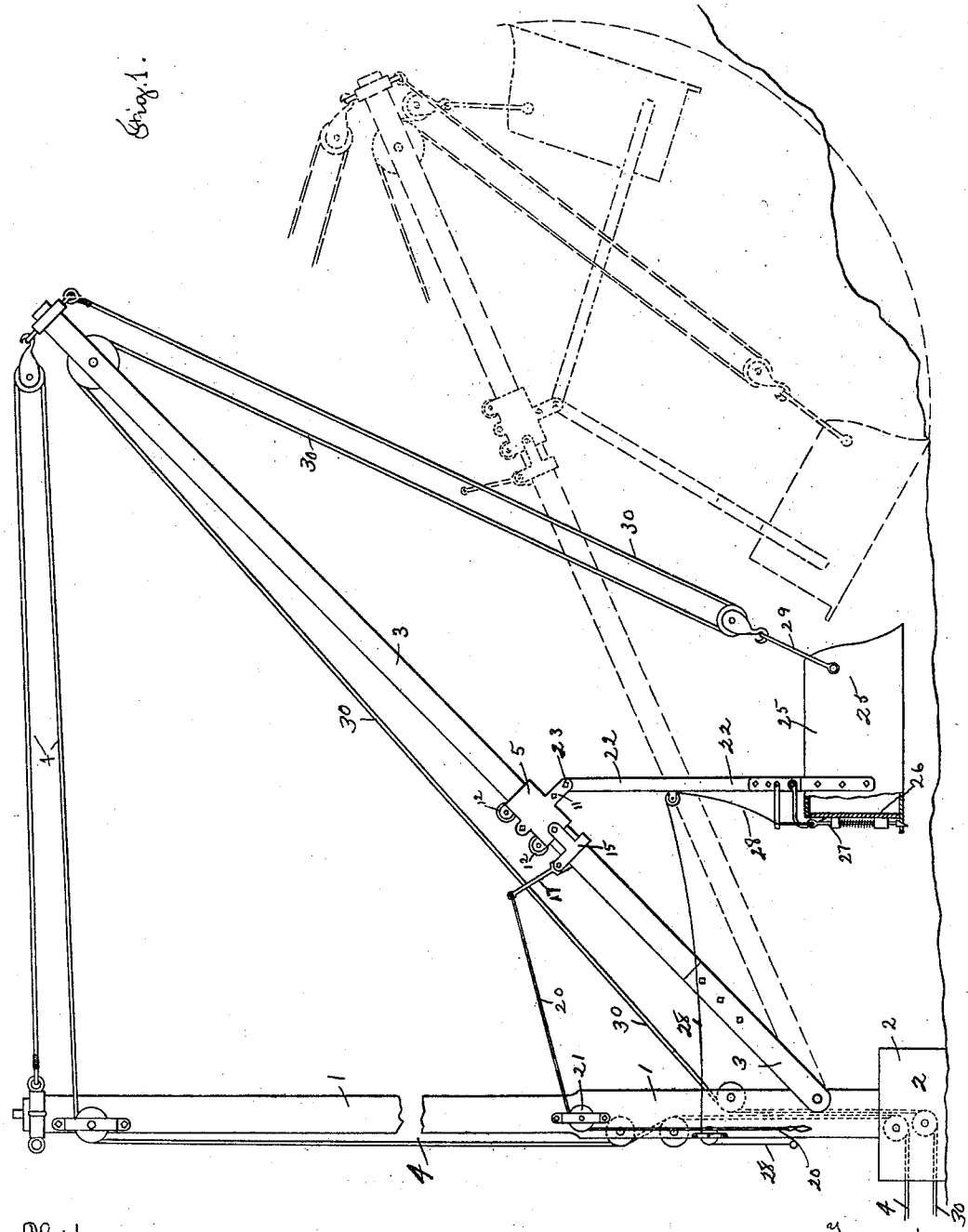
(No Model.) 2 Sheets—Sheet 1.

P. J. MALONEY.

EXCAVATOR.

No. 556,012. Patented Mar. 10, 1896.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2

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Fig. 2.

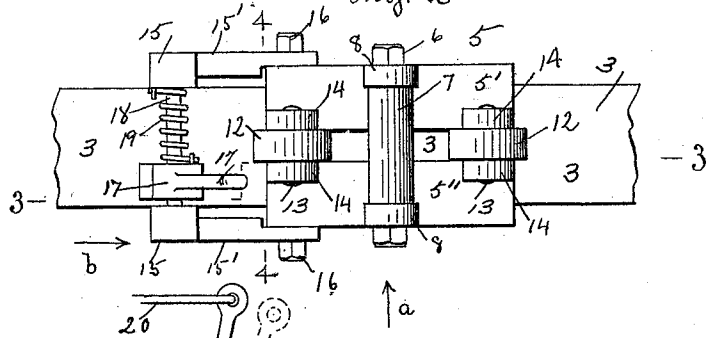


Fig. 3.

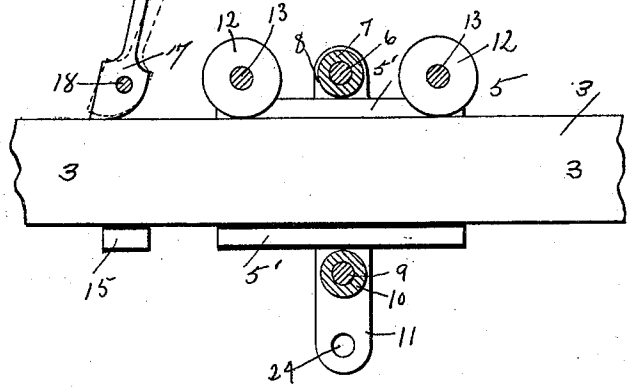
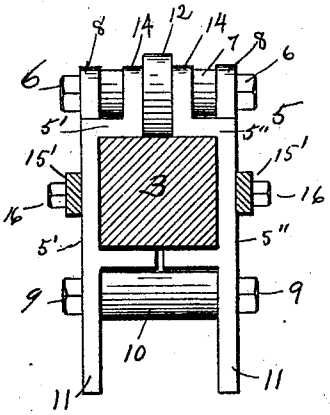


Fig. 4.



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UNITED STATES PATENT OFFICE.

PETER J. MALONEY, OF WORCESTER, MASSACHUSETTS.

EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 556,012, dated March 10, 1896.

Application filed June 7, 1895. Serial No. 552,043. (No model.)

To all whom it may concern:

Be it known that I, PETER J. MALONEY, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Excavators, of which the following is a specification.

My invention relates to an excavator, and the object of my invention is to provide an excavator attachment adapted to be applied to and combined with the movable inclined boom of any ordinary hoisting-derrick.

My excavator attachment consists of a slide or carriage adapted to be combined with the inclined boom of a derrick and to travel freely thereon in the direction of the length of the boom, and a device combined with said carriage to prevent its moving on the boom, said device under the control of the operator, in combination with the bucket-boom, which has no longitudinal motion and is pivoted at its inner end to the carriage above mentioned and moves with said carriage, and the excavating-bucket rigidly attached to the outer end of said boom, and provided with hoisting-tackle for operating said bucket, to move it in the arc of a circle to excavate, and for moving the carriage on the inclined boom, to carry the bucket to the desired position, as will be hereinafter fully described.

Referring to the drawings, Figure 1 is a side view of a hoisting-derrick with my excavator attachment combined therewith. The dotted lines show the lowered position of the derrick-boom and excavator-bucket preparatory to excavating and also the raised position of the bucket after excavating. Fig. 2 is a plan view of the carriage which travels on the boom of the derrick, to which one end of the bucket-boom is pivotally attached, and of the device for locking the carriage on the boom. Fig. 3 is a section on line 3 3, Fig. 2, looking in the direction of arrow *a*, same figure; and Fig. 4 is a section on line 4 4, Fig. 2, looking in the direction of arrow *b*, same figure. Figs. 2, 3, and 4 are shown on an enlarged scale.

In the accompanying drawings I have shown a hoisting-derrick of ordinary construction consisting of the upright mast 1, mounted at its lower end to revolve in the base-block 2, and the movable inclined boom 3, preferably square in cross-section, and hoisting-tackle 4 for raising and lowering the outer end to the boom 3, to vary the inclination thereof, all in the usual way.

I will now describe my excavator attachment adapted to be combined with the boom 3 of the derrick, so that the same may be used as an excavator.

I provide a slide or carriage 5, adapted to be supported or mounted on the boom 3, to travel freely thereon in the direction of the length of the boom. Said carriage 5 is preferably made, as shown in the drawings, in two parts or sections 5′ and 5″, which extend upon opposite sides of the boom and also upon the bottom and top thereof, as shown in Fig. 4. The two parts 5′ and 5″ of the carriage 5 are secured together to allow said carriage to travel freely on the boom in the direction of its length by a bolt 6, having a sleeve or washer 7 thereon and extending through openings in ears or projections 8 on the parts 5′ and 5″ at the upper side of the boom, and a second bolt 9 having a sleeve or washer 10 thereon and extending through ears or lugs 11 on the parts 5′ and 55″ at the lower side of the boom. (See Figs. 2, 3, and 4.)

In order to have the slide or carriage 5 travel freely on the boom 3, and with as little friction as possible, I preferably employ two rolls or small wheels 12 combined with the carriage 5, which travel on the upper side of the boom, as shown in Fig. 3. The wheels 12 in this instance extend between the two parts 5′ and 5″ of the carriage 5 and are mounted on short shafts 13, which have their bearings in stands or projections 14 on the upper inner part of said sections 5′ and 5″. (See Figs. 2 and 3.)

In order to hold or lock the carriage 5 at any point on the boom 3 and prevent it from traveling up or down thereon in the operation of excavating, I provide a device consisting in this instance of a U-shaped loop or strap 15, extending upon the lower surface and the sides of the boom and provided with arms 15′, pivotally attached to the lower end of the carriage 5 by bolts 16. To operate the

strap 15 and draw it against the lower surface of the boom, to lock or hold the carriage 5 thereon, I employ in this instance an eccentric lever 17, supported on a rod 18, mounted in the upper ends of the strap 15, and provided with a spring 19, which acts to hold the eccentric lever 17 from bearing on the top surface of the boom. (See Fig. 2.) A cord 20 is attached to the end of the lever 17, and passes over a pulley 21 on the mast 1, and extends down within easy reach of the operator.

When it is desired to hold or lock the carriage on the boom and prevent its traveling up or down thereon, the eccentric lever 17 is pulled by the cord 20 and acts, as shown in Fig. 3, to raise the strap 15 and draw the lower part thereof against the lower side of the boom to clamp the strap 15 thereon, and thus hold or lock the carriage on the boom.

To the carriage 5 is pivotally attached the inner end of the bucket-boom 22, in this instance by a bolt 23 extending through openings 24 in the downwardly-extending lugs 11 of the carriage 5. The bucket-boom 22 does not have any longitudinal motion and holds the bucket 25, which is rigidly attached to its outer end, always at the same distance from the supporting-carriage 5.

The excavating-bucket 25 may be of any ordinary shape and construction and is provided with a hinged bottom 26 and a spring lock-bolt 27, operated by a cord 28 in the usual way, and a bail 29, to which is attached the hoisting-tackle. The rope 30 of the hoisting-tackle is attached at one end to the end of the inclined boom 3 and passes over a series of pulleys to the foot of the upright mast 1 in the usual way.

From the above description, in connection with the drawings, the operation of my excavator attachment, combined with the movable inclined boom of a hoisting-derrick, will be readily understood by those skilled in the art.

By means of the traveling slide or carriage of the excavator attachment, which supports the bucket-boom and bucket I am enabled to excavate at a distance from the foot of the derrick or near the foot of the derrick, as desired, and to carry the bucket to dump the excavated material at any point within the plane of operation of the derrick; for no matter how long the boom of the derrick is I can cause the carriage mounted on said boom to travel from the lower end to the upper end thereof by simply drawing on the hoisting-tackle attached to the bucket, and by loosening said tackle the carriage will travel by gravity toward the lower end of the boom. By means of the eccentric lever 17 the carriage is held or locked at any desired point on the boom.

In the operation of excavating the carriage is moved up or down on the boom of the derrick according to the distance from the foot of the derrick it is desired to excavate. In case it is desired to excavate at some distance from the foot of the derrick, as shown in Fig. 1, the carriage is drawn up on the boom and held thereon by the eccentric lever 17, as shown by full lines in Fig. 1, so that the bucket will swing clear. The boom 3 is now lowered, causing the bucket to come in contact with the ground and the carriage 5 to travel up on the boom, as shown by dotted lines, Fig. 1, the eccentric lever 17 having been released. The eccentric lever 17 is again operated to hold the carriage on the boom, and the hoisting-tackle attached to the bucket is operated to draw the bucket through the material to be excavated, the weight of the boom forcing the bucket into the material. After the bucket has excavated and has been raised, as shown by dotted lines at the right in Fig. 1, the inclined boom 3 may be raised and the bucket carried toward the derrick to dump its contents by operating the eccentric lever 17 to release the carriage 5, and when it has reached the desired position the eccentric lever 17 is operated to hold the carriage, and the hinged bottom of the bucket is opened and the contents dumped.

The advantages of my excavator attachment will be readily appreciated by those skilled in the art. It is of very simple construction and operation, and can be quickly and easily combined with the boom of any ordinary hoisting-derrick, after the same is in position and ready for use.

It will be understood that the details of construction of my excavator attachment may be varied somewhat, if desired.

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

1. An excavating attachment, consisting of a slide or carriage, supported on the movable inclined boom of a derrick, and adapted to travel lengthwise thereon, and a loop or strap pivotally attached to said slide or carriage, and means for clamping the loop or strap to the boom, to hold the carriage at any desired point thereon, and an excavating-bucket and bucket-boom, said boom pivotally attached at its inner end to said carriage to move with it, and hoisting-tackle to operate said bucket, substantially as set forth.

2. An excavating attachment, consisting of a slide or carriage adapted to be mounted on the movable inclined boom of a derrick, and to travel lengthwise thereon, and a loop or strap pivotally attached to the carriage, and an eccentric lever for clamping said strap to the boom to hold the carriage thereon, and an excavating-bucket and bucket-boom, said boom not having any longitudinal motion, and pivotally attached at its inner end to said carriage to move with it, and hoisting-tackle to operate said bucket, substantially as set forth.

3. The combination with the movable inclined boom of a derrick, of an excavator-

bucket having a bucket-boom rigidly attached thereto at one end, and pivotally attached at its other end to a slide or carriage supported and adapted to travel lengthwise on said inclined boom, and said slide or carriage, and means for holding it at any desired point on said boom, said means consisting of a loop or strap pivotally attached to the carriage, and means for clamping the loop or strap to the boom, substantially as set forth.

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