

C. E. BATHRICK.
EXCAVATOR.

APPLICATION FILED SEPT. 28, 1908.

Patented Feb. 27, 1912.

2 SHEETS—SHEET 1.

1,018,602.

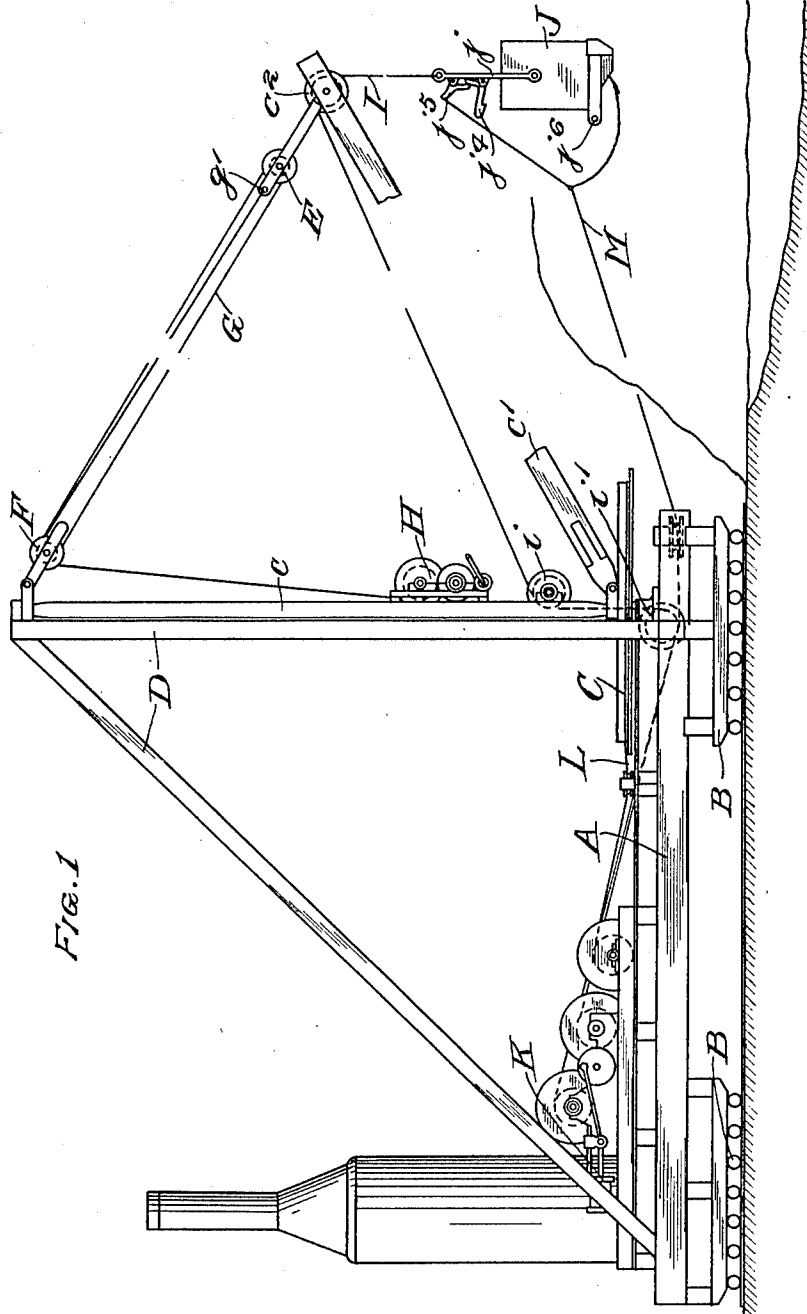


FIG. 1

WITNESSES

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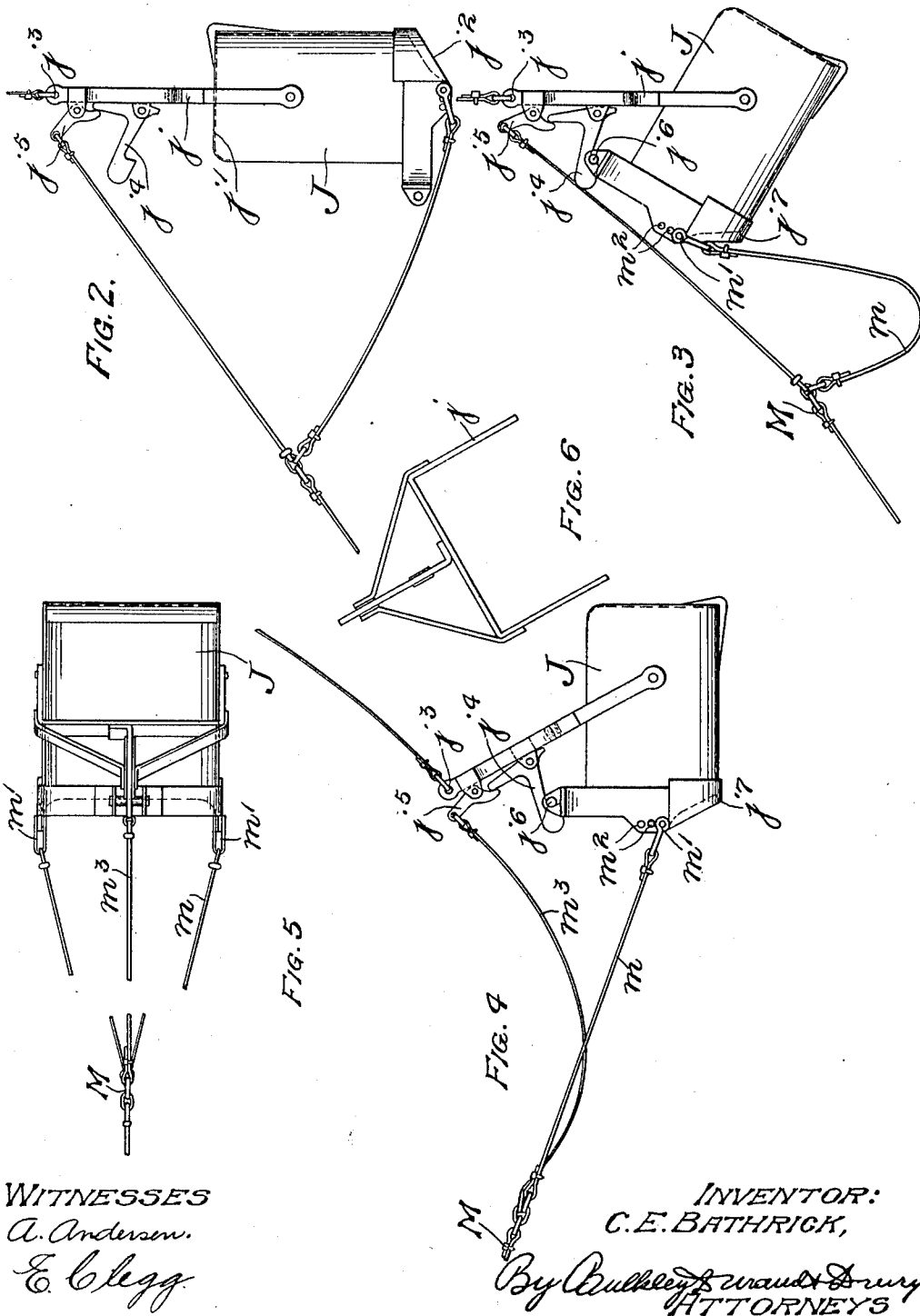
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EXCAVATOR.

1,018,602.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES E. BATHRICK, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Excavators, of which the following is a specification.

My invention relates to excavators of the type ordinarily known as a drag-line bucket. In excavators of this class, a bucket is employed for doing the excavating, the same being operated or drawn along the ground by a drag-line. When the bucket is filled, it is then raised by a hoist-line, and after being brought to the desired position, the load is then dumped from the bucket. Various methods have been proposed for dumping the load from the bucket, as by slacking up on the drag-line, or by a final pull on the hoist-line. Occasionally an additional line or rope has been employed for the purpose of dumping the load from the bucket.

My invention contemplates broadly, therefore, an arrangement whereby the bucket can be unlocked or released and the load dumped by a pull on the drag-line after the bucket has been raised and brought to the desired position for discharging its contents. This I accomplish by so attaching the drag-line that a pull thereon, when the bucket is in loading position, will cause the bucket to fill; but when the bucket is raised, then its position is such that a pull on the drag-line will unlock or release the bucket and cause it to tilt or turn over. When thus turned up side down the bucket discharges the load therefrom. Obviously, there are many advantages in this mode of operation. For example, it obviates the necessity of providing an additional line or rope for dumping the load, and also obviates the necessity of keeping the drag-line taut while the bucket is being raised. Moreover, only a slight pull on the drag line is necessary to dump the load.

To these and other useful ends, my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings:—Figure 1 is a side elevation of a drag-line bucket excavator embodying the principles of my invention. Fig. 2 is an enlarged side elevation of the bucket shown in Fig. 1, showing the same in dumping position. Fig. 3

is a similar view, showing the bucket in position to raise the load. Fig. 4 is a similar view, showing the bucket in loading position. Fig. 5 is a plan of the bucket shown in Fig. 4. Fig. 6 is a detail view showing the bail upon which the bucket is pivotally mounted.

As thus illustrated, the excavator is of the well known form in which the body A is mounted on suitable trucks or skids or other devices B for enabling it to move about. The turn table or reversing circle C is mounted at the forward end of said body and provided with a mast *c* and a boom *c'*. The said mast has its upper end swiveled in an upright frame D that is rigid with the body of the machine. At its outer end the said boom is provided with a sheave E and on its upper end the mast is provided with a similar sheave F; and over these two sheaves a line or rope G is arranged to travel for the purpose of raising and lowering the boom, said line having its end attached at *g'* to the block of the sheave E, as illustrated. The free end of said line or rope G is brought downward from the top of the mast to the hand winch H, which latter is carried by the mast, and whereby the said line or rope can be operated to raise and lower the boom. Another sheave *c''* is mounted at the end of the boom, and over this sheave travels the hoist-line I which carries the bucket J. The said hoist-line is also arranged to travel over a sheave *i* on the base of the mast, thence downward and around a sheave *i'* carried by the body of the machine, and thence back to one of the drums which are operated by the engine K at the rear of the machine. Another line or cable L extends around the circumference of the turn table or reversing circle C, and thence to another one of the drums at the rear of the machine. The drag-line M which is also attached to the bucket, as will hereinafter be explained, extends back below the turn table or reversing circle C, being held in proper position by suitable sheaves and is then led to another one of said drums. It will be understood that these drums can be operated or controlled in any suitable manner, for the purpose of enabling the operator to control the operations of the bucket.

Referring more particularly to Figs. 2 to

6 inclusive, it will be seen that the said bucket is pivoted on a frame or bail j , the axis about which the bucket is adapted to turn being located nearer its rear end j' than its mouth or forward end j^2 . This bail has its upper end provided with an eye j^3 to which is attached the hoist-line, and the said bail is also provided with a pivoted latch or hook j^4 , which is in the form of a bell crank, and which has its upper end arranged in position to be actuated by a pivoted trigger or lever j^5 , in the manner shown. At the front of the bucket, and above the mouth thereof, a cylindric bar or pin j^6 is provided, the same being adapted to be engaged by the latch or hook j^4 when the bucket is in either loading or carrying position, as shown in Figs. 3 and 4. The drag-line M has a draft connection m that is attached to the front of the bucket at m' , which point of connection can be varied or shifted up and down by reason of the holes m^2 in the sides of the bucket. The drag-line also has a hitch m^3 that extends to the upper end of the trigger or pivoted lever j^5 , in the manner illustrated. The mouth of the bucket has a lower cutting edge j^7 that enables it to more effectively cut into the ground and gather up a load.

When the bucket is in the position shown in Fig. 4, the pull of the drag-line will be exerted on the points of the attachment m' at each side thereof, and the bucket will be filled. Then when the drag-line is slackened off and the hoist-line I is drawn taut, the bucket will assume the position shown in Fig. 3 in which position it will sustain the load, being locked to the bail by reason of the engagement of the hook or latch j^4 with the pin j^6 , as previously explained. When the bucket is raised in the desired position, and brought over the place where the load is to be discharged, the draft connection m is then slack, while the hitch m^3 is more taut and extends in direct continuation of the main portion of the drag-line, whereby any pull on the drag-line at this time will be exerted on the trigger or pivoted lever j^5 rather than on the mouth of the bucket. This being the case, the dumping of the load from the bucket is accomplished by a pull on the drag-line, which pull causes the lever j^5 to raise the latch or hook j^4 out of engagement with the pin j^6 , permitting the bucket to turn over or upset and assume the position shown in Fig. 2. In this position the bucket allows the load to fall, and it remains in this position until it is again lowered to the ground by paying out the hoist-line. As soon as it touches the ground, a pull on the drag-line will cause the bucket to again assume the position shown in Fig. 4, and by easing off on the hoist-line, the bail will then fall forward and again lock itself to the forward portion of the bucket. This opera-

tion is repeated to accomplish the desired excavation. Thus it will be seen that only two lines are necessary for the bucket, one a drag-line and the other a hoist-line, and that the dumping is accomplished by a pull on the drag-line. In this way it is not necessary to keep the drag-line taut while the bucket is being raised, nor is it necessary to supply an additional or extra line for dumping the load. Also the bucket can be raised to the maximum height, swung to the desired position, and then tilt it to dumping position by a slight pull on the drag-line. Furthermore, this method permits the dumping of the bucket at any desired height, without changing the position of the boom, as it is not necessary to draw the bucket upward into engagement with the boom in order to dump. Thus the bucket can be raised slightly above the ground and then swung to the desired position and dumped without further manipulation of the hoist-line. Other advantages will be obvious to those familiar with this kind of work.

As a matter of special improvement, it will be seen that the bucket is hoisted in a tilted or inclined position whereby the contents are not liable to fall out. This is of special value when the bucket is used in sand or loose gravel, or other similar soil, as it enables the bucket to fill while in a horizontal position, and to then be hoisted in a position with its mouth or open end higher than its closed rear end, thus preventing the dirt from spilling. When filling, however, the bucket occupies a substantially horizontal position, in the manner illustrated.

Inasmuch as the drag-line is loose or slack while the bucket is being raised, the boom is less liable to be broken or buckled, as the only pull on the drag-line after the bucket is hoisted is the slight jerk that is necessary to unlock the bucket and allow it to upset. Thus there is no necessity of keeping the drag-line taut while the bucket is being elevated, and consequently there is, as explained, practically no danger of the boom being broken or buckled by the strain imposed upon it.

What I claim as my invention is:—

1. A drag-line bucket excavator provided with drag-line controlled locking mechanism adapted to be unlocked for dumping the bucket by a pull on the drag-line, said drag-line having connection with a movable element of said mechanism.

2. A drag-line bucket excavator provided with drag-line controlled locking mechanism adapted to be unlocked for effecting a tilting of the bucket to dumping position by a pull on the drag-line, said drag-line having connection with a movable element of said mechanism.

3. An excavator comprising a bucket, a drag-line therefor, a hoist-line, a latch for locking the bucket in carrying position when the hoist-line is raised, and means actuated by a pull on the drag-line for operating said latch and thereby releasing the bucket to dumping position.

4. An excavator comprising a bucket, a bail therefor, a hoist-line secured to said bail, a latch on said bail, a drag-line secured to said bucket, and a hitch from the drag-line to the latch.

5. The combination of an excavator bucket, a drag-line, means for raising the bucket, adapted to change the position of the latter, and drag-line controlled locking mechanism adapted to be unlocked by a pull on the drag-line after the bucket is raised for dumping the load, said drag-line having connection with a movable element of said mechanism.

6. A bucket provided with a drag-line, a hoist-line, and devices for tilting the bucket when the hoisting line is operated, having provisions for locking the bucket in an inclined position with its mouth or open for-

ward end higher than its closed rear end, to prevent the contents from falling out.

7. A drag-line bucket excavator provided with means for dumping the bucket by a pull on the drag-line, adapted to permit the bucket to discharge while the drag-line remains loose or slack, after the said pull thereon, and means for then lowering the bucket on to the ground to thereby restore it to carrying condition, as set forth.

8. A drag-line bucket excavator provided with means for effecting a tilting of the bucket to dumping position by a pull on the drag-line, adapted to permit the bucket to discharge while the drag-line remains loose or slack, after the said pull thereon, and means for then lowering the bucket on to the ground to thereby restore it to carrying condition, as set forth.

Signed by me at Chicago, Illinois, this 22nd day of September 1908.

CHARLES E. BATHRICK.

Witnesses:

CLARENCE E. TAYLOR,
E. CLEGG.