M. M. HODGMAN.

EXCAVATOR.

No. 113,883. Patented Apr. 18, 1871.

Fig. 1

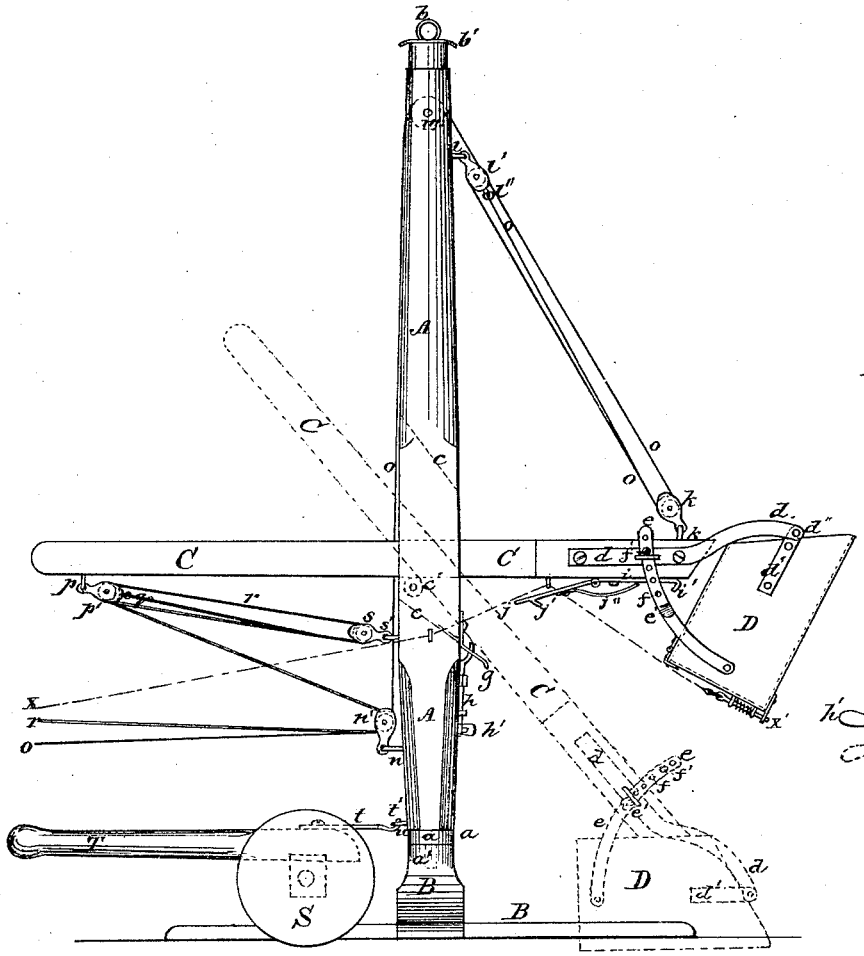


Fig. 3

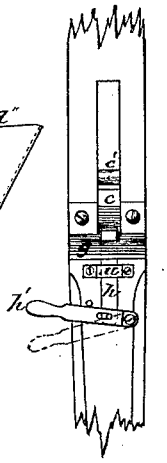
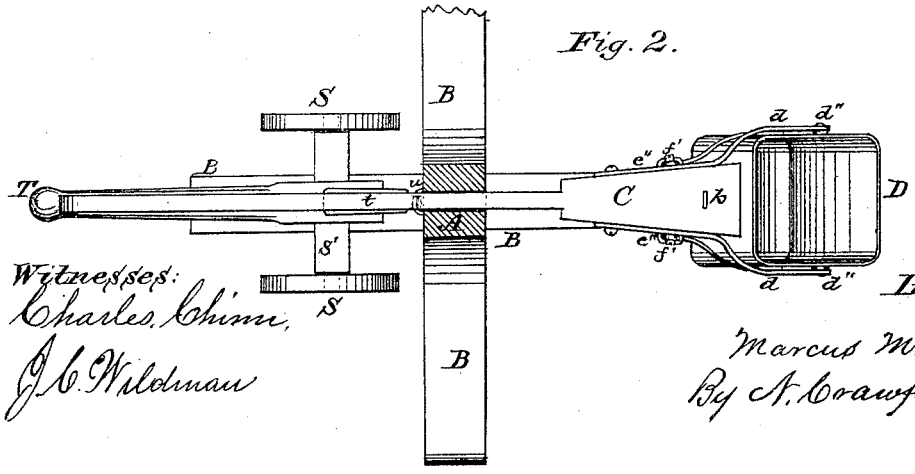


Fig. 2.



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MARCUS M. HODGMAN, OF WEYMOUTH, MASSACHUSETTS.

Letters Patent No. 113,883, dated April 18, 1871

IMPROVEMENT IN EXCAVATORS.

The Schedule referred to in these Letters Patent and making part of the same.

I, MARCUS M. HODGMAN, of Weymouth, in the county of Norfolk, in the State of Massachusetts, have made certain Improvements in Excavators, of which the following is a specification.

The object of this invention is to supply a cheap, durable, and effective machine, that is light and strong, can be operated by a less number of attendants than ordinary machines of this kind, and at the same time be easily moved from place to place, as may be required; and

It consists in the construction and arrangement of the devices by which the shovel may be adjusted to different positions on the boom or shovel-stock and held in suspension on the mast while at rest, and the means by which the excavator is moved from place to place.

In the drawing—

A represents the mast, having band *a* around its lower end, and a pivot-pin, *a'*, in the center of the end of the mast, and extending some distance below it and entering into the base or supporting-frame B, and so as that the mast can freely turn with the pivot-pin that rests in and is supported by the base, as is seen in fig. 1 in dotted lines.

The base-support of the mast may be constructed in any practical manner or form, having the proper width and height to sustain the mast and at the same time be light.

At the top of the mast is provided the common eye-bolt *b* and revolving plate *b'*, with holes in it for attaching guy-ropes to secure the mast into its upright position and prevent it from leaning toward the shovel when the shovel is filled.

At the proper height above the base is an inclined mortise, seen at *c c*, fig. 1, in dotted lines, through the mast.

C is the boom or shovel-stock, made broad at the lower or shovel end, and thin in that portion which passes through the mortise in the mast.

In the mortise through the mast, and transverse thereto, above the bottom and near the side of the mast furthest from the shovel, is a friction-roller, *c'*, seen in fig. 1 in dotted lines, on which the lower side of the boom or shovel-stock always rests in whatever position it may assume, and relieves it of friction when the stock is sliding upon it.

D is the shovel or excavator, made of sheet metal, the proper thickness and shape for scooping up earth or mud, and is made with the usual hinged bottom and spring catch, so that it can, when desired, be emptied in the ordinary manner, which does not need to be specially described.

On each side of the shovel are riveted ear-plates *d'*, xtending above the top of the shovel, and at *d''* are pivoted to bent arms *d*, that are firmly bolted to the sides of the boom or shovel-stock C, by which means the shovel is secured to the stock or boom.

Centrally on the sides, and near the bottom of the shovel, on the outside thereof, are bolted bent guide-arms, *e*, which are so bent as to pass upward through guide-staples *e'' e''* that are made fast to the bent arms on the sides of the shovel-boom or stock.

These guide-arms *e* have stop-lugs *e'* projecting from their outside faces that strike against the under side of staples *e''* and stop the shovel from a further inclination toward the boom or stock, and firmly hold it in the required relative position with the stock while the shovel is being filled.

In these guide-arms *e* are several holes, *f f*, and *f' f'* are stop-pins that can be inserted in any of the holes *f*, when they will strike and bear against the top of the guide-staples *e''* and prevent the shovel from swinging too much forward or too far from its proper position while the filled shovel is being elevated and carried out from the mast to be emptied.

On the front side of the mast is a slitted metal plate, *g*, which is slit from the upper edge down a proper distance into three parts. The two outside parts are bolted to the face of the mast, while the middle part is bent into and covers the bottom of the inclined mortise through the mast for a considerable distance, while the bottom part of the plate *g* is inclined downward and from the mast.

Centrally and vertically through the plate *g*, that projects from the mast, is a mortise, and through this mortise slides a bolt, *h*, in proper guide-ways or staples, at the lower end of which is lever *h'*, which operates to raise or lower the bolt *h* in the mortise of the inclined projecting plate.

Underneath and near the shovel end of the boom or stock is bolted a plate, *i*, having its forward end bent to have an acute angle, and forming a flange-projection, *i'*, by which the shovel is prevented from inclining too much under the stock while that is in the different positions that it has to assume in filling and being discharged.

To the back part of plate *i* is hinged a catch-plate, *j*, and at its back end projects a catch, *j'*, while *j''* is a metal stop-plate that is riveted fast to the under side of plate *j*, and extends forward far enough to strike against the under side of plate *i*, and thus prevent the back end of plate *j*, with catch *j'*, from falling too low. This stop-plate *j''* can be bent to regulate the position that the catch *j'* shall assume with relation to the shovel-stock.

On the top of the forward end of the boom or shovel-stock is an eye-bolt, *k*, in which is hooked a pulley-block, *k'*, having two or more pulleys, as may be desired, proportioned to the amount of force to be applied to operate to raise the shovel.

Toward and near the upper end of the mast is an eye-bolt, *l*, in which is hooked a pulley-block, *l'*, with one pulley less than block *k'* may have, and at its lower end is another hook or eye, *l''*.

Above eye-bolt *l*, and freely working in a mortise through the center of the mast, is a single pulley, *m*, seen in dotted lines in fig 1, which freely turns on an axis which is fast in the mast.

Toward the bottom and on the back side of the mast is another eye-bolt, *n*, in which is hooked a pulley-block, *n'*, with two pulleys.

To the hook or eye at the lower end of pulley-block *l'* is made fast a rope, *o*, seen in full lines in fig. 1, which passes down and around one of the pulleys in block *k'*, and so on until the required power is obtained in the system of pulleys and rope to raise the shovel, when the rope is passed through the mast over single pulley *m* down on the back side of the mast and around a pulley in block *n'*, when it leads off to where the power is applied for raising the shovel, which may be any power that is adapted to such use, and when applied the shovel will be raised from the position seen in dotted lines in fig. 1 to that shown in full lines in the same figure.

Near to the back end, and on the under side of the shovel-stock or boom, is an eye-bolt, *p*, in which is hooked a pulley-block, *p'*, having eye or hook, *q*, in which is made fast the end of rope *r*; from this hook or eye the rope *r* goes underneath and around a pulley-block, *s*, that is hooked fast in eye-bolt *s'* in the back side of the mast; then the rope *r* goes over and around the pulley in block *p'*, and from there to a second pulley in block *n'*, and from thence to the power to be applied.

This rope *r* is represented by open lines as seen in fig. 1, and is used to force the shovel forward or from the mast in whatever position the boom or shovel-stock may be in.

S S are wheels to revolve on axle S'.

T is a lever or pole fast on the upper side of axle S', and extends back a sufficient distance to affect the management of the device, and forward of the axle a sufficient distance as that the axle S' can be used as a fulcrum to lever T.

On the extreme forward end and on the top of lever T is a metal bar, *t*, bolted fast thereto, and has a hook, *t'*, on its extreme forward end.

u is a stout staple made fast in the mast at its lower end, and projects from the mast far enough to allow the hook *t'* of bar *t* to go under and between it and the mast and securely attach itself to the mast, and so that, by bearing down on the back end of lever T, the whole excavator can be raised from the ground and its weight rest upon the wheels S, when the entire excavator and its rigging can be transported quickly and easily to any desired location for use or storage.

Before putting the truck in position to raise and move the excavator the shovel-stock or boom and shovel are hung and held up from the ground by drawing on rope *o* until the shovel-stock is raised high enough to allow the catch *j'* to enter into the mortise in the mast, when the hand-lever *h'* forces the bolt *h* up above the plate *g* far enough so that when the rope *o* is let slack the catch *j'* will engage the bolt *h* and hold the shovel and its stock securely up from contact with the ground, and while so kept the entire machine can be moved as desired.

To disengage the catch *j'* from bolt *h* the bolt may be forced down and let the shovel slide down free, or the rope *o* may be drawn so as to raise the shovel-stock high enough to clear the catch *j'* from bolt *h*, when the rope is quickly slackened and the shovel will gently slide down to the position for work.

When the rope *r* is drawn back it forces the shovel forward into the earth until it is filled, when rope *o* is drawn and the shovel raised with its load, and when the shovel has been brought to the exact position for discharging its contents, by operating the rope *r* and turning the mast on its pivot-pin *a'* to swing the shovel around in either direction to the right position, rope *x* is suddenly pulled, and, disengaging the spring bolt *x'* the hinged bottom of the shovel is opened by the weight of the contents inside, and such contents slide out and the shovel is again empty; rope *r* is suddenly slackened and rope *o* let free, the shovel falling to the position for being again filled, and as it falls the trip-rope *x* is suddenly slackened and the bottom assumes its place by its specific gravity, and is secured in place by the spring bolt entering the catch, by which it is held until another load in the shovel is to be discharged, when the operation is repeated.

Having thus described my invention,

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

1. The shovel D hung, as above described, to stock C, in combination with the guide-arms *e* having stop-lugs *e'*, holes *f*, adjustable gauge-pin *f'*, and guide-staples *e''*, constructed to operate in the manner shown and described.

2. The slide-bolt *h*, lever *h'*, and plate *g*, in combination with the hinged arm *j* having catch *j'* and stop-plate *j''*, in the manner and for the purpose described.

3. The truck, composed of wheels S, axle S', lever T, plate *t*, and hook *t'*, in combination with the mast A having staple *u*, in the manner and for the purpose described.

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Witnesses:

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