No. 627,306.

Patented June 20, 1899.

J. F. O'ROURKE.

DUMPING BUCKET.

(Application filed Apr. 15, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

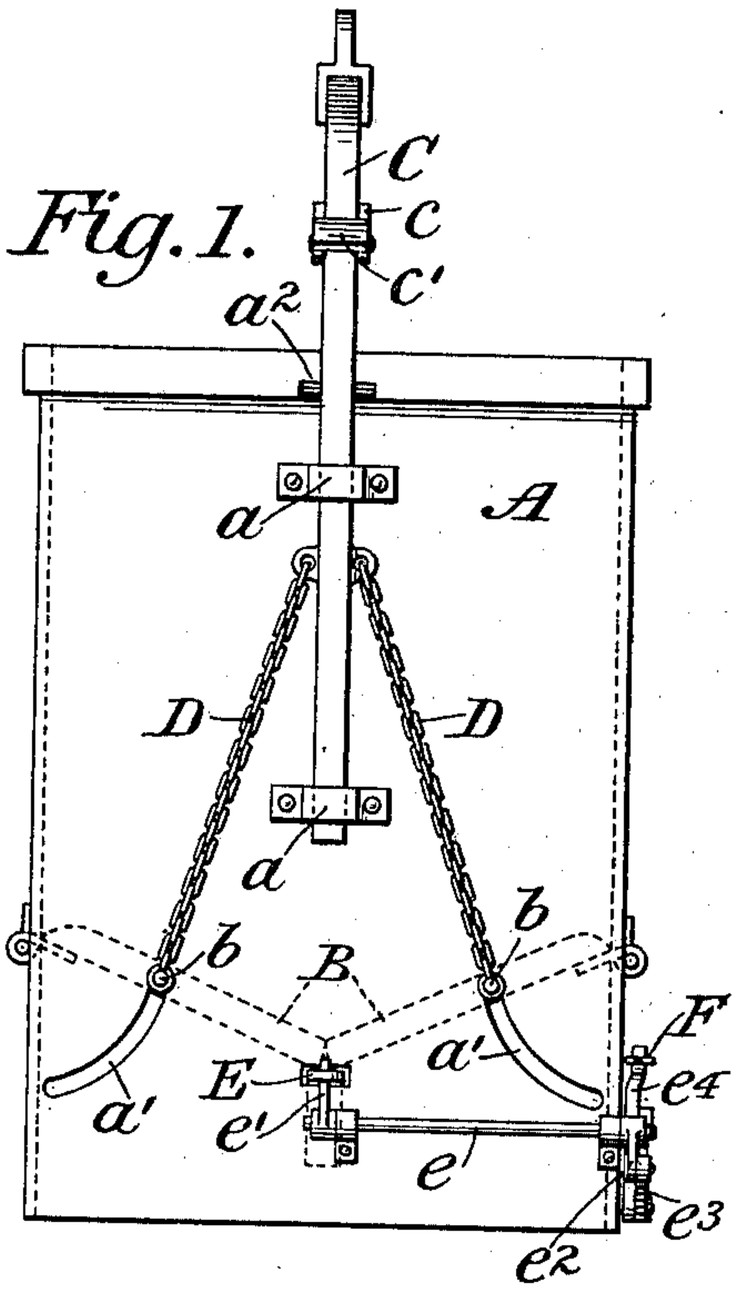


Fig. 2.

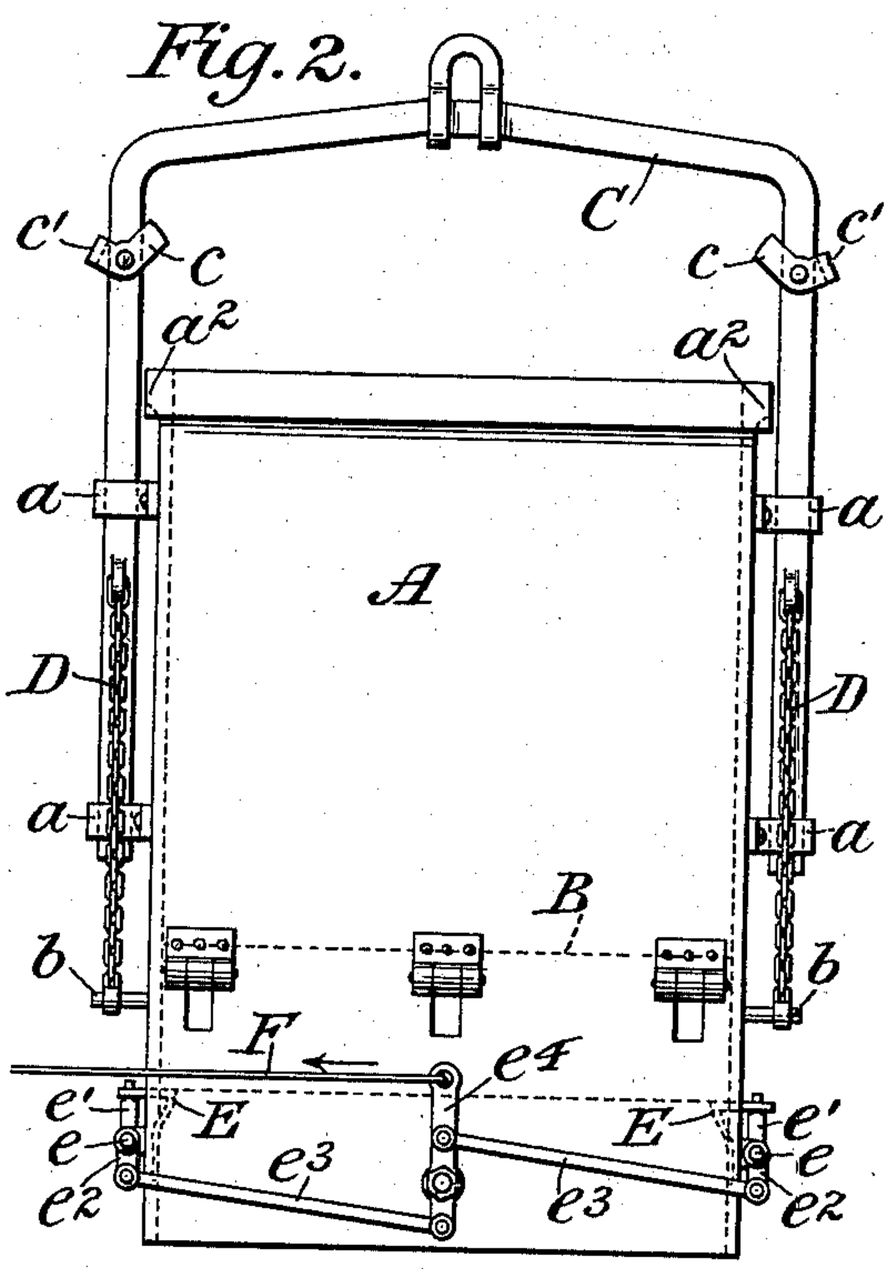


Fig. 3.

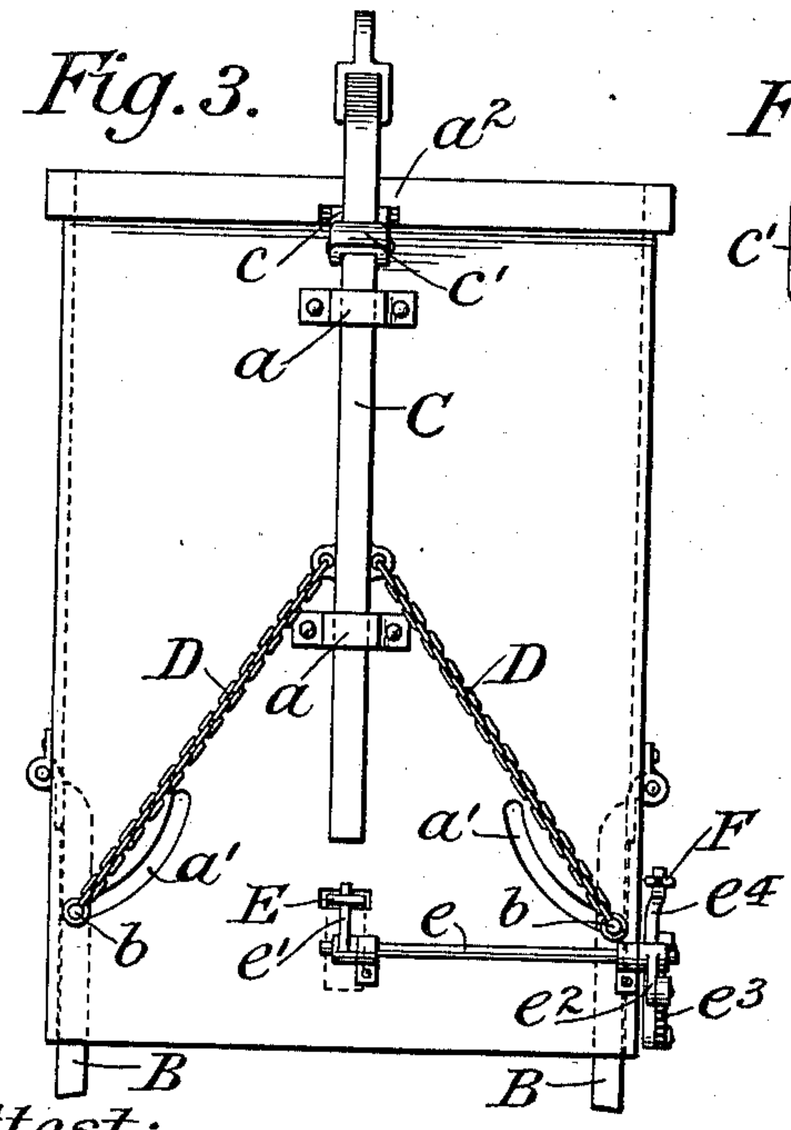


Fig. 5.

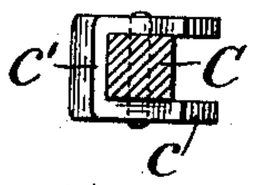


Fig. 4.

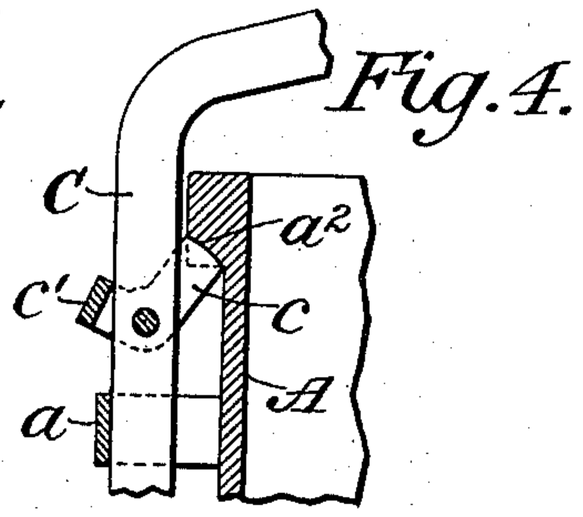
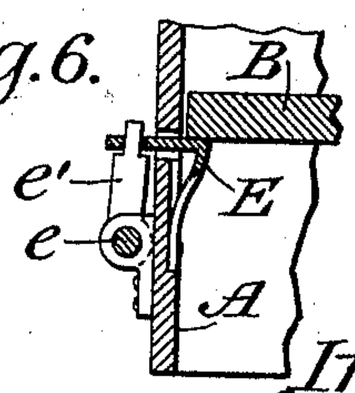


Fig. 6.



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No. 627,306. Patented June 20, 1899.

J. F. O'ROURKE

DUMPING BUCKET.

(Application filed Apr. 15, 1899.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 9.

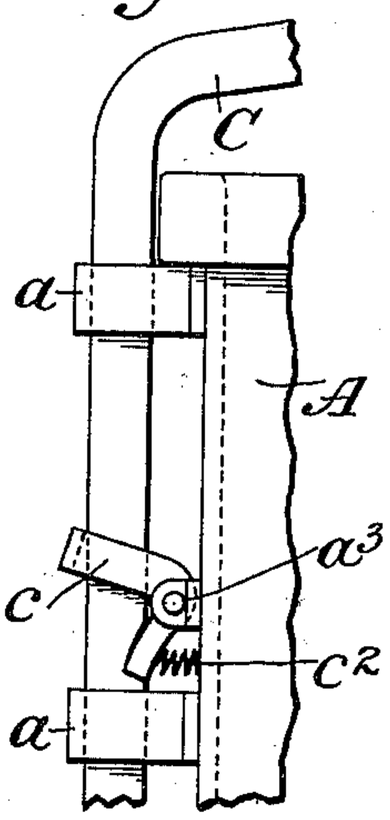


Fig. 7.

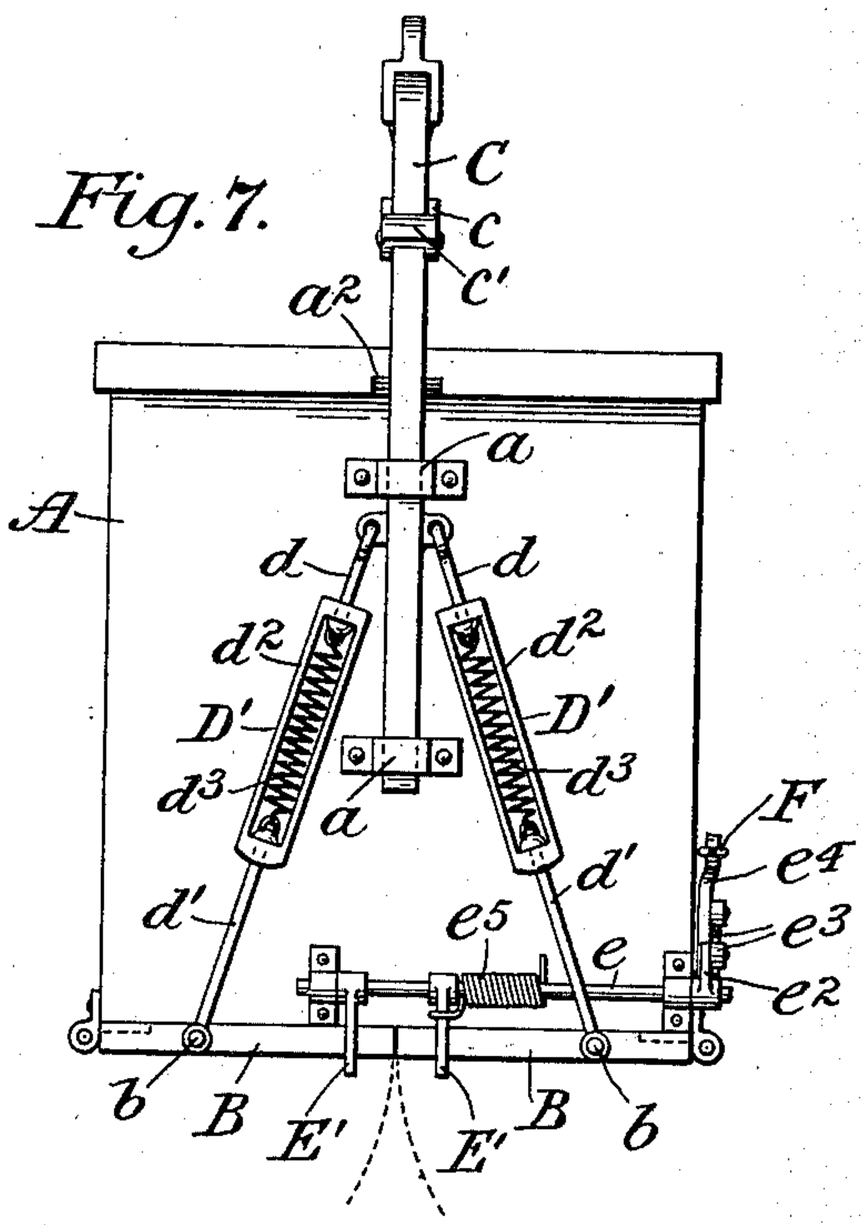
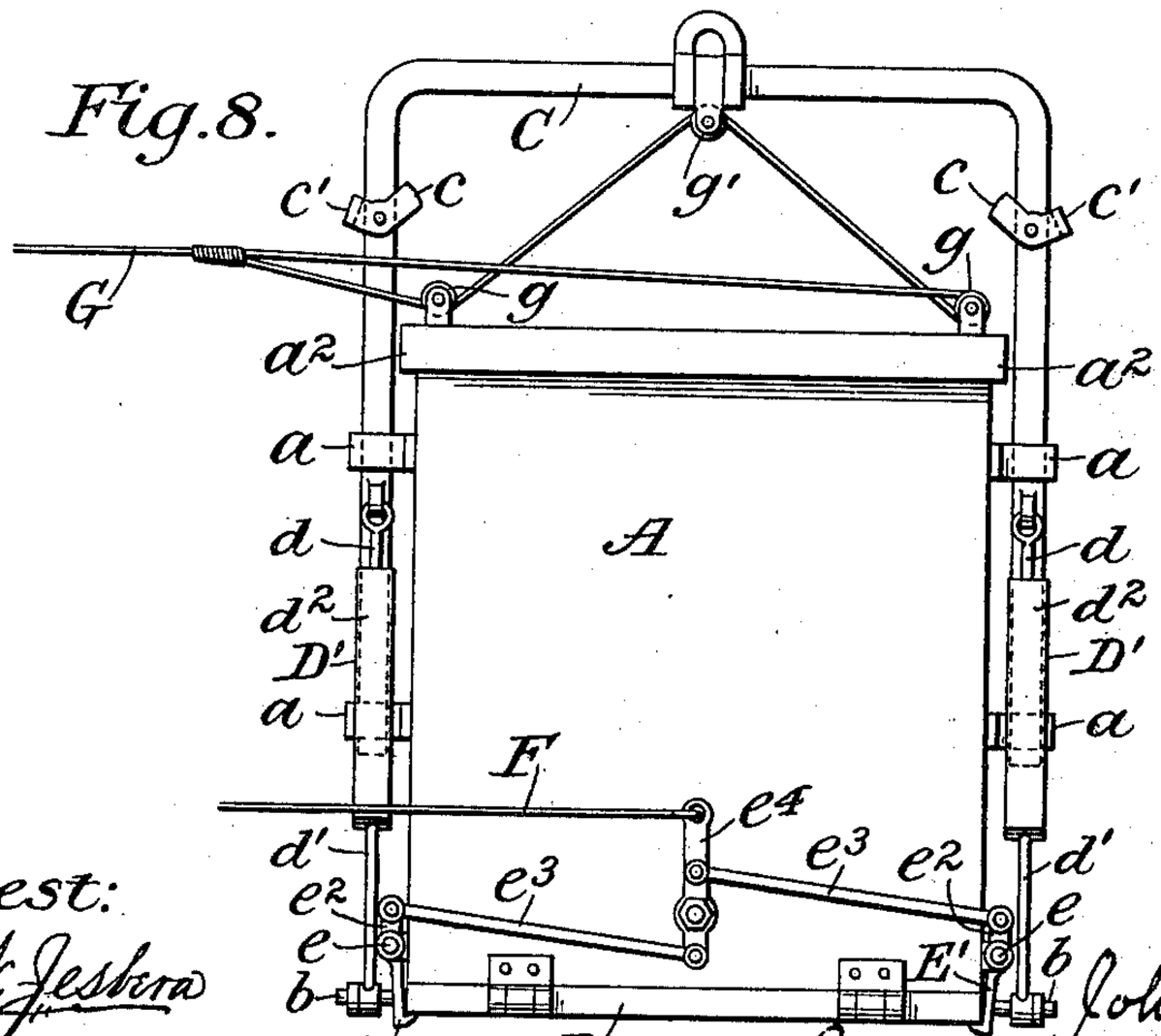


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN F. O'ROURKE, OF NEW YORK, N. Y.

DUMPING-BUCKET.

SPECIFICATION forming part of Letters Patent No. 627,306, dated June 20, 1899.

Application filed April 15, 1899. Serial No. 713,094. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. O'ROURKE, a citizen of the United States, residing in the borough of Manhattan, city of New York, State of New York, have invented certain new and useful Improvements in Dumping-Buckets, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to dumping-buckets of the general character of those commonly employed in loading and unloading grain, coal, gravel, and other materials, in excavating, in depositing concrete in submarine work, and for other like purposes, and more especially to buckets of this general character which are known as "drop-bottom" buckets.

One object of the invention is to produce a bucket of this kind which shall discharge its contents with certainty whenever required, but shall not be liable to an accidental discharge of its contents.

A further object is to produce a bucket which shall be capable of use either as an automatically-discharging bucket or as one which shall discharge its contents only at the will of the operator.

Still another object is to make it possible to dispense altogether with a trip-rope whenever the use of such a rope is undesirable, as in submarine work.

Other features of the invention will be more particularly pointed out hereinafter with reference to the accompanying drawings, in which, for purposes of explanation, several forms or embodiments of the invention are illustrated.

In the drawings, Figure 1 is a side elevation of a bucket which can be used either as a self-dumping bucket or as one which dumps under the control of the operator, the parts being shown in the positions which they occupy when the doors are closed. Fig. 2 is a front elevation of the same. Fig. 3 is a view similar to Fig. 1, but with the parts in the positions which they occupy when the doors are opened. Fig. 4 is a detail view showing the relation of the bail and its engaging dog or latch to the bucket when the doors are opened. Fig. 5 is a detail view of the bail and dog, the former being shown in section. Fig. 6 is a detail view in section showing the relation of one of the doors and its latch, together with the means for operating the same. Fig. 7 is a view similar to Fig. 1, but showing a modification. Fig. 8 is a view similar to Fig. 2, but showing the modified form represented in Fig. 7, together with an additional device for operating upon the bail. Fig. 9 is a detail view showing the dog or latch mounted on the bucket.

The body A of the bucket is made of any suitable material, preferably of metal, and of any suitable shape and size. It is provided with a door shown as formed of two leaves B B, which are preferably hinged to opposite walls of the body and constitute the bottom of the bucket. As shown in Figs. 1, 2, and 3, the walls of the body are extended below the doors to form an apron, while in Figs. 7 and 8 the doors are shown as hinged to the lower edge of the bucket. The usual bail C to which the hoisting-rope is connected is not fixed rigidly to the body of the bucket, but is free to move vertically to a limited extent with respect thereto, being guided in eyes $a\,a$, secured to the body A. The bail is adapted to engage the body of the bucket directly and is also adapted to support the bucket and its contents through connection with the doors B B. For this latter purpose loose connections are provided between the bail and the doors which permit of a certain amount of lost motion, or rather of motion of the bail with respect to the doors, and vice versa. Such connections may be formed of chains D, as shown in Figs. 1, 2, and 3, or as extensible links D′, as shown in Figs. 7 and 8, such links comprising headed rod-sections d and d' connected, respectively, to the bail and to the door, an intermediate link-section d^2, with the ends of which said headed rods engage, and a spring d^3, which tends to draw the rods together and so shorten the link D′, the ends of said spring being connected to the rods d and d', respectively. In the construction shown in Figs. 1, 2, and 3 the pins b, to which the chains D are connected, extend from the door outwardly through curved slots a' in the apron of the bucket. In order to effect direct engagement of the bail with the bucket, each leg of the bail may be provided with a dog or latch c, which is pivoted on the leg of the bail and is adapted to engage a lip a^2 or

other suitable projection on the body of the bucket. The dog is preferably double, as shown clearly in Figs. 4 and 5, and its cross-bar c', outside of the leg of the bail, forms a stop which limits the movement of the dog in either direction. The inner or engaging end of the dog overbalances the outer end, so that the dog normally occupies with relation to the bail the position shown in Figs. 2 and 4, whereby as the bail descends relatively to the body of the bucket the dog passes freely by the lip a^2, but engages the lip with certainty as the bail moves upward with relation to the body of the bucket. The under side of the lip and the end of the dog are so curved as to insure and to maintain the proper engagement between the two; but to permit the disengagement of the dog from the lip to be readily effected, when necessary, by striking the dog. As shown in Fig. 9, the dog c may be pivoted, as at a^3, upon the body of the bucket and thrown outward by a spring c^3 to engage a notch in the leg of the bail.

Without other parts than those described above the improved bucket is capable of use, particularly in the forms shown in Figs. 1, 2, and 3, as an automatic or self-dumping bucket which does not require the use of a trip-rope. Thus assuming that the bucket is suspended in the air with the bail in the relative position shown in Figs. 1 and 2, the bucket can be filled with material, such as concrete for use in submarine work, the weight of the bucket and its contents being transferred through the door B to the bail. As soon as the bucket is lowered away and touches bottom at the point where its contents are to be discharged the hoisting-rope is slacked away, permitting the bail to descend and the doors to open and discharge the load. The bail descends until the dogs c pass the lip or projections a^2, and upon hoisting away again the dogs immediately engage the lip or projections, keeping the bail in its lower position with respect to the body and permitting the doors to swing downward to the full extent, as shown in Fig. 3. If an apron be used, as shown in Figs. 1, 2, and 3, it will be obvious that the doors will drop as soon as the lower edge of the apron rests upon solid bottom, while in the construction shown in Figs. 7 and 8, in which there is no apron, the doors will not open until the bucket is lifted from the bottom by hoisting away. In this case it may be desirable to provide means for insuring the downward movement of the bail with respect to the body, and to this end the springs d^3 are interposed between the rod-section d and d' of the extensible links D' and operate to draw down the upper sections d and the bail C with them. The link-sections d^2 serve to limit the separation of the rod-sections d and d' and prevent the undue stretching of the springs d^3. When the bucket is to be reloaded, the engaging devices between the bail and the body are released, and the bail being held by the hoisting-rope the body falls with reference to the bail, and the slack of the chains is taken up, the weight of the body thus being utilized to close the door.

If the bucket is not to be used as a self-dumping bucket, but is to be wholly under the control of the operator, means must be provided to retain the doors in their closed positions and to permit them to be released when desired. For this purpose in the construction shown in Figs. 1, 2, 3, and 6, a latch or detent E is mounted on the wall of the bucket, being preferably in the form of a spring secured to the wall and so shaped as to permit the door or the two leaves to pass up by it, but to prevent their downward movement, the single latch in the construction shown being wide enough to engage both leaves and to hold them against opening. Any convenient means may be employed for withdrawing the latch. As shown in the figures referred to, a rock-shaft e, mounted in suitable bearings on the bucket, has at one end an arm e' to engage the latch E and at the other end an arm e^2, which is connected by a link e^3 with the operating-lever e^4. A trip-rope F may be attached to the lever e^4, if desired. The arrangement shown in Figs. 7 and 8 is substantially the same as that already described; but as there is no apron to support the latch it is secured directly, as shown at E', (one for each leaf, it may be,) to the rock-shaft e, and a spring e^5 is so placed as to act upon the rock-shaft.

As an additional device for insuring with certainty the downward movement of the bail a rope G may be led through guide-pulleys g on the body of the bucket and through a pulley g' on the bail, as clearly shown in Fig. 8, or in any other similar manner, so that by pulling upon the rope G the bail will be pulled down positively and the engagement of the dogs c with the bucket assured.

The operation of the improved bucket in its various uses has already been indicated sufficiently in connection with the description of the construction thereof and need not be further described herein.

It will be obvious that the details of construction and arrangement may be varied from what is shown and described herein without departing from the spirit of the invention.

I claim as my invention—

1. The combination with the body of a bucket and a door forming the bottom thereof, of a bail movable with respect to the body, a loose connection between the bail and the door whereby the bail in its upper position supports the bucket through connection with the door, and means to connect the bail directly to the body, whereby the bail in its lower position supports the body directly and leaves the door free.

2. The combination with the body of a bucket and a door forming the bottom thereof, of a bail movable with respect to the body, a loose connection between the bail and the door, and a dog or latch carried by one of said

parts to engage the other in the upward movement of the bail.

3. The combination with the body of a bucket and a door forming the bottom thereof, of a bail movable with respect to the body, a loose connection between the bail and the door whereby the bail in its upper position supports the bucket through connection with the door, means to connect the bail directly to the body, whereby the bail in its lower position supports the body directly and leaves the door free, and means to insure the downward movement of the bail with respect to the body.

4. The combination with the body of a bucket and a door forming the bottom thereof, of a bail movable with respect to the body, a loose connection between the bail and the door, means to connect the bail directly to the body, a latch to engage the door, and means to disengage the latch.

This specification signed and witnessed this 14th day of April, A. D. 1899.

JOHN F. O'ROURKE.

In presence of—
ANDREW H. SCOBLE,
W. B. GREELEY.