

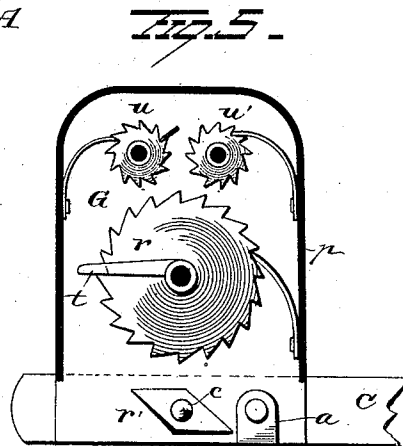
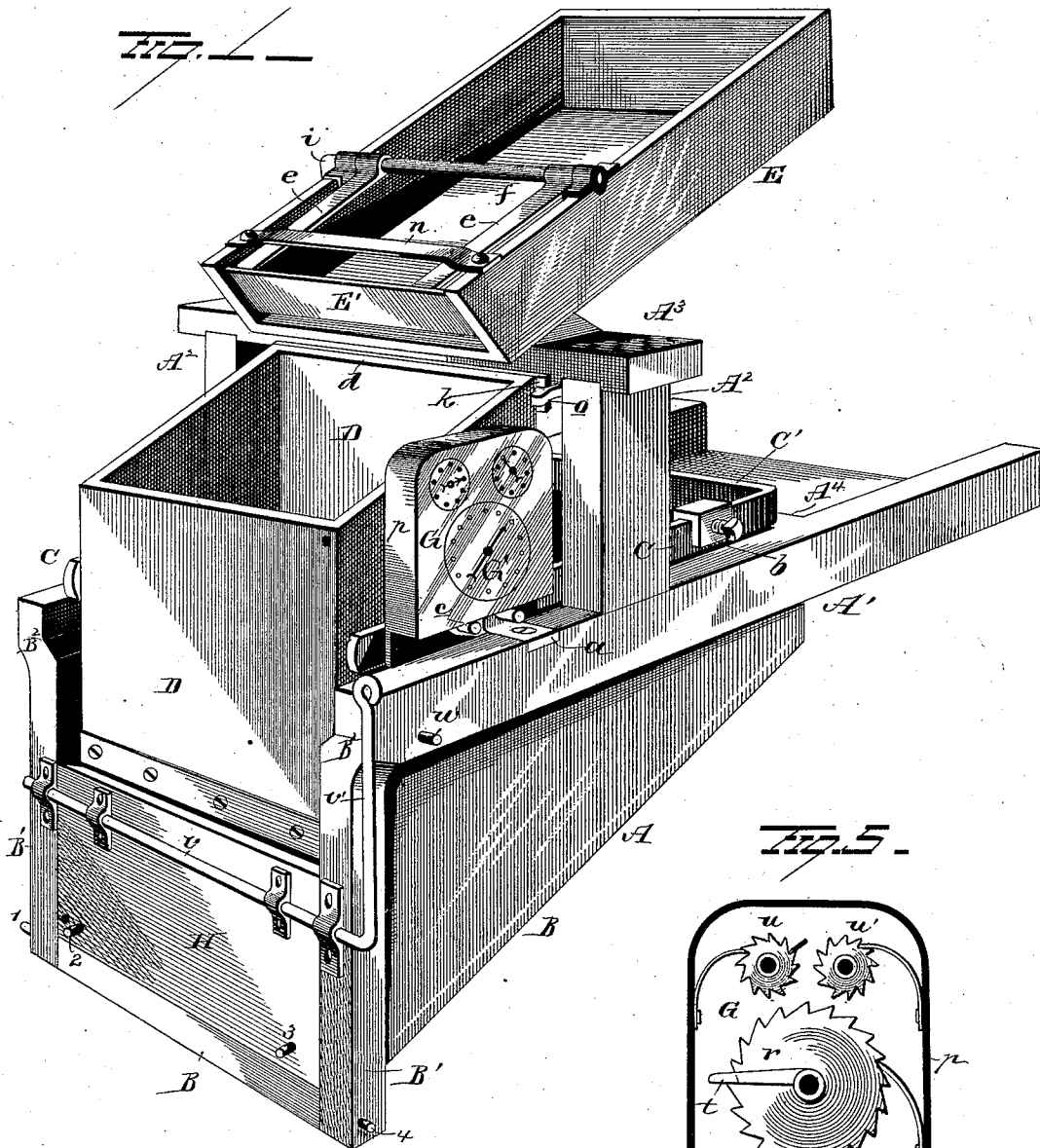
(No Model.)

2 Sheets—Sheet 1.

J. O. MARKS.
GRAIN METER.

No. 379,799.

Patented Mar. 20, 1888.



Witnesses
 E. Nottingham.
 G. F. Downing.

Inventor
Jacob O. Marks.

By his Attorney
H. A. Seymour.

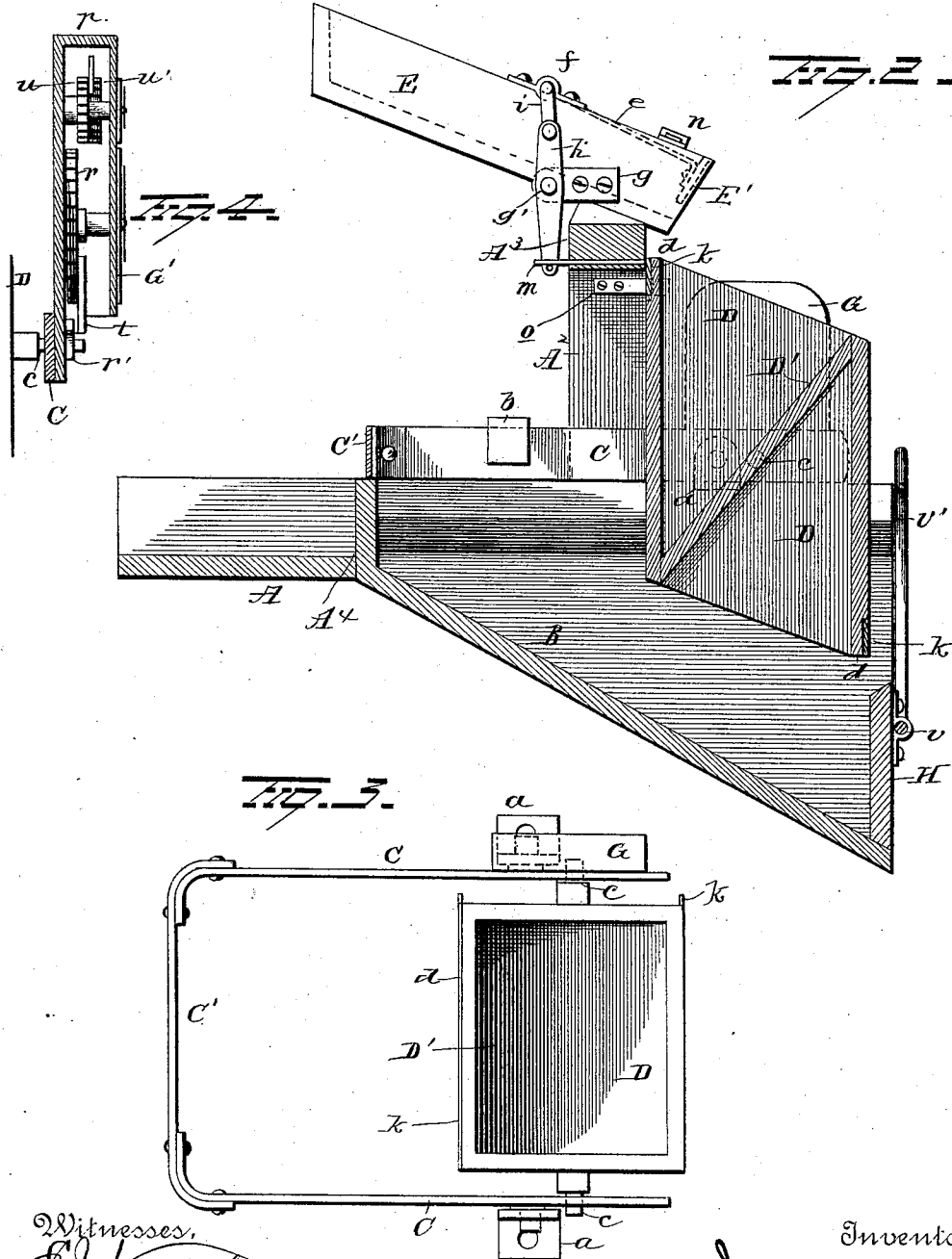
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Witnesses,
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Inventor,
Jacob O. Marks.

By his Attorney,
H. A. Sugmon.

UNITED STATES PATENT OFFICE.

JACOB O. MARKS, OF URBANA, ILLINOIS.

GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 379,799, dated March 20, 1888.

Application filed January 6, 1888. Serial No. 259,948. (No model.)

To all whom it may concern:

Be it known that I, JACOB O. MARKS, of Urbana, in the county of Champaign and State of Illinois, have invented certain new and useful Improvements in Grain-Meters; 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.

My invention relates to an improvement in grain meters or weighers.

The object of my present invention is to furnish a device of this character in which grain is automatically weighed and registered as it is received from the discharge-spout of a thrasher, corn-sheller, bin, elevator, separator, or other source of supply, and deposited into any receptacle provided therefor, that may be a wagon-body, bin, or bag, which latter is held in position by proper provision, constituting one of the novel features of my invention.

A further object is to provide a grain-meter with two oppositely-located and integrally-connected grain-receiving buckets pivoted near their center of weight upon two parallel scale-beams which vibrate on a proper frame, these grain-buckets being adapted to receive falling grain from the discharge-spout of any source of supply, the discharging grain-spout that feeds the weighing-buckets having a shut-off gate that is opened by the impact of a bucket when it assumes a proper position to be filled, the preponderance of weight of a filled bucket releasing it and causing a semi-revolution of the connected buckets to discharge the contents of a bucket filled to a predetermined weight, and also registering the quantity of grain thus weighed just previous to its escape from the bucket, the shut-off gate closing by gravity or by a spring when the buckets are changing position.

A further object is to construct the two connected grain-weighing buckets employed in this grain-meter so that a preponderance of weight will be assured, the bulk of the grain in a filled bucket lying near its upper end or point farthest removed from the pivotal point of suspension of the two buckets.

A further specific object of this invention is to afford a means of graduating or arresting the discharge of weighed grain, so as to allow

a filled bag to be removed and an empty one affixed in place to receive the weighed grain, and thus obviate any waste or scattering of grain when it is being bagged from the weighing-machine.

With these objects in view my invention consists in certain features of construction and combinations of parts, that will be hereinafter described, and pointed out in the claims.

In the drawings making a part of this specification, Figure 1 represents a right-side elevation in perspective of the grain-meter. Fig. 2 is a left-side elevation in section of the grain-feed spout in position on the grain-weighing machine. Fig. 3 is a plan view of the grain-registering mechanism of the meter, bucket, and scale-beam. Fig. 4 is a cross-section of the register and the toes that operate it, and Fig. 5 is a view of the register with the face or dial removed.

A represents the frame of the grain-meter, consisting, essentially, of two horizontal rectangular pieces of wood, A', of such a length as will permit attachment upon the upper side of a thrasher or any other substantial support. Upon the upper sides of the horizontal timbers A' the vertical uprights A² are secured, and upon these uprights a cross-piece, A³, is attached, and serves to hold the pieces A' spaced apart a proper distance. The horizontal pieces A' are further supported by the transverse piece A⁴, which is affixed to their inner sides, this piece forming the rear end of the inclined grain-trough B, also attached to the inner faces of the horizontal pieces A' and depending therefrom, the forward edges of the sides of the trough being stayed by a continuous border-frame, B', which surrounds the trough and is connected at B² to the horizontal frame-pieces A'. Upon the upper faces of the frame-pieces A' two brackets, a, are affixed, which have their vertical ears perforated to receive the fulcrum-studs of the scale-beam C, and these points of suspension are of such a height from the timber pieces A' of the frame A that a proper degree of vibration of the scale-beams will be afforded. The scale-beams C are parallel and jointed together at their outer ends by the cross-bar C', so that the beams will vibrate together. The outer side of one of the beams C is graduated for

weighing purposes, and a sliding weight, *b*, is mounted on this beam, by the adjustment of which the grain may be weighed, as will be more fully explained.

5 At proper opposite points in the scale-beams *C*, forward of the brackets *a*, on which these beams are supported, the grain-buckets *D D* are pivoted. These buckets consist of a single box of rectangular or rhomboidal form
10 having its two opposite ends open, the edges of the open ends being sloped, so as to be parallel with each other and afford a high side to each of the two buckets, which are produced by the insertion of a diagonal partition, *D'*,
15 that extends from one low corner of the box to the other low corner, as shown in Fig. 2.

It will be seen that the construction of the grain-buckets *D D*, as just described, will afford two receptacles of equal dimensions, each
20 having a wedge-shaped form in section, as shown in Fig. 2, which will dispose the bulk of grain that may be introduced therein near the tops of the buckets as they are alternately filled. The twin buckets *D D* have two projecting trunnions, *c*, affixed to their sides at
25 opposite points near the center of weight, and these trunnions *c*, entering holes in the scale-beams *C*, afford pivotal support on the beams for the buckets, and also allow them to rotate
30 thereon. When the grain-buckets *D D* are in position on the beams *C*, the weight of these beams will counterbalance the weight of the buckets, and their edges *d*, which are adjacent to the cross-piece *A²* of the frame *A*, will abut
35 against it, having such a slight surface of contact that when the bucket is filled it will fall sufficiently by the vibration of the scale-beams *C* to clear the cross-piece *A²*, and by reason of the superior weight of said contents near its
40 top open end be rearwardly rotated, so as to discharge the grain into the inclined trough *B*.

Upon the cross-piece *A²* the spout *E* rests, with its lower end in position to discharge grain which is fed into it. This spout is given
45 a sufficient inclination to insure the free escape of grain from it, and its upper end stably supported by any suitable means. It is designed to receive grain of any description that is to be weighed, said grain being discharged
50 into it from the elevator of a thrashing-machine or corn-sheller; or it may be conveyed to it from an elevated storage-bin or other source of supply.

At the lower or discharge end of the spout
55 *E* a gate, *E'*, is located. This gate is secured to the arms *e e*, which are mounted on and attached to the rock-shaft *f*, which latter is supported on the top edges of the sides of the spout.

60 On one side of the spout *E* a bracket, *g*, is fastened, the latter having a stud, *g'*, projecting from its side near the free end, on which a pendent lever, *h*, is pivoted to vibrate at a point near its center of length, the upper end
65 of this lever being loosely secured to a crank-arm, *i*, which is formed on the end of the rock-shaft *f*.

Across the top ends of the high sides formed on the grain-buckets *D D* metallic strips *k* are attached, which latter have their top edges in
70 line with the edges of the buckets, these strips being adapted from their position to abut against the front end of the slide-bar *m*, that is loosely supported to reciprocate on the lower
75 side of the cross-piece *A²*, and has its body slotted near the rear end to receive the lower end of the pendent lever *h*, and thus be connected loosely to it to cause it to vibrate and
80 raise the gate *E'* when one of the edge plates or strips *k* is made to impinge against the front end of the slide-bar *m* by a revolution of the buckets on their trunnions. The upward
85 movement of the gate *E'* in opening is limited by the cross-bar *n*, which also stays the sides of the spout *E*. One end of each of the metal
90 strips *k*, attached to the vertical front and rear walls of the buckets near their upper edges, is made to project beyond the sides of the buckets, so as to provide a catch for the engagement of the spring-hook *o*, which is se-
95 cured to the inner surface of the upright piece *A²* of the frame *A*.

A register, *G*, is provided to indicate each weighed bucketful of grain just previous to
its discharge from said receptacle, which reg-
95 ister is attached to one of the scale-beams *C* near the fulcrum-point. It consists, essentially, of a casing, *p*, in which is placed a toothed main wheel, *r*, that represents a certain number of bucketfuls weighed, (indicated
100 on the face of the register by the larger lower dial, *G'*.) Into the wheel *r* a toe of the lozenge-shaped block *r'* is caused to mesh by the revolution of the bucket-trunnion *c*, on which
105 the block *r'* is mounted and secured; and as this block is provided with two toes that are opposite to each other in a line with the center of the trunnion it is evident that a semi-rotation of the buckets that will discharge the
110 weighed contents of a full bucket and place the empty one in position to receive grain from the spout *E* will register the weighed grain before it is decanted into the trough below it. A projecting tooth, *t*, on the wheel *r*
115 is caused to mesh with a second gear-wheel, *u*, and move it one tooth when the first wheel has completed a revolution, and a toe on this second wheel will move a tooth on a third wheel, *u'*, for each revolution of the second
120 wheel, the movements of these wheels being indicated by separate dials on the face-plate of the register, which thus exhibit the aggregate amount of grain weighed upon inspection of the dials.

A gate-board, *H*, is affixed to the transverse
125 shaft *v*, which latter is adapted to rock in boxes secured on the border-frame *B'*, surrounding the open end of the trough *B*, said shaft having an upright arm, *v'*, projecting
130 from this arm, being adapted to move the gate-board *H* and hold it open at a desired point by the abutment of the arm with a pin, *w*, which is short enough to allow the elastic arm to be sprung laterally, and by clearance of

the pin in this manner close the gate H or hold it opened sufficiently to regulate the discharge of grain from the trough.

If this weighing-machine is to be employed in connection with a thrashing-machine, it may be fixed on the top of the thrasher-frame, so that the gate end just described will be projected sufficiently to permit a wagon-bed to be placed below the gate H and receive the grain that has been weighed and is being discharged from the lower end of the trough B; or the grain may be placed in bags, which latter are hooked onto the projecting hooks or pins 1 2 3 4, two of which are located on the sides of the border-frame B', the remaining hooks projecting from the front face of the gate-board H near its lower edge.

In operation the grain that is introduced into the spout E will enter the top bucket D, the sliding weight *b* being adjusted to poise a nearly-filled bucket. When a slight overweight of the bucket tips the beams C, the other ends of these beams will fall and the buckets be correspondingly lowered, which movement will release the hooked engagement of the filled bucket, and its preponderance of weight located at the rear side of the pivotal centers that support the buckets will quickly induce a semi-rotation of these buckets and discharge the contents of the upper bucket into the trough B. The impetus afforded by the weight of the grain will be sufficient to move the register and raise the gate E', which latter was closed by gravity when the filled bucket dropped below the end of the slide-bar *m*. If the gravity of the cut-off gate E' is not sufficient to close it, a spring may be introduced between the cross-bar *n* and the arms *ee* in an obvious manner to enforce its closure at a proper time.

Other slight changes might be made in the construction of this device without exceeding the scope of the invention; hence I do not wish to limit myself to the exact forms shown; but,

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

1. In a grain-meter, the combination, with a rhomboidal vessel divided by a partition through its short diameter into a pair of equal-sized V-shaped vessels or buckets, of a cross-piece for limiting the rotation of the buckets while the latter are in their elevated positions, and a hook for locking the buckets to the cross-bar, substantially as set forth.

2. In a grain-meter, the combination, with a frame, a scale-beam fulcrumed therein, and buckets pivoted in the beam, of a cross-piece in position to be abutted by the buckets until depressed by the weight of their contents, and

a hook for locking the buckets to the cross-piece until said buckets are depressed, substantially as set forth.

3. In a grain-meter, the combination, with a frame, a scale-beam fulcrumed therein, buckets pivoted in the beam, a cross-piece in position to be abutted by the buckets, and a hook for locking the buckets to the cross-piece until the buckets are depressed, of a feed-trough and a gate in said trough adapted to automatically open or close, according to the position of the buckets, substantially as set forth.

4. In a grain-meter, the combination, with a frame, a scale-beam fulcrumed therein, buckets pivoted in the beam, and a cross-beam in position to be abutted by the buckets when in an elevated position, of a feed-trough, a gate pivoted therein, and a slide-bar having connection with said gate, said bar projecting loosely through the cross-bar and adapted to receive the impact of the buckets, substantially as set forth.

5. In a grain-meter, the combination, with a frame, a scale-beam, and buckets pivoted in the latter, of a feed-trough, a crank-shaft pivoted therein, a gate secured to the shaft, a lever pivoted to the trough and connected at one end to the shaft, and a slide-bar in position to be abutted by the buckets when in their elevated position, whereby the gate in the trough is opened, substantially as set forth.

6. In a grain-meter, the combination, with a frame, a scale-beam, a pair of revolving buckets pivoted in the scale-beam, and a cross-piece against which the buckets abut, of a feed-trough, a gate therein, a slide in the cross-piece adapted to receive the impact of the turning buckets, and thereby open the gate in the trough, and a register connected with the trunnions of the buckets, whereby each turn of the buckets is registered, substantially as set forth.

7. The combination, with a feed-spout supported on a frame, of a cut-off gate attached by arms to a rock-shaft, a rock-shaft, a pendent lever pivoted to the rock-shaft and supported on a bracket to vibrate, and a slide-bar which is engaged loosely by one end with the lower end of the pendent lever, and with its opposite end adapted to receive the impact of a rotating bucket, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JACOB O. MARKS.

Witnesses:

S. F. WHITE,
J. B. TIBBITTS.