(No Model.) 2 Sheets—Sheet 1.

J. C. KING.

AUTOMATIC GRAIN WEIGHER.

No. 505,769. Patented Sept. 26, 1893.

Fig. 1.

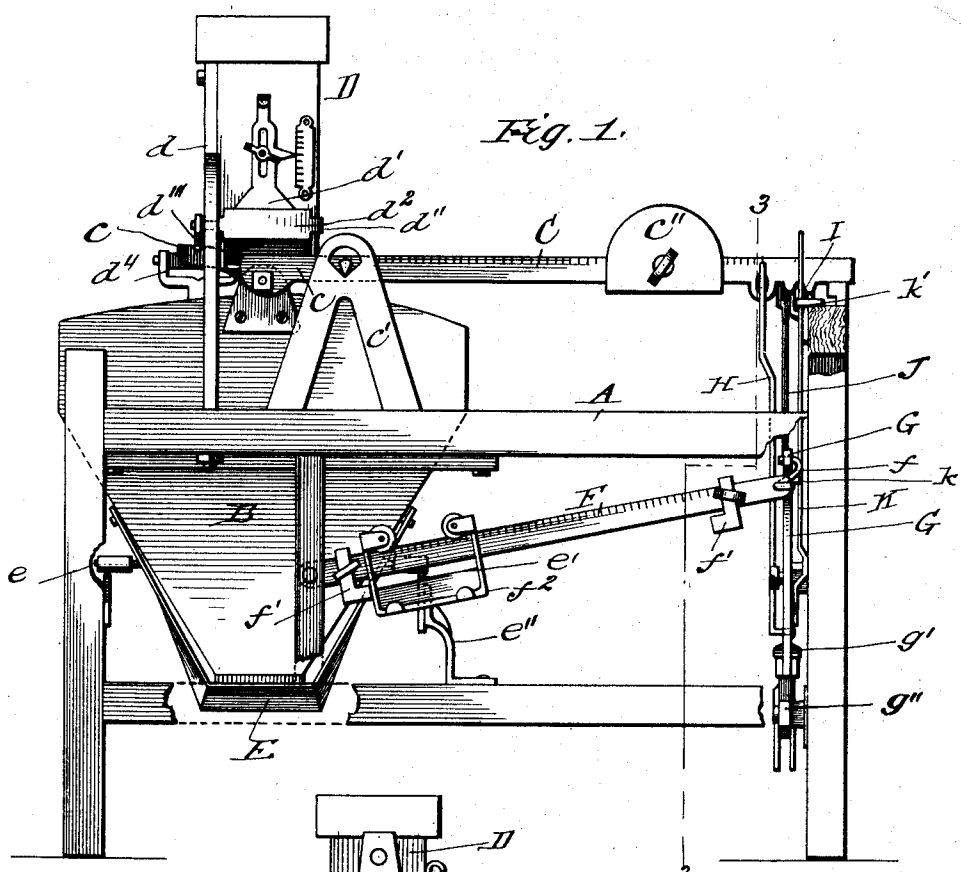
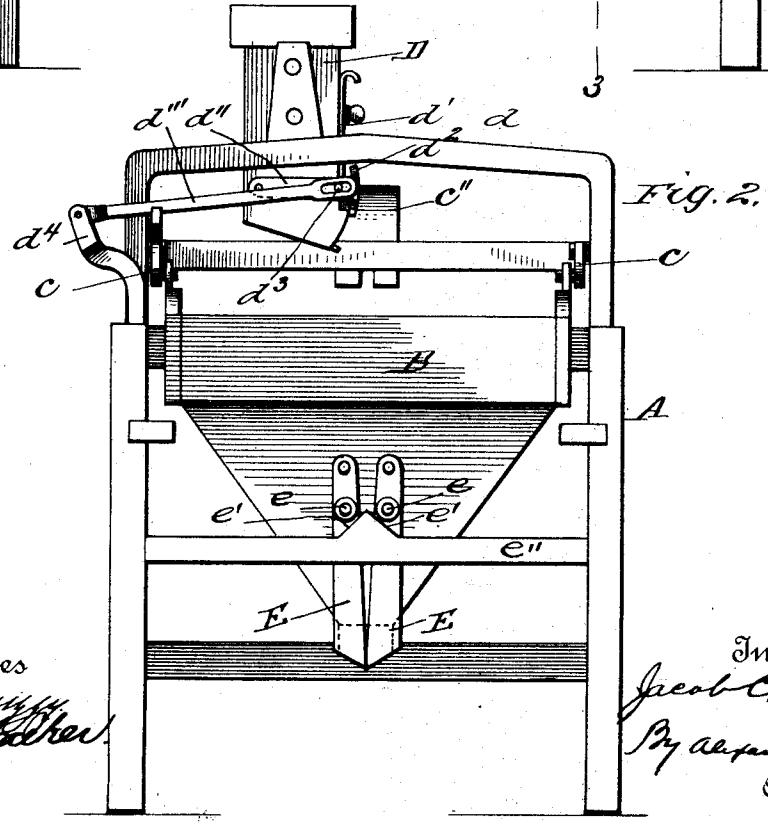


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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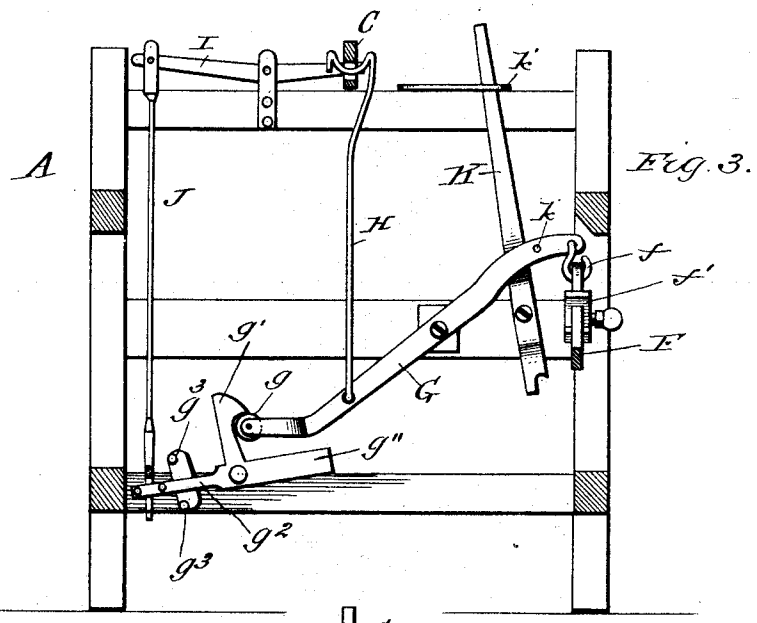

Fig. 3.

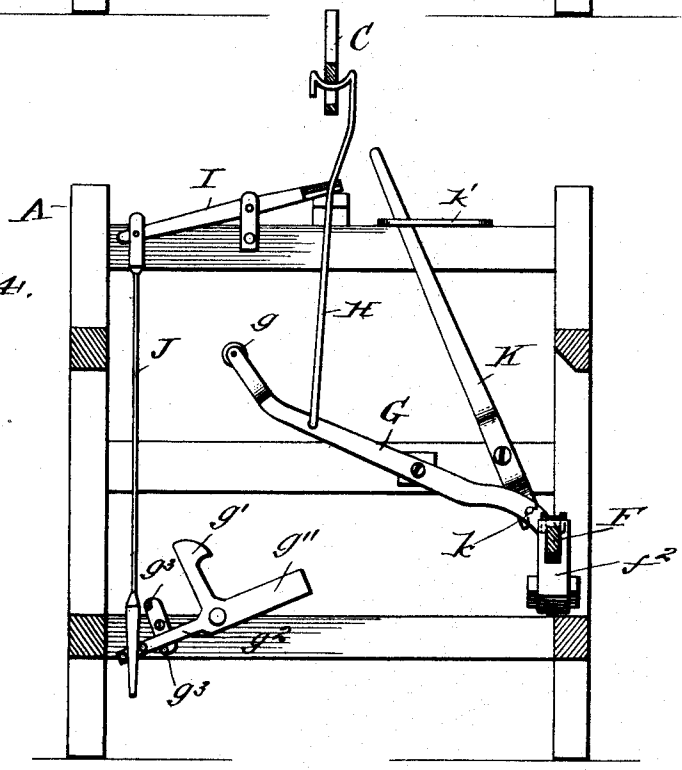

Fig. 4.

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UNITED STATES PATENT OFFICE.

JACOB C. KING, OF YORK, PENNSYLVANIA.

AUTOMATIC GRAIN-WEIGHER.

SPECIFICATION forming part of Letters Patent No. 505,769, dated September 26, 1893.

Application filed April 4, 1893. Serial No. 468,998. (No model.)

To all whom it may concern:

Be it known that I, JACOB C. KING, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Grain-Meters, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a side elevation of the complete machine; Fig. 2 an end elevation thereof; Fig. 3 a transverse section on the line 3—3, Fig. 1, the parts being in their normal positions; and Fig. 4 a similar view showing the parts in the positions they assume during the discharge of the bucket.

This invention has relation to that class of automatic weighing machines wherein the bucket is pivotally suspended to the weighing-beam and automatically descends when the desired amount of grain enters it, automatic devices being employed to close and open the discharge openings of the conveying spout and the bucket and to hold the hopper in a depressed position until the grain is entirely discharged, as more fully hereinafter described.

In the drawings A designates the frame of the machine; B the usual tapering bucket pivotally suspended in the usual manner between the bifurcated arms *c* of the scale-beam C, this beam being pivotally supported on the standards *c'* and provided with the usual adjustable weight *c''*; D the grain spout, supported over the bucket (in this instance) by the yoke or frame *d* mounted on the frame, said spout being provided with the usual sliding-gate *d'* to regulate its discharge opening; d^2 the swinging valve carried by two arms *d''* pivoted on opposite sides of the spout and operated automatically by a lever *d'''* whose slotted inner end engages a pin d^3 on one of the arms *d''* and whose outer end is bifurcated and pivoted between the arms of a bracket d^4 secured to the frame, this lever being adapted to normally rest in a notch in an extension of one of the arms *c* of the weighing-beam. It will be observed that when the weighing beam and bucket are in their normal positions, the valve d^2 is raised above the spout-opening but when the bucket is depressed by the weight of the grain therein, the descent of the arms of the weighing-beam permits the lever *d'''* and the valve to fall by gravity, which closes the discharge-opening of the spout and shuts off the supply of grain until the bucket rises again. This construction forms a very simple and reliable automatic valve. The two swinging bucket-valves E, which normally close the discharge-opening of the bucket, have their upwardly-inclined arms pivoted on opposite sides of the bucket and provided with projections *e* carrying rollers. These projections or rollers are adapted to strike against the oppositely-inclined edges of Λ-shaped cams or plates *e'* (supported on opposite sides of the bucket by suitable bars or brackets *e''*) when the bucket is depressed and automatically separate and swing open the valves; the valves close by the action of gravity when the bucket ascends, as is evident.

The letter F is a graduated supplemental-beam which is pivoted at one end to the frame and has its other end connected by a pivotal-link *f* to the outer end of a pivoted lever G.

f' f' are adjustable stops on beam F between which is adapted to automatically slide the movable weight f^2 which is suspended from the beam by means of flanged rollers and normally rests against the inner stop. The inner end of lever G is provided with a small roller *g* which, when the bucket is in its normal position engages under the upwardly-projecting hooked-end *g'* of a gravity-catch, said catch being held normally against the end of the lever by a weight *g''* and restricted in its movements by an oppositely-projecting arm g^2 which works between stationary stops g^3 on the frame. A vertical rod H is pivotally connected at the lower end to the lever G between its roller and pivot and its upper end is loosely connected to the weighing-beam. A gravitating lever I is pivoted on the frame and has its inner end normally bearing up against the lower edge of the scale-beam, and hung on its outer end is a vertical rod J which normally draws the outer end of the lever down. The lower end of rod J is bifurcated and embraces the arm g^2 of the gravity catch and is held in engagement therewith by two stops on the arm.

The operation of the foregoing parts is as

follows:—The weight c'' is first set so that the bucket will descend when the predetermined quantity of material enters it. It will be noticed that the tendency of the rolling weight f^2 is to depress the free end of its beam F but that the consequent upward pressure (through the medium of lever G and rod H) against the beam is prevented by the engagement of the lever G under catch g'; and it will also be observed that rod J is held above and prevented from depressing arm g^2 of the catch by the engagement of lever I under the weighing-beam. When the bucket falls it raises the weighted end of the scale-beam and releases lever I and permits rod J to gravitate and depress arm g^2 of the catch, thereby throwing hook g' over to the position shown in Fig. 4, and releasing the lever G. As soon as lever G is released the rolling weight depresses and rolls down to the free end of beam F, as shown in Fig. 4, thereby raising the inner end of lever G and permitting rod H to follow the scale-beam C, to which it is connected. The parts remain in the position shown in Fig. 4 until all the grain is discharged from the bucket, whereupon the parts will resume their original positions, ready for another operation. It will be observed that in thus returning the weight c'' must overcome the weight of the empty bucket and also the upward pressure exerted by the rolling weight on the depressed free end of its beam, said upward pressure being exerted through the medium of lever G and rod H. The adjustment required to accomplish this automatic return of the parts is obtained by first adjusting weight c'' to weigh off the desired quantity and then nicely setting the outer stop f' on beam F so that the weight c'' will be able to just barely overcome the resistance offered by the weight f^2 and the empty bucket. In this manner a very delicate adjustment can be obtained so that the bucket will not commence to ascend until practically all its contents have passed out. This is the essential advantage of this construction, namely, that it can be accurately adjusted so that the bucket will be entirely emptied before it returns, thereby obtaining unusual accuracy in weighing off the materials.

To lock the parts in the position shown in Fig. 4, in which position the bucket is down and the valve on the spout D is closed, a lever K is pivoted on the end of the frame adjacent to lever G, said lever K having its lower end notched to engage a pin k on lever G and keep its outer end depressed. A guard k' limits the movement of the upper end of said lever K.

Having thus fully described my invention, what I claim is—

1. The combination of a grain-spout, a frame and weighing-beam mounted thereon, a bucket hung on the beam, a lever d''' pivoted on the frame out side of the scale-beam and extending inwardly alongside the spout, and resting on a portion of the scale-beam, and a gravity-valve carried by the spout and carrying a pin engaging in a longitudinal slot in the inner end of lever d''', substantially as described.

2. The combination of a vertically movable bucket, valves E E swung thereto and adapted to normally close the discharge opening thereof, each of said valves carrying a lateral projection e and $\wedge$-shaped cams e' supported under said projections e and adapted to spread same when the bucket falls, substantially as described.

3. In a weighing-machine, the combination of a bucket, a weighing-beam carrying an adjustable weight, a supplemental beam adapted to be inclined in opposite directions, a weight slidably mounted on this beam and adapted to move automatically, and mechanism connecting one end of said supplemental-beam to the weighing beam, whereby the end connected to the beam will be depressed on the upward movement of the scale-beam, substantially as and for the purpose described.

4. In a weighing-machine, the combination of a bucket a weighing-beam carrying an adjustable weight, a supplemental beam adapted to be inclined in opposite directions, a weight slidably mounted on this beam and adapted to move automatically and mechanism connecting one end of said supplemental-beam to the weighing-beam, an automatic device for engaging said mechanism and keeping the pressure off the weighing-beam, and an automatic tripping-mechanism for this latter device, operated by the upward movement of the weighing-beam, substantially as described.

5. In a weighing machine, the combination of a bucket a weighing-beam, a weight on said beam, a supplemental beam pivoted at one end and having its free end inclined upwardly, an automatically movable weight on this beam, stops for this weight, mechanism connecting the free end of this beam to the weighing-beam and automatic devices for preventing this connecting mechanism exerting upward pressure on the weighing beam, substantially as described.

6. In a weighing machine, the combination of a bucket a weighing-beam, a weight on said beam, a supplemental beam pivoted at one end and having its free end inclined upwardly, an automatically movable weight on this beam, stops for this weight, a pivoted lever and a vertically movable rod connecting the free end of the supplemental lever to the weighing beam, and an automatic catch for engaging this pivoted lever and holding it down while the bucket is up, substantially as described.

7. In a weighing machine, the combination of a bucket a weighing-beam, a weight on said beam, a supplemental beam pivoted at one end and having its free end inclined upwardly, an automatically movable weight on

this beam, stops for this weight, a pivoted lever and vertically movable rod connecting the free end of the supplemental lever to the weighing-beam, and an automatic catch for engaging this pivoted lever and holding it down while the bucket is up, a gravitating rod engaging an arm of said catch and a pivoted lever I attached to said rod and engaging the weighing-beam, substantially as described.

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

JACOB C. KING.

Witnesses:
MILTON D. SAKEMILLER,
NOAH STUMP.