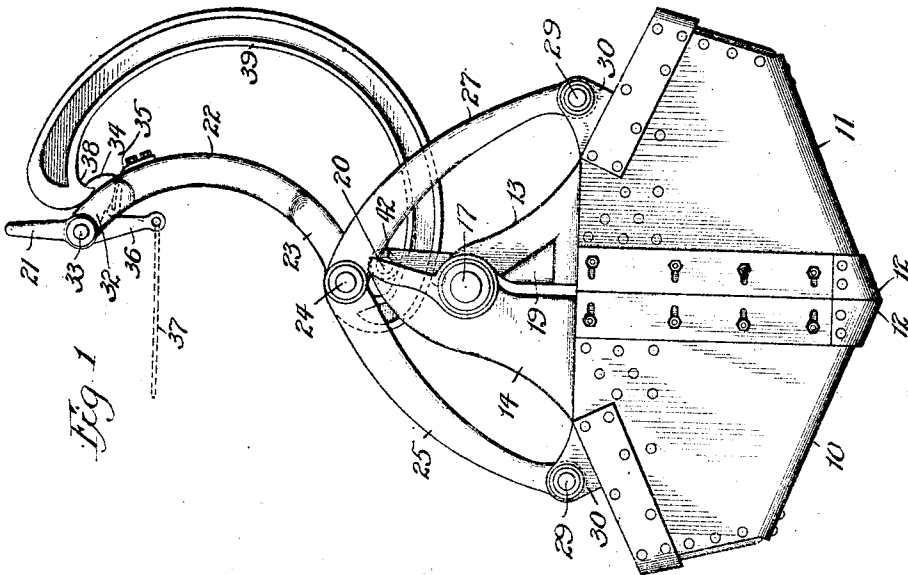
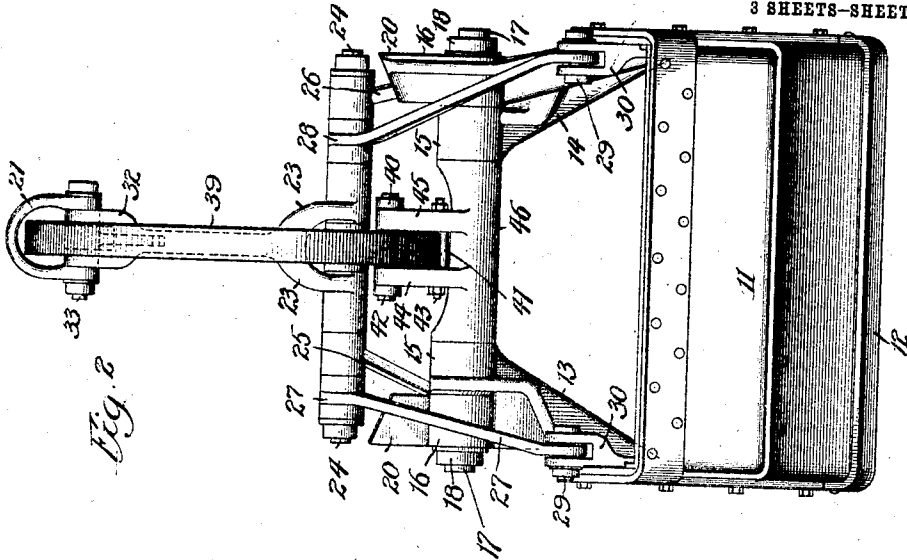


J. L. BUTLER.
 GRAB BUCKET.
 APPLICATION FILED JULY 30, 1909.

1,024,827.

Patented Apr. 30, 1912.

3 SHEETS-SHEET 1.



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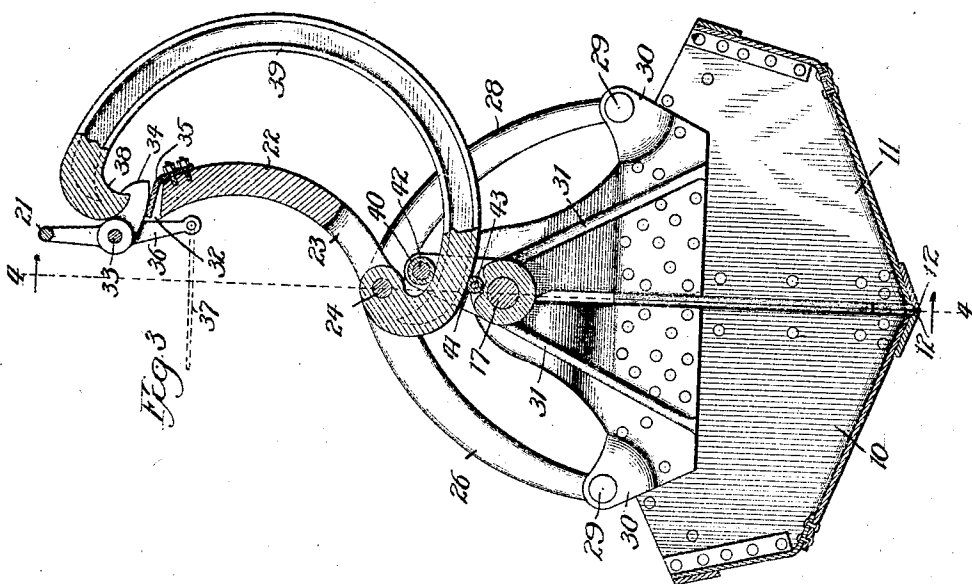
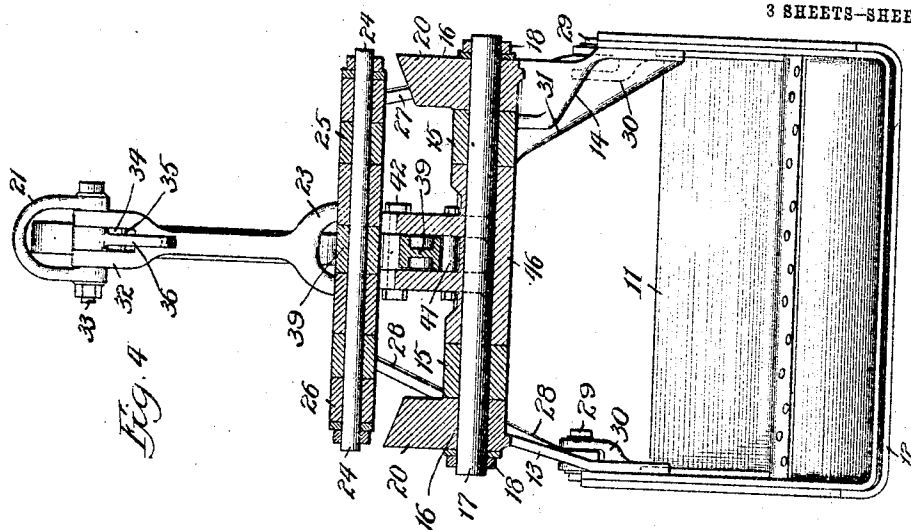
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3 SHEETS-SHEET 2.



Witnesses

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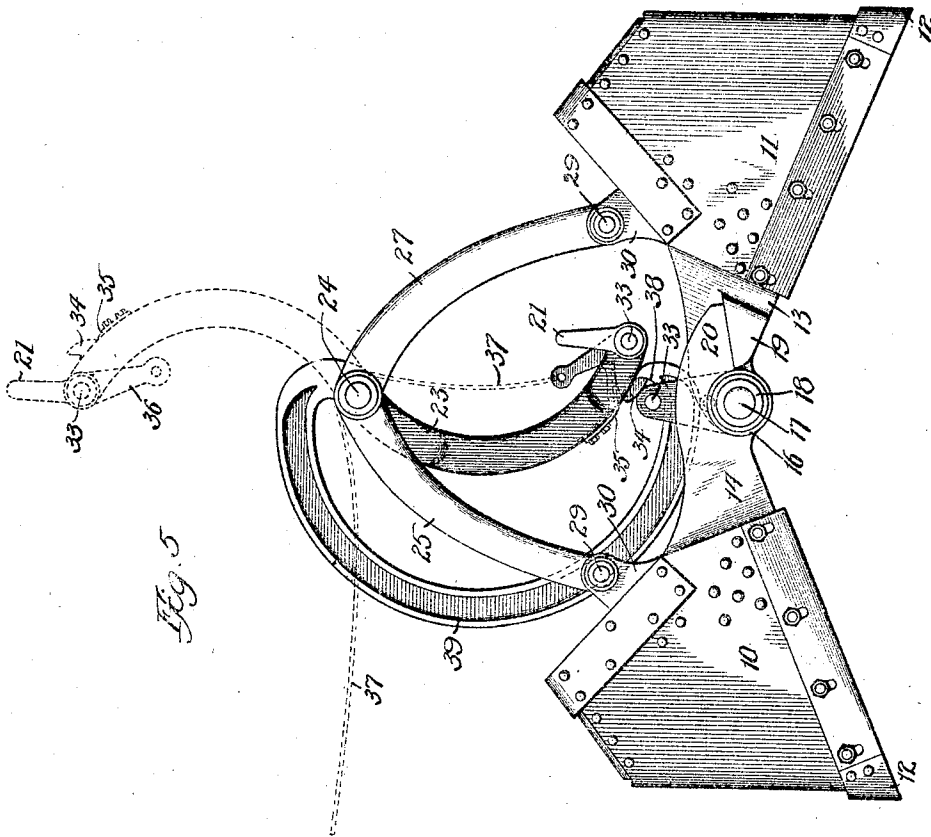
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

JAMES L. BUTLER, OF ALLIANCE, OHIO.

GRAB-BUCKET.

1,024,827.

Specification of Letters Patent.

Patented Apr. 30, 1912.

Application filed July 30, 1909. Serial No. 510,348.

To all whom it may concern:

Be it known that I, JAMES L. BUTLER, a citizen of the United States, residing at Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Grab-Buckets, of which the following is a specification.

My invention relates to features of novelty and improvement in the operating mechanism of buckets, and more particularly those of the grab companion bucket type. In such appliances effective actuating means are necessary to secure the closure or load-receiving action of the buckets, and at the same time such buckets must be free to readily drop or discharge their load when necessary.

The provision of a simple and effective appliance for securing these results is the aim and purpose of this invention.

In the accompanying drawings, which form a part of this specification, a preferred and desirable embodiment of this invention has been illustrated, and throughout the various views like reference characters refer to the same parts.

In these drawings—Figure 1 is a side elevation of such an embodiment of this invention, the bucket being shown in closed position; Fig. 2 is an end elevation; Fig. 3 is a central vertical section; Fig. 4 is a vertical section on line 4—4 of Fig. 3; and Fig. 5 is a side elevation of the bucket in open position.

By reference to these drawings it will be made apparent that the device comprises two sharp-edged buckets or shovels 10 and 11 arranged with their cutting edges 12, 12 and their open mouths facing toward one another, as is clearly indicated in the figures. Each bucket or shovel has fastened to the inner faces of its side walls a pair of brackets or arms 13 and 14, the upper ends 15 and 16 of which overlap one another in approximately the planes of the mouths of the buckets, as shown in Fig. 2, and are apertured in alinement for the reception of a hinge rod or pin 17 which constitutes a connection between the two buckets, as will be readily understood, such pin or rod having retaining collars 18, 18 secured to its opposite ends. In order to limit the opening movement or action of such pair of hinged companion buckets each bracket or arm 13

is supplied with a stop or abutment lug 19 disposed on one side of the same and in the path of travel of a cooperating stop finger or extension 20 integral with the bracket 14 of the other bucket. It will be obvious, therefore, that the opening movement of such buckets is limited and restricted by the engagement of the parts 19 and 20 at the opposite sides of the buckets, as is clearly shown in Fig. 5.

The chain or cable of the hoisting or raising and lowering appliance is intended for attachment and engagement with an eye or loop 21 secured to the outer or upper end of a curved actuating arm 22, the lower bifurcated end of which supports a shaft 24 connected to the side walls of the pair of brackets by the four links 25, 26, 27 and 28, the upper ends of which are freely rotatable on the supporting shaft 24, while their lower ends are fulcrumed or pivoted to the buckets at 29 by means of the ears 30 forming integral inwardly off-set parts of the brackets 13 and 14 described above, the latter having strengthening ribs 31 if desired. The upper end 32 of arm 22 is also bifurcated and has hung on the pin or bolt 33, by means of which the loop or eye 21 is attached to said arm, and between the fingers of the bifurcated portion of the latter, a latch 34 pressed outwardly by a leaf-spring 35 secured to the arm and having an apertured portion 36 for the attachment of an operating cord 37, the latch coacting with the hook-shaped part 38 of a curved eccentric or cam 39 hung on the shaft 24 in the bifurcated portion 23 of the arm in such manner that the cam is free to turn or rotate on said shaft. As is clearly shown in Fig. 4, the rotary cam 39 is of I-shape in cross-section and has cooperating with its top and bottom surfaces a pair of rollers 40 and 41 mounted on pins 42 and 43, respectively, supported in the pair of outstanding arms 44 and 45 of a bushing or sleeve 46 supported on and receiving in a longitudinal hole through the same the central portion of the hinge rod 17, the rollers being disposed between such spaced arms, as is indicated.

The operation of this grab bucket takes place in substantially the following manner: Assuming that the bucket is opened, that is the two companion buckets are in separated relation as in Fig. 5, their rotation on the

hinge rod or pin being restricted by the co-operating stops 19 and 20, and that it is desired to actuate the bucket so as to grab or pick up a load of sand or the like, the hoisting mechanism (not shown) is operated so as to permit the actuating arm 22 and the latch 34 which it carries to swing downwardly from the dotted line position to the full line position of Fig. 5, the curved contour of such arm bringing its center of gravity to one side of the shaft 24 so that when freed such arm will swing down to the right as the parts are viewed in Fig. 5. When this arm reaches the position shown in full lines in such figure its latch 34 automatically engages the hook part 38 of the eccentric or cam 39, and upon elevation of the cable or chain (not shown) attached to the loop or eye 21 both the actuating arm 22 and the operating cam 39 are caused to swing upwardly around the shaft 24 until the parts assume the positions indicated in Fig. 1. This rotation of the eccentric or cam 39 about the shaft 24, by coöperation with the roller 40 mounted on the hinge pin or rod 17, lifts such hinge connection between the buckets, turning the latter on the pivoted connection of the supporting links therewith into closed relation as shown in Fig. 1. During such movement of the buckets they grab or grasp a load of the sand or other material upon which such buckets rest during the closing operation. The closed bucket with its load may now be transported by the cable or chain of the hoisting mechanism to the proper dumping point; and when it reaches such position the operator by pulling upon the cord 37 swings the latch 34 sufficiently in opposition to the pressing action of the spring 35 to free the cam from the actuating arm, and as soon as the parts are thus disengaged the cam, due to its off-set center of gravity and the action of the load in the buckets thereupon, swings downwardly around the supporting shaft 24, and in so doing the roller 40 travels on its top surface, such movement of the parts permitting the descent of the hinge connection between the buckets, consequently permitting the opening turning of such buckets on the lower ends of the links and on the bucket hinge connection and the drop or discharge of their load. The operation of loading and discharging the bucket may be repeated indefinitely, as will be readily understood from the above description.

It should be apparent that the hoisting mechanism supports the eye or loop 21 and that the latter through the pin 33 supports the actuating arm 22 such arm in turn through the shaft 24 and the lines 25, 26, 27 and 28 supporting the buckets, while the oscillatory eccentric or cam 39 governs and controls the opening and closing of the buckets by varying the position of their hinge

connection one with the other, such connection, as is clearly illustrated, being at the front or mouth ends of such buckets.

It will be noted that the present device includes a hanger made up of the shaft or cross bar 24 and the swinging links or arms 25, 26, 27 and 28. Each bucket is pivotally hung from one of the pair of arms as at 29, and the two buckets are pivotally connected together by the hinge pin or rod 17. There is a yoke, best shown in Fig. 4, made up of parts 44, 45, 46 and rollers 40 and 41, with which the cam 39 is associated in such a manner as to successively elevate and depress the pivotal connection 17 between the buckets, whereby the latter are swung closed and open.

Although the precise and exact structural features of the various elements of this appliance have been described herein somewhat minutely, it should be noted that the invention is susceptible of a considerable number of embodiments and is not limited to the precise construction shown, since the latter may be modified within comparatively wide limits without departure from the substance and essence of the invention.

I claim:

1. In a device of the character described, the combination with a pair of pivotally connected buckets, of mechanism for raising and lowering the same, and means for opening and closing the buckets comprising a swinging member pivotally carried by said raising and lowering mechanism and having a cam engagement with said buckets.

2. In a device of the character described, the combination with a pair of pivotally connected buckets, of mechanism for raising and lowering the same, and means for opening and closing the buckets comprising a swinging member carried by said raising and lowering mechanism and having a cam engagement with the pivotal connection of said buckets.

3. In a device of the character described, the combination with raising and lowering mechanism, of a pair of buckets pivoted to one another independently of said raising and lowering mechanism, a swinging cam carried by the raising and lowering mechanism, and a connection between said cam and said buckets for opening and closing the same by the swinging movement of the cam.

4. In a device of the character described, the combination of a pair of oppositely-arranged buckets hinged together, a shaft, links connecting said shaft to said buckets, a cam rotatable on said shaft, a roller on said bucket hinge connection coöperating with said cam, an actuating arm rotatable on said shaft and adapted to be connected to suitable hoisting and lowering mechanism, and a latch adapted to detachably connect said arm and cam whereby the companion buck-

ets may be closed together when the cam is swung on the shaft by means of said arm and latch and may swing open when the cam is unlatched from said arm, substantially as described.

5. In a device of the character described, the combination of a pair of oppositely-arranged buckets hinged together, a cam rotatably mounted on said buckets, means associated with the bucket hinge connection and cooperating with said cam or eccentric, a swinging operating arm adapted to be connected to a hoisting and lowering appliance, the center of gravity of said arm being at one side of the line through its swinging attachment and the part adapted for securing to the hoisting appliance, and means to secure and break operative connection between said arm and cam or eccentric, whereby said arm and cam control the opening and closing of said buckets, substantially as described.

6. In a device of the character described, the combination of a hanger, a pair of buckets independently pivoted to the hanger, a pivotal connection between the buckets, a cam pivoted upon the hanger and having a slidable engagement with the pivotal connection between the buckets, and a cam-actuating device mounted upon the hanger, substantially as described.

7. In a device of the character described, the combination of a hanger, a pair of buckets independently pivoted to the hanger, a yoke carried by said pivotal connection, a pivotal connection between the buckets, a cam pivoted upon the hanger and having a slidable engagement with the pivotal connection between the buckets, and a cam-actuating device mounted upon the hanger and provided with a latch for detachable en-

gagement with the cam, substantially as described.

8. In a device of the character described, the combination of a hanger, a pair of buckets independently pivoted to the hanger, a pivotal connection between the buckets, a yoke carried by said pivotal connection, a cam pivoted upon the hanger and having a slidable engagement with the yoke, and a cam-actuating device mounted upon the hanger, substantially as described.

9. In a device of the character described, the combination of a hanger including a cross-bar and two pairs of swinging arms depending therefrom, a pair of bucket members, each bucket member being pivotally hung from a pair of the arms, a pivotal connection between the buckets, a cam pivoted upon the cross bar and having a slidable engagement with the pivotal engagement of the buckets, and means mounted on the cross bar for actuating the cam, substantially as described.

10. In a device of the character described, the combination of a hanger including a cross bar and two pairs of pivotal arms depending therefrom, a pair of buckets, each bucket being pivotally hung from a pair of said arms, a pivotal connection between the buckets, a yoke carried by said pivotal connection, a cam pivoted upon the cross bar and having a slidable engagement with the yoke, and a swinging cam-actuating member mounted upon the cross bar and having a latch for detachable engagement with the cam, substantially as described.

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Witnesses:

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WM. L. CROBAUGH.