(No Model.)

# J. HENRY.

## AUTOMATIC GRAIN METER.

No. 386,745. Patented July 24, 1888.

Fig. 2.

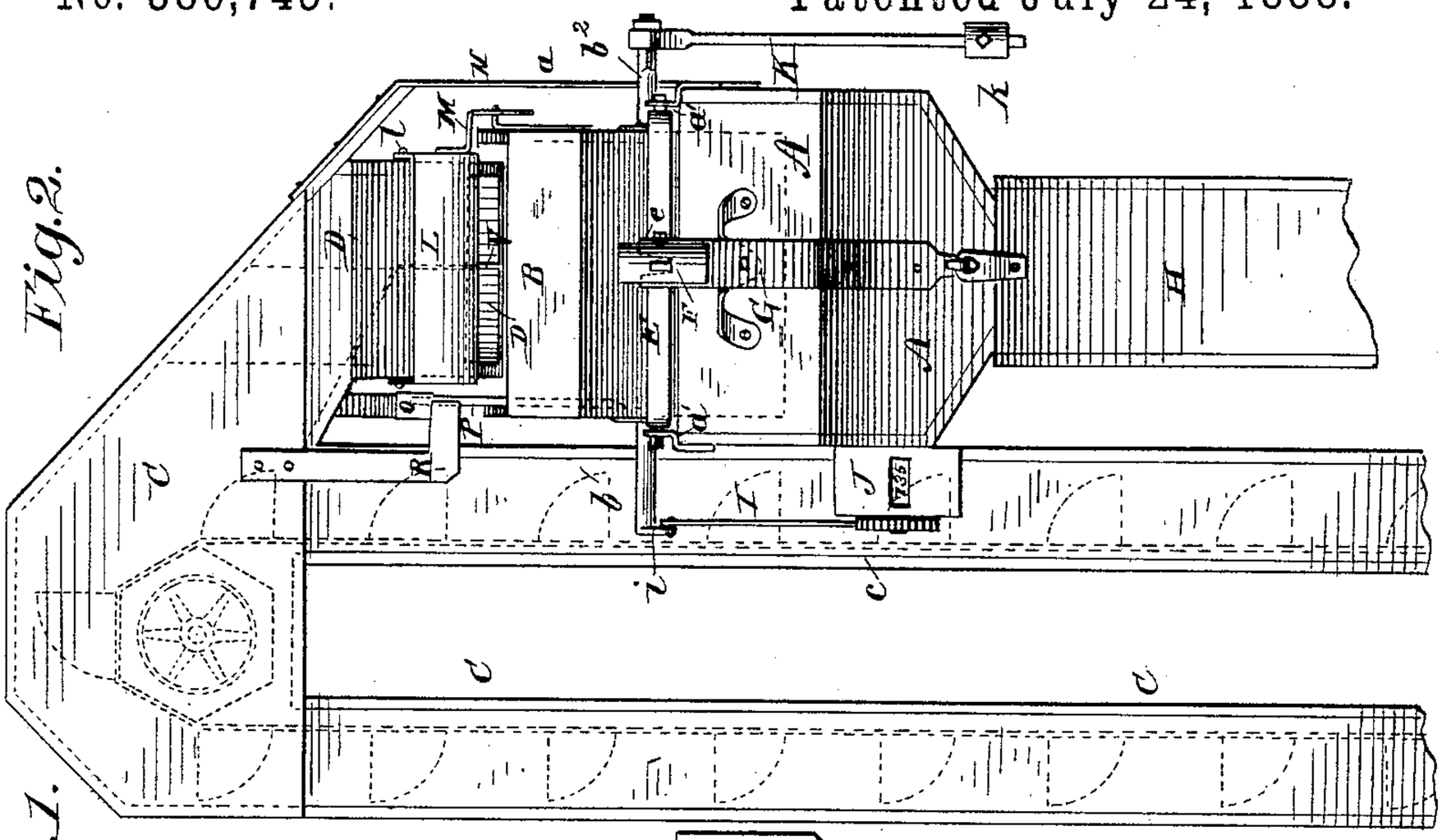

Fig. 1.

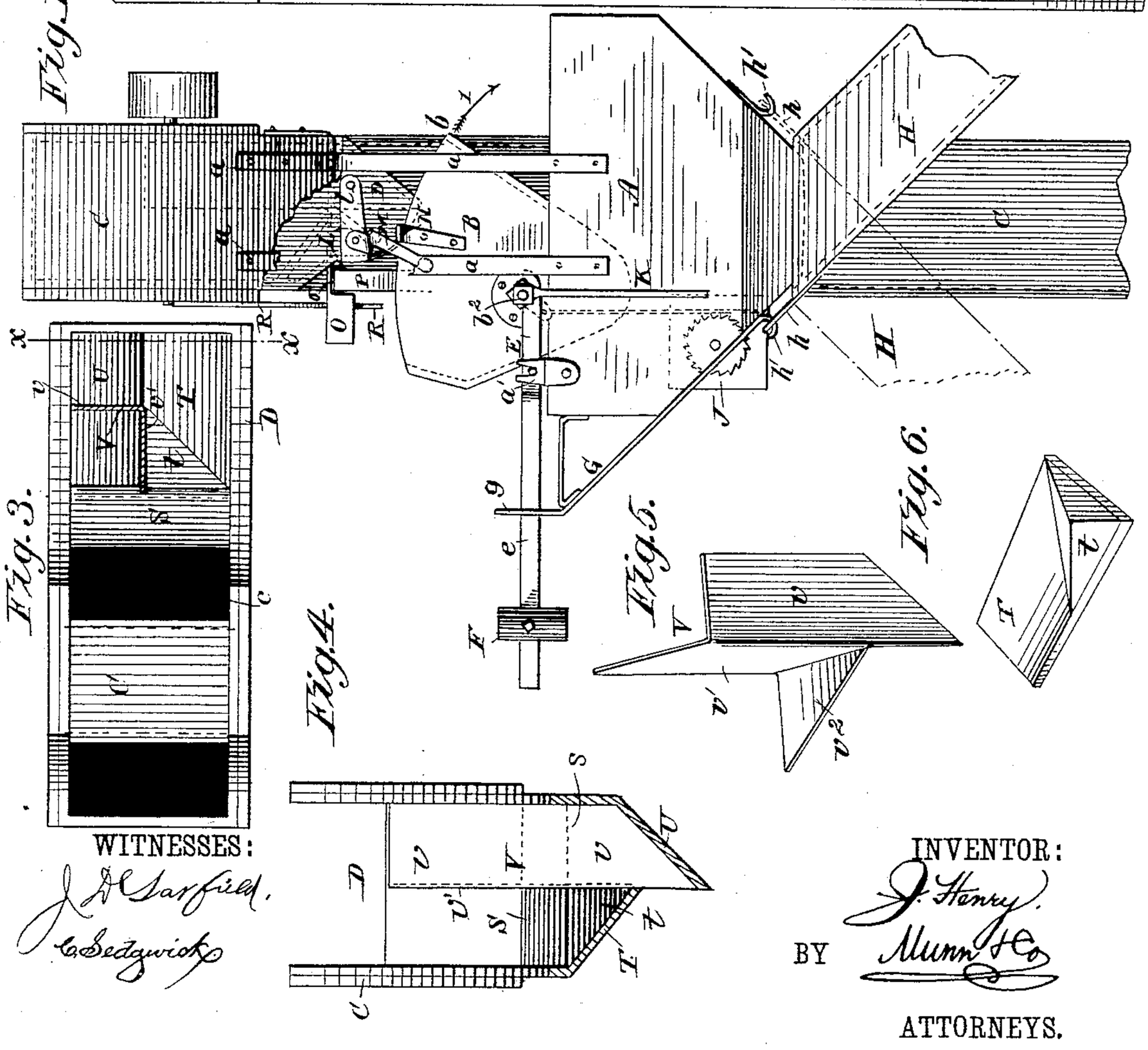

Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.



WITNESSES:

J. H. Garfield.

C. Sedgwick

INVENTOR:

J. Henry.

BY Munn & Co

ATTORNEYS.

N. PETERS, Photo-Lithographer, Washington, D. C.

# UNITED STATES PATENT OFFICE.

JOHN HENRY, OF ARDOCH, DAKOTA TERRITORY.

## AUTOMATIC GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 386,745, dated July 24, 1888.

Application filed October 26, 1887. Serial No. 253,413. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN HENRY, of Ardoch, in the county of Walsh and Territory of Dakota, have invented a new and Improved Automatic Grain-Weigher, of which the following is a full, clear, and exact description.

My invention relates to grain-weighers, and has for its object to provide a simple, easily-handled, and effective apparatus of this character, which, in connection with an elevator, will take the grain directly from the grain-well of a thrashing-machine and weigh it, register the weight, and discharge it into vehicles for delivery, the work being accomplished automatically, thereby saving time and labor.

The invention consists in certain novel features of construction and combinations of parts of the apparatus, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is an elevation of my improved grain-weighing apparatus, showing it in connection with parts of a grain-elevator and adjustable discharge-chute, the elevator hood or top being partly broken away to show the construction more clearly. Fig. 2 is an elevation of the weigher, elevator, and chute, viewing the parts at right angles to Fig. 1. Fig. 3 is a plan view of the elevator with its top cover and endless chain of buckets removed, and is intended more particularly to illustrate the construction of the elevator discharge-spout. Fig. 4 is a vertical section taken through the elevator head and spout and on the line *x x*, Fig. 3. Fig. 5 is a perspective view of one form of partition-plate adapted to the elevator-spout to secure even distribution or fall of grain to the tilting hopper of the weigher, and Fig. 6 is a detail view of one of the inclined bottom boards of the delivery-spout of the elevator as arranged when the lateral fin or extension of the partition-plate is not used.

The hopper A, into which the grain-box B discharges, is fixed to the outer leg, *c*, of an elevator, C, which is supposed to be connected to the frame of a thrashing-machine in a manner to raise the freshly-thrashed grain and deliver it through the elevator-spout D into the grain-box B. The hopper A has further support from the elevator by metal straps or plates *a a*, fixed to the outer side or wall of the hopper and to the elevator-spout. The grain-box B is supported by aligned shafts *b' b²*, fixed to its opposite ends on the inner forked end or part of a weigh-beam, E, which is fulcrumed on or in suitable arms or supports, *a' a'*, fixed to the hopper A, and on its outer part or arm, *e*, the beam carries a weight, F, to measure or control the amount of grain filled into the box B prior to each tilting and discharge of the box. The arm *e* finds guidance and a rest in the upper forked end, *g*, of a bracket, G, fixed to the hopper A.

The pivot-shafts *b' b²* are fixed to the grain-box at points behind and below the center of gravity of the box, whereby when the box is released from its latch or catch device, as presently explained, said box will automatically tilt at its nose or discharge edge *b* in the direction of the arrow *l* in Fig. 1 of the drawings, and discharge its contents into the hopper A, whence the grain falls into a delivery-chute, H, which is held to the hopper by means of an eye, *h*, on the chute engaging a hook, *h'*, on the hopper. There is a hook, *h'*, on each end of the hopper, allowing the chute H to be connected to either hook to direct the nose or lower end of the chute to discharge at either the right or left hand, as may be most convenient, to load the weighed grain into a cart or bin. The chute H is shown in both positions by the full and dotted lines in Fig. 1 of the drawings.

A rod, I, connected to a crank-arm, *i*, on the shaft *b'* of the grain-box, is connected to suitable mechanism of a tally device, J, fixed to the elevator-leg *c* or the hopper A, or both, whereby each time the grain-box is tilted the tally will register the grain discharged, and in a manner common with apparatus of this character. To the other shaft, *b²*, of the grain-box is connected an arm or bar, K, which swings as the box turns, and carries a weight, *k*, held, preferably, by a set-screw. By adjusting the weight *k* on the arm K the pivoted grain-box may be overbalanced by the arm in a manner to bring the box back into normal latched position after each tilting of the box to discharge its load and without undue jar or shock to the parts.

I describe the grain cut-off and grain-box

latch devices as follows: The delivery end or mouth of the elevator-spout D is rounded in the arc of a circle struck from the pivots *l* of the cut-off L, which at its bent end portions is held by the pins or pivots *l* to the spout D, and by its curved main portion or body is adapted to close the spout to cut off the flow of grain therefrom to the grain-box B. To the cut-off L there is fixed a bent arm, M, which is adapted to be swung upward by an arm, N, fixed to the grain-box to open the spout for delivery of grain to the box, each time the empty box is swung or turned upward by the gravity of the weighted arm K above described. When the box is released from its latch device and tilts for discharging its contents, the arm N leaves the cut-off arm M and allows the cut-off to fall or swing down by its gravity to stop discharge of grain from the spout.

The latch device consists of an elastic or spring-pressed latch-bar, O, which is held at one end to the elevator-spout D, and is provided at or near its other end with a notch, *o*, into which the upper end of an arm, P, fixed to the grain-box B, is adapted to enter, as shown in Fig. 1 of the drawings. A bar or plate, R, fixed at one end to the spout D, extends below the free end of the latch to support it in proper position to engage the grain-box arm P, and when the arm engages the latch it lifts it a little above the support R, so that during the first part of the tilting movement of the grain-box the latch-bar will follow the arm a little distance before the latch comes to a rest on the support, thus giving the grain-box a start in overbalancing without undue friction or jar of the parts.

It is obvious that when the weight of grain in the box B is sufficient to overbalance the weight F on the beam E the arm P will fall from the notch *o* of the latch O, thus freeing the box, which will then automatically tilt to discharge its load into the hopper A and chute H, and as the box empties the weighted arm K, which had been swung about to a horizontal position by the tilting forward of the box, will swing or turn the box back again, and the arm P will again be engaged by the latch-bar O to lock the box in position to receive its next load of grain. As the box had tilted forward for discharging its contents, the cut-off L had closed the spout D, and as the box had about resumed its normal latched position, the box-arm N had, by action on the cut-off arm M, raised the cut-off to open the spout to deliver grain to the box, the entire operation being very simple and effective and wholly automatic.

It is desirable in apparatus of this character to have a steady or evenly-distributed flow of the grain from the elevator-spout to the grain-weighing box, and to secure this I have fitted the spout with partitions, as next described.

As the grain is discharged from the buckets at the top of the elevator-leg *c* it falls upon an inclined floor or plate, S, and thence upon a lower inclined ledge or plate, T, which joins the left-hand side of the spout D and extends toward the right-hand about half-way across the spout and delivers some of the falling grain onto a lower inclined plate or floor, U, which joins the right-hand wall of the spout and extends toward the left hand about to the center of the spout. The plates T U thus incline or range in opposite directions and are at right angles to the inclined plate S, all as most clearly shown in Figs. 3 and 4 of the drawings. In the spout D is fitted a plate, V, which is preferably bent into right-angular general form, so that when in place its longer part, *v*, fits down upon the lower inclined plate, U, of the spout, and its shorter part, *v'*, forms a wall which divides the grain flowing down the inclined plate S into two streams, one of which falls inside the angular partition-plate V directly onto the lower inclined plate, U, while the other stream falls onto the upper plate, T, and thence onto the lower plate, U. The part *v'* of the plate V may extend downward to the front or outer edge of the plate T; but this would leave an angle or break in the slanting surfaces, onto or into which the grain would lodge, and to avoid this and secure free flow of all the grain discharged from the elevator I purpose either to fit a block, *t*, onto the plate T or to provide an inclined angular fin or extension, $v^2$, on the plate V, either of which parts, $t\ v^2$, will form a practical continuation of the inclined plate S to a point next the side or part *v* of the plate V, or where the grain falls from the plate T onto the lower plate, U, next the corner of the partition V, as will be clearly understood from the drawings.

It is obvious that the grain from the elevator, when divided into two downflowing streams by the partition V, will pass quite evenly into the grain-box B and facilitate the correct weighing of the grain and easy tilting movement of the box in discharging the grain.

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

1. The combination, in an automatic grain-weigher, of a hopper, A, a weigh-beam, E, fulcrumed thereon, a grain-box, B, journaled on the weigh-beam at a point below and behind the center of gravity of the box, and a weighted arm, K, held to the grain-box or its shaft and operating to return the box to normal upright position after each tilting of it to discharge its contents, and a tally device connected with the shaft of the box, substantially as herein set forth.

2. The combination, in an automatic grain-weigher, of a hopper, A, a weigh-beam, E, fulcrumed thereon, a grain-box, B, journaled on the weigh-beam at a point below and behind the center of gravity of the box, a weighted arm, K, held to the grain-box or its shaft and operating to return the box to normal position after each tilting of it to discharge its contents, a latch-bar, O, held to a relatively-fixed support and notched at *o*, and an arm, P, on the grain-box, which is engaged by the

latch-bar as the box resumes normal upright position, and the support R on the elevator-spout below the free end of said latch-bar, substantially as herein set forth.

3. The combination, in an automatic grain-weigher, with a hopper, A, a weigh-beam, E, fulcrumed thereon, a bracket, G, fixed to the hopper and having forked upper end, *g*, forming a guide and rest for the arm *e* of said beam, a tilting grain-box, B, journaled on the weigh-beam, and a spout discharging grain or other material into the box, of a cut-off, L, fitted to the spout and provided with an arm, M, and an arm, N, on the grain-box, substantially as shown and described, whereby the cut-off will be operated to open the discharge-spout as the grain-box resumes normal upright position, and the spout will be closed as the grain-box tilts for discharge, as herein set forth.

4. The combination, in an automatic grain-weigher, of a hopper, A, a weigh-beam, E, fulcrumed thereon, a tilting grain-box, B, journaled on the weigh-beam, a weighted arm, K, held to the box and returning it to normal position, a spout discharging into the box, a latch-bar, O, held to a relatively-fixed support and notched at *o*, an arm, P, on the grain-box, adapted for engagement by the latch, a cut-off, L, fitted to the discharge-spout and provided with an arm, M, and an arm, N, on the grain-box, all arranged for operation substantially as described, for the purposes set forth.

5. In a grain-weighing apparatus, the combination, with the spout delivering into the weighing-box, of reversely-inclined plates T U and an angular partition, V, arranged to divide the flowing grain to discharge it evenly to the grain-box, substantially as herein set forth.

6. In a grain-weighing apparatus, the combination, with the spout D, of reversely-arranged inclined plates T U, a partition, V, and a filling-piece, as *t* or $v^2$, arranged at the angle or corner between the parts V T, substantially as herein set forth.

7. In a grain-weighing apparatus, the combination, with the weighing-box and the spout delivering into said box, of the inclined plate S, the inclined plate T at right angles thereto, the reversely-inclined plate U, and the angular partition V in the elevator-spout, substantially as and for the purpose specified.

JOHN HENRY.

Witnesses:
W. T. SHEPPARD,
CHAS. JACOBSON.