

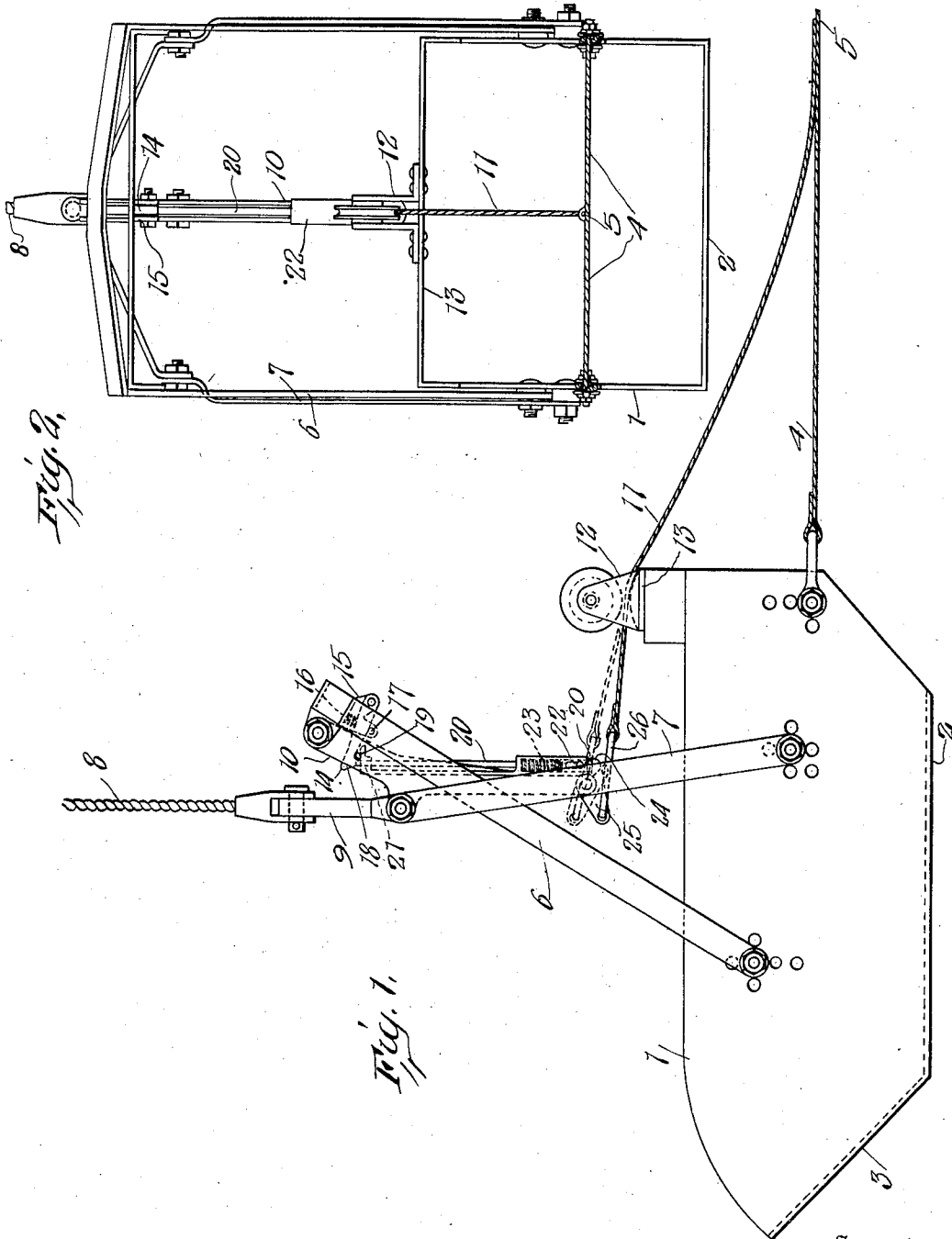
EXCAVATING BUCKET.

APPLICATION FILED SEPT. 24, 1910.

1,050,839.

Patented Jan. 21, 1913.

2 SHEETS—SHEET 1.



Witnesses

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Edward J. Reed

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By

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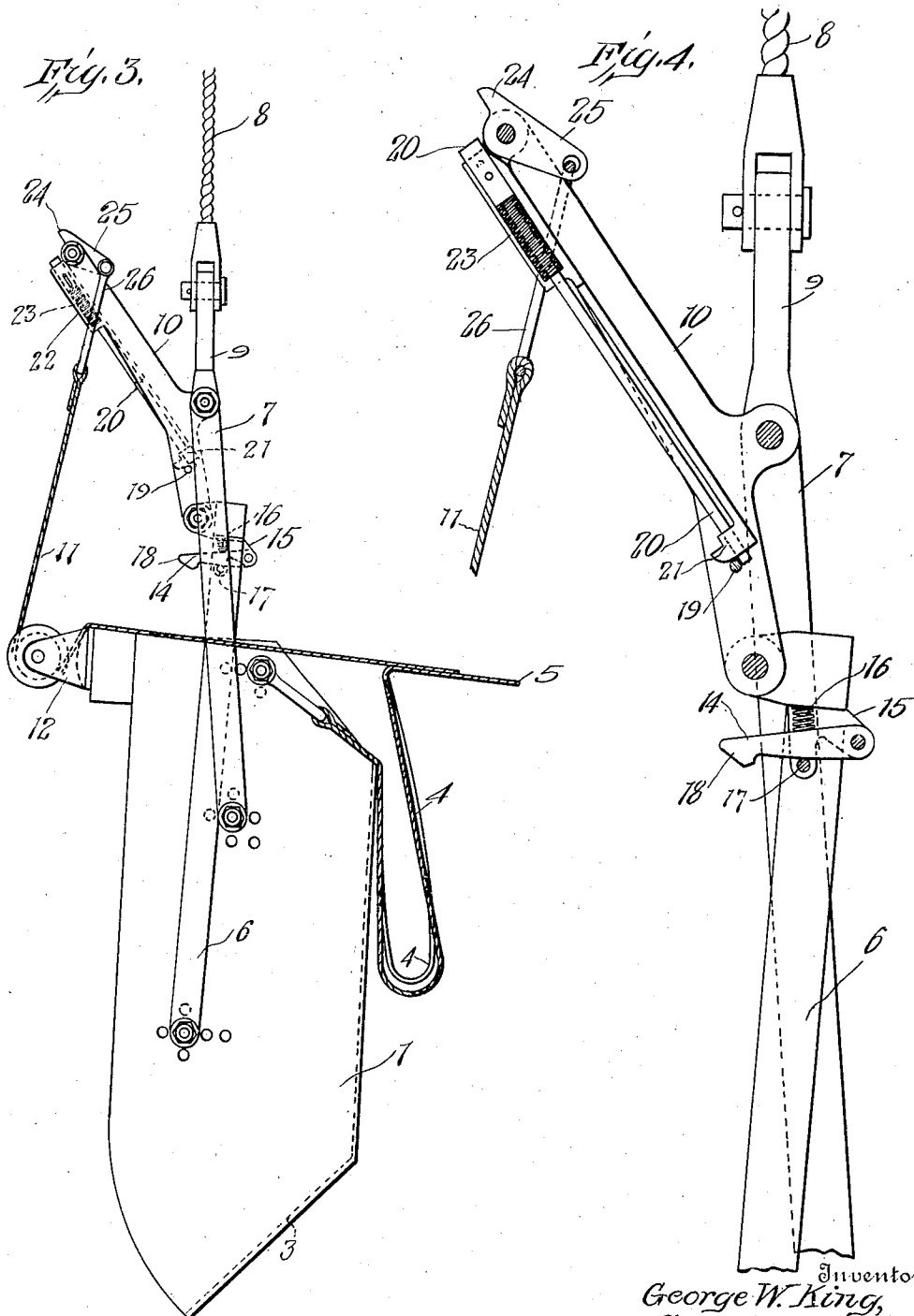
G. W. KING, C. B. KING, H. T. GRACELY & H. E. ROUSH.
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UNITED STATES PATENT OFFICE.

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EXCAVATING-BUCKET.

1,050,839.

Specification of Letters Patent.

Patented Jan. 21, 1913.

Application filed September 24, 1910. Serial No. 583,612.

To all whom it may concern:

Be it known that we, GEORGE W. KING, CHARLES B. KING, HARVEY T. GRACELY, and HERBERT E. ROUSH, citizens of the United States, residing at Marion, in the county of Marion and State of Ohio, have invented certain new and useful Improvements in Excavating-Buckets, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to excavating buckets and more particularly to that type of excavating bucket known as a drag line bucket.

The object of the invention is to provide a bucket of this type which will be supported in its hoisting position without effort on the part of the operator and without imposing any strain on the drag line, and which can be dumped at the will of the operator.

It is also an object of the invention to provide such a bucket which can be dumped from the rear end thereof, *i. e.*, from the end opposite the filling end.

To this end it is a further object of the invention to provide a rearward dumping bucket with two supporting members connected one to the other and adapted to be retained in their normal positions, to support the bucket in hoisting position, by means of a retaining device which is under the control of the operator.

In the accompanying drawings, Figure 1 is a side elevation of a bucket embodying our invention, showing the same in hoisting position; Fig. 2 is a front elevation of such a bucket; Fig. 3 is a side elevation of such a bucket showing the same in the position assumed after the load has been dumped; and Fig. 4 is a detail view of the connecting member and retaining device.

In these drawings we have illustrated one embodiment of our invention and have shown the same as applied to a bucket comprising substantially vertical side walls and open at its front and rear ends. The bottom 2 of the bucket is substantially flat for a portion of its length and is then inclined upwardly and rearwardly, as indicated at 3, to a point substantially midway to the height of the bucket. This upwardly extending portion of the bottom of the bucket tends to retain the material within the bucket while it is being filled and hoisted.

Suitable hauling ropes 4 are connected to the forward edges of the side walls of the bucket, converge forwardly and are connected at their forward ends to a drag line 5. It will be noted that the forward end of the bottom 2 of the bucket is some distance in the rear of the forward edges of the side members of the bucket and that the forward lower corners of these side members are cut away. The hauling ropes being connected to the forward edges of the side members will cause the forward end of the bottom to bite into the material over which the bucket is being dragged. The bucket herein shown and described is a good one but is only one of a number of styles which can be used and it is not to be understood that the invention is in any sense limited to this particular type of bucket.

Two supporting members 7 and 6 are pivotally connected to the bucket in the front and rear of its center of gravity, respectively, and one of these supporting members has connected thereto a hoisting rope 8 by means of which the bucket is elevated. These supporting members are, in the present instance, in the form of bails having their side members or arms pivotally connected to the respective side walls of the bucket. The bail 7, which is connected to the bucket in front of its center of gravity, is somewhat shorter than the bail 6 which is connected to the bucket in the rear of its center of gravity and is, moreover, somewhat wider than the bail 6, thus permitting the bail 6 to extend between the side members thereof, as shown in Fig. 1. The hoisting rope 8 is connected to the crosswise member 9 of the bail 7, the side portions of this member being shown as converging upward to the point of connection with the hoisting rope.

The two supporting members are connected one to the other in such a manner as to permit their relative positions to be controlled by the operator, and, further, means are provided for locking the two supporting members in predetermined positions relative one to the other, these predetermined positions being such that the bucket will be supported in hoisting position, *i. e.*, in a position which will retain the material within the same while it is being hoisted. In that form of the device here shown the

connecting member comprises a lever 10 pivotally connected at one end to the rear or longer supporting member or bail 6 and pivotally connected at a point between its ends with the shorter and forward supporting member or bail 7. The other end of the lever extends some distance below its point of connection to the bail 7 and is connected by means of a dumping rope 11 with the drag line 5. The dumping rope passes through a suitable guide 12 supported on a cross bar 13 extending between the side walls of the bucket near the forward end thereof. The means for retaining the supporting members in predetermined positions preferably comprises a locking member pivotally mounted on one of the bails and adapted to engage a second locking member carried by the lever. In the present instance the pivoted locking member comprises a dog or catch 14 pivotally mounted on a bracket 15 rigidly secured to the cross bar of the bail 6. A spring 16 is confined between the latch 14 and the top of the bracket 15 and serves to move the latch downward, this downward movement being limited by a pin 17 mounted in the bracket. The latch 14 is provided at its free end with a nose 18, the outer end of which is beveled, adapted to engage a stop or lug 19 carried by the lever 10 and preferably arranged between the two parallel members constituting that lever. The stop 17 and spring 16 retain the latch 14 in such a position that when the parts are moved toward their normal positions the beveled nose 18 will engage the stop 19 and ride over the same, and, as soon as the nose has passed the stop the spring will force the latch down and cause the rear edge of the nose to engage the stop and retain the parts in their respective positions. This locking device is controlled by means of the dumping rope 11 and a suitable tripping device is interposed between the same and the dumping rope. This tripping device, as here shown, comprises a rod 20 slidably mounted in suitable guides 21 and 22 arranged between the two members of the lever and is supported in alinement with the nose 18 of the latch 14. A spring 23 may, if desired, be employed to retain the rod 20 normally in its lowermost position, *i. e.*, with its end projecting beneath the guide 22. A tripping finger 24 is pivotally mounted upon the lever in such a position that when moved about its pivotal center it will engage the lower end of the rod 20. An actuating arm 25 is rigidly connected with the finger 24 and has connected thereto the adjacent end of a dumping rope 11. This connection is preferably made by means of a loop or bail, 26, which is adapted to extend about the lower end of the lever 10 and permit the end of the dumping rope to rise above the lower

end of said lever. When the actuating arm 25 is in its lowermost position and its outer end is below the pivotal center of the finger 24 a pull on the dumping rope will cause the tripping finger to move the rod 20 upward into engagement with the nose of the latch 14, moving that latch about its pivotal center and releasing the lever therefrom. When the two supporting members are in their predetermined or supporting positions the pull exerted by the hoisting rope 8 will be longitudinally to the lever 10 but will not be in direct alinement therewith. Consequently, the pull will exert a slight tendency to cause the supporting members to move relatively one to the other, but this tendency will be so slight that a light catch will easily resist the same. This tendency of the supporting members to move relatively one to the other is sufficient, however, to cause this movement to take place when the lever is released from the latch, and, consequently, when the lever is so released, the bail 6 and the rear end of the bucket to which it is connected will move downward relatively to the bail 7 and the hoisting rope 8 which is connected thereto, thus causing the material to be discharged from the rear end of the bucket.

Buckets of this character are commonly operated from the end of a boom which is so mounted that its outer end will swing in the arc of a circle. When the bucket has been filled and hoisted above the bank which is being excavated a swinging movement imparted to the boom will cause the bucket to swing outward beyond the end of the boom, and, by tripping the catch which retains the supporting members in their supporting positions while the bucket is being swung outward, the centrifugal force will cause the material to be thrown beyond the end of the bucket, thus enabling the material to be deposited at a point considerably removed from the end of the boom, a feature which is very desirable in certain classes of work.

When the bucket has been filled and is being hoisted it will occupy the position shown in Fig. 1. After it has been elevated the desired distance and the dumping rope has been actuated to release the lever and permit the bucket to dump it will assume the position shown in Fig. 3. This position will be assumed as soon as the movement of the boom has ceased. It will be noted, however, that the rear end of the bucket hangs downward and if the bucket were dropped onto the bank in this position the rear end would strike and difficulty would be experienced in righting the bucket and filling it. To avoid this the bucket is moved into its normal or hoisting position before it is dropped onto the ground, which is accomplished by a pull on the drag line. The dumping rope

11, which passes about the guide 12, will draw the lever and the supporting members, to which it is connected, toward their normal positions. The pull on the dumping rope moves the tripping finger 24 away from the rod 20 and as the parts assume their normal positions the end of the actuating arm 25, to which the dumping rope is connected, is above the pivotal center of the tripping finger. Consequently, the tripping finger will be held out of engagement with the tripping rod 20 even after the parts have assumed their normal positions, thus permitting the catch 14 to drop into engagement with the stop 19. When the parts have assumed their normal positions the dumping rope is slacked off and the drag line manipulated to cause the forward edge of the bucket to engage the bank and to fill the bucket. As soon as the dumping rope is slacked off the end of the actuating arm 25 will drop below the pivotal center of the tripping finger and the next pull on the dumping rope will move the tripping finger into engagement with the tripping rod 20. By means of this construction only alternate pulls on the dumping rope will actuate the tripping device, thus permitting the dumping rope to be utilized to pull the parts into their normal positions without interfering with the locking of the parts.

While we have shown and described one form of mechanism embodying our invention it will be understood that this form is shown for the purpose of illustration only and that numerous alterations could be made both in the construction and in the arrangement of the several parts without departing from the spirit of our invention. Further, the coöperating parts, such as the hoisting rope, dumping rope and drag line, may be of any suitable character, and while ropes will ordinarily be used to accomplish the functions of these parts, it is obvious that any other device which would perform the functions of these parts would be the full equivalent thereof. We, therefore, wish it to be understood that we do not desire to be limited to the details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. The combination, with an excavating bucket, and a hoisting rope therefor, of two supporting members interposed between said hoisting rope and said bucket, positively actuated means connected with said supporting members to control their relative positions and thus control the position of said bucket, and an operable fastening device to hold said supporting members against movement relatively one to the other in either direction.

2. The combination, with a bucket, and a drag line therefor, of two supporting members connected with said bucket, a device connecting said supporting members one to the other, means for manipulating said connecting device to control the relative positions of said supporting members, and an operable fastening device controlled by said drag line to retain said supporting members in predetermined relative positions.

3. The combination, with a bucket, and means for filling the same, of two supporting members connected with said bucket, a hoisting rope connected with one of said supporting members, a lever connecting said supporting members one to the other, a dumping rope to control the position of said lever, and a device to lock said lever in a predetermined position.

4. The combination, with a bucket, and means for filling the same, of two supporting members connected with said bucket, a hoisting rope connected with one of said supporting members, a lever connecting said supporting members one to the other, a dumping rope to control the position of said lever, a device to lock said lever in a predetermined position, and means controlled by said dumping rope to release said lever from said locking device.

5. The combination, with a bucket, a drag line connected therewith, two bails pivotally connected with said bucket, a lever connecting said bails one to the other, a hoisting rope connected with one of said bails, a rope connecting said lever with said drag line, and means for locking said lever in a predetermined position.

6. The combination, with a bucket, and a drag line connected therewith, of two bails pivotally connected with said bucket, a hoisting rope connected with one of said bails, a lever connecting said bails one to the other, a stop carried by said lever, a catch carried by one of said bails and adapted to engage said stop, and means controlled by said drag line for moving said catch out of engagement with said stop.

7. The combination, with a bucket, and a drag line connected therewith, of two bails pivotally connected with said bucket, a hoisting rope connected with one of said bails, a lever connecting said bails one to the other, a stop carried by said lever, a catch carried by one of said bails and adapted to engage said stop, a tripping device carried by said lever and adapted to engage said catch to move the same out of engagement with said stop, and means for operatively connecting said tripping device with said drag line.

8. The combination, with a bucket, and a drag line connected therewith, of two bails pivotally connected with said bucket, a hoisting rope connected with one of said bails, a lever connecting said bails one to the other,

a stop carried by said lever, a catch carried by one of said bails and adapted to engage said stop, a rod slidably mounted on said lever and arranged to engage said catch, a tripping finger arranged to engage said rod to move the same into engagement with said catch, and a rope operatively connected with said tripping finger.

9. The combination, with a bucket, and a drag line connected therewith, of two bails pivotally connected with said bucket, a hoisting rope connected with one of said bails, a lever connecting said bails one to the other, a stop carried by said lever, a catch carried by one of said bails and adapted to engage said stop, a rod slidably mounted on said lever and arranged to engage said catch, a tripping finger arranged to engage said rod to move the same into engagement with said catch, and a rope for operatively connecting said tripping finger with said drag line.

10. The combination, with a bucket, and a drag line connected therewith, of two bails pivotally connected with said bucket, a hoisting rope connected with one of said bails, a lever connecting said bails one to the other, a stop carried by said lever, a catch carried by one of said bails and adapted to engage said stop, a rod slidably mounted on said lever and arranged to engage said catch, a tripping finger arranged to engage said rod to move the same into engagement with said catch, an actuating arm rigidly connected with said tripping finger and having its outer end adapted to be moved above and below the pivotal center of said tripping finger, and a rope connected with the outer end of said actuating arm and extending forwardly past the pivotal center of said tripping finger, whereby, a pull on said rope when said actuating arm is below the pivotal center of said finger will cause said tripping finger to operatively engage said rod and a pull on said rope when said actuating arm is above the pivotal center of said finger will retain said finger out of engagement with said rod.

11. The combination, with a bucket, and means for filling the same, of two supporting members connected with said bucket, a hoisting rope connected with one of said supporting members, a lever connecting said supporting members one to the other, a device to lock said lever in a predetermined position, a tripping device to release said lever comprising a member movable from one position to another, and a rope operatively connected with said movable member.

12. The combination, with a bucket, and a drag line connected therewith, of two bails pivotally connected with said bucket, a hoisting rope connected with one of said bails, a lever for connecting said bails one to the other, a locking device for securing said lever in a predetermined position, a tripping

member for said locking device, a rope, and a movable member for operatively connecting said rope with said tripping member upon alternate movements of said movable member.

13. The combination, with a bucket, and means for filling the same, of two intersecting supporting members pivotally connected to said bucket, a hoisting rope connected to one of said supporting members, a device to connect said supporting members one to the other, and means to manipulate said connecting device.

14. The combination, with a bucket open at its front and rear ends, and a drag line connected to the front end of said bucket, of two intersecting supporting members pivotally connected to said bucket in the front and rear of the center of gravity thereof, respectively, a hoisting rope connected with that supporting member which is connected to said bucket in front of its center of gravity, a lever connecting said supporting members one to the other, and a rope connected with said lever.

15. The combination, with a bucket open at its front and rear ends, and a drag line connected to the front end of said bucket, of two intersecting supporting members pivotally connected to said bucket in the front and rear of its center of gravity, respectively, that supporting member which is connected to said bucket at the rear of its center of gravity being of greater length than the other supporting member, a hoisting rope connected with said supporting member which is secured to the bucket in front of its center of gravity, a lever connecting said supporting members one to the other, and a rope operatively connecting said lever with said drag line.

16. The combination, with a bucket open at its front and rear ends, and a drag line connected to the front end of said bucket, of two intersecting bails pivotally connected to the side walls of said bucket in the front and rear of the center of gravity thereof, respectively, one of said bails being of greater length than the other, the shorter bail being connected with said bucket forward of the center of gravity thereof, a hoisting rope connected with said shorter bail, a lever connected at its upper end with said longer bail and connected at a point between its ends with said shorter bail, and a rope operatively connected with said lever.

17. The combination, with a bucket open at its front and rear ends, and a drag line connected to the front end of said bucket, of two intersecting bails pivotally connected to the side walls of said bucket in the front and rear of the center of gravity thereof, respectively, one of said bails being of greater length than the other, the shorter bail being connected with said bucket forward of the

center of gravity thereof, a hoisting rope connected with said shorter bail, a lever connected at its upper end with said longer bail and connected at a point between its ends
5 with said shorter bail, cooperating locking members carried by said longer bail and said lever, and a rope operatively connected with one of said locking members.

18. The combination, with a bucket open
10 at its front and rear ends, and a drag line connected to the front end of said bucket, of two intersecting bails pivotally connected to the side walls of said bucket in the front and rear of the center of gravity thereof, res-
15 spectively, one of said bails being of greater length than the other, the shorter bail being connected with said bucket forward of the center of gravity thereof, a hoisting rope connected with said shorter bail, a lever con-
20 nected at its upper end with said longer bail and connected at a point between its ends with said shorter bail, cooperating locking members carried by one of said bails and by said lever, a tripping device carried by said
25 lever and adapted to engage one of said locking members to move it out of engagement with the other of said locking members, and a dumping rope operatively connected with said tripping device and with
30 said drag line.

19. The combination, with a bucket, and means for filling and hoisting the same; of two supporting members connected with said bucket, a connecting device for said
35 supporting members which may be manipulated to control the relative positions of said

supporting members, a fastening device to hold said supporting members against movement relatively one to the other, and a single actuating member to release said fas- 40
tening device and manipulate said connecting device.

20. The combination, with a bucket, and means for hoisting the same, of two support-
ing members intersecting each other at 45
points between their ends, pivotally connected at their lower ends to said bucket and connected at their upper ends with said hoisting means, and operable means to control the relative positions of said supporting 50
means and thus control the position of said bucket.

21. The combination, with a bucket, and means for hoisting the same, of two support-
ing members intersecting each other at 55
points between their ends, pivotally connected at their lower ends to said bucket and connected at their upper ends with said hoisting means, operable means to control the relative positions of said supporting 60
means and thus control the position of said bucket and means to lock said supporting members against relative movement.

In testimony whereof, we affix our signatures in presence of two witnesses.

GEORGE W. KING.
CHARLES B. KING.
HARVEY T. GRACEY.
HERBERT E. ROUSH.

Witnesses:

M. O. STOLL,
J. H. KUTSCHER.