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A. N. DOUD.
 BOTTOM DUMPING HOISTING BUCKET.
 APPLICATION FILED APR. 17, 1909.

Patented Apr. 5, 1910.
 2 SHEETS—SHEET 1.

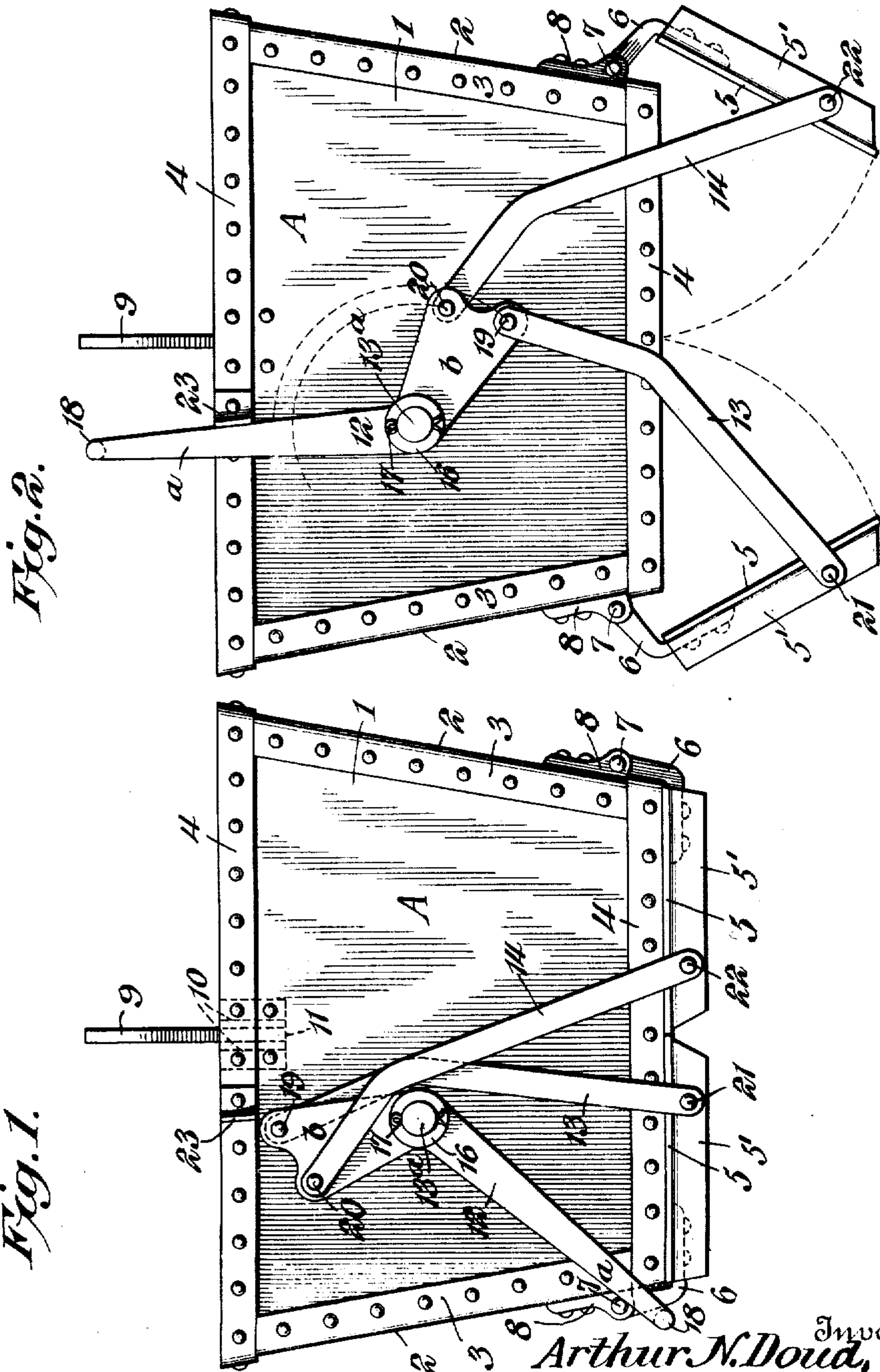


Fig. 2.

Fig. 1.

Witnesses
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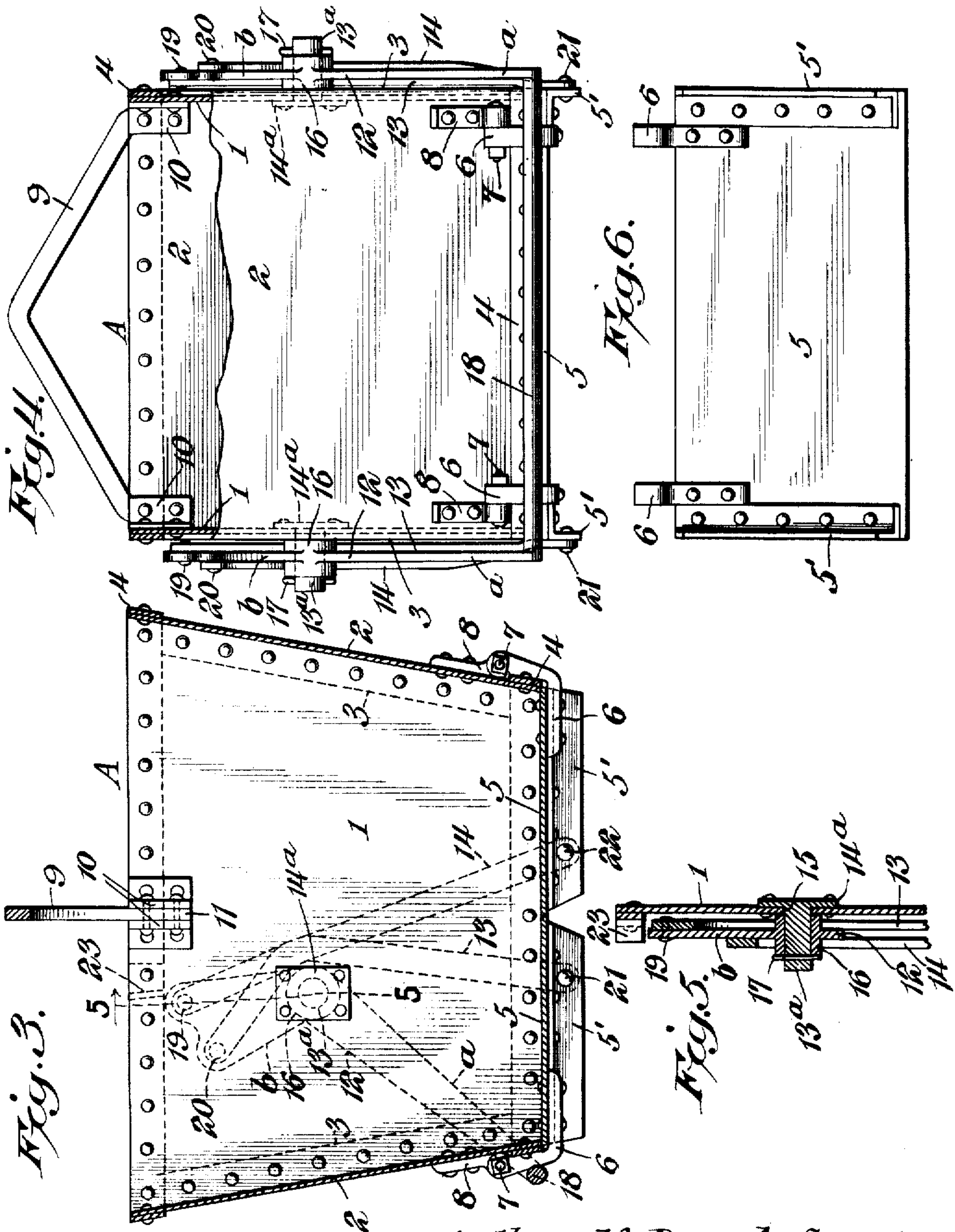
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Witnesses

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UNITED STATES PATENT OFFICE.

ARTHUR NATHAN DOUD, OF NORTH STOCKHOLM, NEW YORK.

BOTTOM-DUMPING HOISTING-BUCKET.

954.266.

Specification of Letters Patent.

Patented Apr. 5, 1910.

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To all whom it may concern:

Be it known that I, ARTHUR NATHAN DOUD, a citizen of the United States, residing at North Stockholm, in the county of St. Lawrence and State of New York, have invented a new and useful Bottom-Dumping Hoisting-Bucket, of which the following is a specification.

This invention relates to a double door bottom dumping hoisting bucket, and relates more particularly to an improved door-operating mechanism having for its primary object the opening and closing of the doors simultaneously through the medium of the novel arrangement of operating levers and links, the construction being extremely simple and inexpensive to manufacture, reliable and efficient in use, and composed of comparatively few parts.

Another object of the invention is to so design the door-operating mechanism as to automatically lock the doors in closed position, and whereby slidably connected parts are eliminated, as such are extremely objectionable, especially when the buckets are used in handling mortar, cement or the like, since the lodging of such material on the sliding parts and hardening thereon prevents efficient operation.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figures 1 and 2 are side views of the bucket showing the doors in open and closed positions, respectively. Fig. 3 is a vertical section of the bucket. Fig. 4 is an end view thereof partially broken away. Fig. 5 is a detail section view on line 5—5, Fig. 3. Fig. 6 is a bottom plan view of one of the door sections.

Similar reference characters are employed to designate corresponding parts throughout the views.

Referring to the drawings, A designates the body of the bucket, which may be constructed of any suitable material and of any desired shape. In the present instance, the bucket is composed of two parallel sheet metal side plates 1 and oppositely-sloping sheet metal end plates 2 which are connected

together at their edges by flanges 3 on the plates 2 and around the top, and bottom of the plates are encircling bands 4 which, like the flanges 3, are riveted to the plates whereby a strong and substantial structure is produced. The bottom is adapted to be closed by swinging door sections 5 that are in the form of rectangular plates, reinforced by angle irons 5', adapted to fit flush against the bottom band or the lower edges of the bucket plates to tightly close the bucket. Each door section has a pair of L-shaped ears or hinge members 6 secured to their outer portions, and the upwardly-projecting members of the ears are pivoted at 7 to brackets 8 fastened to the end plates of the bucket. The inner edges of the door sections are adapted to meet at the center of the bucket. Extending transversely across the top of the bucket is a suspension bail 9 rigidly secured to the side plates of the bucket by angle connecting pieces 10 riveted to the bucket and to the depending extremities 11 of the bail.

The means for operating the door sections and for holding the same in locked position comprise a swinging element composed of a lever or a pair of levers 12 connected by links 13 and 14 with the respective door sections at the ends thereof, each lever and its respective pairs of links forming toggle joints. In the present instance, a swinging element is shown composed of two connected levers which are disposed exterior to the buckets and fulcrumed on the side plates 1 thereof. It is to be understood, however, that in some buckets of small capacity, where the door sections are comparatively light and the load to be carried is small, a single lever will be sufficient. The fulcrums of the levers are in the form of studs or pivots 13^a each having a plate or head 14^a at its inner end which is riveted to the adjacent side plate of the bucket, the said side plate, as shown in Fig. 5, having an aperture 15 through which the stud passes. The pivot studs are located both to one side of a medial plane passing through the bail 9, and the levers are provided with hubs 16 to form a substantial bearing on the pivots, the levers being held in place by cotter pins 17 extending through the pivots. The long arms *a* of the levers are connected together by a bar or handle 18, so that both levers will operate simultaneously, and the said long arms are of sufficient length to swing

over the top and one end of the bucket in opening and closing the door sections. The short arm *b* of each lever is connected with the upper extremities of both links 13 and 14, and the pivotal connections 19 and 20 are located at different distances from the axis of the pivot 13^a so as to move in different arcs, as indicated by the dotted lines in Fig. 2. The pivot 19, which is connected with the link 13, is located at a greater radial distance from the pivot 13^a than the pivot 20, so that as the levers 12 are oscillated, the door sections 5 will open symmetrically and simultaneously. The links 13 and 14 are connected with their respective door sections by pivots 21 and 22, and these pivot points are located equidistant from the pintles 7 of the hinges for the door sections, and this being so and the fulcrums 13^a being located at one side of the medial plane of the bucket, the crank arms of the levers connected with the links 13 and 14, must be of different lengths for the purpose of causing the door sections to open in absolute synchronism. If the pivot points 19 and 20 are the same distance from the fulcrum 13^a, it is necessary to vary the distance between the pintles of the hinges and the points of connection between the links and door sections.

Another important feature is the automatic locking of the doors in closed position by limiting the downward movement of the handle 18 to bring the levers at rest when the links will be on the dead centers, as shown in Fig. 1. It will be observed that the pivots between the ends of the links and the lever and door sections are located in lines passing through the center of the fulcrum 13^a, with the result that the door sections are locked in closed position. The bucket will thus hold the load without danger of the door sections opening, and yet it is comparatively easy to open the door sections by the manipulation of the lever handle bar 18. The links 13 and 14 are suitably bent so as to accommodate themselves to the location of the fulcrum points 13^a. The opening movement of the door section is limited by stops 23 on the upper band of the bucket, said stops being located in the path of the long arms of the levers.

When the bucket is closed, the door sections are in the position shown in Fig. 1, and they are locked in this position by the operating mechanism. The bucket can then receive its load to be transported to the desired point, and when it is desired to empty the bucket, it is merely necessary to grasp the handle 18 which bears against the upstanding ears of the hinge members 6, Fig. 3, and throw the handle bar upwardly to shift the pivot points 19 and 20 out of dead center position to thereby unlock the door sections and permit the weight of the

material in the bucket to throw them wide open to the position shown in Fig. 4. The open movement of the door sections is arrested by the levers striking the stops 23. In closing the door sections, the handle bar 18 is swung downwardly until it strikes the side of the bucket or the stop 6. At this position, the doors will be automatically locked closed.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

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

1. A bucket open at its top and bottom, door sections for the open bottom separately pivoted on the bucket to swing inwardly and outwardly to closed and open positions, a swinging lever element fulcrumed on the bucket, and links pivotally connected directly with the element and door sections at such points as to cause both door sections to open simultaneously and at the same rate, the element being arranged to act through the links to pull the door sections as the element moves in one direction and to push the said sections as the element moves in the opposite direction in the use of the bucket.

2. A bucket having door sections, a swinging lever element fulcrumed on the bucket, and links pivotally connected with the door sections and pivotally connected with the said element at different points at the same side of the fulcrum thereof.

3. A bucket having door sections, a pivoted element on the bucket, separate links between the element and door sections for opening and closing both the latter by the element, pivotal connections between the links and door sections located at different points from the axis on which the sections swing, and pivotal connections between the links and said pivoted element located at different points from the axis of movement of the element, said element being tilted in one direction to positively move the door sections to closed position and tiltable in the opposite direction for opening the door sections.

4. A bucket open at its bottom, door sections hinged directly to the bucket to swing on fixed axes, links disposed at opposite sides of the bucket with their lower ends

connected directly with the door sections at points eccentric to their axes, a swinging element consisting of connected levers fulcrumed on the sides of the bucket and to which the upper ends of the links are separately and directly connected, whereby the levers operate through the links to positively open or close the door sections.

5. A bucket provided with oppositely-swinging door sections, fixed pivots on the bucket for the door sections, a swinging element mounted on the bucket at one side of the medial plane thereof, link members connected with the door sections and element, an actuator for the element, and means for limiting the movement of the actuator in opposite directions to hold the sections in open and closed position.

6. A bucket having oppositely-swinging door sections arranged to meet at the middle of the bucket, an element fulcrumed on the bucket, a pair of links separately connected with the element and each connected with a door section, an actuating member connected with the element, and means for limiting the movement of the member in one direction to throw the points of connection between the links and element in dead center lines passing through the axis of movement of the element when the doors are in closed position.

7. A bucket open at its bottom, door sections hingedly connected to the ends of the bucket to swing upwardly and downwardly in opposite directions to open position, a swinging element fulcrumed on the buckets, links connected with the door sections and both separately and directly connected with a portion of the said element at one side of the fulcrum, the other portion of the said element being provided with a handle, and fixed abutments for limiting the movement of the element.

8. A bucket having an open bottom, outwardly-swinging door sections for closing the same and separately mounted on the bucket, the axis of rotation of the door sections being fixed, a swinging element comprising levers fulcrumed at opposite sides of the bucket with their pivot points alining and a handle bar connecting the corresponding arms of the levers, and a pair of links at each side of the bucket having their upper ends independently connected with the adjacent lever and their lower ends pivotally connected with the door sections to move the latter simultaneously to open or closed positions by the oscillation of the element.

9. A bucket having an open bottom, op-

positely swinging door sections meeting at the center of the open bottom when in closed position, an oscillatory element pivotally mounted on the bucket and consisting of spaced levers connected by a handle bar, a pair of links between each lever and the respective door sections, the axis on which the levers tilt being located at one side of the vertical plane in which the free edges of the buckets meet when in closed position, each lever and its pair of links forming toggle joints.

10. The combination of a bucket having an open bottom, swinging door sections therefor, a swinging element including a bell crank lever having a long and short arm, a fulcrum on the bucket for the element, links pivotally connected with the door sections, pivots connecting the links with the short arm of the element and located at different distances from the fulcrum thereof, and means with which the long arm engages for arresting the movement of the element in one direction in closing the door sections to lock the latter in closed position by throwing the said pivots in dead center lines passing through the said fulcrum and the points of pivotal connection between the lower ends of the links and door sections.

11. The combination of a bucket having an open bottom, oppositely-swinging door sections therefor, fixed pivots on the bucket on which the door sections swing, an oscillatory element mounted on the bucket, a pair of links pivotally connected with the door sections and pivotally connected with opposite sides of the element, and a handle connected with the member for actuating the same.

12. A bucket having an open bottom, oppositely swinging door sections meeting at the center of the open bottom when in closed position, separate and spaced pivots on the bucket for the door sections, a swinging element including a lever pivoted on the side of the bucket and having long and short arms, a separate link pivotally connected to each door section at a point remote from the pivot of the latter, and separate spaced pivots for connecting each link with the short arm of the lever.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ARTHUR NATHAN DOUD.

Witnesses:

PEARLIE MATHEWS,
MAGGIE MATHEWS.