

O. J. MARTINSON.
EXCAVATOR BUCKET.
APPLICATION FILED SEPT. 28, 1910.

976,088.

Patented Nov. 15, 1910.

2 SHEETS—SHEET 1.

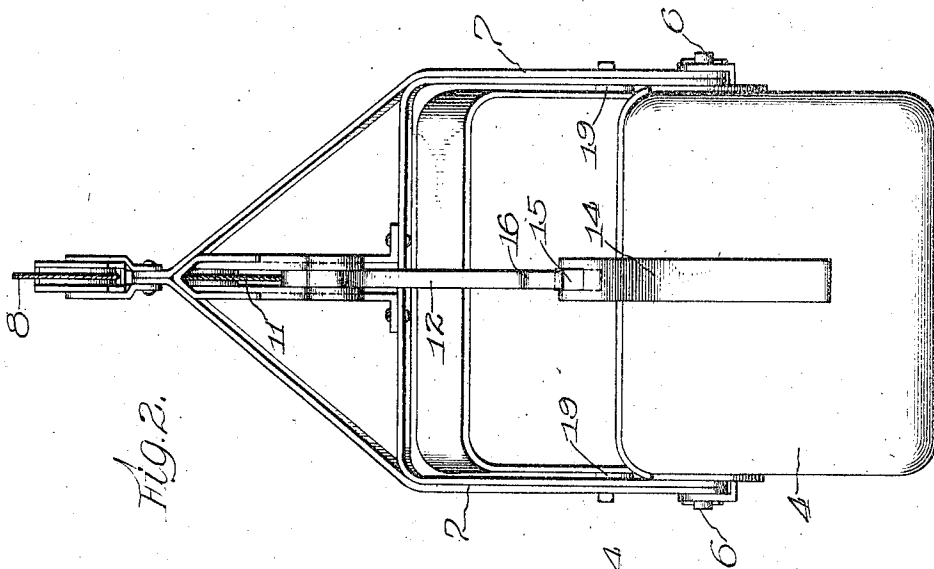


Fig. 2.

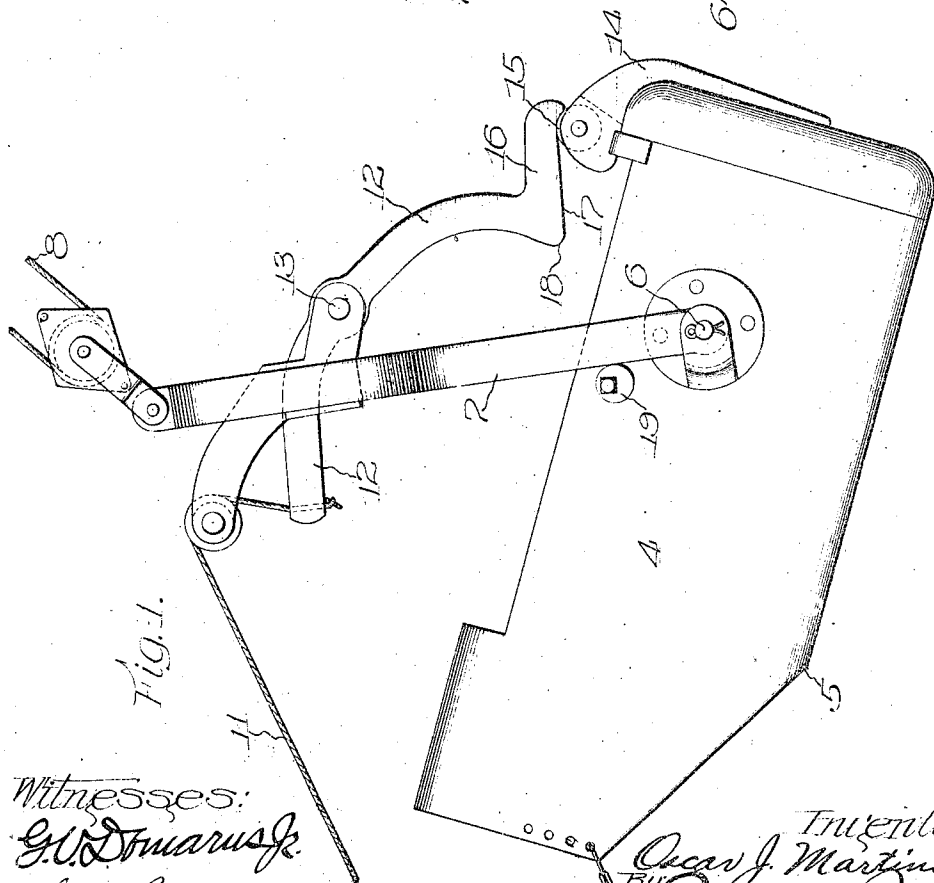


Fig. 1.

Witnesses:

G. D. Dumas Jr.

C. A. Paubrockmatt

Inventor:

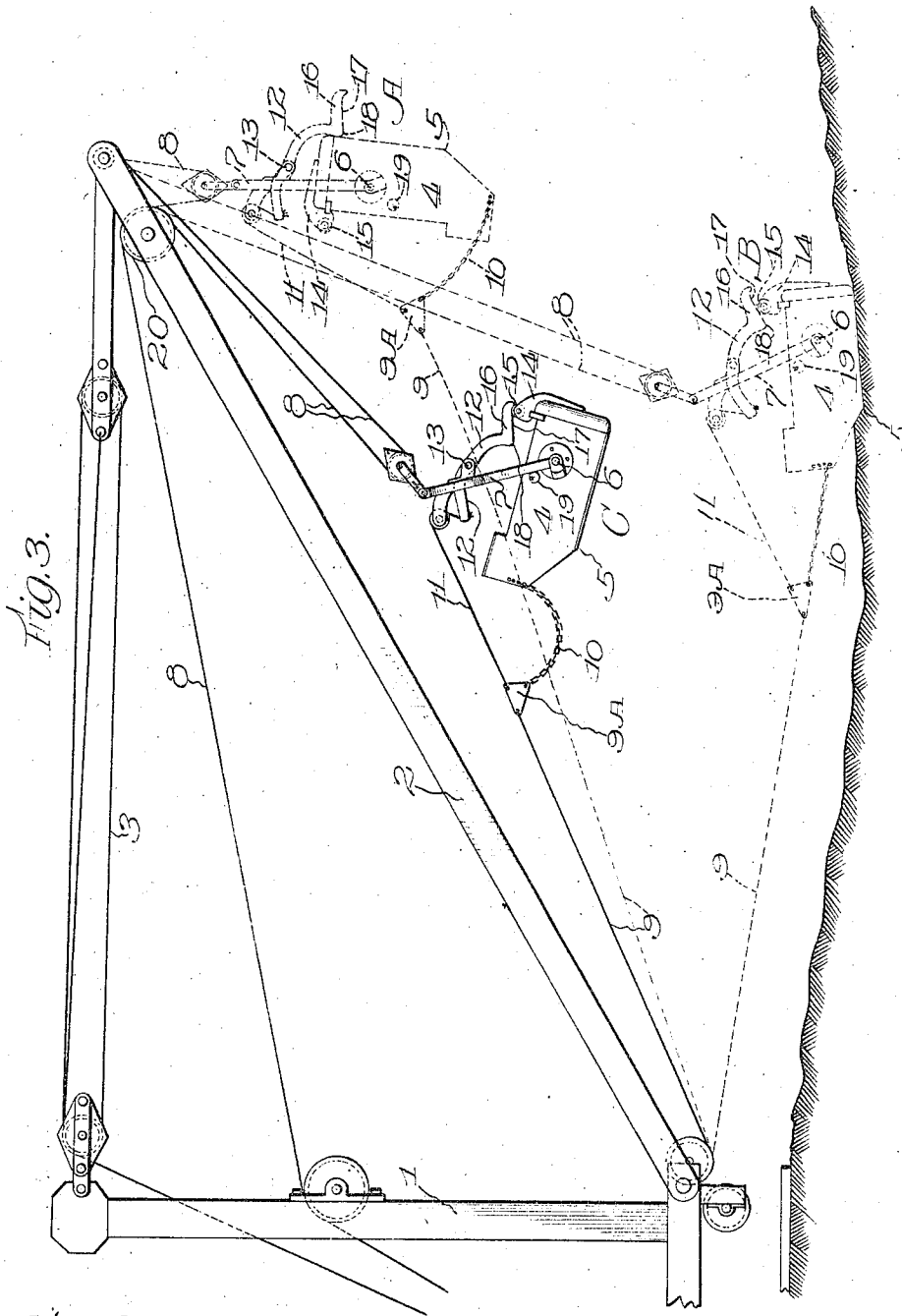
Oscar J. Martinson
By Rummel & Hummel, ATTYS.

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2 SHEETS—SHEET 2.



Witnesses:
G. V. Donatus Jr.
C. A. Pauchenschmidt

Inventor:
Oscar J. Martinson,
By: Hummiller & Hummiller
Attys:

UNITED STATES PATENT OFFICE.

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

EXCAVATOR-BUCKET.

976,088.

Specification of Letters Patent. Patented Nov. 15, 1910.

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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.

The main object of this invention is to provide an improved form of excavator bucket suitable for use with a derrick and adapted to have its dumping and loading movements controlled by the manipulation of the hauling and hoisting cables.

A specific construction embodying this invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of the excavator bucket and its controlling mechanism when the bucket is in its load carrying position. Fig. 2 is a rear elevation of the same. Fig. 3 is a side elevation, showing the method of connecting the bucket with the derrick and illustrating different positions of the bucket.

In the construction shown in the drawings, the derrick is of usual type, and comprises a mast 1 and a boom 2 having its upper end supported by a cable 3 in the usual manner. The bucket 4 is provided with a cutting edge 5 at the front of its bottom, and is supported by trunnions 6 located rearward of its center of gravity and journaled in a supporting frame in the form of a bail 7, which is connected at its upper end with a hoisting cable 8. The hauling cable 9 is divided in front of the bucket so as to provide two parts 10 which are respectively connected to opposite sides of the bucket at points above and in front of the cutting edge 5, and a third part 11 which will be hereinafter referred to as the controlling line, the connection between the hauling cable and these parts being made by means of a triangular plate 9^A.

The tilting of the bucket in the bail is controlled by means of a lever 12 fulcrumed at 13 on the bail 7, and having a forwardly extending arm connected with the controlling line 11, and having a rearwardly extending arm adapted to bear downward on the rearward end of the bucket 4. There is a shoe 14 mounted on the rearward part of the bucket 4 for engagement with the lever 12

and provided at its forward end with an anti-friction roller 15. The rearwardly extending arm of the lever 12 is bent at an angle to provide a foot or part 16, which bears on the roller 15, and which is disposed at an angle to the path of the roller 15 when the bucket turns on its trunnions 6. Any part of the lower surface 17 of the foot 16 is capable of preventing the tipping of the bucket, and there may thus be a considerable angular movement of the bucket on its trunnions while in its load carrying position. The part of the lever 12 in front of the part 16 is curved sharply upward, so that as soon as the roller 15 has passed the heel 18 of the foot 16, the bucket will be free to tip forward to its dumping position. Stops 19 at opposite sides of the bucket engage the bail, and prevent it from tilting backward beyond its load carrying position relative to the bail.

The operation of the device shown is as follows:—The bucket is supported by its bail from the hoisting cable, as illustrated in Fig. 3, and when the hauling cable 9 is slack, the bucket will hang in the position indicated by dotted lines and designated A 80 in Fig. 3. As the front of the bucket is open, this is the dumping position. The bucket may now be dropped to the ground by lowering away on the hoisting cable 8. If it is desired to drop the bucket at a point inward of the end of the boom 2, it may be drawn to such point by a suitable pull on the hauling cable 9 as it is being lowered. When it strikes the ground, it will tip to a horizontal position, on account of the shape 90 of its front end, and when the hoisting cable is slackened, the bail 7 may be pulled forward by the hauling cable so that the parts will assume the position indicated at B (Fig. 3). A pull on the hauling cable 9 95 will now cause the cutting edge 5 to cut into the earth and load the bucket.

As soon as strain is applied to the hoisting cable, a part of the strain on the hauling cable is transmitted to the controlling line 11, which pulls upon the lever 12 and causes it to lock the bail and bucket together, that is, the bail is forced forward against the stop 19, and secured against relative movement with respect to the bucket. If the strain is maintained on the hauling cable 9, the bucket may be lifted clear of the ground by a pull on the hoisting cable, and

will then assume a position as at C. If the hauling cable is paid out gradually, so as to maintain a strain on the controlling line 11, the bucket may be swung to a position below the outer end of the boom. Further paying out of the cable 9 will cause it to release the strain upon the controlling line 11, and the weight of the bucket and its contents, acting through the roller 15, on the inclined surface 17 of the lever, will force the lever out of the way, and permit the bucket to swing to the dumping position, as represented by the dotted lines in position A. The length of the surface 17 on the lever 12 provides for a certain amount of angular movement between the bail 7 and the bucket, while the bucket is in its load carrying position, and thus insures against accidental discharge of the contents of the bucket through a momentary slackening of the hauling cable 9.

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

I claim:—

1. In an excavator, the combination of a bucket, a bail pivoted to said bucket back of its center of gravity, hoisting means connected to said bail for lifting said bucket, a hauling cable operatively connected with the front of the bucket, a lever fulcrumed on said bail and adapted to control the tilting of said bucket relatively to said bail, a sheave on said bail, and a controlling line extending around said sheave and connecting said lever to said hauling line, so that the position of the lever may be controlled by tension on the hauling line.

2. In an excavator, the combination of a bucket open at the front, a bail pivotally connected thereto at a point back of the center of gravity thereof, a lever fulcrumed on said bail and having a part extending rearward of its fulcrum and adapted to bear on said bucket to prevent the same from tilting forward to its dumping position, a hauling line for said bucket, a sheave on said bail, and a controlling line passing over said sheave and connected between said lever and hauling line for controlling the movement of the lever.

3. In an excavator, the combination of a bucket, a bail pivoted to said bucket, hoisting means connected with said bail, a lever fulcrumed on said bail and having arms extending respectively in front of and behind said fulcrum, a hauling cable operatively connected with said bucket, a sheave on said bail, a controlling line passing over said sheave and connecting said hauling line with one arm of said lever, the other arm of said

lever being adapted to control the tilting of said bucket in said bail through the tension on said controlling line.

4. In an excavator, the combination of a bucket, a bail pivoted to said bucket, hoisting means connected with said bail, a lever fulcrumed on said bail and having arms extending respectively in front of and behind said fulcrum, a hauling cable operatively connected with said bucket, a sheave on said bail, a controlling line passing over said sheave and connecting said hauling line with the front arm of said lever, the other arm of said lever being adapted to control the tilting of said bucket in said bail through the tension on said controlling line.

5. In an excavator, the combination of a bucket, a bail pivoted to said bucket, hoisting means connected with said bail, a lever fulcrumed on said bail and having arms extending respectively in front of and behind said fulcrum, a hauling cable operatively connected with said bucket, a sheave on said bail above said lever, a controlling line passing over said sheave and connecting said hauling line with the front arm of said lever, the other arm of said lever being adapted to bear downward on said bucket at a point rearward of its pivotal connection to said bail to control the tilting of said bucket in said bail through the tension on said controlling line.

6. In an excavator, the combination of a bucket, a bail pivoted to said bucket, hoisting means connected with said bail, a lever fulcrumed on said bail and having arms extending respectively in front of and behind said fulcrum, a hauling cable operatively connected with said bucket, a sheave on said bail, a controlling line passing over said sheave and connecting said hauling line with the front arm of said lever, the other arm of said lever being adapted to control the tilting of said bucket in said bail through the tension on said controlling line, and an anti-friction roller interposed between said bucket and said rearwardly extending arm.

7. In an excavator, the combination of a bucket, a bail pivoted to said bucket, hoisting means connected with said bail, a lever fulcrumed on said bail and having arms extending respectively in front of and behind said fulcrum, a hauling cable operatively connected with said bucket, a sheave on said bail, a controlling line passing over said sheave and connecting said hauling line with the front arm of said lever, the other arm of said lever being adapted to control the tilting of said bucket in said bail through the tension on said controlling line, and a roller mounted on said bucket behind said bail, said rearwardly extending arm of said lever being bent to provide a part coacting with said roller to prevent the forward tilting of said bucket, said part be-

ing so disposed as to secure the bucket against dumping throughout a considerable range of angular movement of said lever.

8. In an excavator, the combination of a
5 bucket, a bail pivoted to said bucket, hoisting means connected with said bail, a lever fulcrumed on said bail and having arms extending respectively in front of and behind
10 said fulcrum, a hauling cable operatively connected with said bucket, a sheave on said bail, a controlling line passing over said sheave and connecting said hauling line with the front arm of said lever, the other arm
15 of said lever being adapted to control the tilting of said bucket in said bail through the tension on said controlling line, a roller mounted on said bucket behind said bail,

said rearwardly extending arm of said lever being bent to provide a part coacting with said roller to prevent the forward tilting of
20 said bucket, said part being so disposed as to secure the bucket against dumping throughout a considerable range of angular movement of said lever, and said part being inclined in such direction that the pressure
25 of the roller thereon will tend to cause said lever to swing toward a position for releasing said bucket.

Signed at Chicago this 22nd day of September 1910.

OSCAR J. MARTINSON.

Witnesses:

EUGENE A. RUMMLER,
EDWIN PHELPS.