April 28, 1925. 1,535,878

J. S. TOWNSEND

GRAB BUCKET

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Fig. 1.

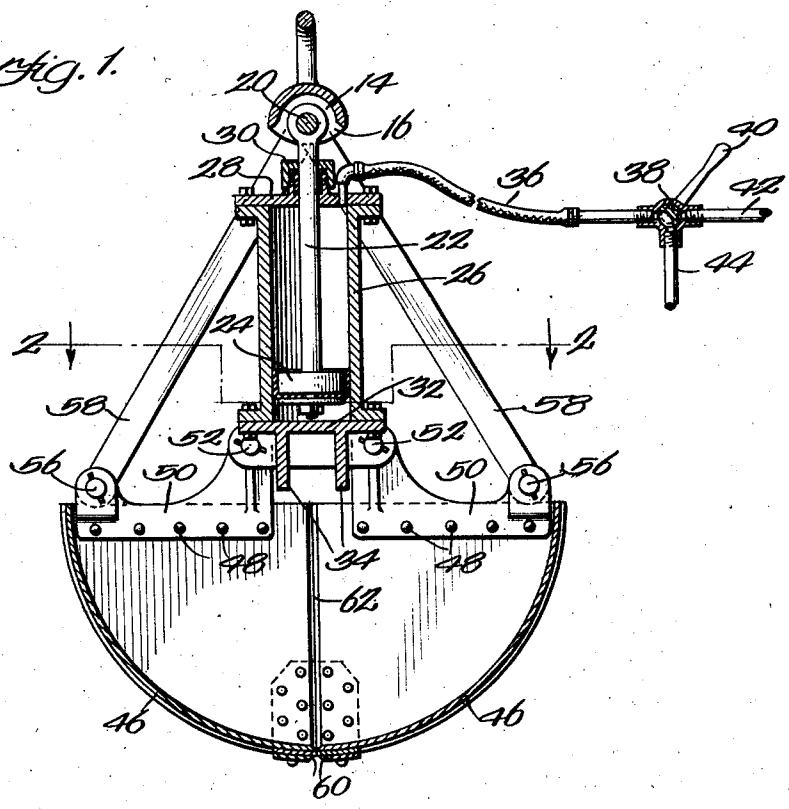
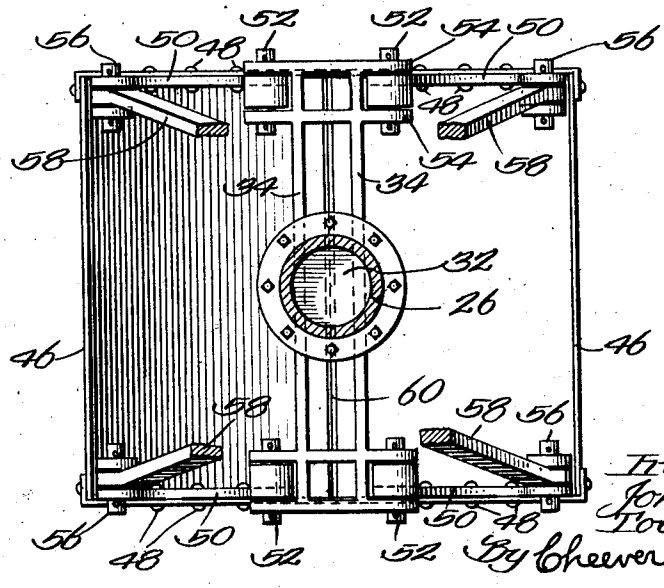


Fig. 2.



Inventor
John S. Townsend
By Cheever Cox Attys.

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Fig. 3.

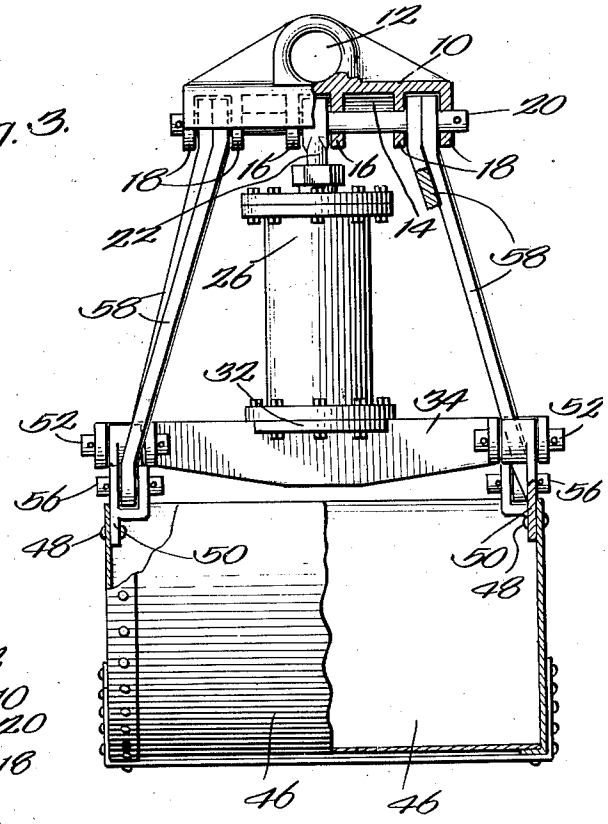
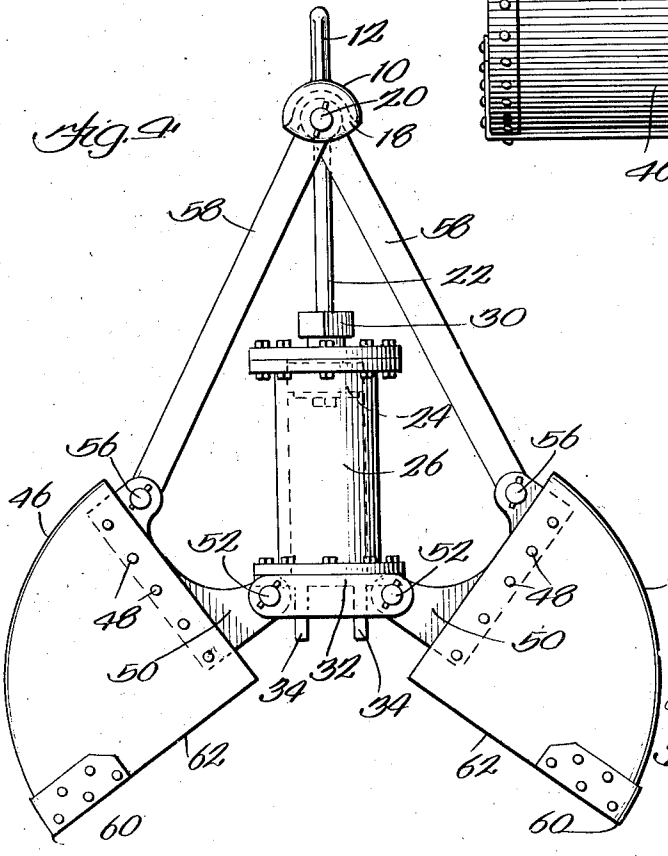


Fig. 4.



Inventor:
John S. Townsend
By Cheever & Cox
Attys.

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UNITED STATES PATENT OFFICE.

JOHN S. TOWNSEND, OF HARVEY, ILLINOIS, ASSIGNOR TO WHITING CORPORATION, OF HARVEY, ILLINOIS, A CORPORATION OF ILLINOIS.

GRAB BUCKET.

Application filed March 17, 1924. Serial No. 699,633.

To all whom it may concern:

Be it known that I, JOHN S. TOWNSEND, a citizen of the United States, residing at Harvey, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Grab Buckets, of which the following is a specification.

This invention relates to grab buckets commonly used in dredging, mechanical loading operations and the like. The object of the invention is to provide a device of this kind in which the load carrying parts of the bucket of whatever form are positively operated by a motive fluid such, for example, as water, steam or compressed air, thereby insuring positive engagement of the load to be lifted by the load carrying parts of the bucket in taking on the load and positive locking of the bucket thereafter during the lifting operation.

The invention consists in mechanism capable of attaining the foregoing and other objects; which can be easily and cheaply made; which is highly efficient and otherwise satisfactory in operation; which is not readily liable to get out of order. More particularly, the invention consists in numerous features and details of construction which will be hereafter more fully set forth in the specification and claims.

Referring to the drawings in which like numerals represent the same parts throughout the several views;

Figure 1 is a side view largely in section of mechanism illustrating this invention in its preferred form, with the load carrying parts, specifically semi-cylindrical jaws, in closed or load carrying position.

Figure 2 is a plan view, partially in section, on the irregular line 2—2 of Figure 1.

Figure 3 is a side view, partially in section, taken from the left hand side of Figure 1.

Figure 4 is a changed position view of Figure 1, showing the load carrying jaws in discharging position.

In the preferred form of construction, the grab bucket mechanism is suspended from a block 10 provided on its top with a perforation 12 entered by a hook or the like on a crane or dredge to thereby suspend the entire mechanism in various selected operative positions determined by the movement of the crane or dredge under the control of an operator.

The under side of this block 10 is provided with a semi-cylindrical, longitudinal recess 14, closed at intervals by depending partition lugs 16 and 18 in which is journaled a longitudinal shaft 20. Intermediate between the two lugs 16 which are located at approximately the center of the block 10 and depending from the shaft 20 is a piston rod 22 carrying at its lower end a piston 24, conventionally reciprocable in cylinder 26, closed at its upper end by a head 28, having a stuffing box 30 through which piston rod 22 slides. The lower end of the cylinder 26 is closed by a head 32 carrying integrally therewith cross head bars 34. A motive fluid is admitted to the upper end of cylinder 26 through a pipe 36 entering cylinder head 28 in obvious manner. This pipe 36 is provided with a valve 38 manually controllable by hand lever 40 so that motive fluid may be admitted from a pipe 42, leading from a source of supply not shown. An exhaust pipe 44 is also conventionally connected to the valve 38 so that by properly swinging handle 40 in convenventional manner, contents of cylinder 26 may pass through pipe 36 through said exhaust pipe 44 in conventional manner.

The load carrying mechanism proper of the device, as here shown, comprises two quarter cylinders 46 assembled in load carrying position as shown in Figure 1 and in discharge position as shown in Figure 4. Rigidly secured to the opposite ends of the load carrying members 46, near the tops thereof by any suitable means, such as rivets 48, are brackets 50 journaled at their inner ends on pivot pins 52 carried on laterally projecting lugs 54 on the sides of cross-head bars 34 heretofore referred to. The opposite ends of the brackets 50 suitably support pivot pins 56, parallel to the pins 52. Journaled on each pin 56 is the lower end of a connecting rod 58 whose upper end is journaled on shaft 20 between two of the depending lugs 18. As clearly shown in Figure 3, the upper ends of the two connecting rods 58 at a given end of the load carrying semi-cylinder are journaled more or less in contact with each other on the shaft 20 between the pair of lugs 18 at one end of the shaft and

of block 10, while the opposite pair of connecting rods 58 are correspondingly journaled adjacent to each other on the opposite end of shaft 20 between the lugs 18 on block 10 at that end of the shaft.

When the valve 38 is open to the exhaust pipe 44 so that motive fluid in cylinder 26 is free to flow out through pipe 36 and exhaust pipe 44, the weight of cylinder 26 will, under normal conditions, cause the parts to by gravity assume the position shown in Figure 4 in which the piston 24 is at the top of the cylinder. In this position, the operator manipulating the crane or the like places the mechanism so that the cutting jaws 60 of the load carrying members 46 rest upon the load material which is to be scooped up. The operator now manipulates handle 40 to close exhaust pipe 44 and admit motive fluid from pipe 42 to pipe 36 and thence into cylinder 26. The entering motive fluid at once engages the upper end of piston 24 and the under side of cylinder head 28. As the piston 24 is held rigid with reference to shaft 20 by rigid piston rod 22, it cannot move and therefore the cylinder has to move upward along piston rod 22 thereby causing the cutting edges 60 of the load carrying members 46 to cut into the material to be lifted and to continue to move through said material until the parts assume the position of Figures 1, 2 and 3 wherein the load of material to be lifted is enclosed within the quarter cylinders 46 and can be carried up by the crane or the like attached at 12 to the block 10. Owing to the fact that the connecting rods 58 and the piston rod 22 all push or pull, as the case may be, against shaft 20, the mechanism is entirely self-contained and will, within the limits of the weight of the entire mechanism, operate wherever placed without being forced into its work by an outside mechanism engaging block 10.

In the closed position of the bucket, the load carrying members 46 abut more or less closely along the vertical plane or line 62, and in opening swing outwardly and upwardly from that position.

It is pointed out that the shaft 20 is the abutment against which the power cylinder mechanism operates and that it is connected to the respective load carrying members 46 by the links 58.

One great advantage of the device of this invention over prior devices is that in operation, all of the weight of the bucket rests upon the lip 60 of the bucket, while it is in digging operation; whereas, in the case of buckets of the prior art which are closed by pulling on a cable, only a certain part of their weight is available for digging, the remainder of the weight being, of course, supported by the cable which does the closing.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a grab bucket device including a pair of pivoted load carrying members and a cylinder and piston mechanism for operating them, a block, and rods connecting said load carrying members and the piston of the cylinder and piston operating mechanism to said block whereby the device is suspended from the block, said block having an elongated semi-cylindrical recess formed in the under face thereof, partition lugs extending across said recess at spaced intervals, and a shaft engaged through said lugs to which the upper ends of all of said rods are connected.

2. In a grab bucket device including a pair of pivoted load carrying members and a cylinder and piston mechanism for operating them, a removable head for one end of the cylinder of said cylinder and piston mechanism, crosshead bars carried by said removable head and extending beyond opposite sides thereof, lugs connecting said crosshead bars and extending laterally beyond the sides thereof, and members on the load carrying members pinned to said lugs whereby the load carrying members are pivotally connected to said cylinder.

In witness whereof, I have hereunto subscribed my name.

JOHN S. TOWNSEND.