Jan. 2, 1923. 1,441,023.

J. F. POLAND ET AL.

UNLOADING MECHANISM.

FILED MAR. 17, 1919.

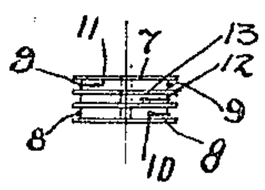

FIG. 3

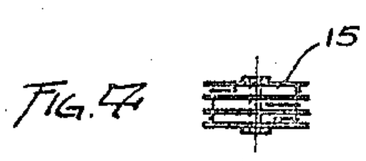

FIG. 4

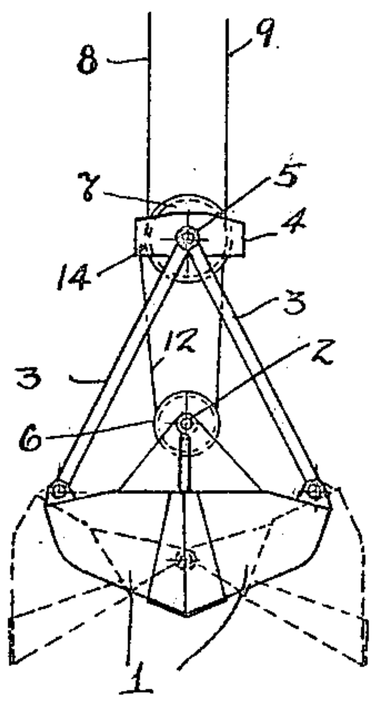

FIG. 1.

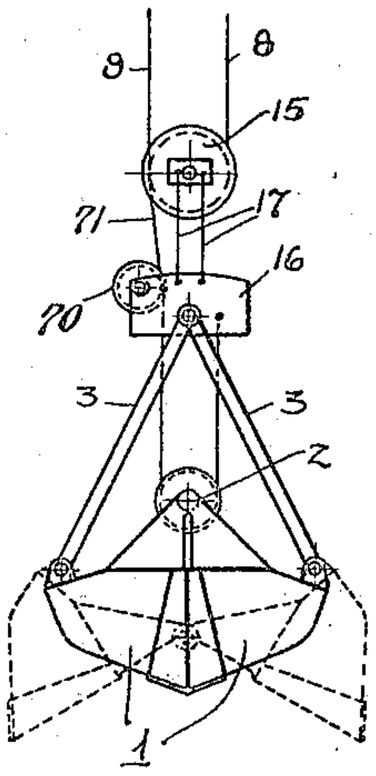

FIG. 2

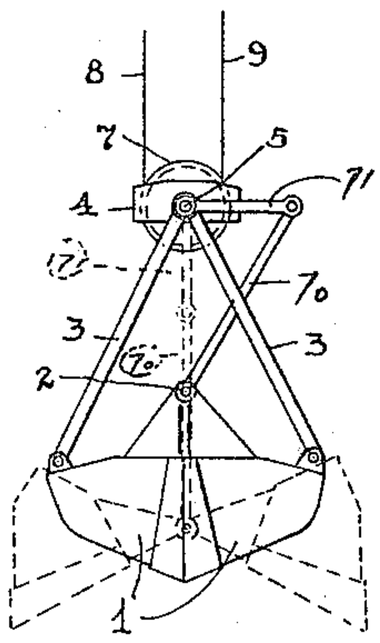

FIG. 5.

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UNITED STATES PATENT OFFICE.

JOHN F. POLAND, OF EAST CLEVELAND, AND RICHARD E. MILLER, OF BAY VILLAGE, OHIO.

UNLOADING MECHANISM.

Application filed March 17, 1919. Serial No. 283,029.

To all whom it may concern:

Be it known that we, JOHN F. POLAND and RICHARD E. MILLER, both citizens of the United States, and residents of East Cleveland, county of Cuyahoga, and State of Ohio, and of Bay Village, county of Cuyahoga, and State of Ohio, respectively, have jointly invented a new and useful Improvement in Unloading Mechanism, of which the following is a specification, the principle of the invention being herein explained and the best mode in which we have contemplated applying that principle, so as to distinguish it from other inventions.

The present invention, relating, as indicated, to unloading mechanism is more particularly directed to an improved grab bucket and means for operating the same for use in connection with an overhead bridge for loading and unloading bulk materials. A further object of the invention is the provision in such a system of a simple mechanism involving but four lines across the bridge, capable of racking the bucket in either direction across the bridge, and of positively opening and closing the bucket itself. The present improvements are further designed to be used in connection with an existing bridge and operating mechanism for providing a better and more positive control for the operation of the bucket and a control involving but two lines but affording positive actuation of the bucket at all times.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

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

In said annexed drawings:—

Fig. 1 is a side elevation of our improved bucket; Fig. 2 is a similar view of the other side of a modification of the bucket; Figs. 3 and 4 are plan views of the sheaves for controlling the buckets of Figs. 1 and 2, respectively; and Fig. 5 is a view of another modification of our bucket.

Reference will first be made to the bucket, as a clear understanding of the bucket is desirable before the explanation of the operating system therefor is made. With reference then to Figs. 1 and 2 we have provided a grab bucket having two co-operative jaws 1, which are pivoted together about an axis 2 disposed above the bucket jaws proper, while the outer ends of the two jaws are connected by means of arms 3 to a bucket head 4, where these arms are pivotally mounted about an axis or shaft 5. In the form of bucket shown in Fig. 1 there is a sheave 6 rotatably mounted upon the axis of the shaft 2 and a second sheave 7 rotatably mounted in the bucket head 4, and attached to the shaft which forms the axis 5 for the two arms 3.

Only two lines are necessary to operate our improved bucket and these two lines 8 and 9 extend downwardly from the bridge or other support above and are then wrapped about the grooves in the sheave 7 in opposite directions, and are fastened or dead-ended on the sheave at the points 10 and 11, respectively. A short line 12 also extends about the upper sheave 7 and is dead-ended at the point 13, this line 12 extending downwardly around the sheave 6 and being dead-ended on the bucket head at the point 14. The line 12 serves as the bucket operating line, directly effecting the opening and closing of the bucket.

In the bucket shown in Fig. 2 the construction is the same as that previously described, except that here an operating sheave 15 is mounted above a bucket head 16, the latter being supported from a frame holding the sheave 15, by means of cables 17. Except for this separation of the operating sheave cables from the bucket head the construction of the bucket of Fig. 2 is identical with that of Fig. 1 and the mounting and operation of the various lines are also identical, as is indicated by the use of corresponding numerals for the lines shown in Fig. 2 on the bucket head 16. In this form of our device there is mounted a sheave 70 to which is attached one end of the cable 12, while a second cable 71 is also attached to this sheave and carried about the upper sheave 15.

The operation of the bucket is entirely controlled by operation of the two lines 8 and 9, which extend about the sheave 7. The line 8 is the opening line and the line 9 is the closing line. If the cable 8 is wound

in, the weight of the bucket and lower sheave will cause the jaws to open, rotating the sheave 7 in a clockwise direction, and thus unwinding the cable 12 from this sheave. This increases the distance between the centers of the sheaves 6 and 7 and allows the bucket jaws to descend or open into the position shown in dotted lines in Figs. 1 and 2. To close the bucket the cable 9 is wound in, rotating the sheave 7 in a counter-clockwise direction and winding in the cable 12. This draws up the bucket jaws to their closed position, shown in full lines in Figs. 1 and 2. To lift the bucket the lines 8 and 9 are drawn in simultaneously, or, if desired, a slightly greater tension may be put on the line 9 than on the line 8, thus insuring that the bucket jaws remain in their closed position, although this will not ordinarily be necessary. By means of the two lines 8 and 9 and our improved bucket construction it is possible to lift or lower and to open or close the bucket positively by the operation of the two lines 8 and 9, which is a very great advantage in the handling of the bucket for many uses.

Our improved bucket possesses one very great operating advantage over the standard two line bucket in which a closing line is slacked away to allow the bucket jaws to open. In such a bucket the closing line must extend from the bucket to the bridge, across the bridge and to the engine. If the bucket is at any great distance from the engine when opened it has to exert a great force to pull the sag out of the line extending over the bridge and consequently great trouble has been found under such conditions. In our bucket, the real bucket closing and opening line —12— is but a few feet in length and no sag troubles can occur. Sag may of course come in the control lines 8 and 9, but these are never operated merely by the bucket's weight, as one or the other is always positively wound in to operate the sheave 7.

Fig. 5 is a further modification of the bucket design, in which two controlling lines 8 and 9 operate, as before, a sheave 7. In this form the cable 12 is omitted and there is substituted therefor two connecting links 70 and 71, of which the former is connected to the axis 2 of the spades of the bucket, while the link 71 is connected to, and operated by, the sheave 7. In such a bucket both the opening and closing of the bucket are positively secured by the rotation of the sheave 7 through the lines 8 and 9.

Other modes of applying the principle of our invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by the following claim or the equivalent of such stated means be employed.

We therefore particularly point out and distinctly claim as our invention:—

In a grab bucket, the combination of two pivotally connected jaws, a bucket head, arms connecting said head and the free ends of said jaws, a sheave mounted in said head, two cables extending about said sheave in opposite directions and attached thereto, and a bucket closing cable attached to said sheave and controlling opening and closing of said bucket, said first named two cables effecting rotation of said sheave to control said closing line.

Signed by us, this 15th day of March, 1919.

JOHN F. POLAND.
RICHARD E. MILLER.