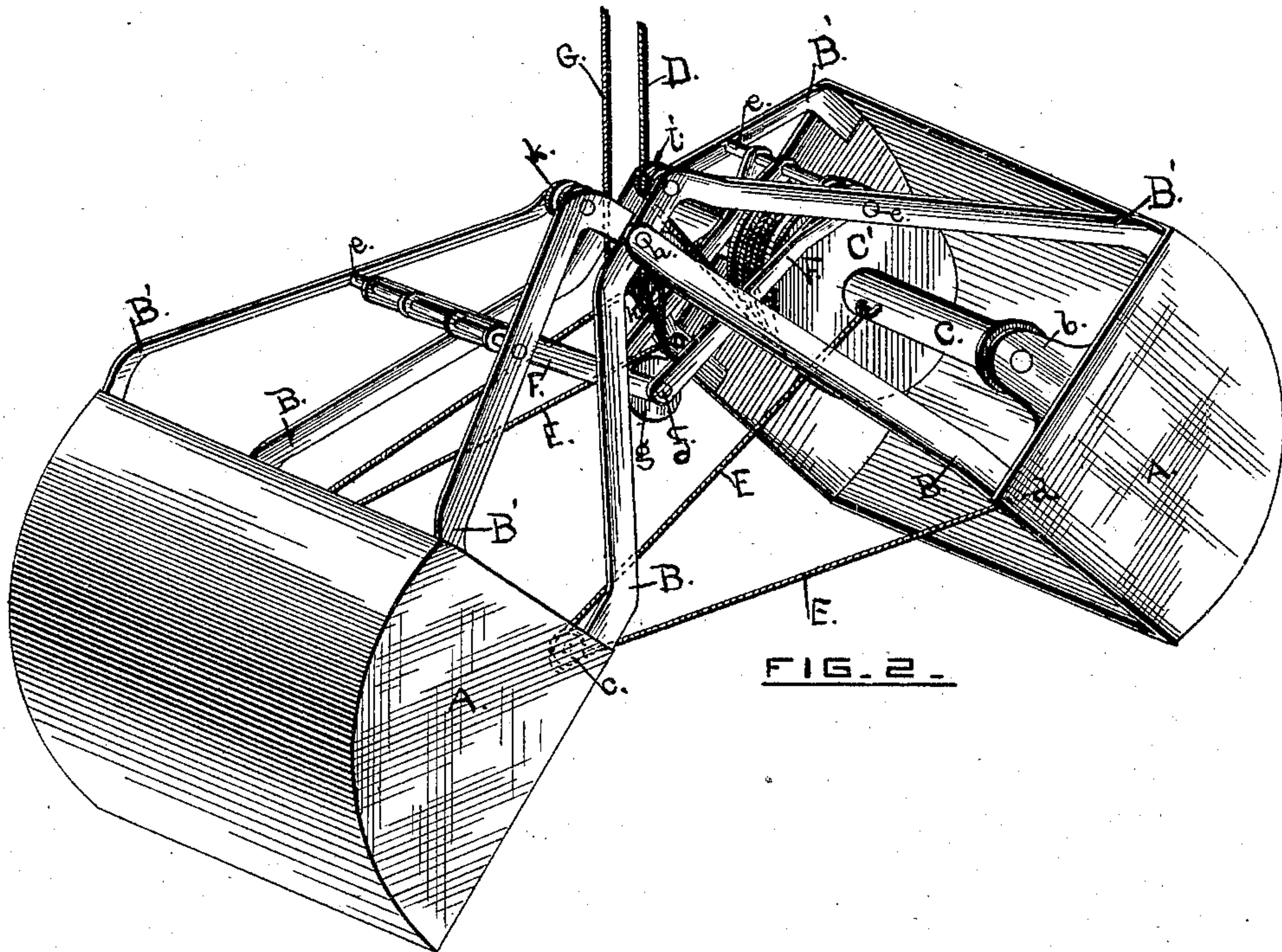
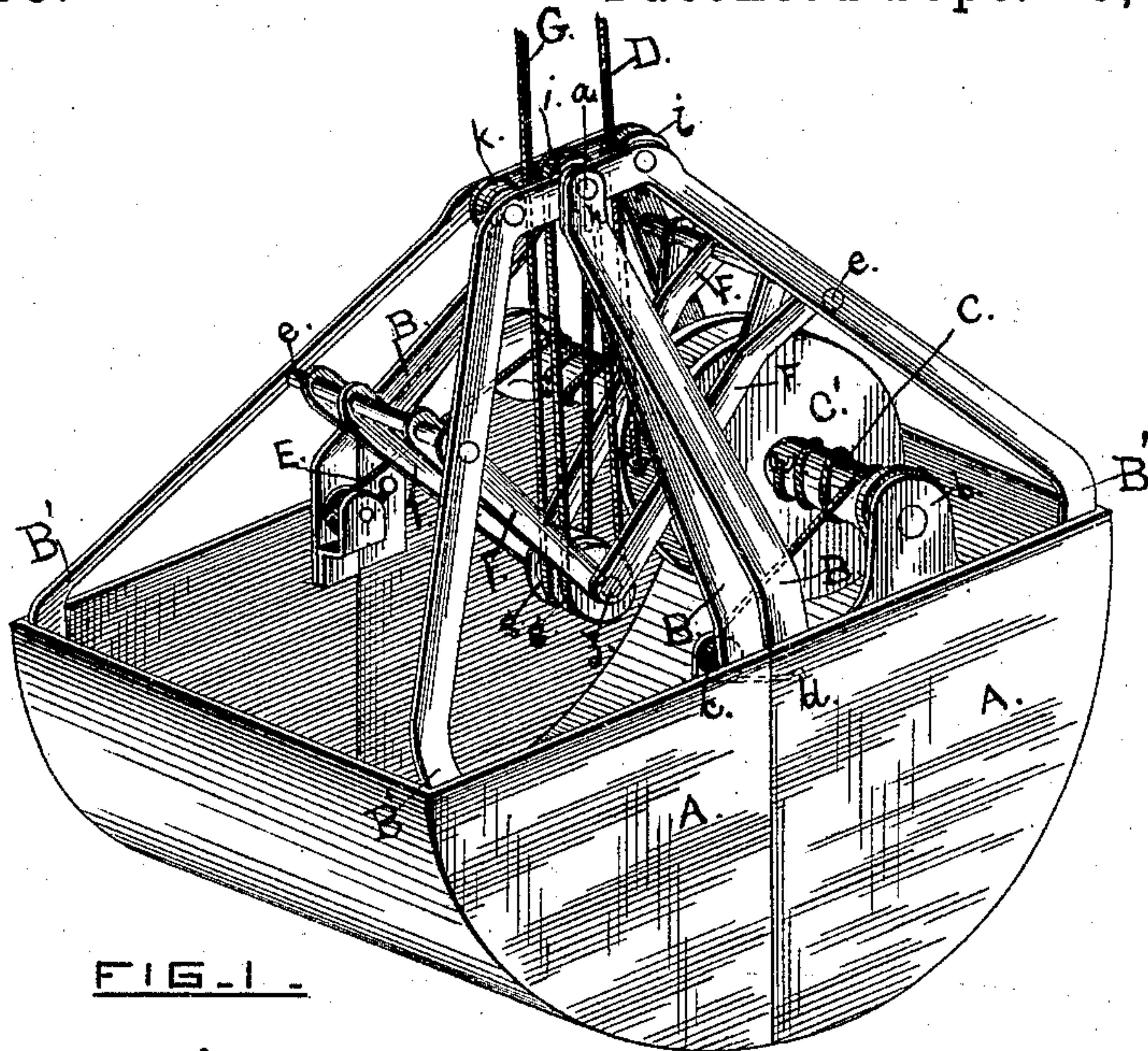


(No Model.)

L. G. LADD.
HOISTING BUCKET.

No. 369,798.

Patented Sept. 13, 1887.



WITNESSES:

H. B. Thurston.
A. Murphy.

INVENTOR:

Loren G. Ladd.

UNITED STATES PATENT OFFICE.

LOREN G. LADD, OF PAWTUCKET, RHODE ISLAND.

HOISTING-BUCKET.

SPECIFICATION forming part of Letters Patent No. 369,793, dated September 13, 1887.

Application filed June 28, 1886. Serial No. 206,463. (No model.)

To all whom it may concern:

Be it known that I, LOREN G. LADD, of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Hoisting-Buckets; and I do hereby declare the following specification, taken in connection with the accompanying drawings, forming a part of the same, to be a full, clear, and exact description thereof.

My invention relates to that class of hoisting-buckets of which the bucket shown and described in the Letters Patent granted to me, No: 314,031, dated March 17, 1885, is an illustration; and the objects of the invention are, first, to lessen the height of the bucket, whereby less space will be required for its operation, at the same time providing the necessary amount of leverage for properly closing the bucket, and, second, to provide means for positively opening the bucket.

In the bucket shown and described in the said prior Letters Patent the two halves of the bucket are pivoted or hinged together at the upper edge of the side walls of the bucket, and the windlass shaft and drum are centrally located and in line with the pivotal connection between the two halves of the bucket, and the power applied to close the bucket is in part transmitted to the halves of the bucket through the upwardly-extending rods pivoted thereto. In the practical operation of a bucket thus organized it has been found that, to secure the required leverage to properly close the bucket against the resistance of the material to be hoisted, it was necessary to make the upwardly-extending rods of considerable length and the windlass-drum of a large diameter. The long rods made the bucket of such a height as to require a comparatively large vertical space for its operation, and the large windlass-drum projected so far toward the bottom of the bucket as to come in contact with the material to be loaded, and thereby prevent the proper entrance of the bucket into the mass. In the prior bucket referred to there were no means for positively opening the bucket, such opening being effected solely by the weight of the parts of the bucket and its load when suspended by the hoisting-rope.

The improvements hereinafter described are designed to overcome the objections above re-

ferred to and to secure the proper closing and opening of the bucket under all circumstances.

Referring to the drawings, Figure 1 is a view in perspective of my improved bucket with the parts in closed position; and Fig. 2 is a view in perspective, showing the bucket open.

A A are the two halves or parts of the bucket. To the inner corners of each of said halves are secured the upwardly-projecting arms B B, said arms being pivoted together at their upper or outer ends by the pivot-pin *a*, thereby pivotally connecting the two parts of the bucket, which in opening or closing swing upon said pivot-pin *a*. To the outer corners of each half of the bucket are secured the bent arms or bars B' B', the upper ends of said arms B' being likewise pivoted upon the pivot-pin *a*. One of the halves of the bucket is provided with standards *b*, one on each side of the bucket, in which standards the ends of the windlass-shaft C, carrying the windlass-drum C', are journaled. To the windlass-drum C' one end of the rope D is secured, and to the windlass-shaft C are attached the ropes E, one at each side of the drum C'. One end of each of these ropes E is attached to the windlass-shaft, and the opposite end is passed around a pulley, *c*, secured to that part of the bucket opposite to the part upon which the windlass-shaft is mounted, and is then fastened to that part of the bucket which carries the windlass-shaft, as at *d*.

To the arms B' B' there is secured, at a suitable distance between their upper and lower ends, the rod *e*, extending from one of said arms to the other, there being one of said rods connecting the arms B' B' upon each side of the bucket, as shown in the drawings. Upon these rods *e e* are pivoted another set of arms or levers F F F F, two upon each rod, as shown in the drawings. These levers F extend downwardly from the rods *e* toward the bucket proper, and their lower ends are pivoted together by the pivot-pin *f*, thereby forming what is practically a toggle-joint. Upon the pivot-pin *f*, and between the ends of the levers F, are mounted two pulleys or sheaves, *g g*. Upon the pivot-pin *a*, and between the ends of the arms B, there is mounted an eye, *h*, and a pulley, *i*. To the eye *h* one end of the rope G is secured. The other end is then passed down around one of the pulleys *g*, up over the pul-

ley *i*, down around the other pulley *g*, and finally upward, thereby forming a double fall, as shown in the drawings. At the upper ends of the arms *B'* may be mounted the pulleys *j* and *k*, to receive the ropes *D* and *G*, respectively, as they pass upward.

As shown in the drawings, when the bucket is closed, as in Fig. 1, the rope *D* is unwound from the windlass-drum *C'* and the ropes *E* are wound up on the windlass-shaft *C*; and when the bucket is open, as in Fig. 2, the reverse is the case—*i. e.*, the rope *D* is wound up on the windlass-drum and the ropes *E* are unwound from the windlass-shaft.

The operation of the bucket is as follows: The bucket in its open position, as shown in Fig. 2, is lowered into the material to be hoisted, into which by its weight it embeds itself. Power is then applied to the rope *D*, which causes the windlass drum and shaft to be revolved, and the ropes *E* to be thereby wound up on the windlass-shaft, the rope *D* at the same time unwinding from the windlass-drum. The winding up of the ropes *E* causes a direct pull to be exerted from one half of the bucket to the other and the parts of the bucket to be thereby closed, as will be readily understood. While this is being done the rope *G* is to be left slack, so as not to interfere with the closing of the bucket. When the bucket has been closed, power is applied to the rope *G*, as well as the rope *D*, and by means of both ropes the bucket with its contents is hoisted to the position where the load is to be deposited. The rope *D* is then slackened, while the rope *G* is held taut. This causes, by means of the described arrangement of pulleys, an upward pull to be exerted upon the pivot-pin *f* and the ends of the arms or levers *F*, pivoted thereto, which results in raising said pivot-pin and the ends of said levers, thereby increasing the angle formed by the levers secured to the opposite sides of the bucket, or, in other words, straightening the toggle-joint. This straightening of the toggle-joint exerts a sidewise thrust upon the arms *B' B'*, to which the said levers *F* are connected, and through said arms *B'* upon the halves of the bucket proper, which are thereby caused to separate and open the bucket, and thus discharge the contents. The bucket is then lowered to secure a second load, when the operation above described is repeated.

If desired, the end of the rope *E* may be secured to the part of the bucket opposite to that upon which the windlass-shaft is mounted, instead of passing around a pulley thereon and then being secured to that part of the bucket which carries the windlass-shaft, as shown in

the drawings, and such modified arrangement will be found to be practically useful for operating upon fine and light material; but, as is apparent, with the arrangement shown in the drawings the leverage is much increased and the bucket thereby better adapted for use upon coarse or heavy material.

It will be observed that by locating the windlass shaft and drum at one side, and upon one of the halves of the bucket instead of centrally, as heretofore, and connecting the same with the opposite half of the bucket, as described, a direct pull is secured from one half of the bucket to the other, when the windlass is rotated to close the bucket. By reason of this direct pull the amount of leverage required is greatly diminished, and consequently the diameter of the windlass-drum can be much reduced. It will also be seen that the upwardly-extending arms *B'* have nothing to do with closing the bucket. Consequently their length does not require to be regulated to serve such purpose, and as a result said arms can be made considerably shorter than in the prior bucket hereinbefore referred to.

By locating the pivotal point about which the halves of the bucket swing in opening and closing at the outer ends of the arms *B*, it is apparent that the bucket can be opened more widely than if such pivotal point were located at the top edge of the side walls, and consequently the bucket will be better able to fill itself under all circumstances, by reason of its capacity to cover a larger area when open and the fact that in closing the parts of the bucket will be dragged over a larger space.

What I claim as my invention is—

1. The combination, in a hoisting-bucket composed of two parts pivoted or hinged together, of a windlass shaft and drum mounted upon one of the halves of the bucket, means, substantially as described, for connecting said windlass-shaft with the opposite half of the bucket, whereby a direct pull may be obtained from one half of the bucket to the other, and means for rotating said windlass-shaft to close the bucket, substantially as set forth.

2. The combination, in a hoisting-bucket, of the two halves or sections pivoted or hinged together, each of said sections being provided with upwardly-extending arms, toggle-jointed levers connected with said arms between their upper and lower ends, and means for operating such toggle-levers to separate or force apart the two halves of the bucket, substantially as described.

LOREN G. LADD.

Witnesses:

S. J. MURPHY,

W. H. THURSTON.