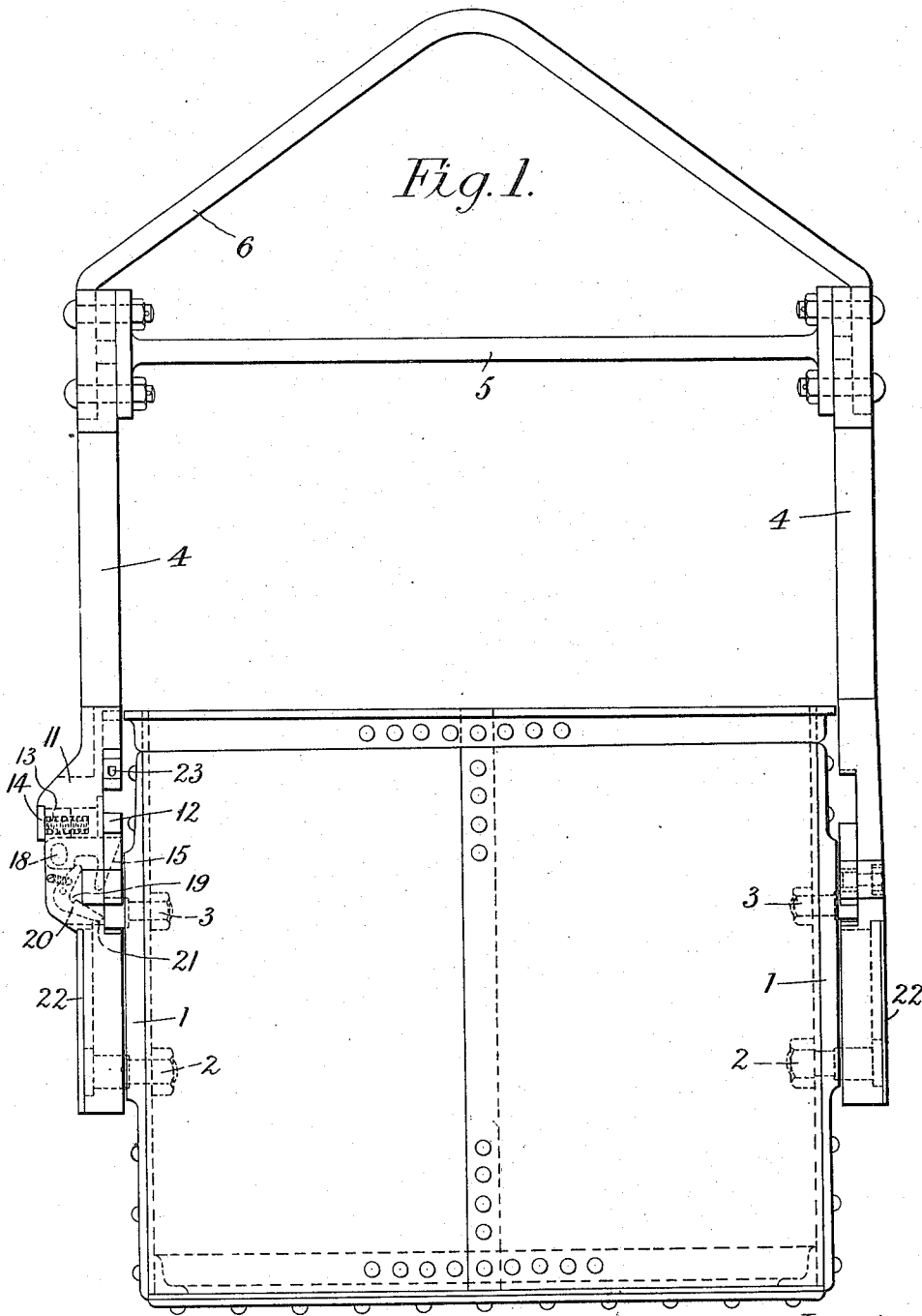


W. J. S. PERKINS.
 AUTOMATIC TIPPING BUCKET.
 APPLICATION FILED MAY 28, 1914.

1,152,342.

Patented Aug. 31, 1915.

5 SHEETS—SHEET 1.



Witnesses.

L. J. ...
W. J. Perkins

Inventor.

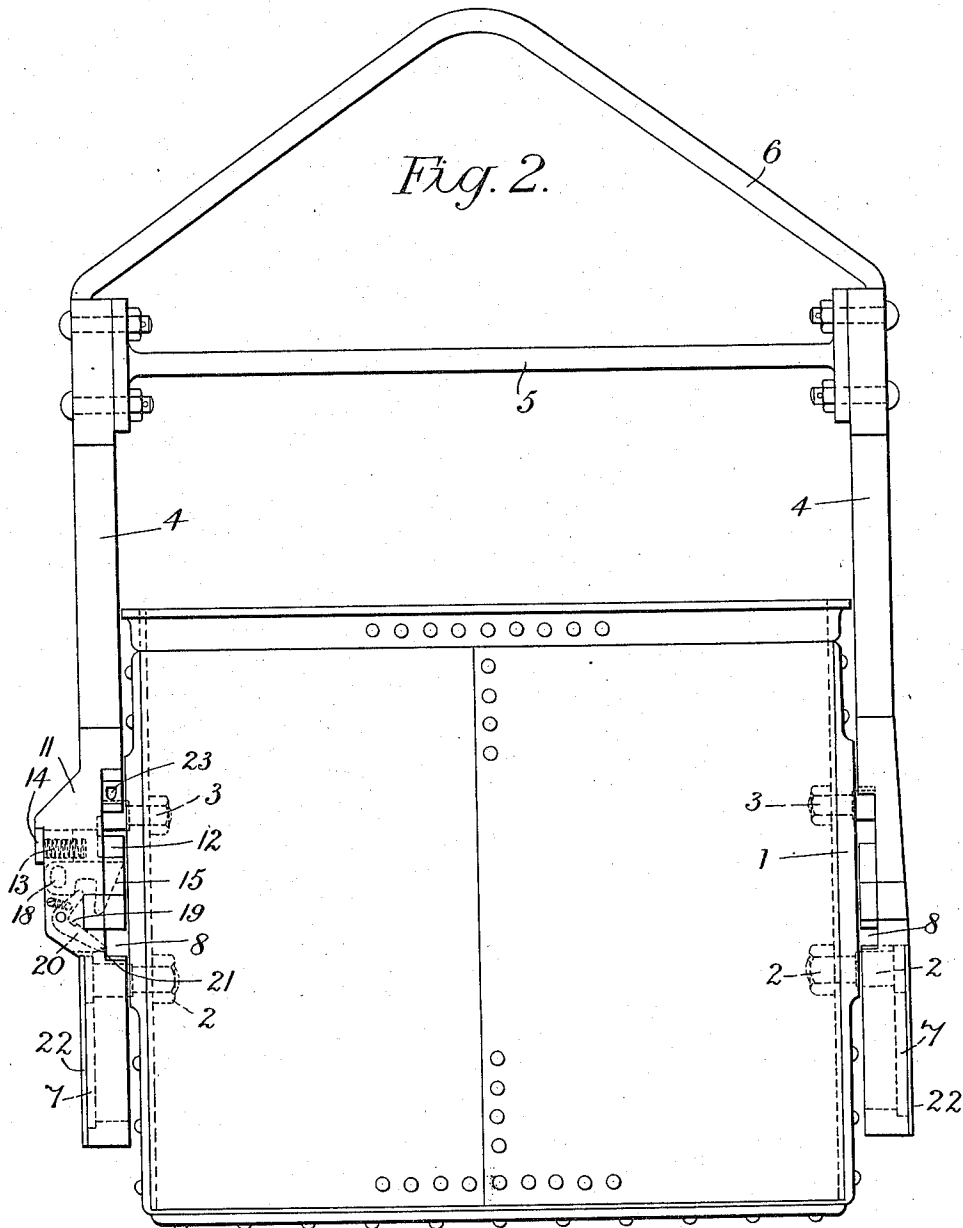
W. J. Perkins
By ...

W. J. S. PERKINS.
 AUTOMATIC TIPPING BUCKET.
 APPLICATION FILED MAY 28, 1914.

1,152,342.

Patented Aug. 31, 1915.

5 SHEETS—SHEET 2.



Witnesses.

Harry W. Allen
W. H. P. Pinner

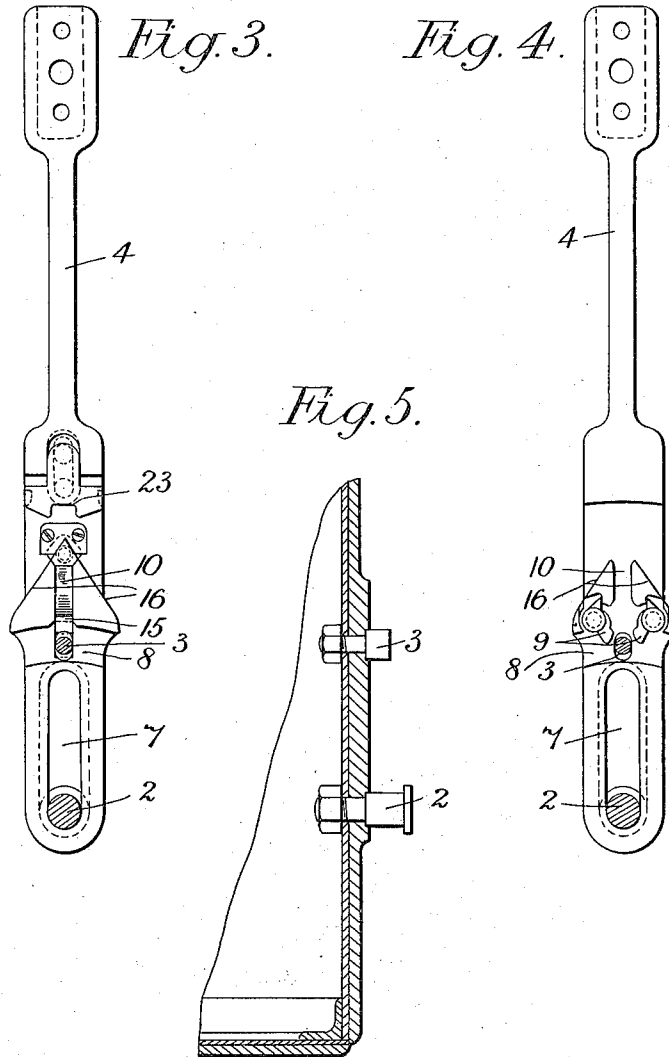
Inventor.

William John Sydney Perkins
E. Wilkinson, Gustav H. Mackay
Attorneys

W. J. S. PERKINS.
AUTOMATIC TIPPING BUCKET.
APPLICATION FILED MAY 28, 1914.

1,152,342.

Patented Aug. 31, 1915.
5 SHEETS—SHEET 3.



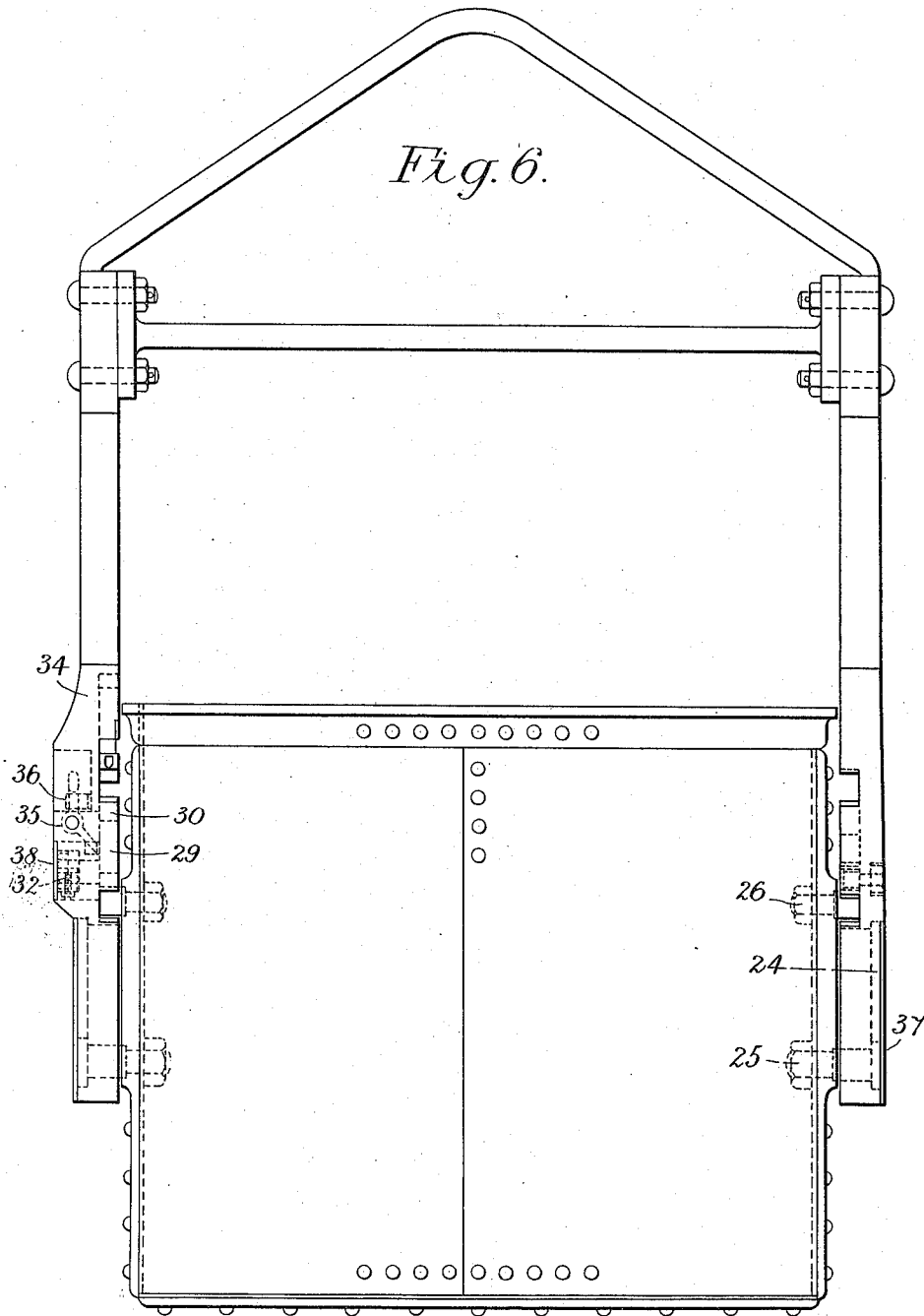
Witnesses.
David M. Hatten
W. J. Perkins

Inventor:
William John Sydney Perkins
E. Williams, Jr., & M. A. Ray
his Attorneys

W. J. S. PERKINS.
AUTOMATIC TIPPING BUCKET.
APPLICATION FILED MAY 28, 1914.

1,152,342.

Patented Aug. 31, 1915.
5 SHEETS—SHEET 4.



Witnesses

John W. Mather

N. W. Primmer

Inventor

William John Sydney Perkins

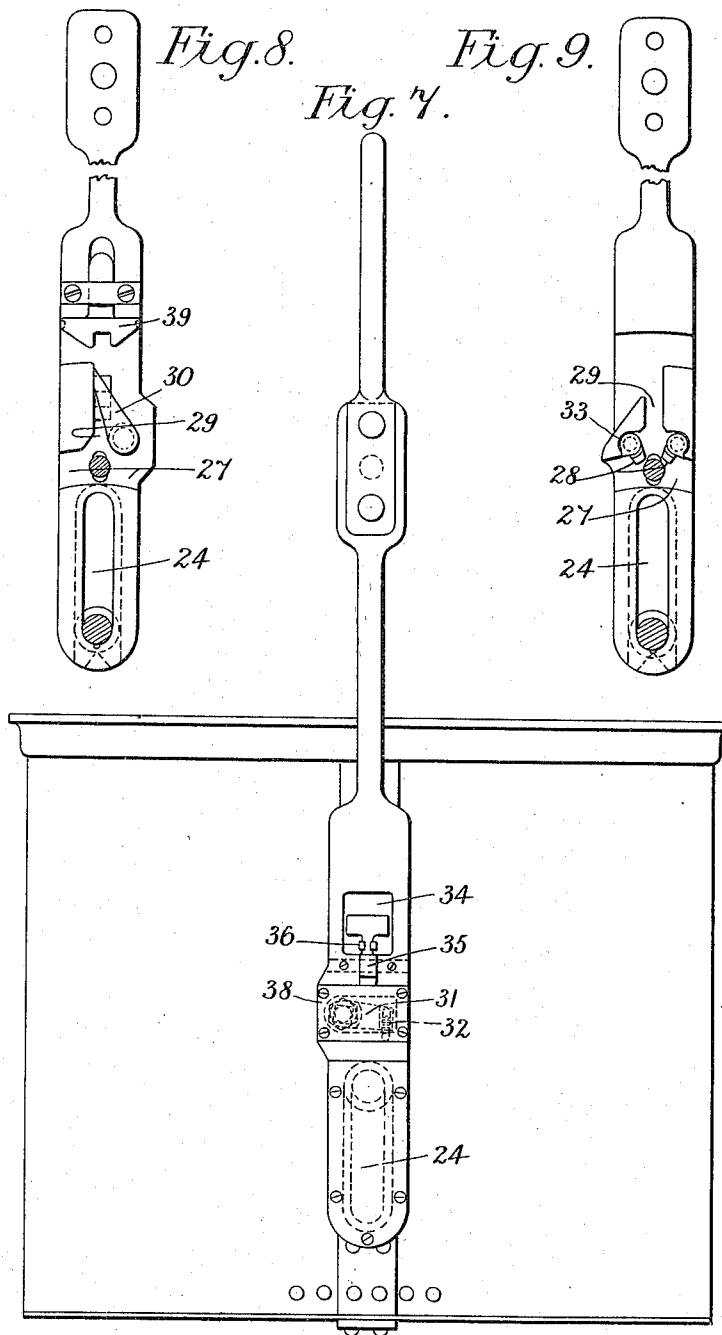
By William J. G. Mather

his Attorney

W. J. S. PERKINS.
 AUTOMATIC TIPPING BUCKET.
 APPLICATION FILED MAY 28, 1914.

1,152,342.

Patented Aug. 31, 1915.
 5 SHEETS—SHEET 5.



Witnesses.
W. J. S. Perkins
W. J. S. Perkins

Inventor.
William John Sydney Perkins
By Wilkinson, Ginter & Co., Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM JOHN SYDNEY PERKINS, OF PORTLAND, ENGLAND.

AUTOMATIC TIPPING BUCKET.

1,152,342.

Specification of Letters Patent.

Patented Aug. 31, 1915.

Application filed May 28, 1914. Serial No. 841,583.

To all whom it may concern:

Be it known that I, WILLIAM JOHN SYDNEY PERKINS, a subject of His Majesty the King of Great Britain and Ireland, residing at Portland, England, have invented a new and useful Improved Automatic Tipping Bucket, of which the following is a specification.

This invention relates to the construction of automatic tipping self righting and self locking buckets such as are employed for loading or unloading coal gravel and other material in bulk.

In the general class of tipping buckets it has heretofore been proposed to employ springs catches and pawls of various kinds, but in nearly all cases the mechanism is so exposed as to be liable to easy damage and clogging of the parts.

According to the present invention the locking and releasing mechanisms are largely protected from liability to damage and yet an effective operation is insured without the use of hand labor at the bucket for releasing or locking the same.

In the accompanying drawings: Figure 1 is an elevation of an ordinary form of bucket and top carrying frame or bail but with the holding carrying and releasing mechanism according to this invention applied thereto the parts being in the position they assume when carrying a load or being lifted empty. Fig. 2 a similar view when the weight has been taken off the frame and the bucket is ready for tipping. Fig. 3 a face view of part of the handle upon one side of the bucket. Fig. 4 a similar view of the other handle. Fig. 5 a section of part of the bucket showing the carrying trunnion and a projection or stud also carried by the bucket. Fig. 6 is a view similar to Fig. 1 but showing a modified form of construction. Fig. 7 is a side view of the arrangement shown in Fig. 6 the handle being lowered. Figs. 8 and 9 are respectively face views of the two side pieces of the handle of the modified construction.

In the example illustrated the bucket is cylindrical in form having stiffening pieces 1 preferably machined on their outer surfaces and riveted on each side thereof, through which pieces projecting bolts or trunnions 2 and 3 pass (Fig. 5). The lower trunnions 2 act as pivots and carry the weight of the bucket during transportation, and the bucket rotates on tipping and right-

ing about said trunnions. The upper projections 3 serve to lock the bucket in an upright position during transportation, and also act as a guide and partly support the weight of the bucket at the beginning of the tipping movement.

The position of the lower pivots 2 is fixed at a point between the vertical positions of the centers of gravity of the bucket when empty and when full of coal or the material to be transported, so that when released the bucket tends to automatically tip and empty itself, revolving about the pivots 2 and returning when empty to the upright position.

The handle or bail is formed as shown (Figs. 1 and 2) and comprises two separate side pieces 4 connected by cross pieces 5, 6. Each side piece 4 has a guide slot 7 cut in the lower end with which one of the trunnions 2 engage. Above the upper limit of these guide slots 7 recesses 8 (Figs. 3 and 4) are cut in the handle ends to preferably about half the depth of said ends, and of such a size as to permit the upper projections 3 on the bucket to pass through from side to side. In the recess 8 on one handle end (Fig. 4) tumblers 9 are mounted, so that the projections 3 are allowed to pass freely through from outward toward the center of the handle, but they cannot pass from the center outward, and are therefore always locked in the center keeping the bucket upright when its weight is being carried by the pivots 2 bearing on the lower ends of the guide slots 7 (Fig. 1). Further, vertical recesses 10 are cut in each handle, into which the upper projections 3 pass, said recesses serving as guides for the same when the handle is lowered (Fig. 2) until the upper ends of the guide slots 7 rest on the pivots 2, as is the case when the bucket is landed either empty or full.

On the handle end or part opposite to that having the tumblers 9 (Fig. 3) a thickened portion 11 is provided through which a square hole is machined in which slides a square bolt 12. The face of this bolt 12 when in its normal position is in line with the inner face of the handle, being kept in this position by the coiled spring 13 contained in a recess in the interior of the bolt, which recess is covered by a cap 14.

The bottom of the bolt 12 is provided with a beveled extension 15 the point of which lies in the vertical recess 10, so that

when the handle is dropped, the projection 3 bears first on the lower edge of the bevel 15 and then gradually forces the bolt 12 back against the spring 13 until said bolt drops below the projection 3 when it is forced out again into its extended position beneath said bolt 12 by the spring 13.

On again lifting the bucket by the handle the bolt 12 engages the under surface of the projection 3 and exerts a lifting and tipping action on it, so that the projection slides down one of the inclined planes 16 provided on each handle (Figs. 3 and 4) corresponding to the direction in which it happens to be inclined at the moment, and as the lifting action continues, attains such impetus in the direction of tipping that the bucket immediately upsets tipping out the contents, and continuing to rotate about the pivots 2 rights itself, the projection 3 on each side passing into the recess 8 and so coming into position again in the guides 10. The projection 3 on one side is now locked between the two tumblers 9 (Fig. 4) thus securing the bucket in the upright position ready for refilling on its return to the hold of the collier or other loading position.

A small handle or recess 18 is cut in the back of the spring bolt extension 15, so that when the bucket is lifted after being filled, in order that it may not tip as in the manner previously described, this spring bolt is pulled back beyond the position it is normally forced into by the upper projection 3, and is held in this position by the heel of the beveled extension 15 engaging in a recess 19 formed in a pivoted cam piece 20, the toe 21 of which projects into the vertical guide slot 10. In this instance on the handle being lifted by the crane or the like the upper projection 3 (Fig. 3) slides down the vertical guide 10 until it strikes the projecting toe 21 rotating it clear of the recess 19 and releasing the spring bolt 12 which returns to its normal extended position and the bucket is lifted, its weight being carried by the pivots 2 resting on the bottoms of the slots 7 in the ends of the side pieces 4. The bucket is secured from upsetting during transit, should it strike any obstacle or projection, by the upper projection 3 on the one side being locked between the tumblers 9. On reaching the position where its contents are to be deposited, the bucket is landed and the handle dropped into the lowest position (Fig. 2) when on again attempting to lift the tipping and righting actions before described take place.

The guide slots 7 are covered by plates 22, which prevent dust, small coal or other material clogging or obstructing the slots. The cap 14 (Fig. 3) similarly covers the hole for the sliding bolt 12.

The bolt 12 is square except where reduced at its inner end to conform to the angles

of the slope 16, it works diagonally in a square hole in the handle, and has an extension 15 at its lower end, beveled as shown on its inner face and shaped as shown in section to suit the cam piece 20.

It being at times found convenient for filling, to drop the handle into a horizontal position, this is provided for by the sliding piece 23 (Fig. 3), which is lifted by hand and the handle being in the lower position (Fig. 2) is free to be rotated sidewise until it rests on the ground or material to be loaded into the bucket.

All the mechanism is contained on the inner section of the handle ends, by which the relative positions of the several parts are maintained, and the mechanism secured from damage which might be caused by the bucket striking other heavy objects, or several buckets of the same type striking one another when working in restricted spaces.

In the modified construction shown in Figs. 6 to 9 the bucket is adapted to tip in one direction only. Referring to these figures:—The handle or bale is formed as shown, guide slots 24 being formed in the handle ends and the bucket provided with trunnions and projections 25, 26 as before. Above the upper limit of the slots 24, recesses 27 (Figs. 8 and 9) are cut preferably to about half the depth of the handles and of such size as to permit the upper projections 26 on the bucket to pass through from side to side. In the recess 27 on one handle end (Fig. 9) are fitted tumblers 28, so that although the projections 26 are allowed to pass freely through from outward toward the center of the handle, they cannot pass from the center outward, and are therefore always locked in the center keeping the bucket upright when its weight is being carried by the pivots bearing on the lower ends of the slots 24 (Fig. 6). Further vertical recesses 29 are provided in the handle ends into which the projections 26 pass, and which serve as guides for the same when the handle is lowered (Fig. 7) so that the upper ends of the slots 24 rest on the pivots 25, as is the case when the bucket is landed either empty or full.

On the opposite part of the handle to that in which the tumblers 28 are fitted, one side of the vertical recess 29 (Fig. 8) is cut away and replaced by a sidewise acting tumbler or pawl 30, which in its normal position lies as shown across the recess 29 being further assisted to maintain this position by a balance weight 31 (Fig. 7) placed in a recess at the back of the handle and secured to the pawl spindle. This balance weight 31 engages with the top of its recess and limits the outward sidewise movement of the pawl 30. A small spring 32 is fitted to the balance weight to prevent the pawl and balance weight being loosely thrown about, and fur-

ther assists to keep the pawl 30 in its normal position.

On the handle being dropped into the position shown in Fig. 7, the upper projection 26 engages with the under side of the pawl 30 moving it sidewise until said projection passes above the pawl which latter falls into its normal position behind the projection when the handle is in its lowest position.

On again lifting the handle the pawl 30 engages with the under side of the projection 26 and through it exerts a lifting and tipping action on the bucket, so that the projection 26 is constrained to slide down the upper inclined face of the pawl 30, as also the projection 26 on the opposite side of the bucket down the inclined face 33 (Fig. 9), the bucket thereby attaining such impetus in the direction of tipping that it immediately upsets and shoots out its contents, and continuing to rotate about the pivots 25 rights itself, the upper projection 26 on the one side passing into the recess 27 and being locked between the tumblers 28, (Fig. 9) thus securing the bucket in the upright position ready for refilling on its return to the hold or collier or other position for loading.

A recess 34 is cut in the back of the handle in which is fitted a pivoted arm or lever 35, so that when the bucket is lifted after being filled, in order that it may not tip in the manner previously described, the lever or arm 35 is pulled down and its lower end takes under the pawl 30 lifting it from its normal position to its extreme outward position as determined by the travel of the balance weight 31 before described. In this instance on the handle being lifted the upper projection 26 (the pawl 30 being out of its path) slides down the vertical recess 29 until it strikes the projecting end of the lever 35, rotating the latter clear of the recess and releasing the pawl, which returns to its normal position and the bucket is lifted, its weight being carried by the pivots 25 on the bottom ends of the slots 24, the bucket being secured for upsetting during transit should it strike any obstacle or projection by the upper projection 26 on the one side being locked between the tumblers 28. The lever 35 is retained in its normal position, and in the position taken up on lifting the pawl 30 by the U shaped spring clip 36. On reaching the position where its contents are to be deposited, the bucket is landed and the handle dropped into the lowest position (Fig. 7) when on again attempting to lift the tipping and righting action before described takes place.

The guide slots 24 are covered by plates 37, which prevent dust, small coal or other material clogging or obstructing the guides. The plate 38 (Fig. 7) similarly covers the recess for the balance weight.

It being at times found convenient for

filling, to drop the handle into a horizontal position, this is provided for by the sliding piece 39 (Fig. 8), which is lifted by the hand and the handle being in the lower position (Fig. 7) is free to be rotated sidewise until it rests on the ground or material to be loaded into the bucket.

It will be noted that with this construction the bucket is constrained to tip in one direction only which is of advantage in certain circumstances. As in the previous construction all the mechanism is contained on the inner section of the handle ends, by which the relative positions of the several parts are maintained, and the mechanism secured from damage which might be caused by the bucket striking other heavy objects, or several buckets of the same type striking one another when working in restricted spaces.

What I claim is:—

1. An automatic tipping, righting, and locking bucket comprising, a bucket body, trunnions on same, a handle having recessed vertical guides which engage said trunnions, and locking and releasing mechanism for said bucket inclosed and protected by said handle.

2. An automatic tipping, righting and locking bucket comprising, a bucket body, trunnions on same, a handle having recessed vertical guides which engage said trunnions, a projection on each side of the bucket, and mechanism actuated by said projection inclosed and protected by the handle which enables the bucket to be released for tipping.

3. An automatic tipping, righting and locking bucket comprising, a bucket body, trunnions on same, a handle having recessed vertical guides which engage said trunnions, a projection on each side of the bucket, mechanism actuated by one projection for tipping the bucket inclosed in one side of the handle, and mechanism for locking the bucket in an upright position inclosed in the other side of the handle.

4. An automatic tipping, righting and locking bucket comprising, a bucket body, trunnions on same, a handle engaging said trunnions, a projection on each side of the bucket, recessed vertical guides in each handle end, recessed horizontal guides in each handle end, a movable locking bolt in one handle end and pivoted locking means in the other handle end for locking the bucket in an upright position.

5. An automatic tipping, righting and locking bucket comprising, a bucket body, trunnions on same, a handle engaging said trunnions, a projection on each side of the bucket, recessed vertical guides in each handle end, recessed horizontal guides in each handle end, a movable locking bolt in one handle end, a beveled extension on said locking bolt, and pivoted locking means in

the other handle end for locking the bucket in an upright position.

6. An automatic tipping, righting and locking bucket comprising, a bucket body, 5 trunnions on same, a handle engaging said trunnions, a projection on each side of the bucket, recessed vertical guides in each handle end, recessed horizontal guides in each 10 handle end, a movable locking bolt in one handle end means for guiding the tipping action of the bucket, and pivoted locking means in the other handle end for locking the bucket in an upright position.

7. An automatic tipping, righting and 15 locking bucket comprising, a bucket body, trunnions on same, a handle engaging said trunnions, a projection on each side of the bucket, recessed vertical guides in each handle end, recessed horizontal guides in each 20 handle end, a movable locking bolt in one handle end, a beveled extension on said locking bolt, means for guiding the tipping action of the bucket, and pivoted locking means in the other handle end for locking 25 the bucket in an upright position.

8. An automatic tipping, righting and locking bucket comprising, a bucket body, trunnions on same, a handle engaging said trunnions, a projection on each side of the 30 bucket, recessed vertical guides in each handle end, recessed horizontal guides in each handle end, a spring pressed locking bolt in one handle end, means for guiding the tipping action of the bucket, pivoted locking 35 means in the other handle end for locking the bucket in an upright position, a beveled extension on said locking bolt, a pivoted catch for holding back said bolt, means for guiding the tipping action of the bucket and 40 pivoted locking means in the other handle end for locking the bucket in an upright position.

9. An automatic tipping, righting and locking bucket comprising, a bucket body, 45 trunnions on same, a handle engaging said trunnions, a projection on each side of the bucket, recessed vertical guides in each handle end, recessed horizontal guides in each handle end, a spring pressed locking bolt in 50 one handle end, means for guiding the tip-

ping action of the bucket, pivoted locking means in the other handle end for locking the bucket in an upright position, a beveled extension on said locking bolt, a pivoted catch for holding back said bolt, angle 55 pieces in each handle end for guiding the tipping action of the bucket and pivoted locking means in the other handle end for locking the bucket in an upright position.

10. An automatic tipping, righting and 60 locking bucket comprising, a bucket body, trunnions on same, a handle engaging said trunnions, a projection on each side of the bucket, recessed vertical guides in each handle end, recessed horizontal guides in each 65 handle end, a spring pressed locking bolt in one handle end, means for guiding the tipping action of the bucket, pivoted locking means in the other handle end for locking the bucket in an upright position, a beveled 70 extension on said locking bolt, a pivoted catch for holding back said bolt, angle pieces in each handle end for guiding the tipping action of the bucket and pivoted tumblers in the other handle end for locking the bucket 75 in an upright position.

11. An automatic tipping, righting and locking bucket comprising, a bucket body, trunnions on same, a handle having recessed vertical guides which engage said trunnions, 80 locking and releasing mechanism for said bucket inclosed and protected by said handle, and means for causing the bucket to tip in one direction only.

12. An automatic tipping, righting and 85 locking bucket comprising, a bucket body, trunnions on same, a handle having recessed vertical guides which engage said trunnions, locking and releasing mechanism for said bucket inclosed and protected by said handle 90 and means inclosed in the handle for causing the bucket to tip in one direction only.

In witness whereof I have hereunto set my hand in the presence of two subscribing 95 witnesses.

WILLIAM JOHN SYDNEY PERKINS.

Witnesses:

WILLIAM MATTHEW JACKMAN,

TOM FOOT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."