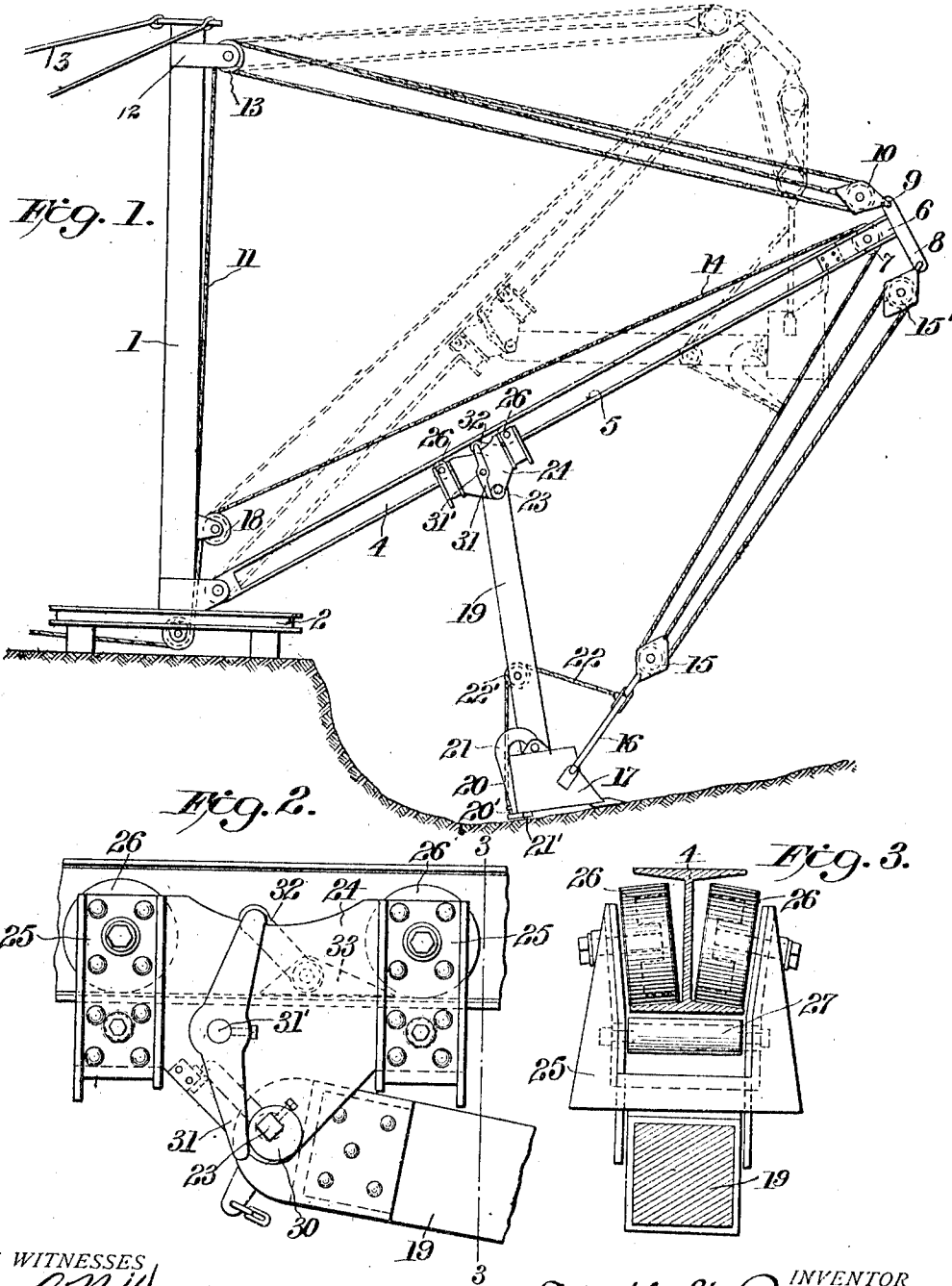


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EXCAVATOR.
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1,064,121.

Patented June 10, 1913.



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EXCAVATOR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ADOLPH G. BANSMER, a subject of the Emperor of Germany, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Excavators, of which the following is a full, clear, and exact specification.

This invention relates to excavators and its principal object is to provide improved means for automatically dumping the bucket when it has been raised to the desired level.

Other objects will become apparent in the course of the following description.

The invention will be first fully described with reference to the accompanying drawings, which form a part of this specification, and then pointed out in the claims at the end of the description.

In the drawings, wherein similar numerals of reference indicate corresponding parts in each of the several views, Figure 1 is a side elevation of an excavator embodying the invention, showing the scraping and dumping positions in full and dotted lines respectively; Fig. 2 is an enlarged side elevation of the carriage and adjacent portions of the boom and dipper arm to more clearly illustrate the brake for clamping the carriage to the boom; and Fig. 3 is a cross section on the line 3—3 of Fig. 2.

The excavator here illustrated as an example of the invention may consist of a mast 1, mounted upon a turntable 2, and secured by guy ropes 3 or other suitable braces. A boom 4 is hinged at its lower end to the lower end portion of the mast, and the boom is constructed with longitudinal tracks 5, along its lower and upper edges, for the travel of the main rollers of the carriage. The boom is preferably made I-shaped in cross section, as shown best in Fig. 3, and to the upper end of said boom there are secured brackets 6 between which is journaled a sheave 7. Beyond the sheave a cross bar 8 is secured to the brackets, and to the upper end of said cross-bar there is pivoted an arm 9 carrying a sheave 10, at its free end. A cable 11, one end of which is secured to a block 12, at the upper end of the mast, is passed around said pulley 10, over a sheave 13, on the block, and thence extends down the mast to be connected with the operating engine (not shown). A second cable 14 passes over the sheave 7, and has one end secured to the lower end of the

cross bar 8, that portion of the cable between the cross-bar 8 and pulley 7, being passed around a sheave 15, mounted on a bail 16, pivoted to and projecting forward from the front end of the bucket or dipper 17 and a sheave 15' mounted on the cross bar 8. From the sheave 7 the cable 14 passes to a sheave 18, on the mast and thence to the operating engine.

The bucket or scoop 17 is carried by the lower end of a dipper arm 19, and the bottom of the bucket constitutes a door 20, which controls the discharge of the material taken up by the bucket. Said door is hung upon overhanging hinges 21, pivoted upon the rear wall of the bucket, and carries a sliding bolt 20', at its free forward edge adapted to engage a keeper 21', on the bottom of the bucket for holding the door normally closed. A cable or chain 22 is attached to the bolt at one end and to the upper portion of the bail 6, at the other end, the intermediate portion of said cable or chain being passed over a sheave 22'. The length of the cable or chain is such as to allow the bolt to engage the keeper when the bucket is in its lowered position for scraping, and to release the bolt from said keeper when the bucket is raised to the desired elevation by reason of the angle between the bail and dipper arm being increased, as said bucket is raised, whereby the dumping of the contents of the bucket is accomplished automatically. The upper end of the dipper arm 19 is secured to a pivot pin or rock shaft 23, rotatably mounted on the carriage which may consist of side plates 24, arranged at opposite sides of the boom and secured to stirrups or hangers 25, extending under the boom and up close to the sides thereof, to furnish bearings for the main supporting rollers or wheels 26, and retaining rollers 27, arranged respectively above and below the tracks 5, as best illustrated in Fig. 3. The rock shaft or pivot pin 23 projects beyond one or both of the side plates 24 of the carriage and has mounted thereon, so as to turn with the dipper arm, an eccentric or eccentrics 30, which bear against the lower end of brake levers 31. Said levers are pivoted intermediate of their ends to the carriage, as at 31', and at their upper ends are pivotally connected to links 32, which extend downwardly and forwardly between the sides of the carriage and the boom and have their lower ends pivoted to

brake shoes 33, arranged to bear upon the rails 5, at opposite sides of the boom and engage between said rails, and the forward supporting rollers 26. It will readily be
 5 seen that when the dipper arm is raised the eccentric will release the brake levers 31 so that the brake shoes will be free and the carriage may then travel along the boom. As the dipper arm is lowered to a perpendicular
 10 position, however, the eccentrics will actuate the brake levers to apply the brake shoes so that the carriage will be locked to the boom during the scraping operation of the bucket or scoop for taking up the dirt, gravel or
 15 other material to be moved. By properly governing the time and speed of operation of the cables 11 and 14, at the engine, the movement of the boom, the carriage, and the bucket may be so adjusted as to lock the
 20 carriage to the boom at any point along the same and discharge the contents of the bucket wherever desired.

In operation, if the parts are in the position shown in Fig. 1, a pull on the cable 14
 25 will draw the bucket through the earth or material to be moved until said bucket is filled. The boom is then drawn upward by means of the cable 11, simultaneously with the raising of the dipper arm by the cable
 30 14, and at the proper time the cable or chain 22 will be tightened sufficiently to withdraw the bolt 20', on the door of the bucket from the keeper 21', thereby causing the automatic dumping of the contents
 35 of the bucket when the latter has reached a position over the dumping point. Fortaking up another scoop full of material the cable 14 is first gently slackened, allowing the carriage to descend along the boom to
 40 any desired point, whereupon said cable is released so that the dipper arm will swing downward to a position approximately at right angles to the boom, thereby operating the brake to prevent further movement of
 45 the carriage along the boom. The cable 11 is then paid out to allow the boom to swing downwardly so that its weight resting upon the dipper arm will serve to hold the bucket to its work.

50 Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In an excavator; the combination with a boom, of a dipper arm adapted to swing
 55 toward and away from the boom, a bucket carried by the arm, means pivotally attached to the bucket for swinging the arm toward the boom, and means connected to said arm swinging means for dumping the bucket as
 60 it approaches the boom.

2. In an excavator, the combination with a boom, of a dipper arm adapted to swing toward and away from the boom, a bucket
 65 carried by the arm, a bail pivoted to the bucket, means attached to said bail for

swinging the arm toward the boom, and means connected to said bail for dumping the bucket as it approaches the boom.

3. In an excavator, the combination with a boom, of a dipper arm adapted to swing
 70 toward and away from the boom, a bucket carried by the arm, a closure for the bucket, means to normally lock said closure, means pivotally attached to the bucket for swing-
 75 ing the arm toward the boom, and means of connection between the locking means and arm swinging means, whereby the bucket is automatically dumped as it approaches the boom.

4. In an excavator, the combination with a boom, of a dipper arm adapted to swing
 80 toward and away from the boom, a bucket carried by the arm, a closure for the bucket, means to normally lock said closure, means pivotally attached to the bucket for swing-
 85 ing the arm toward the boom, a sheave on the arm, and flexible connecting means extending between said locking means and arm swinging means and passed over said
 90 sheave, whereby the bucket is automatically dumped as it approaches the boom.

5. In an excavator, the combination with a boom, of a carriage, mounted to travel
 95 thereon, a dipper arm hung from the carriage, a bucket carried by said arm, means for automatically locking the carriage to the boom during the scraping action of the bucket, means pivotally attached to the
 100 bucket for swinging the arm toward the boom, and means connected to said arm swinging means for dumping the bucket as it approaches the boom.

6. In an excavator, the combination with a pivoted dipper arm, of a bucket carried
 105 thereby, means pivotally connected to said bucket for swinging said arm upward on its pivot, and means connected to said arm swinging means for dumping the bucket
 110 when the arm has been raised a predetermined distance.

7. In an excavator, the combination with a pivoted dipper arm, of a bucket carried
 115 thereby, means pivotally connected to said bucket for swinging said arm upward on its pivot, said means being arranged to increase its angle to the arm as the latter is raised, a sheave on said arm, and flexible
 120 means connected to said arm swinging means and passed over said sheave, whereby the bucket is automatically dumped when the arm has been raised a predetermined distance.

8. In an excavator, the combination with a pivoted dipper arm, of a bucket carried
 125 thereby, means pivotally connected to said bucket for swinging said arm upward on its pivot, said means being arranged to increase its angle to the arm as the latter is raised, a closure for the bucket, means for normally
 130 locking said closure, a sheave on the arm,

and flexible means of connection extending
between said locking means and arm swing-
ing means and passed over said sheave for
automatically unlocking the closure when
5 the arm has been raised a predetermined
distance.

In testimony whereof I have signed my

name to this specification in the presence of
two attesting witnesses.

ADOLPH G. BANSMER.

Witnesses:

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