2 Sheets—Sheet 1.

M. B. CYPHERS.

Combined Grain Scale and Meter.

No. 226,161 **Patented April 6, 1880.**

Fig. 1.

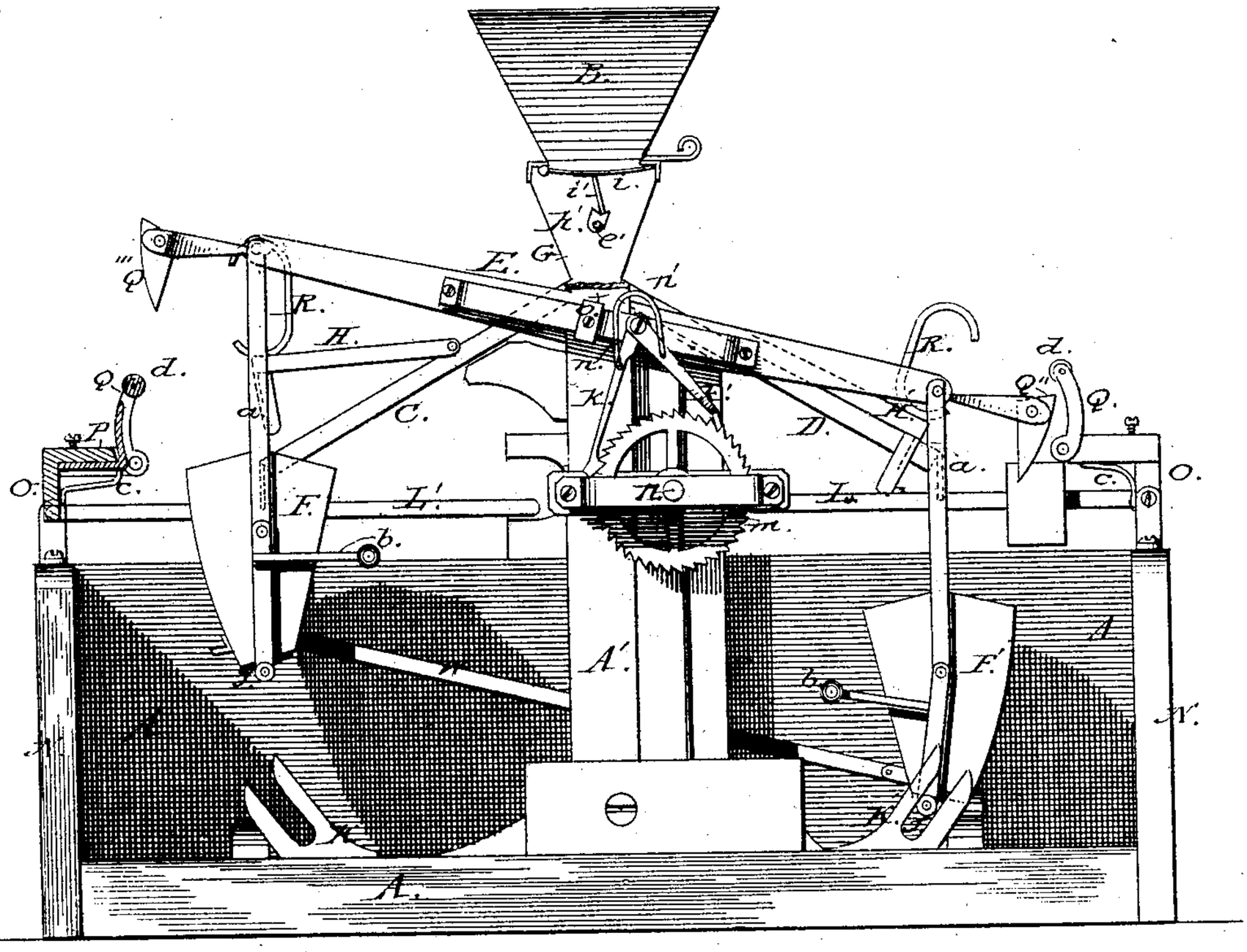
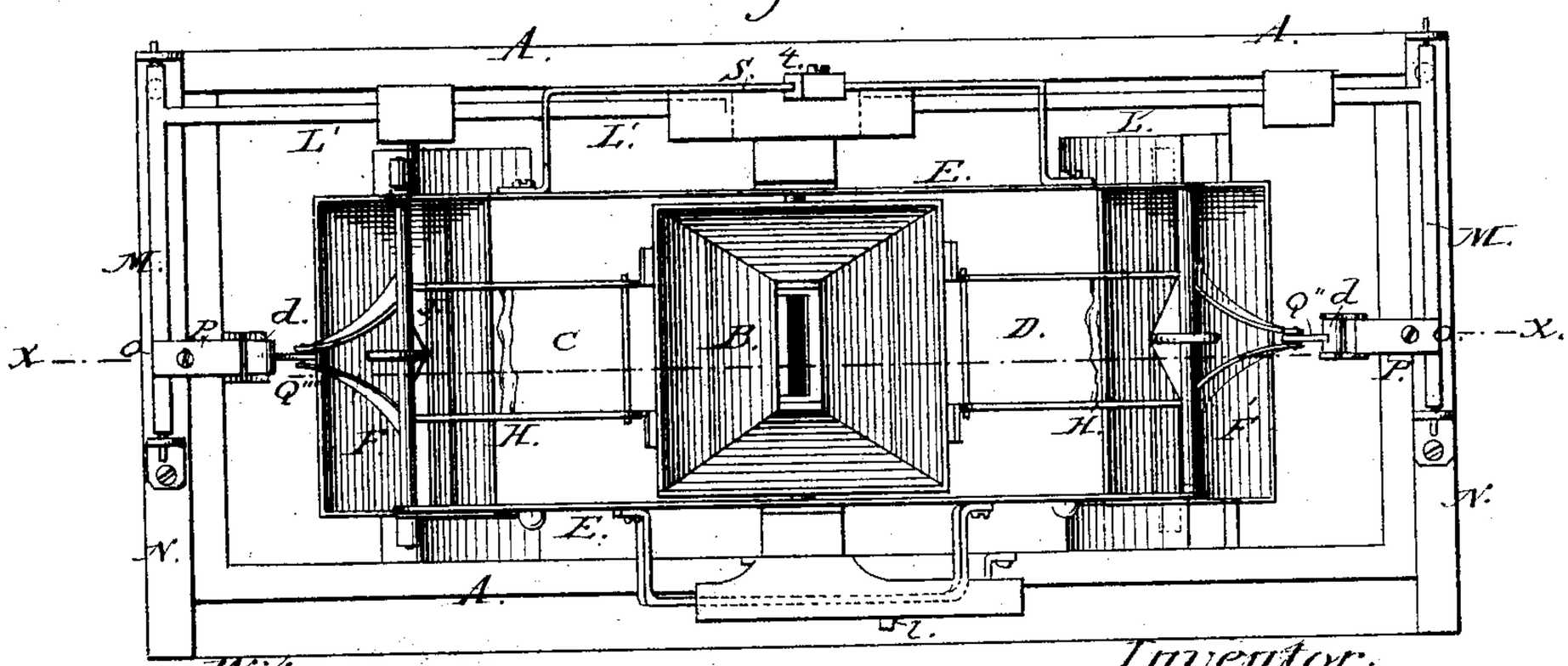


Fig. 2.



Witnesses:
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Joel Thomas

Inventor:
Melville B. Cyphers
by Parker N. Sweet & Co.
Attorneys.

2 Sheets—Sheet 2.

M. B. CYPHERS.

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Fig. 3.

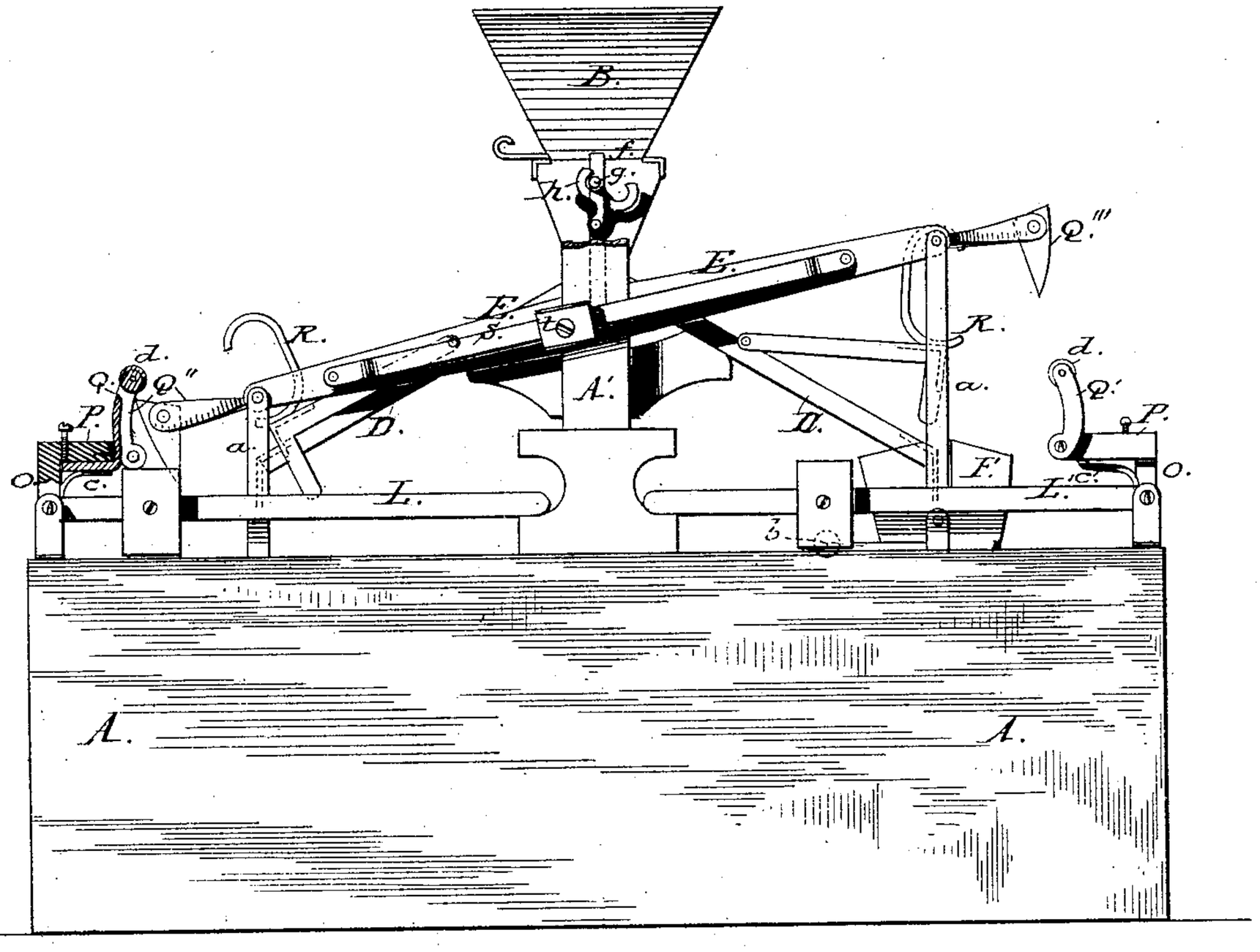


Fig. 5.

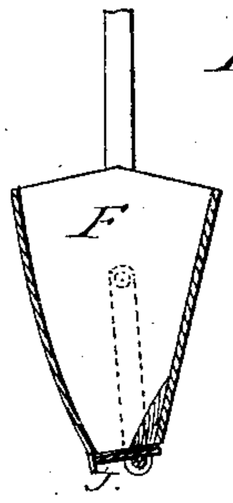
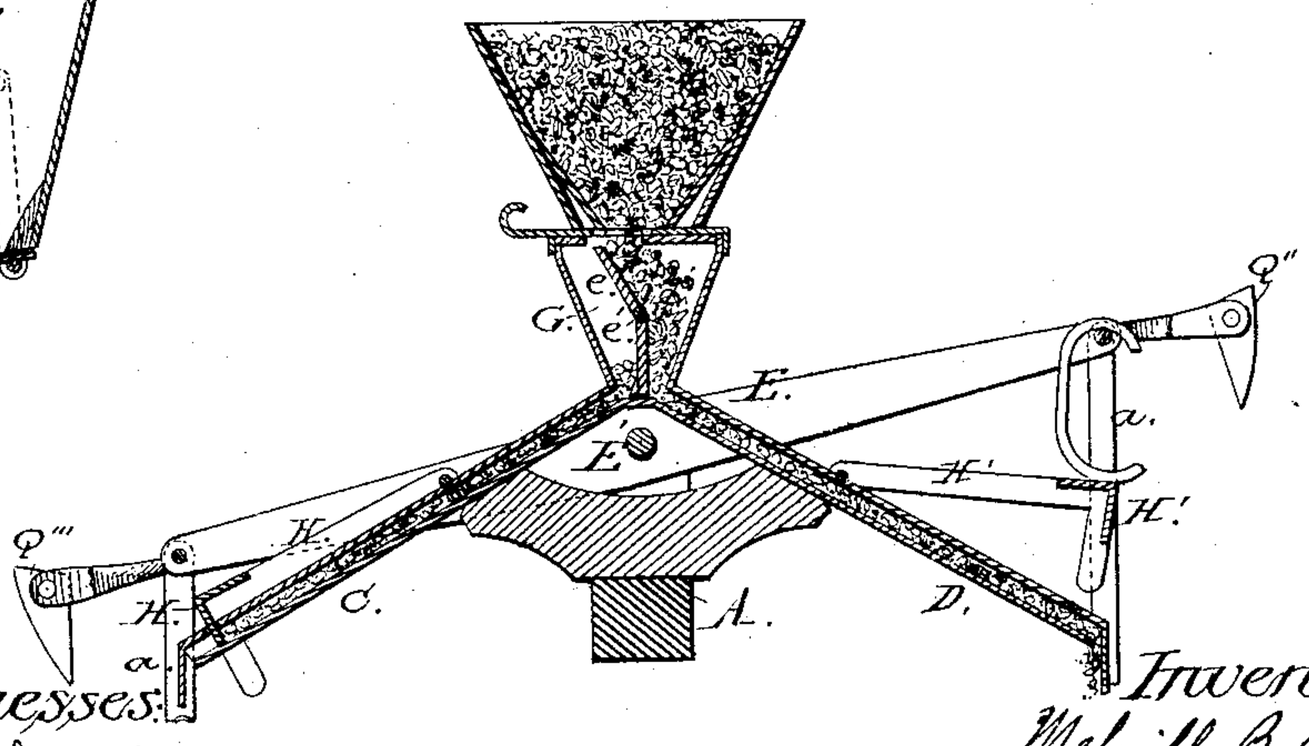


Fig. 4.



Witnesses:
John Parkhurst
Joel Thomas

Inventor:
Melville B. Cyphers
per Parker N. Sweet & Co
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UNITED STATES PATENT OFFICE.

MELVILLE B. CYPHERS, OF GREENVILLE, MICHIGAN.

COMBINED GRAIN SCALE AND METER.

SPECIFICATION forming part of Letters Patent No. 226,161, dated April 6, 1880.

Application filed June 24, 1879.

To all whom it may concern:

Be it known that I, MELVILLE B. CYPHERS, of the city of Greenville, in the county of Montcalm and State of Michigan, have invented certain new and useful Improvements in Grain Scale and Meter Combined; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention is an improvement in meters for measuring grain.

It consists of a vibrating beam adapted to support two buckets suspended from its arms, which alternately receive and discharge the grain to be weighed or measured, each bucket, in turn, serving as a counterpoise to the other as the grain flows from its source through chutes arranged on either side and below a hopper. The flow of grain is checked and released by certain valves, which are operated automatically by the counterpoising influence of the falling grain's weight, all of which will be fully set forth in detail hereinafter.

It consists, also, in connection with the vibrating beam and suspended buckets, of certain levers or links controlled by springs, which momentarily sustain the increasing weight of the filling buckets, and are then overcome by the said buckets' maximum weights.

It consists, also, in connection with the vibrating beam, of a registering device composed of a pair of pawls actuated by the said beam's movement, which carry a ratchet-wheel and shaft, upon which is fixed a hand or pointer moving over a dial to indicate the vibrations of the beam or the quantity of grain that has passed.

In my drawings, Figure 1 is a side elevation of my machine from the dial side, with the case removed. Fig. 2 is a plan or top view of the same. Fig. 3 is a part elevation of the opposite side. Fig. 4 is a vertical longitudinal section on line *x x* of Fig. 2, and Fig. 5 detail of bucket.

Similar reference-letters denote like parts in all of the figures.

Referring to drawings, A is the frame, upon which is set the hopper B and chutes C D branching from it. E is a vibrating beam, pivoted or hung upon a transverse shaft, E′, journaled in upright posts A′ extending upward from the base of the frame A. From the outer ends of this swinging beam are suspended buckets F F′, which are intended to receive the grain as it comes from the chutes. The chutes C D are connected to the hopper B by a valve-chamber, G, which forms the neck of the hopper and incloses a valve or cut-off moved back and forth with the beam's vibrating motion to turn the grain in opposite directions alternately. In the chutes C D are hinged cut-offs H H′, provided with guides extending downward, which fall by their own weight to close said chutes, they being lifted by open links attached to said chutes in the upward movement of the beam's arm.

The vibrating beam E is composed of two long arms connected together at their ends by transverse bars, upon the ends of which are suspended, by metallic straps, the buckets F F′. These buckets, which are narrower at their bottoms than at their tops, are provided with gates, which close automatically as the said buckets are lifted and lowered by the counterbalancing weight of the grain falling into them. The gates J are suspended from the buckets by straps on either side pivoted in the buckets' ends.

To the straps *a*, near the pivots, are fixed weighted levers *b*, which extend inward to perform the office of closing said gates J by throwing them back against points projecting from the bottoms of the buckets. Friction-rollers are provided at the ends of the gates J, which, as the buckets are lowered, enter grooves provided for them to open the said gates.

Forked lugs K, fixed to the base of the frame A, extend upward and form inclined grooves to receive and guide the gates J of the buckets to open them when said buckets are down and ready to be discharged.

The buckets always hang plumb from their pivots in the ends of the beam while receiving and discharging their loads.

The arms of the beam E have rails S con-

nected to them, upon which slide the weights *t* used in balancing the vibrating structure of the meter.

L L′ are scale-beams fixed to bars M, which are supported between suitable bearings extending upward from uprights N′ of the frame A. From the bars M extend posts O, which support bifurcated brackets P, to which are pivoted loops or catches Q. These loops or catches, when in their normal positions under the influence of small springs *c*, have the centers of their anti-friction rollers *d* over the extreme projections of the vibrating beam.

The beam E has bracketed from its transverse bars triangular pieces of metal Q″ Q‴, which encounter the rollers of the loops Q both in their upward and downward movements, and these loops serve to hold the weight of the opposite filling bucket, and at the same time retard its movement slightly after it has filled.

It will be observed that the scale-beams L L′, which extend from and form a part of the bars M, carrying the posts O and brackets P, are each provided with an adjustable weight, which may be graduated to represent the quantity of grain contained in the buckets, the operation of which is such that as one of the buckets is filled with a sufficient quantity of grain to overbalance the weights upon the opposite scale-beam the bucket descends and raises the opposite end of the beam E, carrying the empty bucket, until the triangular projections Q″ Q‴ upon the extreme end of said beam raises up and forces back the brackets P on bars M, thereby raising the scale-beam and allowing the full bucket to descend and be discharged of its contents. The scale-beams are thus operated as the buckets are alternately filled and discharged.

In the neck of the hopper is the cut-off *e*, pivoted on a shaft, *e′*, on one end of which is a forked arm, *h*, and the other a V-shaped hold, *h′*, for a spring, secured to the said hopper's neck. An arm, *f*, extending up from the vibrating beam, has a pin, *g*, which engages the forked arm or lever *h* to throw the cut-off *e* to one side and the other to close or open the mouths of the chutes C D. A spring, *i*, fixed permanently to one side of the hopper's neck, bears against a projection or offset opposite. It has extending from its center downward an arm, *i′*, which engages the V-shaped hold *h′* on the end of the shaft *e′*.

As the arm *f* moves with the beam E to operate the valve *e*, the spring *i*, bearing against the hold *h′*, holds the cut-off to its seat until overcome by the vibrating movement of said beam to throw it to the opposite side.

The registering device is composed of two pawls, *k k′*, pivoted to a slide, $o^{\times}$, which is adjustable on a bracketed bar secured to the vibrating beam, and a ratchet-wheel, *m*, fixed in an arbor, *n*. The said pawls are so fashioned at their ends as to push from one and draw from the other to move the said ratchet-wheel *m*. They are held in place relatively by a spring, *n′*.

The axis of the pawls may be regulated to suit the wheel by a movement of the slide $o^{\times}$, and clamped by a set-screw when in position.

By the movement of the beam E the pawls push and draw, carrying the ratchet-wheel, and with it a hand or pointer intended to pass over the face of a dial to record the quantity of grain passing into and which is discharged from the buckets.

The buckets are held together at their bottoms by a rod, W, hinged to them.

In the operation of my machine I allow the grain to flow into the hopper B from a chute above, the valve in the neck being closed on the right chute to prevent it from passing that way, and the cut-off H being held up by the open link R. The bucket F being up and its gate closed, the grain moves into it and through the chute C, while the triangular piece Q″ having its upper point bearing against the roller of the link Q, the bucket F is held suspended until it receives its given quantity of grain. The spring of the said link Q is now overcome, and the bucket F is carried down and its gate opened by its rollers entering and being guided by the forked lug K. The valves H and *e* close simultaneously with the falling of the bucket F, and the grain is allowed to pass the chute D into the bucket F′, where the operation of filling and discharging is repeated.

My machine might be operated successfully without the upper cut-off; but to insure safety and accuracy I use both cut-offs shown.

The quantity balanced on the scale-beam is that which falls into the bucket moving down before its cut-off is closed.

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

1. The buckets F F′, provided with swinging gates J, having anti-friction rollers at their ends, in combination with forked lugs K, fixed to the lower rail of the meter's frame, as specified.

2. The buckets F F′, in combination with chutes C D, provided with valves H H′, and the hopper B, having the valve *e* pivoted in said hopper's neck, said valves H H′ *e* being operated, as described, from the movement of the vibrating beam E through the influence of the falling grain, as and for the purpose specified.

3. The chutes C D, provided with pivoted valves H H′, which are closed by their own weight and opened by the engagement of the open links R, attached thereto, with the transverse bars of the beam E, as and for the purpose specified.

4. The weighing device composed of links Q Q, pivoted to the brackets P and influenced by the spring *c*, attached to the bar M, and beams L L′, provided with adjustable balancing-weights, as and for the purpose specified.

5. The vibrating beam E, provided with the bracketed triangular pieces Q″ Q‴, in combination with links Q Q, pivoted to brackets P, and scale-beams L L′, as and for the purpose set forth.

6. The valve *e*, pivoted in the neck of the hopper B, in combination with spring *i* and hold *h′*, as and for the purpose specified.

7. The valve *e*, in combination with forked arm *h*, arm *f*, and vibrating beam E, as and for the purpose specified.

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

MELVILLE B. CYPHERS.

Witnesses:

ALEXANDER GLEASON,

JARED G. BENTON.