

O. J. MARTINSON.
EXCAVATOR BUCKET.
APPLICATION FILED DEC. 17, 1909.

954,318.

Patented Apr. 5, 1910.

2 SHEETS—SHEET 1.

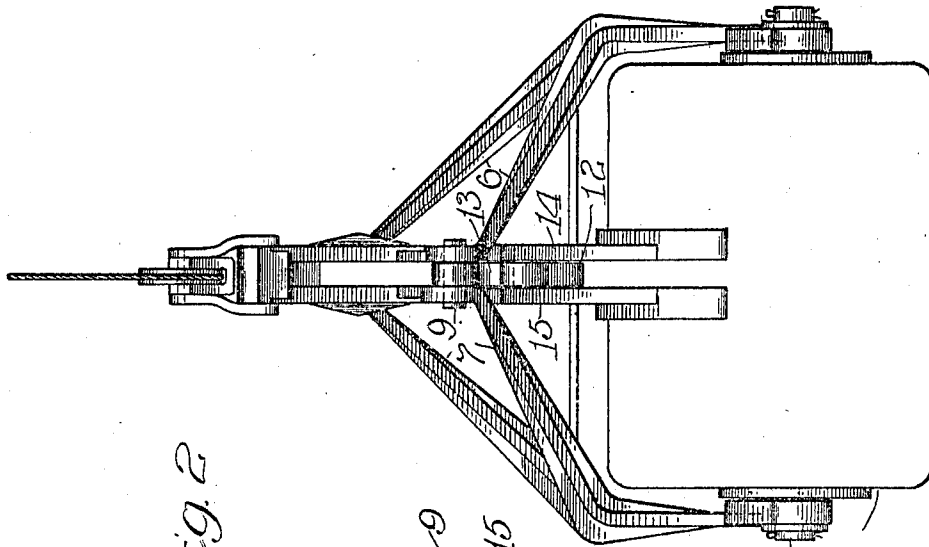


Fig. 2

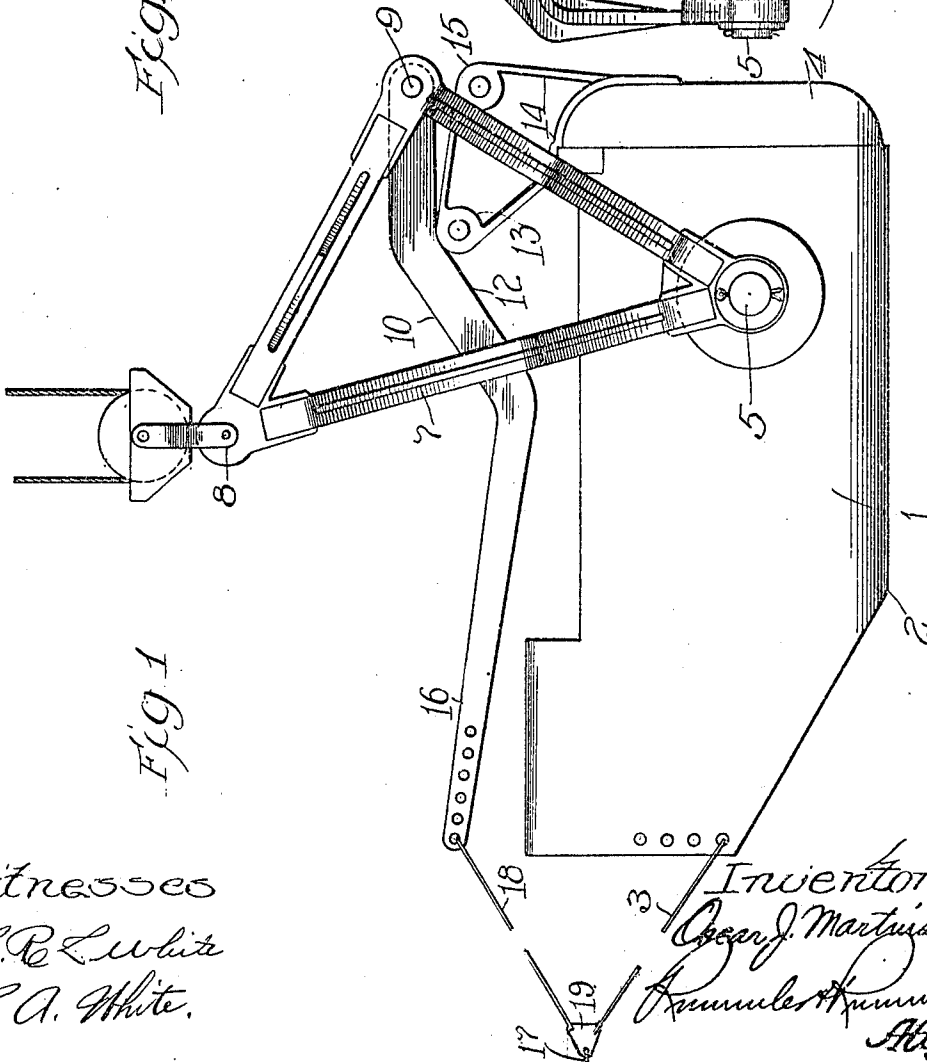


Fig. 1

Witnesses
H. P. L. White
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Inventor:
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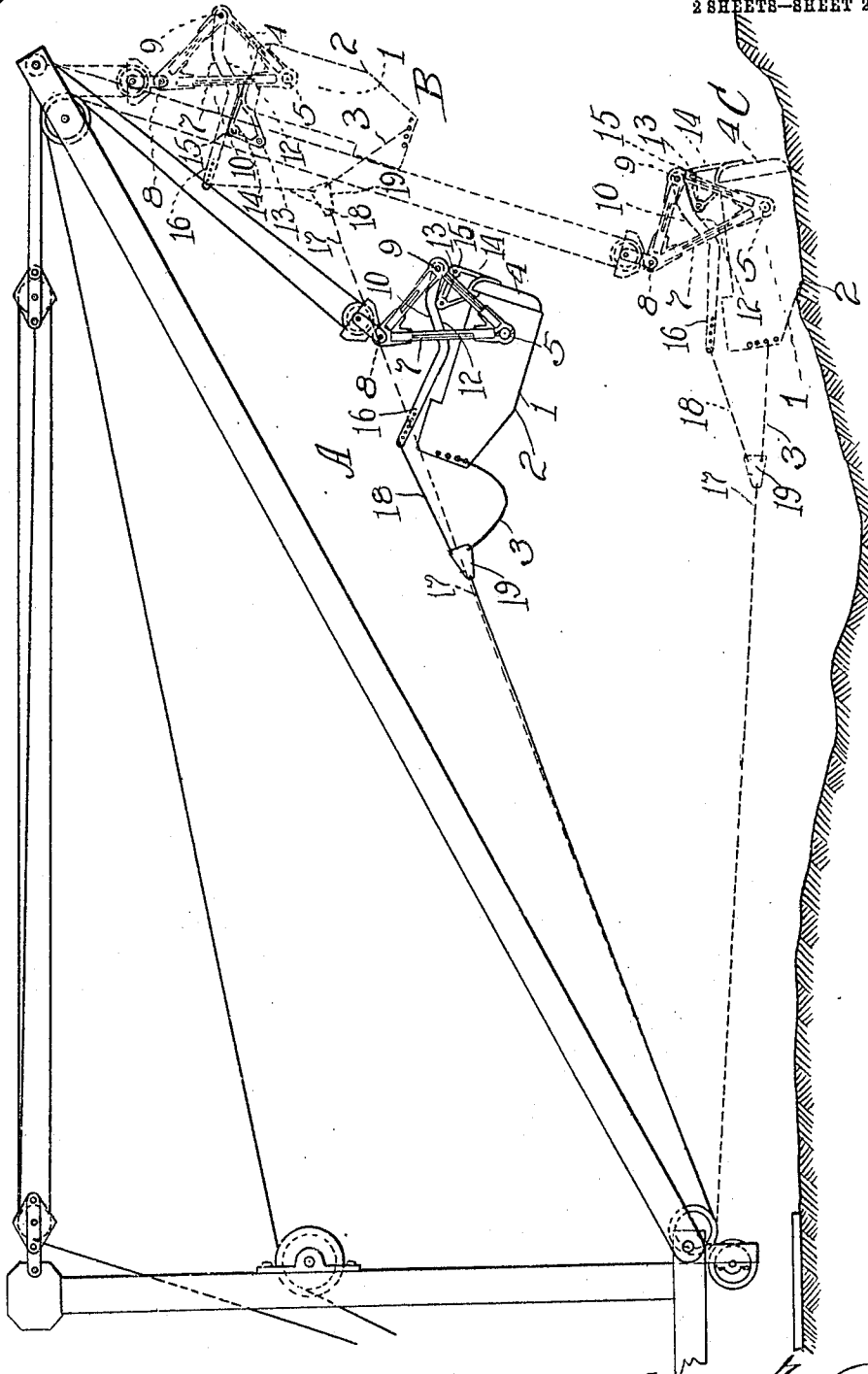
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Fig. 3



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UNITED STATES PATENT OFFICE.

OSCAR J. MARTINSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO MONIGHAN MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

EXCAVATOR-BUCKET.

954,318.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed December 17, 1909. Serial No. 533,738.

To all whom it may concern:

Be it known that I, OSCAR J. MARTINSON, a citizen of the United States of America, and a resident of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Excavator-Buckets, of which the following is a specification.

My present invention relates to excavators, and has for its principal objects to provide an improved scraper-bucket, suitable for use in digging and transporting gravel, clay, rock and the like; to provide a bucket suitable for use with a derrick, and operative from a derrick platform by suitable manipulation of the hauling and hoist lines; to provide a bucket in which the dumping operation is in large measure automatic, and is effected by release of the hauling line; to provide a bucket capable of operation through a large digging radius and capable of dumping into cars or wagons at the outer end of that radius, and also suitable for digging in pits, even though they may be wet or filled with water; to provide a device in which the elements for insuring automatic operation are in large measure located above the bucket and above the material to be dug and out of the path of material entering the mouth of the bucket; to provide a device free, in large measure, from pulleys and similar elements which could become clogged with clay or choked with rock.

A specific construction embodying this invention is illustrated in the accompanying drawings, in which Figure 1 is a side elevation of the complete bucket, Fig. 2 is a rear end elevation of the same, and Fig. 3 illustrates the mode of operation, indicating in dotted lines several successive positions of a bucket.

In the construction shown, the sheet metal bucket 1 is provided at its front with a cutting edge 2, arranged in usual manner, and is equipped with a hauling bridle 3 of usual form. The rear end of the bucket has a permanent closure 4 of rigid construction. The bucket is provided with trunnions 5 located back of its center of gravity. The trunnions engage with a frame or bail 6, consisting of right and left halves, numbered respectively 6 and 7 in Fig. 2, and each preferably of triangular shape. The upper corner of this frame or bail is provided with an eye 8 for operative engagement with a suitable hoist-

ing cable. Another corner, 9, of the triangle has pivoted thereto a detent or latch-lever 10, which is operatively interposed between the bail and the bucket and which has many important functions in the operation of the bucket. This lever 10 has its lower edge 12 specially shaped, as shown, to constitute a sort of cam surface co-acting with a shoulder or roller 13 on a frame-work 14 above the rear end 4 of the bucket. A second roller 15 is located to the rear of roller 13; under certain circumstances, this engages with the cam surface 12 and rolls along that surface. The front end 16 of the latch-lever is operatively connected with the hauling cable 17 as by means of a tripping or controlling line 18 attached to the triangular hauling plate 19 which connects the hauling cable 17 with the hauling shackle 3.

The operation of the bucket is as follows: When the bucket is in the loading position, the several elements are disposed as shown in Fig. 1, or as shown in dotted lines at the lower right hand of Fig. 3. The tightened hauling cable 17 pulls down on the tripping line 18, and holds the latch-lever 10 in firm engagement with roller 13, thereby maintaining the bucket in its loading position. At any point along the normal path of the loading bucket, the hauling operation may be stopped, and the bucket with its partial or full load of earth can then be hoisted toward the upper end of the boom. The bucket will not dump during this hoisting operation so long as sufficient tension is maintained on the hauling cable to prevent releasing of lever 10. But when the bucket reaches its dumping position, as illustrated in full lines on Fig. 3, the hauling cable can be released, thereby releasing the lever 10, and allowing roller 13 to slide along the cam surface 12. The bucket then tilts forward to discharge its load. During the tilting movement the roller 13 strikes the curved surface 12 and travels along that surface.

During the process of loading the bucket, it is hauled along the ground by a strain on the hauling cable, and under normal conditions the hoisting cable is slack during this operation. The angle of the cut with respect to the horizontal may be changed by changing the strain on the hoisting cable. When there is a strain on both the hoisting and hauling cables, the holding line 18 holds the lever 10 against tilting upward and

forces the cam surface 12 against the roller so as to prevent dumping of the bucket, but there is a considerable range through which the bucket may tilt without dumping. If the bucket tends to tilt toward its dumping position, an increased strain on the hauling cable will force it back into its load sustaining position. As long as the bucket is suspended above the ground, any tension whatever on the hauling cable will turn the bucket to its load sustaining position, but during the operation of digging while the bucket is in engagement with the ground, the direction of the cut can be controlled regardless of the angle of the hauling cable by varying the strain on the hoisting cable. This control is accomplished by means of the action of the cam surface 12 on the roller 13.

After discharge of the load, the bucket may be lowered or dropped to the ground for another load. When the front edge of the bucket strikes the ground, the rear of the bucket drops down into the loading position and the triangular frame or bail, together with the lever, drop down over the bucket into their normal position.

The cam surface 12 of the lever is of such form and length that there may be considerable change in the direction of pull on the controlling line 18 and the hauling and hoisting lines without tripping the bucket.

Although but one specific embodiment of this invention is herein shown, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention.

I claim:

1. In an excavator, the combination of a bucket pivoted at a point back of its center of gravity, a hauling cable operatively connected to the front of said bucket, hoisting means for lifting said bucket, and a lever connected with said hauling cable and operatively interposed between said bucket and hoisting means for controlling the tilting of said bucket in said frame.

2. In an excavator, the combination of a bucket pivoted back of its center of gravity, a hauling cable operatively connected with said bucket, hoisting means for lifting said bucket, a lever operatively interposed between said bucket and hoisting means for preventing said bucket from tilting to a dumping position, and an operative connection between said lever and said hauling cable to release said lever and dump said bucket on reduction of the tension on said cable.

3. The combination of a bucket, a frame trunnioned to said bucket back of its center of gravity, a lever operatively interposed between said hoisting means and said bucket at one side of the trunnions to prevent said

bucket from tipping to its dumping position, hauling means operatively connected with said bucket, and a controlling line connected to said lever and controlled by said hauling means.

4. In an excavator, the combination of a bucket, a frame trunnioned thereto, a shoulder on said bucket, a lever pivoted to said frame and coacting with said shoulder to hold said bucket against dumping, a hauling cable for said bucket, and a controlling line connected to said lever and controlled through said hauling cable.

5. In an excavator, the combination of a bucket, a frame trunnioned to said bucket, a roller carried by said bucket, and a lever pivoted to said frame and normally coöperating with said roller to establish a controlling connection between said frame and said bucket.

6. In an excavator, the combination of a frame adapted for engagement with a hoisting cable, a bucket trunnioned to said frame and carrying a roller, a lever pivoted to said frame and adapted to bear against said roller, hauling means operatively connected to said bucket, and a controlling line connecting said lever to said hauling means.

7. In an excavator, the combination of a bucket, a frame trunnioned to said bucket and adapted to normally swing on its trunnions into and out of dumping position, a lever operatively connected to said frame and adapted to initially hold said bucket in holding relation to said frame, said lever being movable to release said bucket and permit dumping, a hauling cable for said bucket and a controlling line connected with said lever and controlled through said hauling cable.

8. In an excavator, the combination of a bucket, supporting means pivoted to said bucket, a lever pivoted to said supporting means, a roller mounted on said bucket and engaging said lever, and means for moving said lever to release said roller and allow said bucket to turn on its pivotal mounting.

9. In an excavator, the combination of a bucket open at the front, a frame trunnioned thereto back of the center of gravity of said bucket, a lever operatively interposed between said bucket and frame and initially holding said bucket against tipping to its dumping position, a hauling cable operatively connected to said bucket, a hoisting cable connected to said frame, and means operative through manipulation of said cables for releasing said lever to allow said bucket to dump.

10. In an excavator, the combination of a bucket, a frame trunnioned thereto back of the center of gravity thereof, a roller carried by said bucket, means initially engaging with said roller to hold said bucket against tilting, a hauling cable for said bucket, a

hoisting cable therefor, and a controlling line operative through one of said cables to release said roller engaging means.

5 11. In an excavator, the combination of a frame, a bucket pivotally mounted therein, a hauling cable operatively connected to the front of the bucket, hoisting means for lifting the frame, and a movable detent operatively interposed between said bucket and

frame controlled by the tension on said hauling cable for controlling the tilting of said bucket in said frame. 10

Signed at Chicago this 15th day of December 1909.

OSCAR J. MARTINSON.

Witnesses:

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EDWIN PHELPS.