavator is raised and lowered, shown in a reverse position from that in fig. 1.

Like letters of reference designate corresponding parts in all the figures.

Our improvements are designed more expressly to be used as a ditching-machine, but it is also capable of being employed for the purpose of excavating generally; and the invention consists in the special combination and arrangement of its various parts, as hereafter specified.

In the drawings, A A represent the lower, main, and horizontal portion of the frame, of rectangular or other suitable form, and A' A' the upper portion inclined backward and properly supported at the rear by posts or braces from the frame A. B B are two main supporting-wheels at the front end of the machine, and C a caster-wheel, pivoted at the centre of the rear cross-timber of the frame, so as to enable the machine to be turned about, and is designed to run in the ditch as it is being dug, as will presently be explained. D is the elevator, which inclines upward and backward centrally within the frame, A', and is provided with the endless belt, F, and a cutter-point or share, E, secured to its lower end. The excavator may be of any suitable construction, so as to form the necessary way for the belt F, and its buckets, *a a*, to operate in; and it may be secured at its lower end to the front of frame A by the brace, *g*, and may be generally supported within frames A A' in any desirable and proper manner. The belt, F, passes around ordinary rollers or pulleys at the lower and upper end of the elevator, the upper roller being mounted on a horizontal shaft, *c*, which has its bearing in ends of the frame, A' A'. The buckets, *a a*, may be of any construction suitable for receiving the earth from the share, E, and conveying it to the top of the elevator, where it is discharged at the apex of two inclined chutes or spouts, H H, which conduct the same to either side of the ditch, as clearly shown. These chutes are attached at their top to the frame of the elevator, and are supported at their lower ends by arms or braces, *s*, secured to and extending from the frame, A. The forward end of the machine is supported, raised, and lowered in the following manner: In the detached and reversed view, (fig. 3,) K represents a lever, having a right-angular arm, *g*, and connecting portion or brace, *h*, and also gear-wheels, *d, e, f*. The wheels, *d*, are rigidly secured to the inner ends of the hubs of wheels, B B, which turn on short axes, *r r*, extending outward from the arms, *g*. A horizontal shaft, *b*, (shown most clearly in dotted lines, fig. 2,) is mounted transversely in the frame, A, and extends outward at each end, passing loosely through K, *g*, at their junction, and the gear-wheels, *f f*, and having rigidly secured at its extremities ratchet-wheels, *m m*, with which engage pawls *n n*, pivoted to the gears *f f*, when the machine is advancing, but which slip over the ratchets when the machine is retrograding, as in backing or turning around. Curved springs, *o o*, press upon the pawls and keep them engaged with ratchet-wheels, as shown most clearly in fig. 1. To each side of the frame, A, is secured a toothed segment, I, having for its centre the axis, *b*, with which engage the pinions, *i*, mounted on the levers K. The pinions, *i*, are fastened in any position on the segments, I, by means of spring-catches, *k k*, jointed to the outer side of the levers, and having each a point which extends through the levers and between the teeth of the pinions, shown clearly in figs. 3 and 2. A band, G, passing over suitable pulleys, communicates motion from the axis, *b*, to the horizontal shaft, *c*, which in its turn imparts motion to the elevating belt, F. P is a pole by which the machine is drawn or guided.

Our machine, thus constructed, is operated as follows: The machine, in the position shown in black lines, fig. 1, having the plough or cutter, E, elevated, is drawn to the point where the ditching is to commence; then, by raising the levers, K, the forward end of the machine, and with it the excavator, is lowered till the point or scoop, E, comes in contact with the ground, and so as to cut a certain depth, which will vary according to the nature and resistance of the soil, while the caster-wheel follows in the ditch. The pinions, *i*, being then secured by the pawls, *k*, the machine is ready for operating. As the machine is drawn along, the wheels B, and pinions *d*, secured thereto, impart motion to the two sets of gearing, *e, f*, on each side, when the pawls, *n*, engaging with ratchet-wheels, *m*, give motion to the axis, *b*, which is transmitted by means of belt G and shaft *c* to the end-

less belt of the elevator, as before described. The buckets, *a*, as the belt revolves, take the dirt as it is scooped up by *E*, and carry it up over the top of the elevator and into the inclined chutes, *H*, which discharge it on either side of the ditch. In turning around or backing, the movement of the gearing is reversed, when the pawls, *n*, slip over the ratchets, leaving the axis, *b*, and other connecting parts of the apparatus, at rest. The machine is drawn successively back and forth over the ditch, the plough being lowered each time, as before described, till the excavation has reached the required depth. Although more especially designed for ditching purposes, it is evident that our machine may be employed for the more general purposes of an excavator, by providing a truck on each side to receive the earth as it is discharged from the chutes, *H H*, and convey it away.

The advantages of our improvements are as follows: The machine is very manageable, light, and of easy draught. The castor-wheel, by following in the ditch, forms, in connection with the scoop, *E*, a guide to the direction of the machine and serves to keep it steady. The double-inclined chute, *H*, discharges the dirt upon each side beyond the track of the wheels and horses, which travel on each side of the ditch.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The triangular lever-frame, consisting of the parts *K*, *g*, *h*, hinged to the frame, *A*, and connecting with the axis of the wheels *B B*, castor-wheel *C*, scoop *E*, in combination with the toothed segment *I*, pinion *i*, and spring-pawl *k*, for supporting, raising, and lowering the frame *A*, arranged and operating in the manner specified.

2. We also claim the arrangement of the gearing, *d*, *e*, *f*, the latter provided with pawl *n*, with the axis *b*, ratchet-wheel *m*, and belt *G*, operated by driving-wheels *B B*, for communicating motion to the endless belt *F*, substantially in the manner set forth.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

JOS. H. MARSHALL,
OSCAR E. MANN.

Witnesses:

J. FRASER,
LYMAN P. PERKINS.