(No Model.) 2 Sheets—Sheet 1.

G. H. KAMMAN.

GRAIN METER.

No. 384,983. Patented June 26, 1888.

Fig. 4.

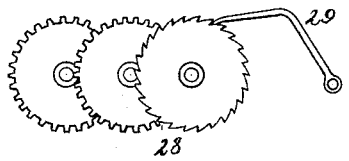

Fig. 1.

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S. T. Marshall

Inventor.
George H. Kamman.
By his Attorney A. G. Huylmann.

(No Model.) 2 Sheets—Sheet 2.

G. H. KAMMAN.

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Fig. 2.

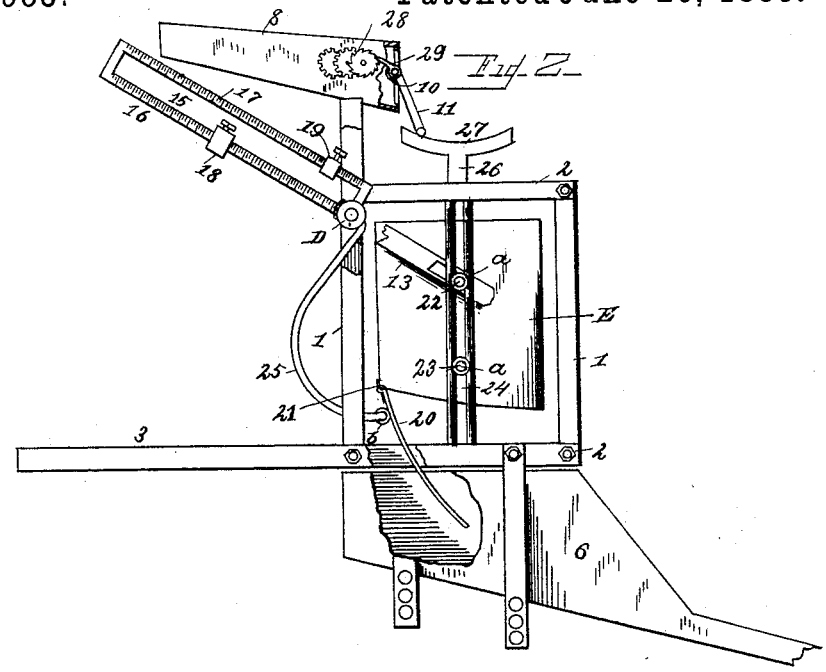

Fig. 3.

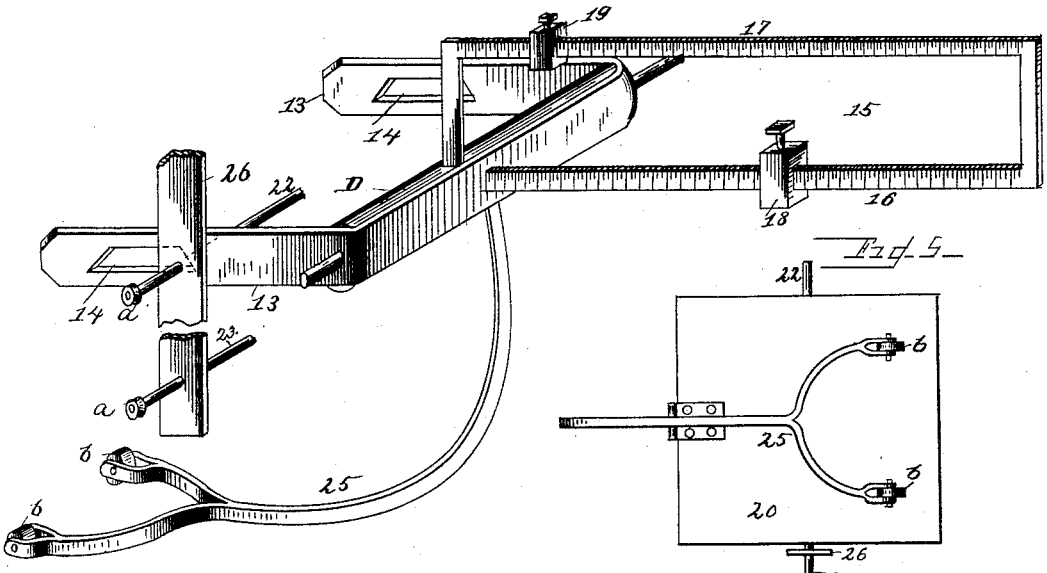

Fig. 5.

Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE H. KAMMAN, OF CHAMPAIGN, ILLINOIS.

GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 384,983, dated June 26, 1888.

Application filed December 3, 1887. Serial No. 256,883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. KAMMAN, a citizen of the United States of America, residing at Champaign, in the county of Champaign, in the State of Illinois, have invented a new and useful Grain-Meter, of which the following is a specification.

My invention has relation to improvements in means or mechanism for automatically measuring grain, and the object is to simplify and improve existing machines for that purpose; and my invention therefore consists in the novel construction of parts and their combination, as will be more fully hereinafter described, and specially as the same is pointed out in the claims.

I have fully illustrated my improvements in the accompanying drawings, wherein—

Figure 1 is a side view of the grain-meter fixed up in connection to a separator with elevator-spout and a delivery-spout leading to a wagon. Fig. 2 is a side view of the apparatus, showing the measure down, the beam tipped, and the bottom open, a part of the frame being removed to better show the construction. Fig. 3 is a perspective of the supporting-shaft, the scale-beam, the arms, and the lever-arms. Fig. 4 is a detail of the registering mechanism, and Fig. 5 is a view of the lever which closes the bottom of the measure.

In the drawings like parts are indicated by the same notations, and, reference being had thereto, A designates the separator or other receptacle from which the grain is to be withdrawn. The letter B designates the elevator from which the grain is run to the spout leading to the measure. These elements form no part of my invention, and hence may be of any approved construction. The measure may be used in connection with any receptacle from which the grain can be delivered to the measure as may suit the circumstances of the storage.

The letter C designates the frame which supports the weighing mechanism. This consists of substantial corner uprights, 1, girded together by cross-pieces 2, arranged at the top and bottom, and when attached or connected to a separator the connection may consist of plate-pieces 3, braced by studs 4, and at the top there may be brace-rods, as 5, the purpose in this respect being accomplished when the frame is seated firmly enough to meet the strains it may be subjected to in the weighing process.

To the lower front part of the frame is secured a delivery spout or chute, 6, which is set at a proper incline to permit the grain to descend by gravity, and arranged so that its inner end shall receive the weighted grain when dropped from the measure and that its outer end will deliver the grain to the wagon or other receptacle under it. The inner corner uprights are extended, as at 7, and have a cross-piece fixed thereto, on which is arranged a chute, 8, to take the grain from the bin, separator, or elevator and deliver it to the measure. In the mouth of this chute is a door or valve, 9, journaled in the sides of the chute, and a spring, 10, arranged to close the valve when the measure drops. The journal of the valve is formed with an arm, 11, the crank of which sets on the arm of the trip fixed to the measure and is raised thereby and the valve opened when the measure comes up after being emptied.

The letter D designates a shaft which has its journals seated in bearings 12 in the upright of the frame. Rigidly secured to this shaft are carrying-arms 13, projected forward and provided with slotted bearings 14 in their ends to receive the trunnions of the measure.

Rigidly secured to and projected from the shaft D in opposite direction to the carrying-arms 13 is the scale-beam 15, which consists of a lower bar or beam-piece, 16, and a balance-rod, 17. On the beam 16 are marked measurements of weight, indicating the amount of grain let into the measure, a sliding weight, 18, being arranged on the beam. I have noted measurements from one pound to eighty-five on the beam; but other weights may indicate the amounts, according to the capacity of the measure. On the balance-rod are also indicated measurements of weight, and a sliding weight, 19, arranged thereon will by adjustment balance the empty measure with the elements which are connected therewith, leaving the weight of the grain to be determined by the weight on the scale-beam proper.

The letter E designates the measure. This

consists of a substantial vessel or receptacle having inclined bottom side edges and provided with a hinged bottom, 20, the hinge being at the rear, as at 21, so that the incline of the bottom shall be toward the front and downward, in order that the grain will drop by gravity into the chute leading to the wagon or other receptacle. Secured to the sides of the measure and projected at right angles therefrom are the trunnions 22 and guide-rod 23, which are arranged to slide in an opening or slot between the vertical rods 24, fixed in the side cross-pieces of the frame, and the trunnion 22 also serves as the journals or trunnions which support the measure in the slotted bearings of the carrying-arms. On each of the trunnions and also on the guide-rod on the measure is arranged an anti-friction roller, *a*, to relieve as far as possible any friction in the reciprocations of the measure. I thus pivotally support the measure to move in a vertical plane, and by making the slots of the carrying-arms project forward of the slot between the upright guides the leverage is lengthened as the measure is carried down and the reaction of the weight on the beam retarded until the measure has been emptied. A lever-arm, 25, has one end rigidly fixed in the shaft D, and is brought down and turned up with its free end to press against and close the bottom of the measure. The end of this lever arm 25 is bifurcated, and has pivoted therein rollers *b* to make the progress of the arm over the bottom easier.

To the side of the measure is fixed a lifting device, 26, formed with a curved cross-head, 27, on which the arm of the valve in the upper chute rests. When the valve is closed by the spring and weight of the arm and the measure has been carried down and emptied, the upward movement takes place, and the curved cross-head will lift the arm of the valve and open it to admit another quantity of grain. On the side of the upper delivery-spout are pivotally mounted tally-wheels 28, graduated to indicate measurements of the grain delivered to the measure. These tally-sheets are actuated by means of a pawl, 29, on the shaft of the valve, so arranged that when the valve opens the first wheel is turned one notch and the other arranged to register in ratio of tens.

It will be observed that all the main operative elements are combined with and operated by the movements of the single supporting-shaft D, which gives a simple, certain, and durable construction attended with results as nearly correct and accurate as have been reached in the art.

The operation is apparent from the foregoing description, but may be here rehearsed as follows: The measure being balanced on the scale and the weight set at the number of pounds desired to be weighed at one measure, the valve may be opened and the grain be let run in the measure. When the measure is filled with the quantity sufficient to tip the beam, it descends by gravity, the lever-arm of the hinged bottom receding as the measure descends, the bottom opens, and the grain is discharged. At the same time that the descent is commenced the upper chute is closed and the grain stopped from that source. When the measure is emptied, the weight on the beam acts, lifting the measure to its normal position, the lever-arm shuts the bottom, and the lift opens the valve in the upper chute and registers on the tally-wheels, and the operations of filling, descending, discharging, and returning are repeated.

What I claim is—

1. The combination, with the frame, of the supporting-shaft journaled in the frame, carrying-arms rigidly fixed to said supporting-shaft formed with bearings in their ends, a scale-beam rigidly projected from the supporting-shaft, the grain-measure having a hinged bottom and swung on trunnions arranged in the bearings of the carrying-arms, and a lever-arm rigidly fixed in the supporting-shaft, arranged with its free end to press against and close the hinged bottom of the measure, substantially as described.

2. The combination, with the frame provided with vertical guide-rods at its sides and a supporting-shaft mounted in the frame provided with carrying-arms having elongated bearings, of the grain-measure having a hinged bottom and supported on trunnions in the slotted bearings of the carrying-arms, and said trunnions being extended and arranged between the vertical guide-rods and having guide-arms near the bottom of the measure to slide between the said guide-rods, and the scale-beam rigidly fixed in the supporting-shaft and arranged with its free end to press against and close the hinged bottom of the measure, substantially as described.

3. The combination of the frame provided with vertical guide-rods, a supporting-shaft journaled in the frame, the grain-measure having horizontal guide-arms projected from its sides provided with anti-friction rollers to fit within the way between the vertical guide-rods of the frame, and carrying-arms rigidly secured to and projected from the supporting-shaft and provided with slotted bearings in which the guide-arms of the measure rest, substantially as described.

4. The combination, in a grain-measuring machine, of a suitably-supported shaft, a graduated beam fixed to the shaft, arms projected from the shaft to support the measure, and a lever-arm on said shaft to close the bottom of the measure after its contents have been discharged, and whereby the said beam, supporting-arms, and lever-arm are operated by the same movement of the shaft, substantially as described.

5. The combination, with the delivery-spout provided with tallying mechanism and the

grain-measure having a lift device attached to and extended above the side thereof, of a valve journaled to set across the mouth of the spout and having its journal formed to engage the lift on the measure, and a pawl fixed on said journal to move the tally mechanism, as described.

In witness whereof I have hereunto set my hand in the presence of two attesting witnesses.

GEORGE H. KAMMAN.

Attest:

JAMES BOURNE,

WM. H. PARKER.