(No Model.)

3 Sheets—Sheet 1.

J. C. KING.

AUTOMATIC GRAIN METER.

No. 383,362. Patented May 22, 1888.

Fig. 1.

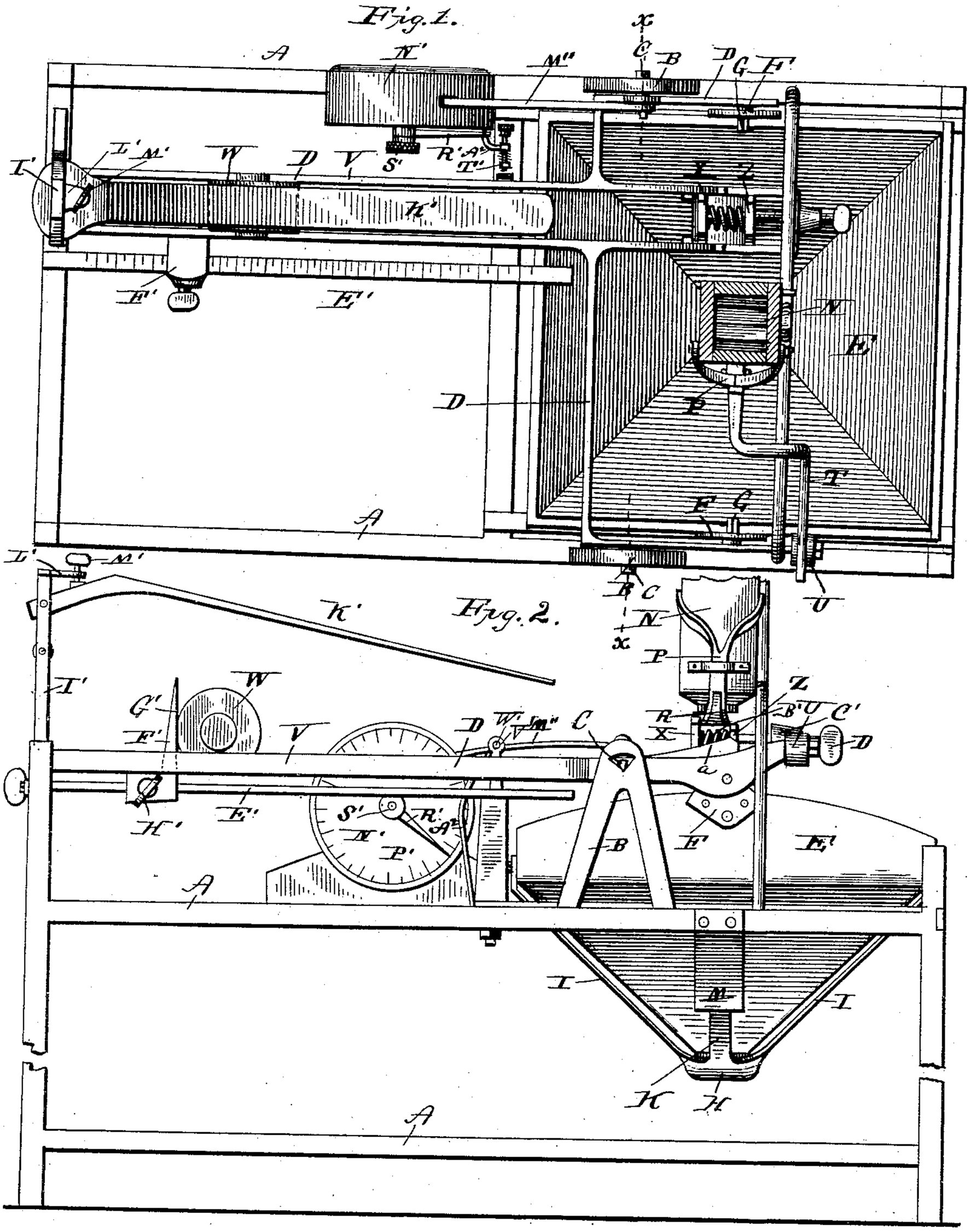

Fig. 2.

WITNESSES.

John L. Finch Jr.

C. A. Davis.

INVENTOR.

Jacob C. King.

By C. M. Alexander

Attorney.

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J. C. KING.

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Fig. 3.

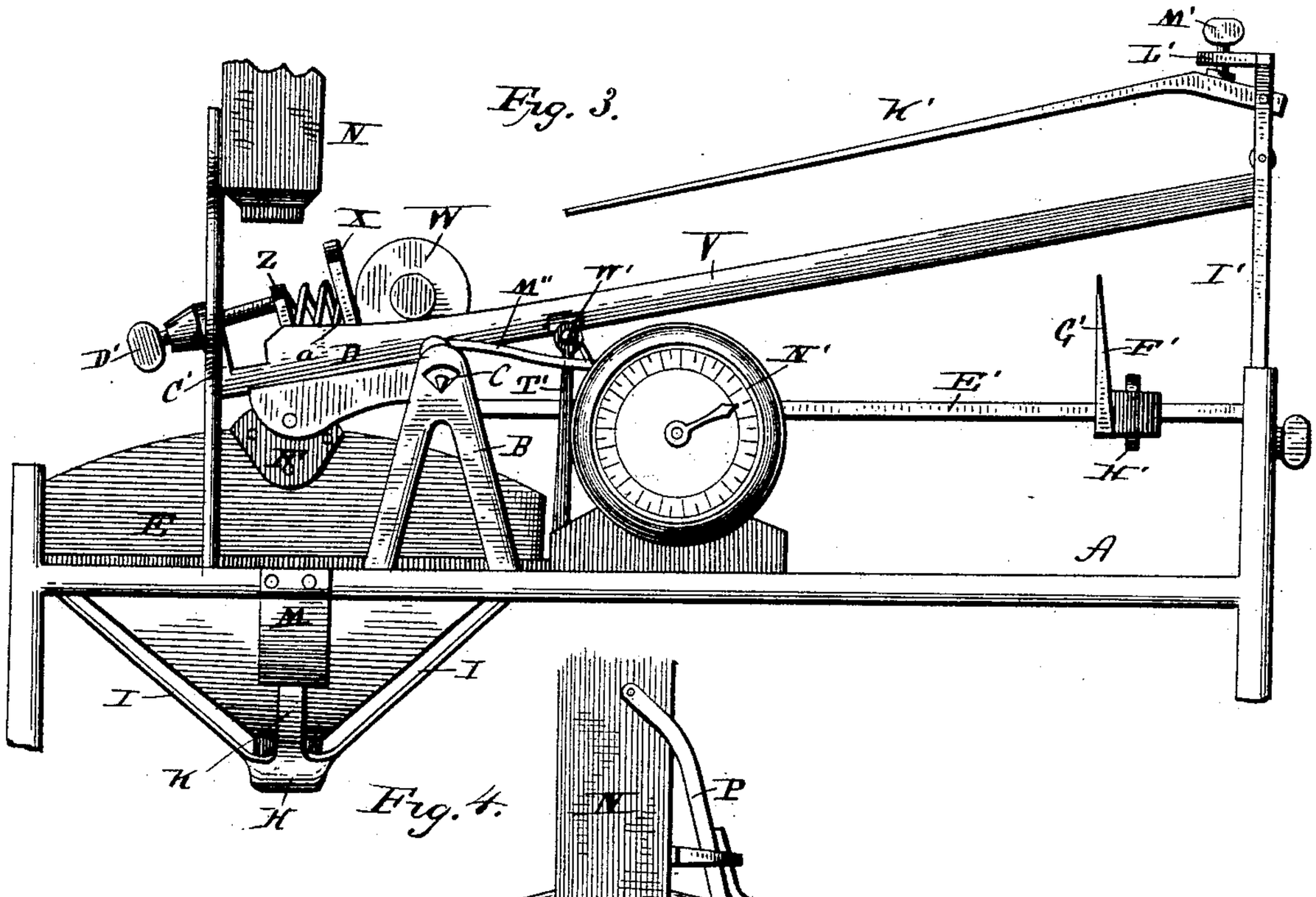
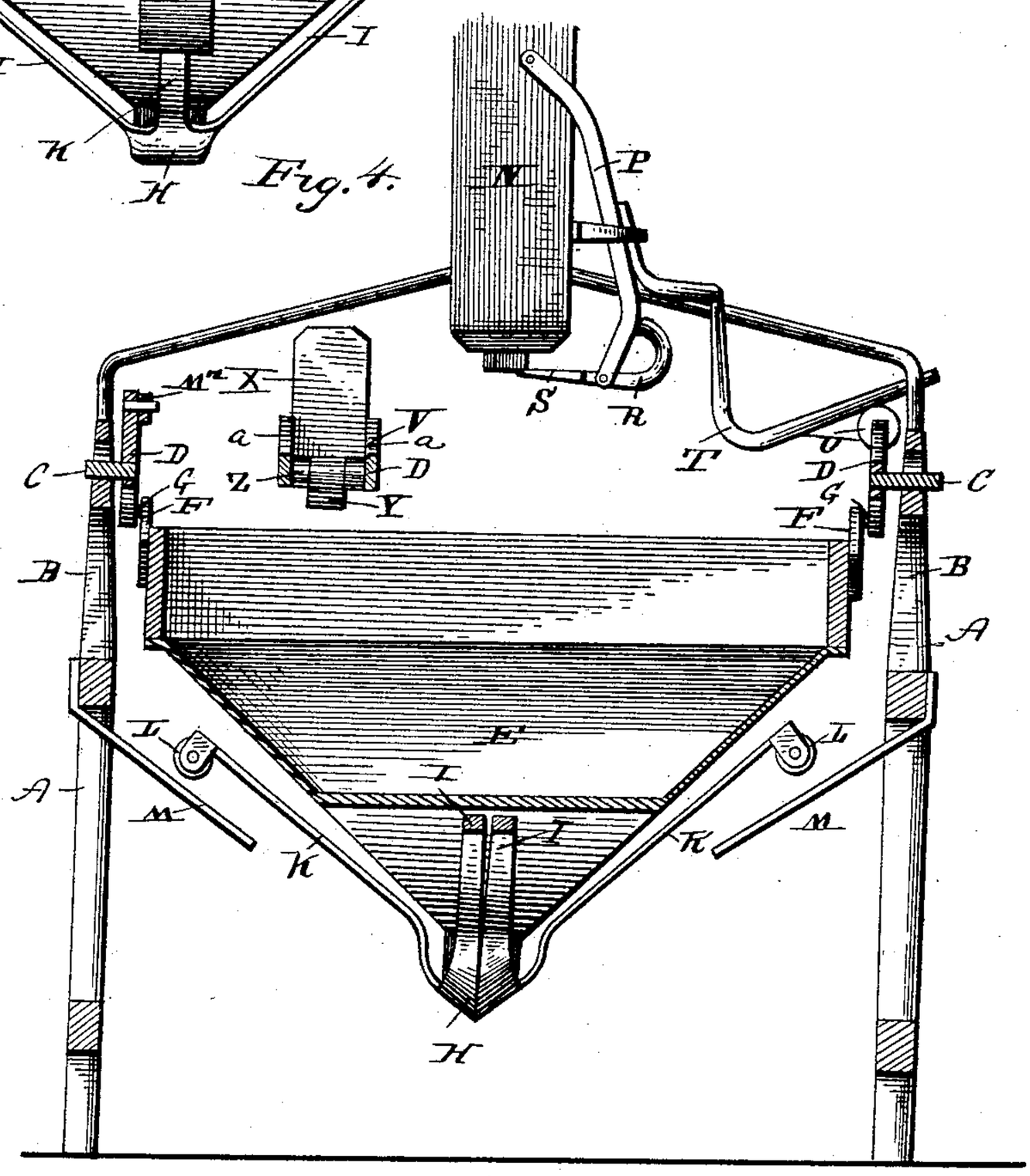


Fig. 4.



WITNESSES.

John S. Finch Jr.

C. A. Davis.

INVENTOR.

Jacob C. King.

By C. M. Alexander,

Attorney.

(No Model.)

3 Sheets—Sheet 3.

J. C. KING.

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Fig. 5.

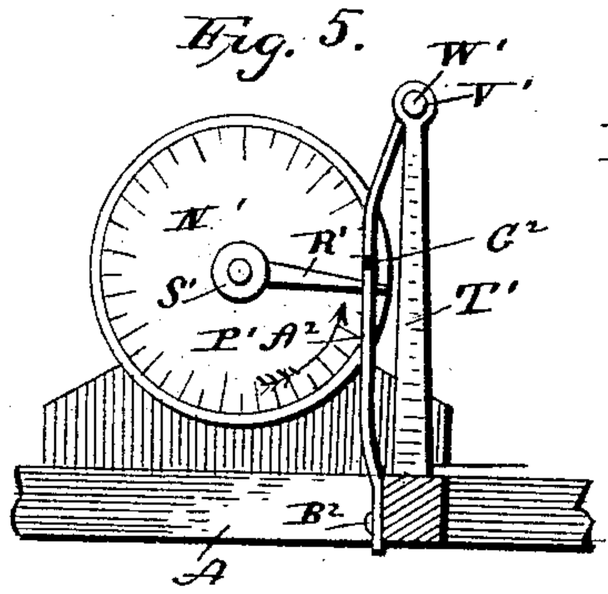


Fig. 6.

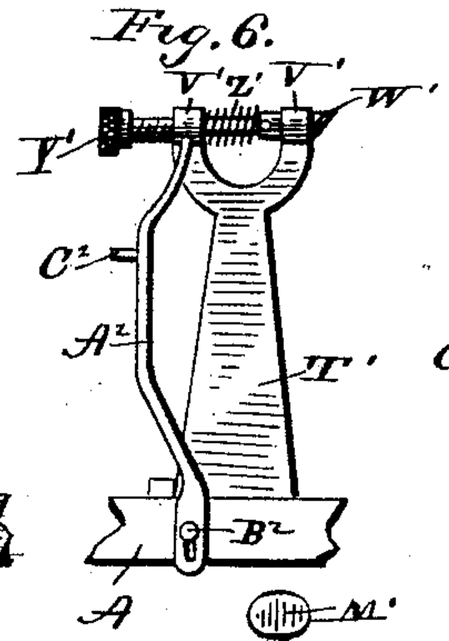


Fig. 7.

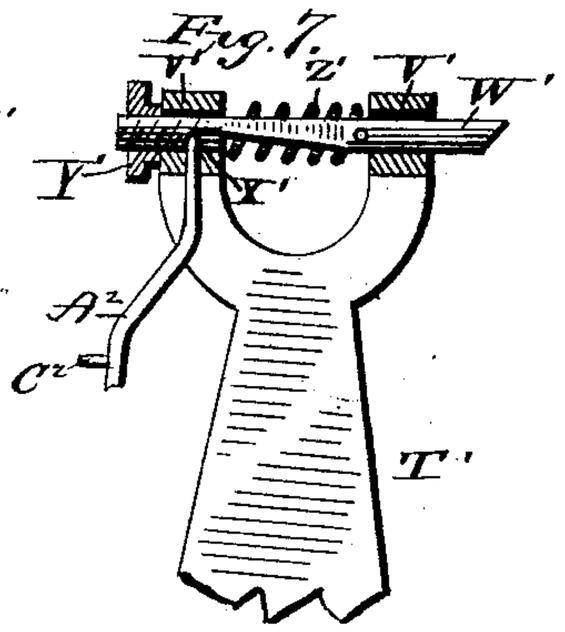


Fig. 8.

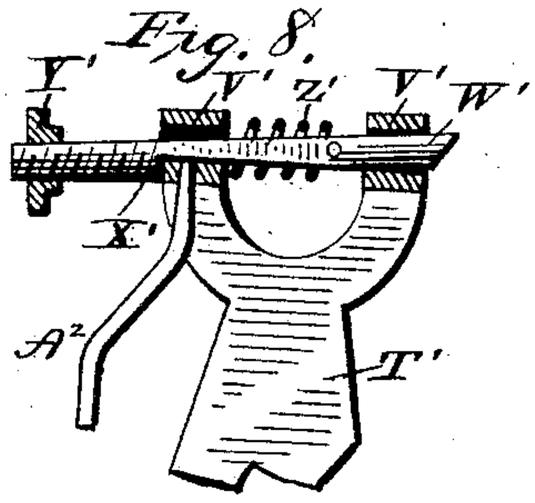


Fig. 9.

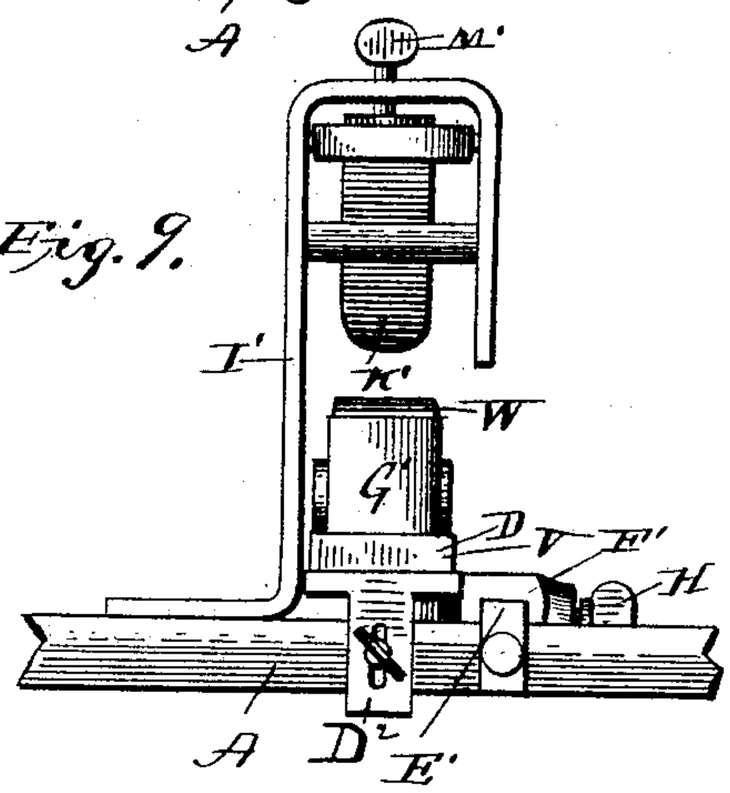


Fig. 10.

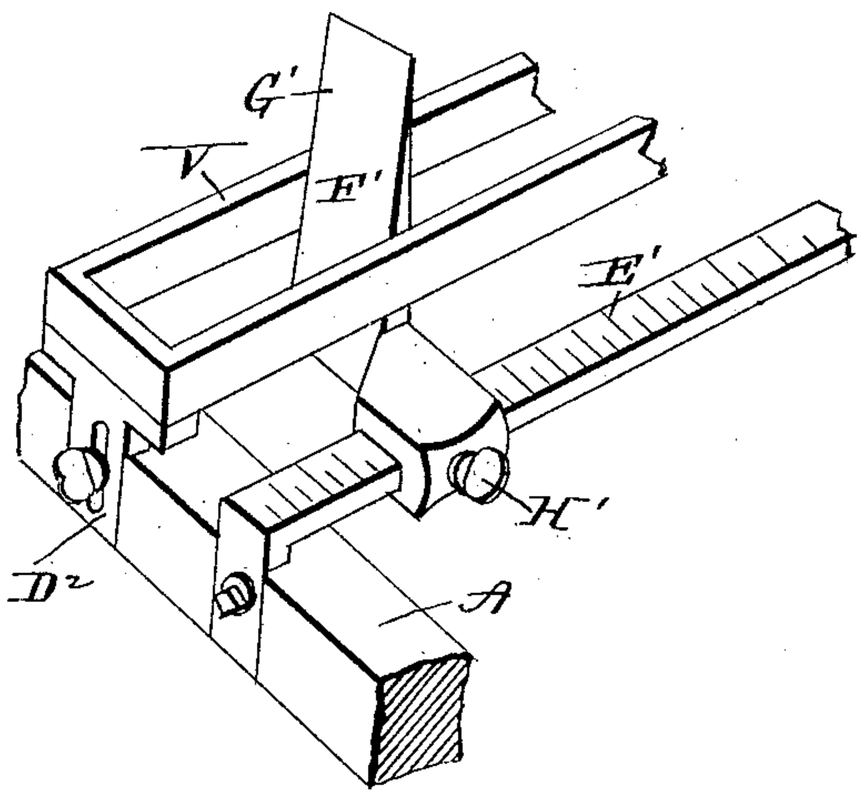
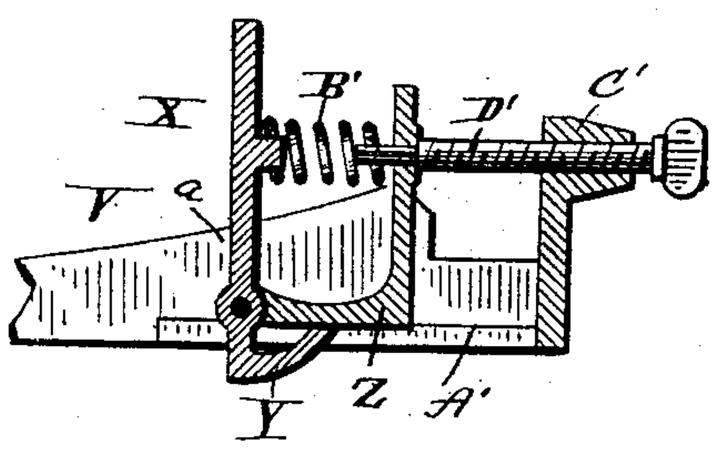


Fig. 11.



WITNESSES

John S. Finch Jr.

C. H. Davis.

INVENTOR,

Jacob C. King.

By A. W. Alexander

Attorney.

UNITED STATES PATENT OFFICE.

JACOB C. KING, OF YORK, PENNSYLVANIA.

AUTOMATIC GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 383,362, dated May 22, 1888.

Application filed February 6, 1888. Serial No. 263,103. (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 Automatic Grain-Meters, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain improvements in automatic grain-meters, and it is an improvement upon the invention for which Letters Patent of the United States were granted to me the 26th day of April, 1887, No. 361,878.

The object of the present invention is to provide improved means whereby the weighing-beam is automatically operated to return the parts to weighing position after the hopper has been discharged; to provide an improved scale-beam and weight-adjusting device to operate in connection with the weighing-beam; to provide improved means for regulating the movement of the weight on the weighing-beam, and to hold the weighing-beam when required, as will more fully hereinafter appear. These objects I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a top view of my improved meter complete; Fig. 2, a side elevation thereof; Fig. 3, an elevation of a portion of the meter, taken on the side opposite to that shown in Fig. 2, the valve on the feeding-spout being removed. Fig. 4 represents a transverse vertical sectional view of the meter, taken through the hopper on the line *x x* of Fig. 1. Fig. 5 represents an elevation of a detached portion of the meter, showing the holding devices. Fig. 6 represents a detached elevation of a portion of the holding devices. Fig. 7 represents a detached sectional view of a portion of the holding device, showing the locking-bolt projected. Fig. 8 represents a similar view, showing the bolt drawn back. Fig. 9 represents a detached elevation of the weighing-beam, the graduated beam, the weight-adjusting device, and the devices for controlling the movement of the weight. Fig. 10 represents a perspective view of a portion of the weighing-beam, graduated beam, and weight-adjusting device; and Fig. 11 indicates a sectional view of a portion of the weighing-beam, showing a buffer, which receives the blow of the weight when the weighing-beam is operated by the falling of the hopper.

Referring to the drawings, the letter A indicates the frame of the machine, constructed of metal or other suitable material. At opposite sides of the frame are standards B, having bearings for the projections C of the beam-frame D, the said projections being provided with knife-edges, which rest in the bearings before mentioned.

E indicates the hopper, which is provided with lugs F on opposite sides, the said lugs having V-shaped openings, which rest upon the knife-edges of the projections G on the inside of the beam-frame D. The said hopper is provided with an opening at its bottom, which is closed when the hopper is elevated by means of the valves H at the lower ends of the swinging arms I, which are pivoted at their upper ends to the upper part of the hopper. These valves have, extending laterally and obliquely upward therefrom, the arms K, which are provided with friction-rollers L at their ends, which are adapted to ride upon the inclined plates M, secured to the frame A, when the hopper is depressed, and open the valves for the discharge of the grain from the hopper.

The letter N indicates the feed-chute, to one side of which are pivoted the upper ends of a bifurcated arm, P, the lower end of which is slotted and has fulcrumed in it a bent lever, R, which has a valve, S, at one end, which keeps the lower end of the chute closed when the hopper is down. The said lever is provided with a bent arm, T, which bears against a friction-roller, U, on the frame D above mentioned.

The letter V indicates the weighing-beam, which forms part of the frame D, and which consists of an oblong rectangular frame, upon the longer parallel sides of which is adapted to travel a rolling weight, W. The said parallel sides at the rear have their upper edges slightly inclined at *a*, and between such rear portion of the said sides is located a buffer-plate, X, which has a curved arm, Y, below, which bears against the lower face of a sliding angle-plate, Z, which rests and is adapted to

move on parallel ways A′ on the inside of the weighing-beam. The said buffer-plate is pivoted to the forward portion of the angle-plate and is pressed normally forward by means of a spiral spring, B′. At the rear extremity of the weighing-beam is a standard, C′, through which passes an adjusting-screw, D′, the forward end of which has a plain extension having a bearing in the upright portion of the angle-plate, whereby the said plate and buffer-plate may be adjusted on the ways A′.

The letter E′ indicates a graduated beam, which is stationary and secured to the frame A. The said graduated beam is parallel to the vertical plane in which the weighing-beam moves, and is provided with an adjustable slide, F′, having an upright extension, G′, adapted to move between the parallel sides of the weighing-beam. The said slide is provided with a set-screw, H′, by means of which it may be clamped at any position on the graduated beam to which it may be adjusted. The beam E′ is graduated on its upper surface, as shown in Fig. 1 of the drawings, and the extension on the slide serves as a stop to the rolling weight, so as to hold it at any desired point on the weighing-beam when its forward end is down to provide for weighing different quantities of grain.

I′ indicates a standard rising from the front of the frame A. The said standard is bent laterally and downward, and within the standard is secured one end of a spring-arm, K′, extending directly over the weighing-beam, the free end of said arm being inclined downwardly, so that it may come in contact with the rolling weight as the same travels to the rear of the weighing-beam and diminish its momentum, so as to avoid injury to the same. The standard is provided with a projection, L′, having a set-screw, M′, bearing against the spring-arm, by means of which it may be adjusted to bear with more or less force upon the weight as it passes.

The letter M″ indicates an arm secured to a stud on frame D, hereinbefore mentioned. Said arm extends into the casing of the registering device N′ and connects with and operates the registering mechanism, which is of the ordinary construction. The pointer-shaft of the said device projects at the rear of the casing, which is provided with a graduated dial, P′. The projecting end of the shaft is suitably shouldered and screw-threaded, and to it is secured an adjustable hand or pointer, R′, which may be held in any desired position upon the shaft by means of a screw-clamping nut, S′.

T′ indicates a vertical standard secured to the frame A, having bearings V′ at its upper end for a sliding bolt, W′. The lower side of the bolt is partly cut away, as indicated in Figs. 7 and 8 of the drawings, leaving a shoulder, X′, which may be caused to engage the edge of the outer bearing, so as to hold the bolt when drawn back, as shown in Fig. 8. The bolt is screw-threaded at one end and has an adjusting-nut, Y′, by means of which the throw of the bolt may be regulated.

Z′ indicates a spiral spring which projects the bolt when released.

The letter A^2 indicates a vertical bent rod, which is flattened and slotted at its lower end and movably secured at said lower end to the frame A by means of a bolt, B^2, or otherwise. The upper end of said rod extends through an opening in one of the bearings V′, its point resting against the lower side of the cut-away portion of the bolt. The said rod is provided with a lateral projection, C^2, which extends across the path of the hand or pointer R′, so that the rod will be raised thereby when the said hand or pointer reaches it, as more fully hereinafter explained.

To the forward end of the frame A is secured by means of a set-screw a slotted rest, D^2, for the forward end of the weighing-beam, by means of which the downward movement of said end may be limited.

The operation of my invention will be readily understood in connection with the above description, and is as follows: The parts being in the position shown in Fig. 1, with the adjustable slide F′ set so as to hold the rolling weight at the proper point on the weighing-beam to permit it to tip when the desired weight of grain is run into the hopper, the meter is ready for use. The grain is then permitted to run in through the chute and collects in the hopper until its weight overbalances the rolling weight on the weighing-beam. The hopper then drops, causing the valves at the bottom to open to discharge the grain and at the same time closing the valve of the chute, stopping the feed of the grain. In the meantime the weighing-beam has assumed the position shown in Fig. 3, with the rolling weight resting against the buffer-plate. During its passage down the beam the roller comes in contact with the spring-arm K′, which arrests its momentum, the buffer-plate finally taking up the shock of the impact of the weight, thus relieving the parts and preventing injury to the same. When the hopper has been emptied, the rolling weight again moves to its original position, the valves of the hopper automatically close, and that of the chute opens, and the weighing begins again automatically, this automatic operation being continued until the desired amount of grain has been weighed out. Previous to starting the weighing operation the hand or pointer R′ on the shaft of the registering device is adjusted to a proper position in connection with the dial to operate the vertical rod A^2 when the desired amount of grain has been weighed, the bolt W′ having been drawn and held back in the manner hereinbefore described. When the hand or pointer reaches the projection of the vertical rod, it lifts it, disengaging the bolt and permitting the spring to project it, so as to engage the weighing-beam when it is tipped, so as to lock it in the position shown in Fig.

3 of the drawings and stop the operation of the meter.

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

1. The combination, with the weighing-beam, of the angle-plate located on ways therein, the buffer-plate pivoted thereto, the spiral spring, and the set-screw whereby the buffer is adjusted, substantially as specified.

2. The combination, in a grain-meter, of the weighing-beam, the rolling weight, and the spring-arm K′, whereby the momentum of the weight is partially overcome, substantially as specified.

3. The combination, with the pivoted weighing-beam, the rolling weight, and the spring-arm K′, of the adjusting screw, whereby said arm may be adjusted to bear against the rolling weight with different degrees of force, substantially as specified.

4. The combination, with the frame of the weighing-beam, of the registering device and the rod which operates it, the adjustable hand on the shaft of said registering device, the vertical rod having a lateral projection operated thereby, the shouldered bolt mounted in bearings in a vertical standard, and the spiral spring, whereby the bolt is operated to stop the action of the meter at any desired point, substantially as specified.

5. The combination, with the frame of the machine, the weighing-beam pivotally hung thereon, the hopper pivotally hung to the weighing-beam, the registering device mounted on the said frame and operated by an arm attached to the weighing-beam, and a hand or pointer on the shaft of the said registering device, of a spring-actuated bolt mounted in bearings in close proximity to the weighing-beam, and means connected with the registering device, substantially as described, for operating this sliding bolt, whereby it is caused to engage with and stop the weighing-beam, as herein specified.

6. The combination, with the weighing-beam and the hopper hung thereon, of the registering device operated by the movement of the weighing-beam, the sliding bolt mounted in bearings in close proximity to the weighing-beam, and means, substantially as described, for operating this sliding bolt connected with the registering device, whereby the bolt is caused to engage with the weighing-beam and hold it when the desired quantity of grain is weighed, substantially as specified.

7. In a grain-meter, the combination, with the frame of the machine, the pivoted weighing-beam and hopper, and the rolling weight upon the said weighing-beam, of an independent stationary graduated beam, E′, secured to the frame of the machine, and an adjustable stop, F′, upon the said graduated beam, whereby the travel of the said rolling weight upon the weighing-beam may be regulated, substantially as described.

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

JACOB C. KING.

Witnesses:

SOL KROPP,

JOHN C. SPANGLER.