M. M. HODGMAN.

Improvement in Excavators.

No. 131,954. Patented Oct. 8, 1872.

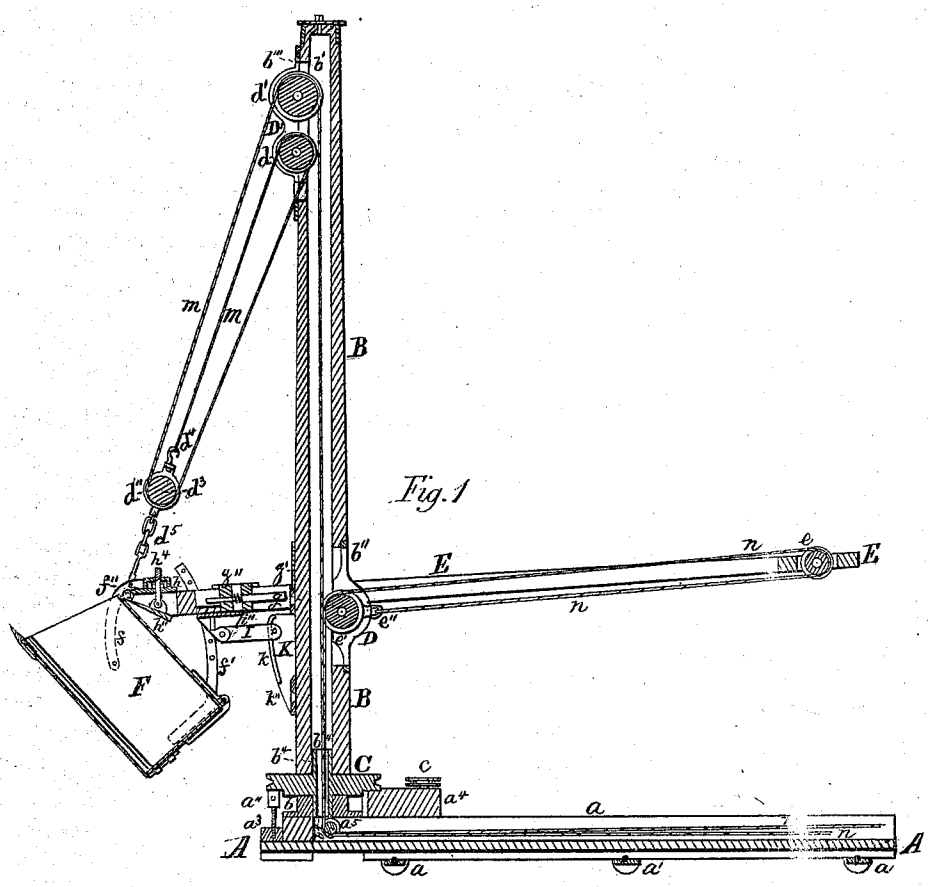

Fig. 1

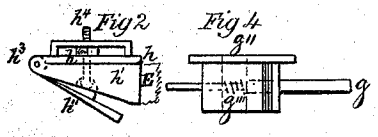

Fig. 2



Fig. 4

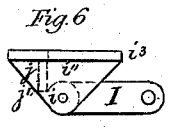

Fig. 6

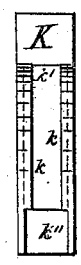

Fig. 9

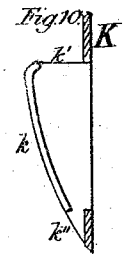

Fig. 10

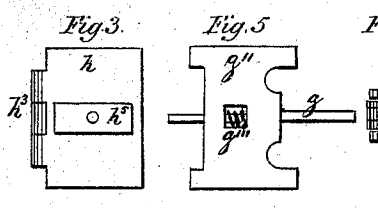

Fig. 3. Fig. 5. Fig. 7. Fig. 8.

Witnesses,
J. A. Lowndes
Harry Coleman

Inventor,
Marcus M. Hodgman
By N. Cranford
atty.

# UNITED STATES PATENT OFFICE.

MARCUS M. HODGMAN, OF WEYMOUTH, MASSACHUSETTS.

## IMPROVEMENT IN EXCAVATORS.

Specification forming part of Letters Patent No. **131,954**, dated October 8, 1872.

*To all whom it may concern:*

Be it known that I, MARCUS M. HODGMAN, of Weymouth, in the county of Norfolk, in the State of Massachusetts, have invented certain Improvements in Excavators, of which the following is a specification:

The object of this invention is to improve the excavator patented to me April 18th, 1871, and numbered 113,883; and it consists in the construction of some of the parts, and their adaptation to the excavator, as will be more fully described hereinafter.

In the drawing, Figure 1 represents a sectional side elevation; and Figs. 2, 3, 4, 5, 6, 7, 8, 9, and 10 details of parts.

A represents the platform or base, having raised ribs *a* thereon, between which a way is formed for the operating chains or ropes to work in, and is supported upon trucks *a'* that are on tracks or ways for the purpose of carrying the implement to its work. B is an upright mast with a center bore or hole, *b'*, through its entire length, and in which bore or hole the operating chains or ropes work. *b''* is a slot in the back side, and at a proper distance above the foot of the mast, to receive a pulley, *e*, in the pulley-block D. *b'''* is a similar slot or mortise in the front side and near the top of the mast to receive pulleys *d* and *d'* in pulley-block D'. C is a large pulley at the foot of the mast with a groove in its periphery, and is fixed in the mast by a hollow hub, $b^4$, that extends upward into the bore or hole *b'* in mast B, and below the pulley far enough to form a journal or pin to work freely in the step or box *b*, which is fast on the platform or base A, and in which the mast B, by means of the hollow hub extending below the pulley C and into the step or box, will freely revolve in either direction. D and D' are pulley-blocks fast on opposite sides of the mast, and contain pulleys over which go the ropes or chains that move the shovel-stock and shovel. E is the boom or shovel-stock, constructed to embrace the hollow mast B, and slide between the sides of the mast and keepers outside of the sides of the boom, and made fast to the mast while the under side of the shovel stock or boom rests upon rollers, that it may reciprocate the more easily when required. F is the shovel, constructed in the usual manner, and hung to the boom or stock E by the bent and pivoted bars *f* and guide-bars *f'*, which have holes therein for limiting the vibration of the shovel in either direction. At the forward end of the boom or shovel stock is attached a contrivance for adjusting a plate to bear against the top of the shovel, while it is being forced forward to be filled, in order to accommodate the different angles at which the shovel may be in with relation to the bank, and the position of the machine for advantageous effect; and this contrivance consists of a plate, *h*, firmly attached to the upper side of the boom or stock E, and at its forward end at $h^3$ is hinged plate *h''*. Plate *h''* is adjusted to different angles by means of its being hinged to a screw-bolt, $h^4$, which passes upward between strengthening-plates *h'* through plate *h* and bracket $h^5$, and by operating a nut, $h^6$, that is screwed onto the bolt $h^4$, and is between plate *h* and bracket $h^5$, as seen in Fig. 2, the hinged plate *h''* will be opened or closed as the nut $h^6$ is turned in the direction to so open or close the plate. *g* is a spring-bumper rod placed in a proper block, *g''*, and firmly attached to the boom or shovel stock E, in which is a spring, *g'''*, through which the bumper *g* passes. *g'* is a plate for bumper *g* to strike against when the shovel is brought up to go into position to be dropped down to commence filling, and is firmly bolted to the mast B in such position that the bumper *g* will always strike against it, and in doing so the spring *g'''* will prevent any considerable jar from being communicated to the mast, while the plate *g'* prevents any wear upon the mast, as would be the case without this device, and by which the mast is made to last much longer, as no abrasion of the wood of the mast results when this spring-bumper and plate are attached.

In order to conduct the shovel as it goes down to commence its forward movement, to be as near as possible to the platform or base A of the excavator, a guide device is made by having a drop-latch, I, pivoted at *i* to flange-plates *i''* on plate $i^3$, in such manner as to rise freely and fall until stopped by the abutting of the shoulder *j'* against the stop *j*, as seen in Figs. 6, 7, and 8. K is a projecting guide-way attached to the mast B, a front view of which is seen at Fig. 9, and a side sectional view at Fig. 10. The front edges of the pro-

plates are turned to form a right
he side plates, and leave a space
width to easily receive the thick-
latch I between the flanges *k*, so
oom with the shovel falls or drops
a position for forcing the shovel
h the latch I passes into the open
of the guide K, and the pin $i^4$ on
tch I passes within the inwardly-
lges of the side plates, and thus
on to the falling boom and shovel
h drops below the flanges *k;* when
l freely pass out of the guide-way.
s then ready to be forced forward
h by pulling upon the chain or rope
which is attached to a hook or eye,
block D; thence passing around
he outer end of the boom or shovel
n back and over pulley *e'* in pul-
to the bore or hole *b'* in mast B;
n said bore below the bottom of
d around pulley $a^5$ to the power
l to operate the excavator. When
rd in the way described far enough
hovel, the movement of chain or
pped, and power is then applied to
rope or chain *m*, one end of which
t in a hook or eye, $d^4$, on pulley-
t is connected to the forward end
or shovel stock E and shovel F,
chain $d^5$, bail *f''*, and bent bars *f;*
rope or chain *m* goes upward to
pulley *d* in pulley-block D'; thence
nd around pulley $d^3$ in block *d''*,
around the upper pulley *d'* in pul-
then down in the bore or hole *b'* of
he bottom of the mast, and around
the power, which will elevate the
its load, to any desired elevation.
sed the mast and boom, with the
rned around by a rope or chain
nd pulley C, and between guide-
such position as is desired for
e contents in the shovel into some
ace to receive it, by the ordinary
means now in use.
e boom with its shovel is run to-
st, in order to get the shovel in
sually strikes the mast with great
s a consequence will in a short
l wear away the wood of the mast
to its great injury, and perhaps final destruction; but by the device hereinabove described the mast is completely shielded and protected from the effects of such shocks and blows, and will last an indefinite length of time by reason of such protection and construction. The means for adjusting the bearing at the end of the boom against the shovel is of great importance, as the same can be adjusted to any angle within the scope of the adjusting-screw, while the means for guiding the shovel in its downward descent to the position to commence its work at the nearest point possible to the mast is a desirable improvement upon the ordinary method. The hollow mast affords protection to the ropes or chains used to operate the machine, and also prevents anything from coming in contact with them while in operation. The mast is held in upright position in the usual way by attaching guys or braces to the plate at the upper end of the mast, and the other end to anchors at any proper position.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the mast B, having the longitudinal bore $b^1$, pulley C, having the hollow hub $b^4$ extending below and forming a pin or journal, with the step *b*, in which the hollow hub is inserted, thus forming the means of sustaining the mast and allowing it to be turned, substantially as described.

2. The combination of the spring bumper *g* upon the boom or shovel stock E with the plate *g'* upon the mast B, substantially as described.

3. The combination of the adjustable hinged plate *h''* upon the end of the boom or shovel stock E with the shovel F, constructed and arranged to operate in the manner substantially as described.

4. The combination of the drop-latch I, having the transverse pin $i^4$ and attached to the boom or shovel stock E, as described, with the guide K on mast B, all constructed to operate substantially as set forth.

MARCUS M. HODGMAN.

Witnesses:
LEVI H. STRAW,
JOSEPH BYRNE.