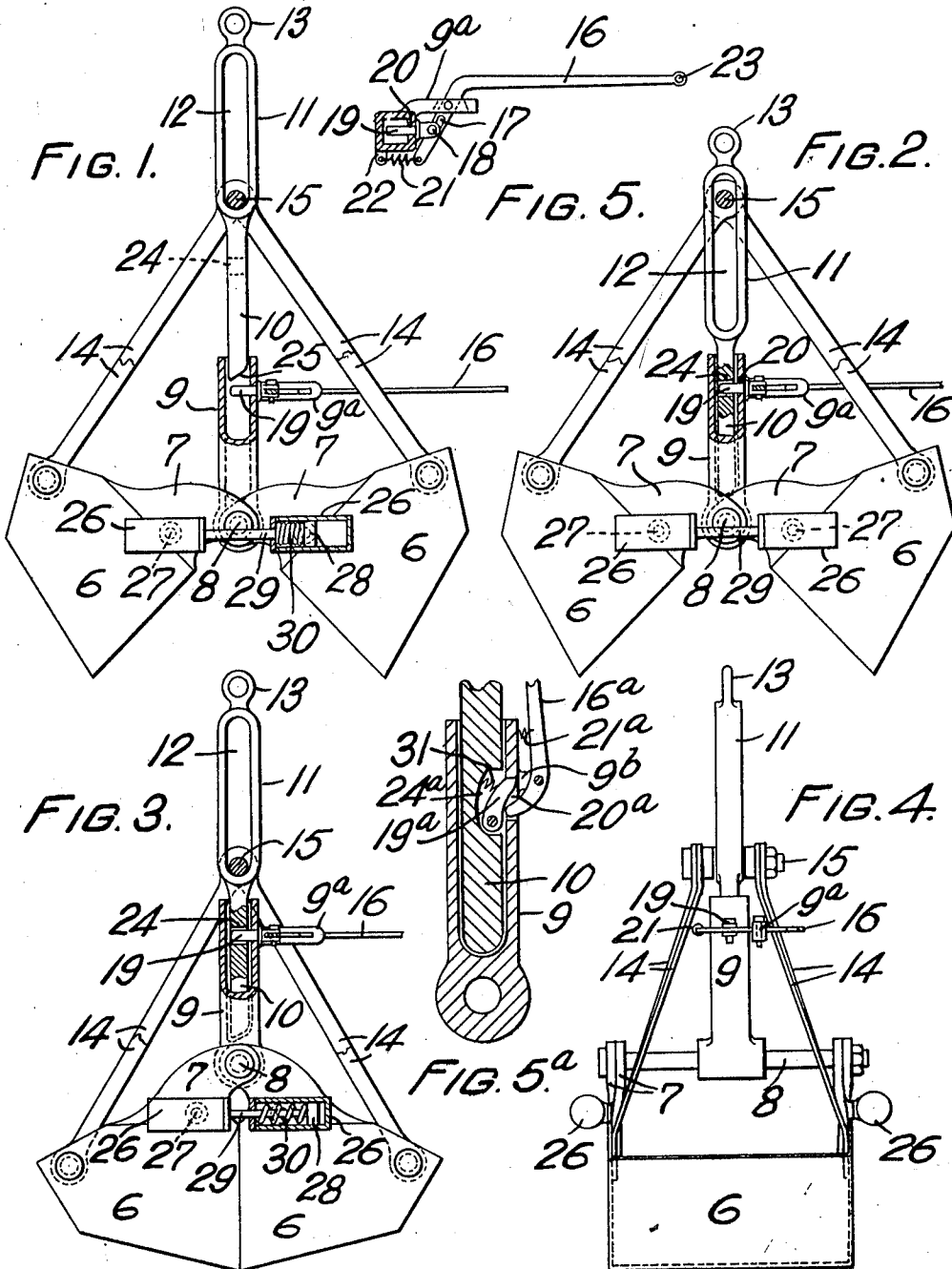


J. G. SMITH.
CLAM SHELL BUCKET.
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1,055,425.

Patented Mar. 11, 1913.



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To all whom it may concern:

Be it known that I, JOHN G. SMITH, of Welland, in the Province of Ontario and the Dominion of Canada, have invented certain new and useful Improvements in Clam-Shell Buckets, of which the following is a full, clear, and exact description.

This invention relates to improvements in hoisting or like buckets of the clam shell or orange peel varieties, and the object is to provide efficient raising and lowering means which will eliminate the chains at present in general use.

A further object is to provide bucket operating means which will be more positive in action and insure the bucket taking a full load.

A still further object is to provide means for minimizing the shock incidental to the opening of the bucket.

In the drawings which illustrate this invention:—Figure 1 is a side elevation of the bucket open, showing the parts in the position they occupy at the moment that the bucket is lowered on the work. Fig. 2 is a similar view showing the position of the parts prior to the commencement of the closing movement of the bucket. Fig. 3 is a side elevation of the bucket in closed position ready for hoisting. Fig. 4 is an end elevation of the bucket in the same position as shown in Fig. 3. Fig. 5 is a horizontal section showing the arrangement of the automatic latch. Fig. 5^a is a sectional view of an alternative form of latch.

Referring more particularly to the drawings, 6 designates a pair of similar jaw members forming the bucket and provided with hinge members 7, which are preferably castings and are connected by the pivot pin 8 in the usual manner. A tubular member 9 preferably square in cross section is pivotally mounted at its lower end on the pin 8, and is adapted to receive a tongue 10 formed on the lower portion of the hoisting and lowering member 11, which is provided in its upper portion with a slot 12 and at its extreme upper end with an eye 13 for the attachment of a single hoisting and lowering chain. The jaw operating chains at present in general use are replaced in this invention by links 14 which extend from the upper corners of the jaw members and are pivotally connected by a common pin 15 which is arranged to slide vertically in the slot 12 of the member 11. The tubular

member 9 is provided with an arm 9^a projecting therefrom in a substantially horizontal plane to which a trip lever 16 is pivoted intermediate its ends. One arm of this lever is provided with a slot 17 through which passes a pin 18 pivotally connecting the trip lever to a latch 19 which operates through an aperture 20 formed in the member 9. A spring 21 is tensioned between the slotted arm of the lever and a lug 22 on the member 9, and operates to hold the lever in such position that the latch is normally maintained projecting into the bore of the member 9. The opposite extremity of the lever 16 is provided with a suitable aperture 23 for the attachment of a trip rope or the like. The tongue 10 is provided near its upper end with an aperture 24 for the reception of the latch 19. The lower end of this tongue is rounded or beveled as shown at 25 in order that when the tongue is lowered into the member 9 it will automatically disclose the latch.

It is well known that the opening of buckets of this type produces great shock which is destructive, not only to the bucket itself but also to the hoisting apparatus. In order to overcome this disadvantage, I provide a cylinder 26 of suitable size pivoted at 27 to each of the hinge members 7 in such a way that the cylinders are free to oscillate with respect to the hinge members. Each cylinder is provided with a piston 28, the pistons of adjacent cylinders being connected by a piston rod 29. A spring 30 is located in each cylinder in such a way as to be compressed between the piston and the cylinder head during the opening movement of the buckets. This compression is due to the fact that the piston rod and pistons remain relatively stationary while the cylinders are moved apart by the opening jaw members, as will be readily understood by a comparison of Figs. 1 and 3.

The operation of the device is as follows:—The bucket is lowered in open position on the work as shown in Fig. 1. It will be noted that the pin 15 lies in the bottom of the slot 12, the weight of the bucket being supported by the links 14 which also hold it open. The tongue 10 is drawn up until only its lower extremity remains in the tubular member 9. When the bucket comes to rest on the work, the lowering operation is continued so that the member 11 descends, the tongues 10 thereof

passing into the member 9. During this descent the beveled end 25 of the tongue forces the pin out of its path as will be readily understood. When the member 11 reaches its lowest position, as shown in Fig. 3, the aperture 24 in the tongue comes into register with the aperture 20 in the member 9, and the spring 21 automatically draws the latch 19 into the tongue aperture 24, thus locking the tongue in the member and preventing relative motion. It will be seen that in this position the pin 15 is at the top of the slot 12 having been held stationary by the links 14 during the descent of the member 11. This position is shown in Fig. 2. The bucket is now raised in the usual manner, but by reason of the tongue 10 being locked in the member 9, the lifting effort is applied to the hinge member 8 so that the bucket closes. This closing is also assisted by the expansion of the springs 30 in the cylinders 26. During the closing operation the links 14 and pin 15 remain practically stationary, and while the member 11 moves upwardly until the pin 15 again lies in the bottom of the slot 12. This position is illustrated in Fig. 3. When the closed bucket has been raised and conveyed to the dumping point, the operator pulls the lever 16 so that the latch 19 is withdrawn from engagement with the tongue 10, thus removing the central support of the bucket and throwing all its weight on to the links 14. The bucket opens and discharges in the well known manner. During the opening movement the hinge members 7 move apart and carry with them the pivoted cylinders 27, so that the springs 30 located therein are compressed and absorb nearly the whole of the shock of the opening buckets, thus removing a great stress from the links 14, member 11 and hoisting chain. The slot 17 in the trip lever allows the latch 19 to move without oscillation.

It will be seen from the foregoing description that the action of this bucket is almost entirely automatic and that there are no slack chains to become entangled in the bucket or other objects. The life of the bucket is prolonged by absorbing the shock of opening and the whole device may be operated more quickly than buckets of the similar type at present in use.

The alternative form of latch shown in Fig. 5^a consists of a latch member 19^a pivotally mounted in a recess 24^a in the tongue 10, and normally pressed outwardly against the member 9 by a spring 31. The trip le-

ver 16^a pivoted to the arm 9^b of the member 9 is normally held out of the member 9 by the spring 21^a. When the tongue is lowered into the member 9, the spring 31 throws the latch 19^a into the aperture 20^a, thus locking the two members together. When the lever 16^a is operated it forces the latch 19^a out of the aperture 20^a, thus disconnecting the two members and allowing the bucket to dump.

Having now fully described my invention, what I claim is:—

1. In a bucket of the class described, a pair of similar bucket members, a pin pivotally connecting said members, a slotted hoisting member having a tongue, links suspending the corners of the bucket from said hoisting member, and operating in the slot of said hoisting member, a tubular member receiving said tongue, and means whereby the suspension of the bucket may be shifted from the corners to the center.

2. In a bucket of the class described, a pair of similar bucket members, a pin pivotally connecting said members, an apertured tubular member pivoted on said pivot pin, a slotted hoisting member telescoping into said tubular member, provided with an apertured tongue, links connected to the corners of the bucket, a pin connecting said links and operating in the slot of said hoisting member, an arm carried by said tubular member, a latch on said arm adapted to enter the aperture in said tubular member and the aperture in said tongue to lock the hoisting member in the tubular member whereby the suspension of the bucket will be transferred from the links to the pivot pin.

3. In a bucket of the class described, a pair of similar bucket members, a pin pivotally connecting said members, a tubular member pivoted on said pivot pin, a slotted hoisting member telescoping into said tubular member, links connected to the corners of the bucket, a pin connecting said links and operating in slot of said hoisting member, and means for automatically locking the hoisting member in the tubular member whereby the suspension of the bucket will be transferred from the links to the pivot pin.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOHN GEORGE SMITH.

Witnesses:

D. L. WEAVER,
CHAS. MAY.