(No Model.) 2 Sheets—Sheet 1.

DE WITT WEST.

AUTOMATIC WEIGHING MACHINE FOR GRAIN.

No. 384,657. Patented June 19, 1888.

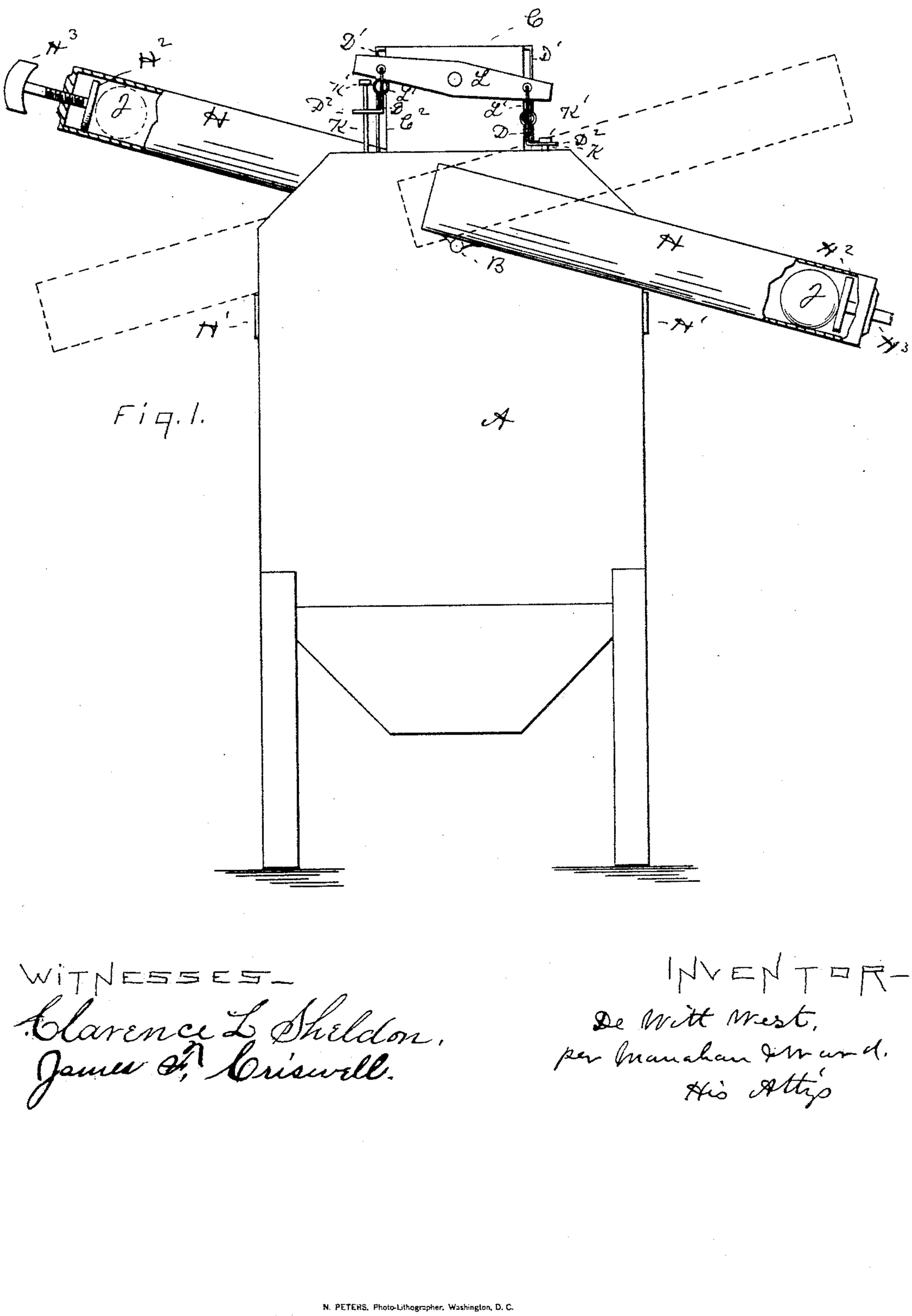

Fig. 1.

WITNESSES—
Clarence L. Sheldon.
James A. Criswell.

INVENTOR—
De Witt West,
per Branahan & Ward.
His Attys

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Fig. 2.

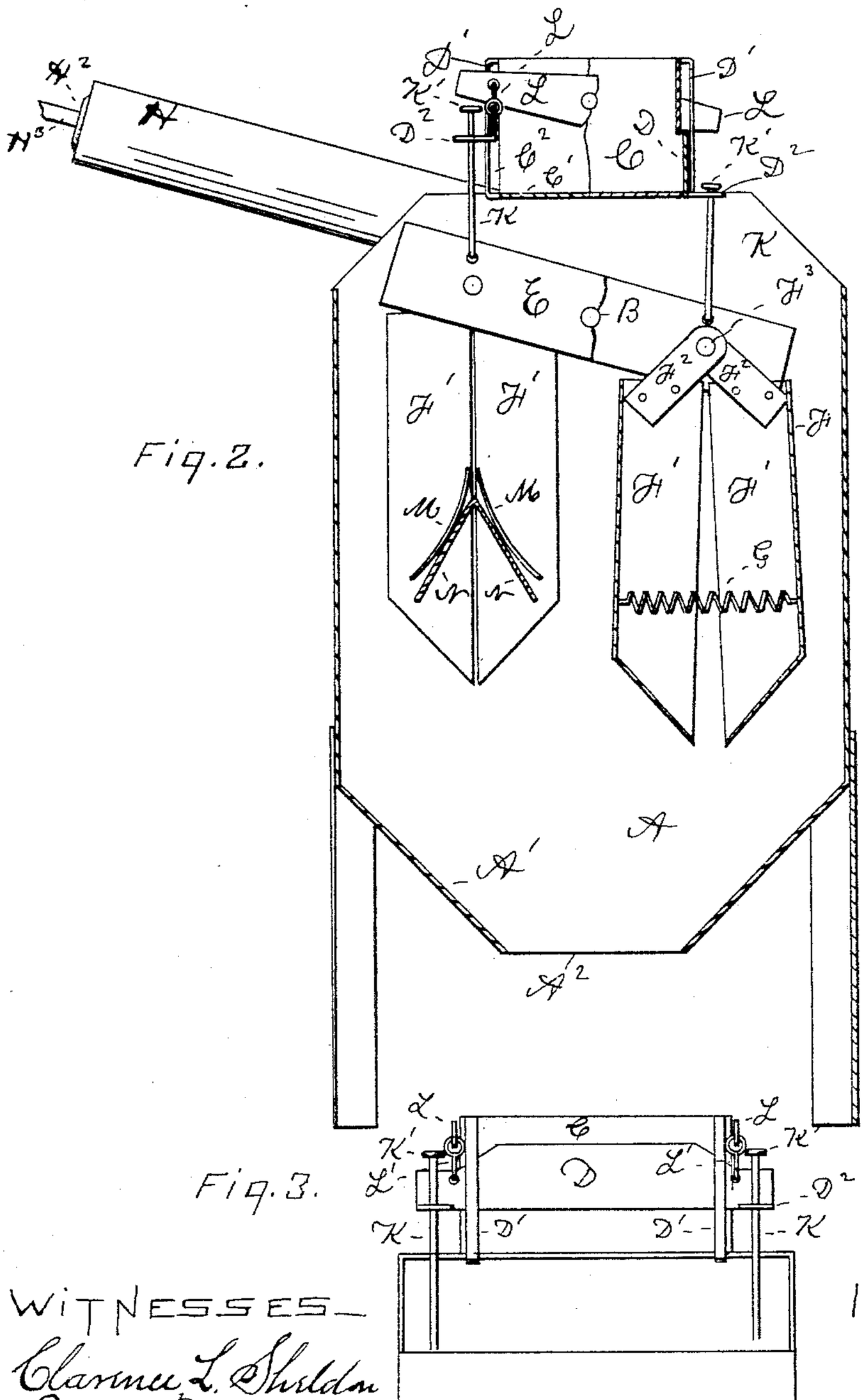

Fig. 3.

WITNESSES—

Clarence L. Sheldon

James F. Criswell.

INVENTOR—

De Witt West.

per Wanaham & Ward.

His Attys.

UNITED STATES PATENT OFFICE.

DE WITT WEST, OF TAMPICO, ILLINOIS.

AUTOMATIC WEIGHING-MACHINE FOR GRAIN.

SPECIFICATION forming part of Letters Patent No. 384,657, dated June 19, 1888.

Application filed October 31, 1887. Serial No. 253,934. (No model.)

To all whom it may concern:

Be it known that I, DE WITT WEST, a citizen of the United States, residing at Tampico, in the county of Whiteside and State of Illinois, have invented certain new and useful Improvements in Automatic Grain-Weighing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention has reference to automatic grain-weighing machines, and pertains more especially to certain novel mechanism by which the grain is alternately discharged into two oppositely and independently suspended buckets, so constructed and arranged that when either of said buckets has received a certain weight of grain it will automatically close the inlet leading thereto, discharge the grain therefrom, and open the inlet into the opposite bucket.

My invention embodies the construction, mutual relation, and operation of mechanism whereby the weight of the grain is utilized as the force to operate the cut-off gates, empty itself from the buckets, and register the number of buckets thus discharged, and therefore the aggregate weight of the grain which may pass through the machine during any period.

As the different modes of operating the registering mechanism simply are well known, and as the machine is adapted to be connected to and operate any of such well-known modes of registering its action, I do not deem it necessary to exhibit or describe the same.

My invention is especially applicable to all conditions in which the grain is passed from one receptacle to another. It can be constructed, also, of any desired size, so as to measure (*i. e.*, by weight) any desired quantities, either greater or less than a bushel, and is therefore adapted to measure grain in or out of an elevator, in or out of a wagon, and out of the elevator or discharge-spout of a corn-sheller or a thrashing-machine. Its advantages are, first, in the regularity and certainty with which the measuring is accomplished, thus avoiding the carelessness, forgetfulness, and sometimes the dishonesty of human instrumentalities in this respect, and, second, as the grain is measured and its quantity registered while it is in course of transmission through the machine, there is no delay occasioned by the operation of measuring.

In the drawings, Figure 1 is an end elevation of a machine embodying my invention. Fig. 2 is a cross vertical section thereof, showing converging flanges M attached to halves F′ of buckets F and cam N attached to inside of box A. Fig. 3 is a detail of the discharge-gate D, at one side of the receiving-box C, and the adjacent mechanism.

A is the rectangular frame or box supported in any suitable mode, which supports and contains the measuring mechanism, and provided with the hopper-bottom A′, in the center of which is the usual discharge-opening, A^2, through which the grain passes after being measured into any receptacle or elevator.

B is a rock-shaft, suitably journaled transversely in and near the top of the box A.

C is a stationary receiving-box, suitably fastened on the top of the box A, having its longitudinal center parallel with and directly over the rock-shaft B. The floor or bottom C′ of the box C may be formed slightly convex, with the apex of such convexity directly over and parallel with the rock-shaft B, so as to tend to force the grain received into such box against the sides thereof. In each side of the box C, and directly above the upper surface of the floor C′, are formed longitudinal discharge-openings C^2. These outlets C^2 are adapted to be alternately opened and closed by gates D, traversing vertical ways D′, formed on the exterior of the box C, and are intermittently actuated, as hereinafter described.

E E are oscillating beams attached centrally to the rock-shaft B at a point thereon respectively slightly within the box A.

F F are the measuring-buckets. These are constructed in two halves, F′, being divided centrally in a vertical plane through their bottom and ends. Each half F′ is provided at each end with upwardly and inwardly extending ears F^2, through which, by means of horizontal bolts F^3, the halves F′ are pivotally hung to the oscillating beams E E near the

ends of the latter. It will be observed that the ears F^2 at each end of the buckets F project past each other, so that the same bolt, F^3, passes through the ear F^2 of each half F′ and forms a pivot which is directly over the vertical divisions between said halves F′. By this means the weight of the halves F′ tend to hold their opposing and open sides together; but to further insure such junctions against any casual opening I put a contracting coiled spring, G, transversely through the center of the bucket F, attaching its respective ends to the walls of the halves F′, so as to hold such halves adjustably in contact.

The rock shaft B projects at each end beyond the walls of the box A, and to such projected ends are rigidly attached the weight-levers H H, one at each end of said rock-shaft.

The weight-levers H H at the inner ends thereof are respectively attached to the shaft B, and project oppositely in a substantially horizontal direction therefrom, perpendicular thereto and parallel with the beams E. The weight-levers H are hollow cylinders, within which there is placed a metal ball, J, of any desired weight, adapted to move by its own weight from one end of said lever to the other, as the latter may have its outer or upper end elevated or depressed.

The downward vibration of the levers H, and therefore the oscillation of the rock-shaft B, is limited by stops H′, attached to the exterior of the box A and projected under said levers.

It is obvious that when the outer end of the lever H is at the limit of its downstroke the metal ball J within said lever will of its own weight roll to the outer end of the latter, and that when said lever is carried to the limit of its upstroke such ball in like manner will roll to the inner end of said lever, at which point it is provided that said ball shall rest directly over the rock-shaft B, where its weight produces no effect upon the lever H.

The weight of the ball J, when at the outward end of its path, exercises, through the medium of the lever H, the required resistance against the downward movement of the bucket F at the opposite ends of the beams E, and each bucket is then in the position to be filled. At this time also the other weight-lever H has its outer end elevated, and the ball J therein is rolled to the inner end of such opposite lever, and is inoperative.

The outer ends, H^2, of the levers H are movable within said levers, and by means of an external set-screw, H^3, can be adjusted within said levers, so as to vary the outer limit of the path of the ball J, and thereby vary the amount of resistance which the latter shall exert against the depression of said buckets F, suspended to the opposite ends of the beams E. The resistance therefore of the ball J can be adjusted so that any desired weight of the grain in the buckets F will be required to depress the ends of the beams E and elevate the opposite protruding weight-lever H. Therefore such buckets can be constructed and conditioned to measure at each operation any desired amount of grain.

The grain passes from the receiving-box C alternately through the opening C^2 into the buckets F. The downward movement of each bucket F is utilized to draw down the adjacent gate D and close the opening C^2 by means of vertical rods K, pivotally attached at the lower ends to the beams E near the ends of the latter, and projected upward through horizontal lugs D^2, formed exteriorly at each end of said gate, and the rods K are provided at their upper ends with the heads K′.

On the outside of the box C, at each end thereof, is centrally pivoted a horizontal lever or walking-beam, L, which is connected at each end by means of links L′ to each end of the gates D, whereby the downward movement of one of said gates is utilized to raise the opposite gate and open the discharge C^2 thereat.

It is essential that after one bucket F is filled from the box C the opposite gate D shall not be opened until said filled bucket F shall have descended sufficiently that one of the balls J shall have started inward and the other thereof outward; otherwise the passage of grain into the empty bucket F would interfere, through the medium of the walking-beams L, with the accuracy of the weighing of the grain in the descending bucket F; but after the ball J, which resists the descent of the filled bucket F, has started on its inward transit and ceased its resistance to said descending buckets and the ball J in the opposite lever has started on its outward transit, thereby assisting the descent of the filled bucket F, the increase of grain in the empty bucket has no effect, and is therefore not objectionable. In order to not open the opposite outlet-gate D until after the descending bucket has descended somewhat, the rods K are projected above the ears D^2, and the heads K′ of rods K do not engage the ears D^2, so as to draw down the adjacent end of the walking-beams L and raise the opposite gate until the filled bucket has descended sufficiently to change the elevation of the lever H and start the outer ball J inward and the inner ball outward, as aforesaid. The additional amount of grain which shall have passed into the descending bucket after it has begun its descent and before its adjacent gate D shall be closed is calculated in the adjustment of the follower or movable outer end, H^2, of the lever H, it having been ascertained by experiment when the machine is set to weigh any specific kind of grain what aggregate amount of grain the bucket F will discharge at each descent when the outer limit of the path of the ball J is fixed at a certain point.

The levers H can be furnished with graduated scales, to which each follower H^2 can be adjusted, and thereby the outward limit of the transit of the balls J fixed, and the amount

of resistance exerted by such balls graduated to equal the weight of the amount of grain desired to be measured with each descent of the buckets F.

The halves F′ of the buckets F are caused to separate near the downward limit of the descent of the latter in the following mode: Diagonal flanges M, mutually converging at their upper ends and slightly convex on their inner sides, are respectively attached to the halves F′ near the line of separation of the latter, and a triangular cam, N, having its apex upward, is attached interiorly to the ends of the frame A between said flanges M, and thereby adapted, in the descent of the buckets F, to wedge between said flanges M, and thereby separate the halves F′ and permit the discharge of the grain contained in the buckets F′.

The contractile force of the spring G, the oblique form of the flanges M, together with the initiative discharge of the grain in the opposite and filling bucket F tend to raise the empty bucket F off of the cam N, so that there shall be no friction on the latter to operate in any degree to interfere with the weighing of the grain in the filling bucket F.

The method of weighing in my machine while automatic is an adaptation of the old and well-known steelyards, the weight being upon one side and the pea on the opposite side of the common fulcrum. Any of the well-known registering apparatuses can be attached in any of the usual modes to the rock-shaft B and be actuated by the latter.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. The combination of the rock-shaft B, suitably journaled in the frame A, hollow levers H, attached at one end to said shaft and projected, respectively, in opposite directions therefrom, movable weights J, placed within said levers H and respectively adapted to roll to and from shaft B from opposite sides of the latter alternately, beams E, attached centrally to said shaft, and buckets F, pivotally attached to said beams at opposite sides, respectively, of said shaft, substantially as shown, and for the purpose described.

2. The combination of the rock-shaft B, suitably journaled in the frame A, weight-levers H, attached to said shaft and projected therefrom in opposite directions perpendicular thereto, adjustable weights J, stops H′, beams E, attached to said shaft, buckets F, suspended to said beams, receiving-box C, provided with discharge-port C^2, gates D, rods K, walking-beams L, and links L′, substantially as shown, and for the purpose described.

3. The buckets F, adapted to receive and discharge grain, consisting of the halves F′, pivotally suspended from a common point and provided on their exteriors, respectively, with diagonal flanges M, the frame A, provided with triangular cam N, and the spring G, substantially as shown, and for the purpose described.

4. The combination of the rock-shaft B, suitably journaled in the frame A, hollow levers H, attached at one end to said shaft and projected, respectively, in opposite directions therefrom, movable weights J, placed within said levers H and adapted, respectively, to roll to and from shaft B from opposite sides of the latter alternately, and buckets F, suitably suspended upon said shaft on opposite sides thereof, respectively, substantially as shown, and for the purpose specified.

5. The combination of the rock-shaft B, suitably journaled in the frame A, hollow levers H, attached at one end to said shaft and projected, respectively, in opposite directions therefrom, movable weights J, placed within said levers H and adapted, respectively, to roll to and from shaft B from opposite sides of the latter alternately, buckets F, suitably suspended upon said shaft on opposite sides thereof, respectively, and means, substantially as shown, for admitting grain to and discharging it from said buckets, for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

DE WITT WEST.

Witnesses:
WALTER N. HASKELL,
GEORGE H. DRAKE.