

4.SHEETS—SHEET 1.

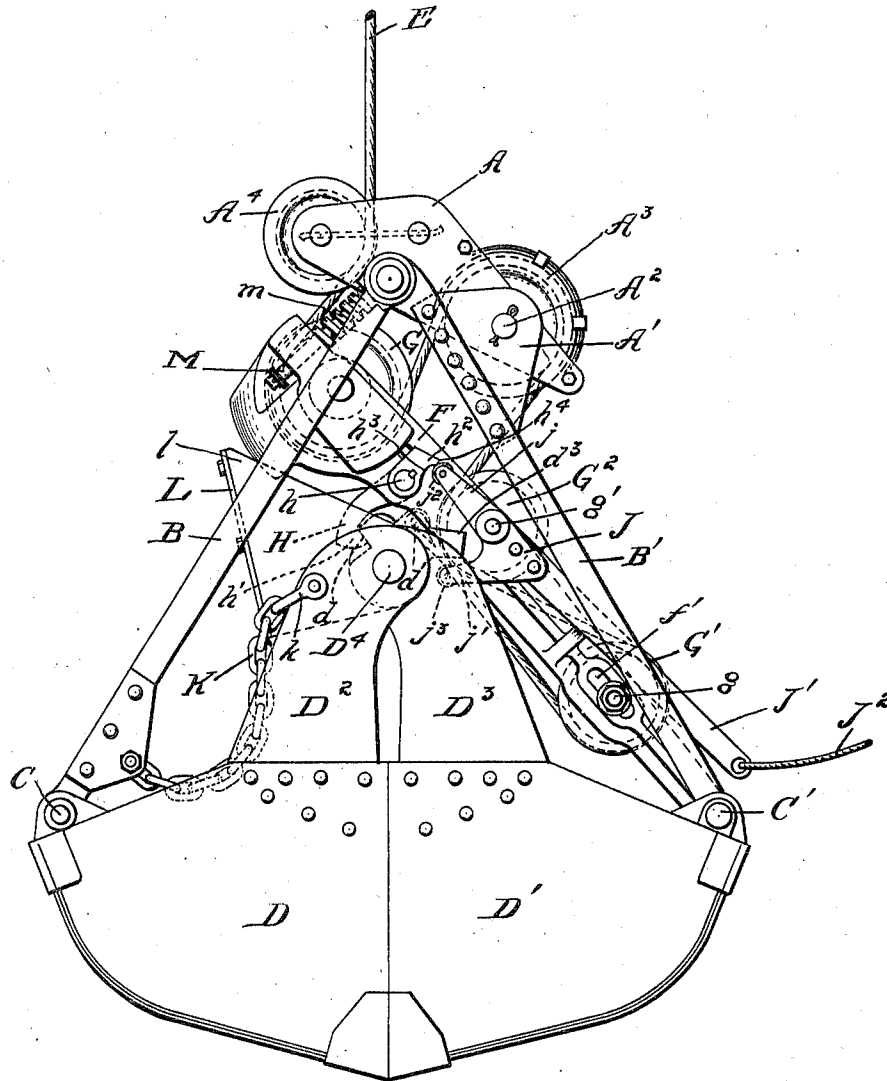


Fig. 1.

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CLAM SHELL BUCKET.
APPLICATION FILED DEC. 2, 1911.

1,062,208.

Patented May 20, 1913.

4 SHEETS—SHEET 2.

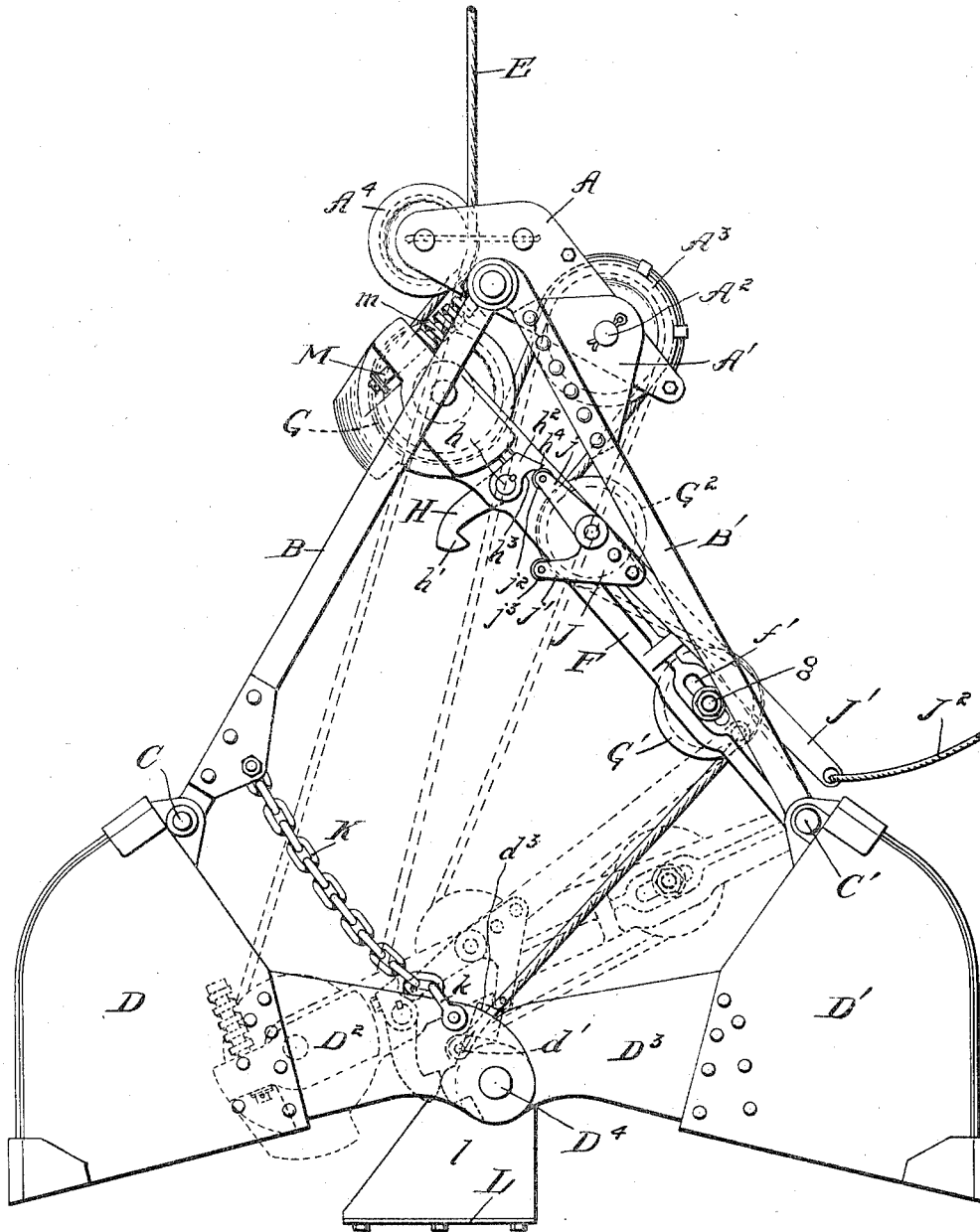


FIG. 2.

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4 SHEETS—SHEET 3.

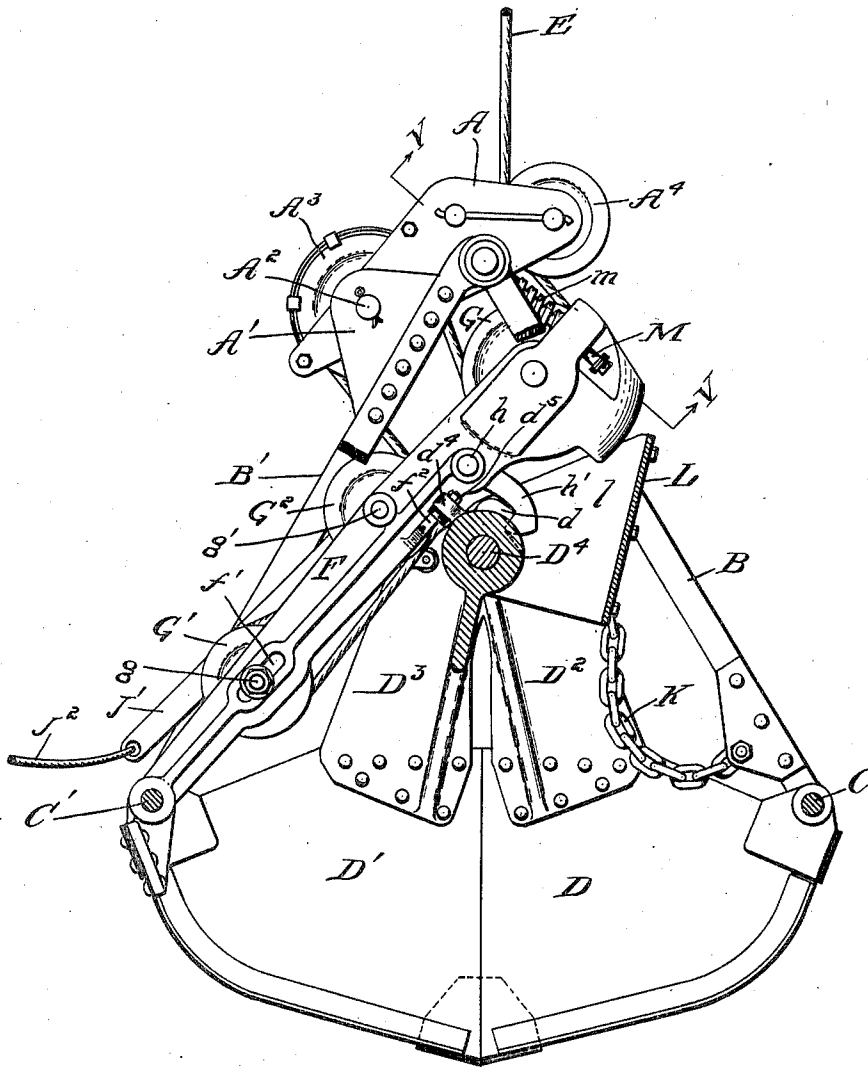


Fig. 3.

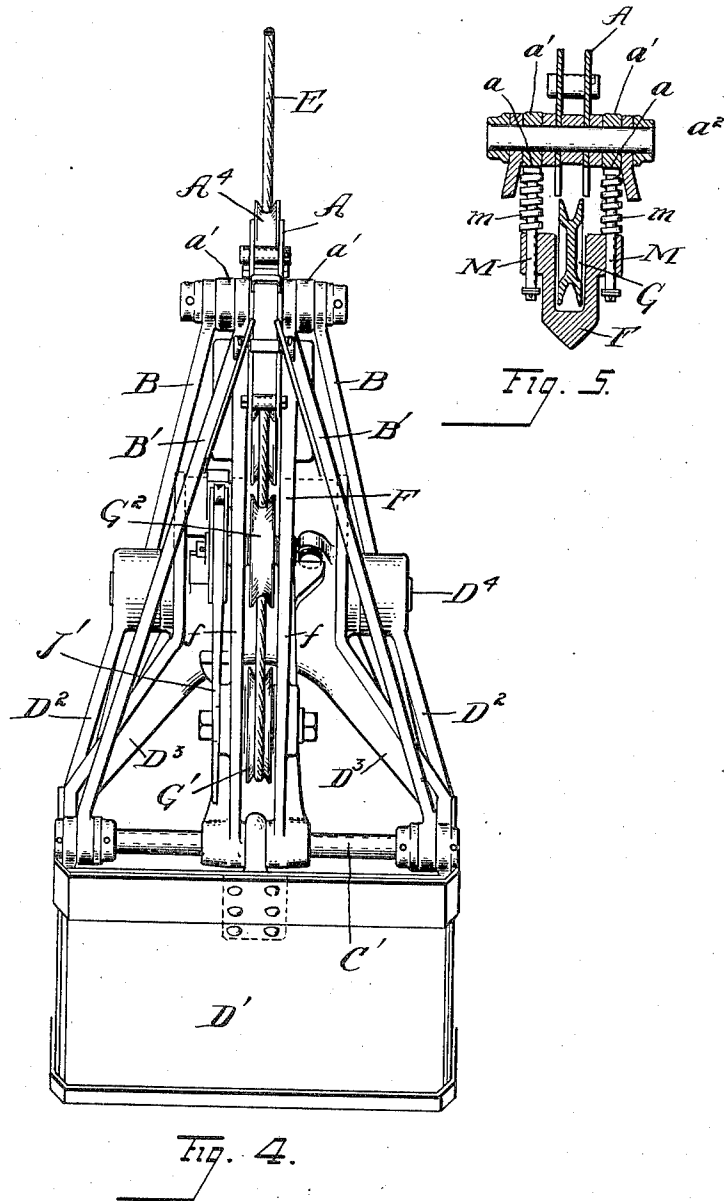
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UNITED STATES PATENT OFFICE.

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CLAM-SHELL BUCKET.

1,062,208.

Specification of Letters Patent.

Patented May 20, 1913.

Application filed December 2, 1911. Serial No. 663,539.

To all whom it may concern:

Be it known that I, CHARLÈ C. WILLIAMS, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Clam-Shell Buckets, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to clam-shell buckets, its object being to provide a bucket which shall be economical in its construction and efficient in its operation.

A specific object of the invention is to provide a clam-shell bucket of what is known as the "single-rope" type, and which will be simple and efficient in its construction and operation.

The said invention consists of means which are hereinafter fully described and particularly set forth in the claims.

The annexed drawings and the following description set forth in detail certain means embodying my invention, the disclosed means, however, constituting but one of various mechanical forms in which the principle of the invention may be applied.

In said annexed drawings:—Figure 1 is a front elevation of a single-rope clam-shell bucket embodying my invention, and showing such bucket in its closed position. Fig. 2 is a front elevation of such bucket and showing same in its open position. Fig. 3 is a fragmentary section and rear elevation of the bucket, in its closed position. Fig. 4 is an end elevation of said bucket. Fig. 5 is a detail section taken upon the plane indicated by line V—V in Fig. 3.

The bucket embodying my invention and illustrated in the drawings, comprises in its structure a support consisting of the frame A; the two pairs of depending arms B and B' depending from and mounted upon the frame A, and the rods C and C' to which the lower ends of the arms B and B' are pivotally connected. The rear or outer ends of the scoop-members D and D' are fixed to or pivotally mounted upon the rods C and C'. The frame A is fixed with reference to the pair of arms B' by means of plates A' riveted to the said arms and connected with the frame by means of the sheave-pin A², which forms the journal for

the sheave A³, the latter forming one of a series of sheaves which provide the running bearing for the hoisting and closing line E, as will hereinafter appear. A second sheave A⁴ is also mounted upon the frame A, and also forms a part of the running bearing for said closing line.

The scoop-member D has riveted to its inner end two extensions D², and the scoop-member D' has riveted to its inner end a bifurcated extension D³ whose upper end is located between the upper ends of the two extensions D², these ends all being mounted upon the pivotal rod D⁴, Fig. 4.

Having its lower end pivoted upon the rod C' is an oscillatory arm F of channel formation and having the two side channel members *f f*, spaced from each other, as shown. Mounted upon suitable journal pins passing transversely through the space between the two members *f f*, of the arm F, are three sheaves, a sheave G at the outer end, a sheave G' at the inner end, and an intermediate sheave G². The pins of the sheaves G and G² are fixed in the arm, but the pin *g* of the sheave G' is mounted in elongated slots *f'* formed in each of the members *f f*, by which means the pin *g* may be shifted or adjusted in the longitudinal direction of the arm F to assume various positions with relation to the sheaves G².

Secured to an oscillatory pin *h* mounted on the arm F, and lying between the two members *f f*, is a depending dog H. This dog is provided with a nose *h'* which is adapted to engage a shoulder *d* formed in the upper end of the bifurcated extension D³, as shown in Fig. 3. One of the outer ends, that is the outer end as illustrated, of the oscillatory pin *h*, has secured to it an arm *h*². This arm is formed with a depression *h*³ formed on the arc of a circle. Also oscillatorily mounted upon the arm F, and for convenience upon the pin *g'* forming the journal for the sheave G², is a locking device J formed with two arms *j* and *j'*. The arm *j'* extends toward the arm *h*², and carries at its end an antifriction roller *j*². This roller engages a lip *h*⁴ formed adjacent to the depression *h*³, when the dog engages the shoulder *d*, as shown in Fig. 1, and thus locks this dog in this position. The locking device J has secured to it a lever J' to which is secured a tripping-line J².

The hoisting and closing line E passes

from the sheave A^4 around the sheave G , then around the sheave A^3 , from whence it passes around the sheave G^2 , around the sheave G' , and then has its lower end secured to the pin d' fixed to the extension D^3 at any suitable point, such pin being shown clearly in dotted lines in Figs. 1 and 2. It will therefore be seen that when the bucket is in its open position, as illustrated in Fig. 2, is resting on the ground and the arm F is in its raised position, as also shown in said figure, said arm may be lowered by slacking away on the line E until the dog H engages the shoulder d . The anti-friction roller j^2 , however, normally engages the lip h^4 , so that unless means were provided for disengaging this roller from such position, the dog could not, in the downward movement of the arm F , engage the shoulder d . In order to effect the release of the dog so that such engagement may be effected, a shoulder d^3 is formed on the extension D^3 , as shown in Fig. 2. This shoulder is so located that it lies in the path of the arm j' of the locking device J . This arm also carries an anti-friction roller j^3 which engages this shoulder at the latter part of the downward movement of said arm F , to throw the device J over into a position in which the roller j^2 lies in the depression h^3 . This permits the dog H to move outwardly a sufficient distance to pass the end of the extension D^3 and engage the shoulder d , as shown in Fig. 2 in dotted lines. Connection between the arm F and the extension D^3 is thus established, and a subsequent pulling-in of the hoisting line E will raise the said arm, and with it the inner ends of the scoop-members. As soon as the roller j^3 is disengaged from the shoulder d^3 , the locking device J , as a result of the action due to the weight of the lever J' , reassumes its locking position, such as is shown in Fig. 1. The continued drawing in of the line E finally effects the complete closure of the scoop-members, so that the parts assume the position shown in Fig. 1. When the parts are in this closing position, it will be noted that the engaging surfaces of the shoulder d and the dog H are such that they would normally disengage each other as a result of gravitation were it not for the fact that locking-device J was arranged to hold the said dog in this position. When it is desired, therefore, to release the dog, for the purpose of discharging the contents of the bucket and permitting it to assume its open position, the tripping-line J^2 is pulled upwardly, thereby causing the arm j to move downwardly to permit the anti-friction roller j^2 to enter the depression h^3 . This action and subsequent position of the locking device with reference to the dog, permits the latter to be disengaged from the shoulder d by the action of gravitation,

which is followed by the downward movement of the inner ends of the scoop-members and the opening of the bucket, as will be readily understood. This downward movement is preferably limited by means of two chains K having their ends fastened to one of the arms B , and a shackle k suitably mounted upon the adjacent extension D^2 , as shown clearly in Figs. 1 and 2.

The closing-line being also the hoisting or suspending-line, is always in tension. When the parts are in their closed positions, it will be noted that the axis of pin d' is located nearer the axis of sheaves G' , than it is when said parts are open, as shown by the drawings. In order therefore, that the scoop-members may open when empty, the said members and the attached parts, that is the lower part of the bucket, must be and hence are, made heavier than the frame-member A and attached parts including the closing-member or arm F , that is the upper part of the bucket. When the tripping mechanism is operated to release the scoop-members, the latter drop and tend to straighten that part of the line E running over the sheaves. On account of the superior weight of the falling parts, such tendency is expressed by a partial straightening of said line, and the consequent rising of the upper part of the bucket. It will also be seen that the sheave G' may be placed in a position such that the line will, at a time prior to that in which the chains K are brought into operation, completely arrest the opening movement, so that the parts will be brought to rest while suspended in the position illustrated in Fig. 2. The said line therefore acts under these conditions as a brake for the downward movement of the scoop-members, and relies for its action, upon the weight of the upper part of the bucket. When the bucket is lowered and rests upon the ground, line E is relaxed, and members D and D' open as far as said chains K will permit.

In order to prevent the unpremeditated disengagement of the dog H from the shoulder d by contact with the material on which the bucket is operating, and when the bucket is in its open position and the arm F has been lowered to effect this engagement, as previously described, a guard-plate L is provided which is suspended from vertical plates l suitably secured to the extension D^3 . This plate, when the bucket is in this open position, extends transversely and beneath the dog H , as shown in Fig. 2.

The extreme end of the arm F is provided with two buffer-members M , which are retained in place by means of coil-springs m , and which are of a length such that they will engage shoulders a , Fig. 5, on the two members a' preferably mounted upon the pin a^2 from which the arms B B' are

suspended. The initial part of this engagement takes place just before the complete closure of the bucket is effected, so that the springs are slightly compressed at the time of such complete closure. The buffer-members M and springs *m* therefore jointly act as a buffer for the moving parts at the time that the parts assume their closing position, and thereby remove deleterious effects of a sudden jar which, in the absence of these elements, would otherwise take place.

As will be noted from the above construction, it is very essential that the position of the shoulder *d* and the nose of the dog H be constantly and accurately maintained, to insure the proper engagement of the dog and shoulder. It is specifically required that spreading of the parts, and consequently an insecure engagement of the dog and shoulder, be prevented, whereby unpremeditated disengagement of these two parts is also prevented. This unpremeditated disengagement would often result in serious accidents to workmen engaged in handling the bucket, and the insurance of such prevention is therefore extremely important. To prevent such accident, the extension D³ is formed with an integral projection or lug *d*⁴, as shown in Fig. 3, and the arm F is formed with an integral projection or lug *f*². The lug *d*⁴ is provided with a threaded bore in which is seated a set-screw *d*⁵, the lower end of which is in a position such that it may engage the upper surface of the lug *f*² when the parts are in their closing position. The set-screw is provided so that this engagement may be accurately obtained. These two parts engaging as they do when the bucket is in its closed position, transfer the strain due to the weight of the parts and the contents of the scoop-members largely from the dog H, and therefore minimize the possibility of dislocation of this dog with reference to the shoulder *d* which it engages. This is due to the fact that the parts are arranged so that when the bucket is filled, the arm F tends to elongate, and therefore cause the dog H to move away from the shoulder *d*. As will be readily seen, the positive engagement of the extension D³ with said arm opposes this longitudinal elongation and consequent displacement of the parts.

Having fully described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a clam-shell bucket, the combination of a frame-member; two oscillatory scoop-members hung from said frame-member; a closing-member suitably pivoted; means for detachably connecting said closing-member and scoop-members; and a closing-line having running engagement with said frame and closing-member, and positively connected with said scoop-members.

2. In a clam-shell bucket, the combination of a frame-member; two oscillatory scoop-members hung from said frame-member; a closing-member suitably pivoted; means for detachably connecting said closing and scoop-members; sheaves mounted upon said frame-member and closing member; and a closing-line positively connected with said scoop-members and passing around said sheaves.

3. In a clam-shell bucket, the combination of a frame-member; two oscillatory scoop-members hung from said frame-member; a closing-member suitably pivoted; means for detachably connecting said closing and scoop-members; and a closing line positively connected with said scoop-members and having a running engagement with said frame and closing member, a point of engagement of said line with the closing-member being adjustable on the latter.

4. In a clam-shell bucket, the combination of a frame-member; two oscillatory scoop-members hung from the latter; a closing-member suitably pivoted; two sheaves mounted upon the latter; a sheave mounted upon the frame-member; and a closing-line permanently attached to said scoop-members, then passing around a sheave on said closing-member; around the sheave on said frame-member, and then around the other sheave on said closing-member.

5. In a clam-shell bucket, the combination of a frame-member; two oscillatory scoop-members hung from the latter; a closing-member suitably pivoted; two sheaves mounted upon the latter; a sheave mounted upon the frame-member; and a closing-line permanently attached to said scoop-members, then passing around a sheave on said closing-member; around the sheave on said frame-member, and then around the other sheave on said closing-member; said first-named sheave being adjustable longitudinally of said closing-member.

6. In a clam-shell bucket, the combination of a frame-member; two scoop-members oscillatorily connected at their outer portions with arms depending from said frame-member, and pivotally connected at their inner ends; an oscillatory closing-member provided with means for detachably connecting such member with the inner ends of said scoop-members; and a closing-line attached to the latter and having a running engagement with said frame-member and closing-member; said closing-line being arranged to oscillate said closing-member.

7. In a clam-shell bucket, the combination of a frame-member; two scoop-members oscillatorily hung from the latter and having their inner ends pivotally connected; an oscillatory arm upon the bucket; a closing-line for raising and lowering said arm; means for detachably connecting the latter with

said scoop-members; said closing-line being
attached to the latter; one of said scoop-
members and said arm being provided with
abutments engaging with each other at such
5 times as the said arm and scoop-members
are connected.

Signed by me, this 29th day of November,
1911.

CHARLES C. WILLIAMS.

Attested by—

WM. R. MILLER,
C. E. KELLER.