

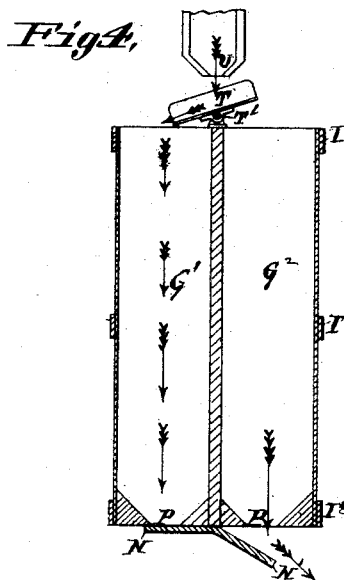
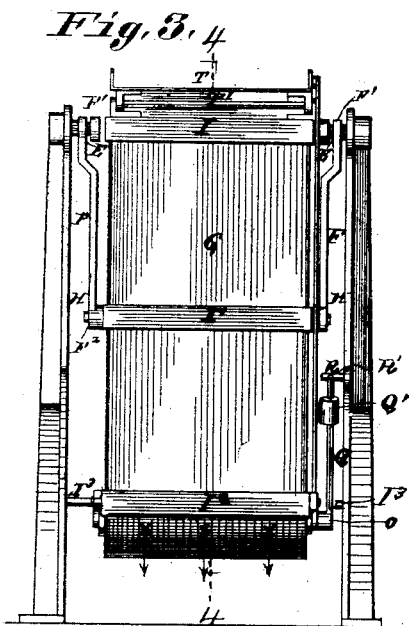
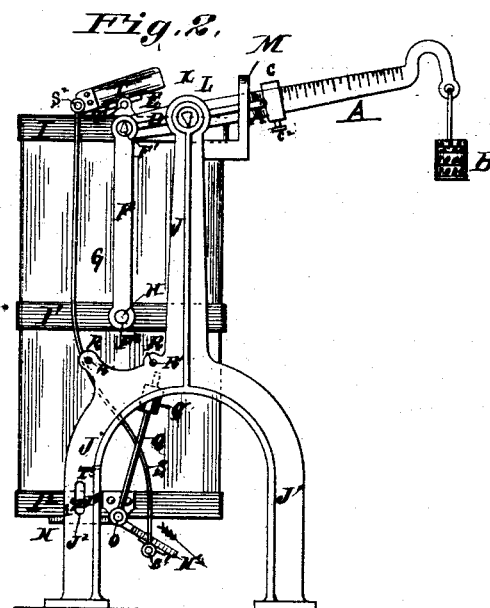
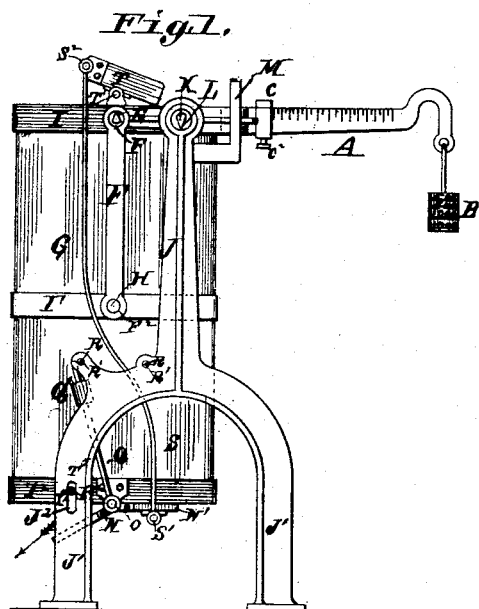
(No Model.)

J. F. MILLIGAN.

AUTOMATIC GRAIN WEIGHING APPARATUS.

No. 344,192.

Patented June 22, 1886.



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# UNITED STATES PATENT OFFICE.

JOHN F. MILLIGAN, OF ST. LOUIS, MISSOURI.

## AUTOMATIC GRAIN-WEIGHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 344,192, dated June 22, 1986.

Application filed December 23, 1885. Serial No. 186,549. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN F. MILLIGAN, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Automatic Weighing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

- 10 Figure 1 is a side elevation of the machine with the weighing-receptacle elevated. Fig. 2 is a side elevation with the weighing-receptacle depressed. Fig. 3 is an end elevation with the weighing-receptacle elevated, and 15 Fig. 4 is a vertical section at 4 4, Fig. 3.

My invention relates to an apparatus for weighing grain with weighing-receptacle in duplicate compartments, and automatic devices for opening and closing its traps and 20 simultaneously reversing the delivery of its chute from one compartment to the other; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

- 25 Referring to the drawings, in which similar letters designate like parts in the several figures, A represents the graduated beam of the scales provided with the suspended weights B and slide-weight C, as usual, and having an 30 extension, D, provided with the knife-edges E, which pass through the upper perforations, F', of the dependent arms, F, that support the weighing-receptacle G. The weighing-receptacle is made in duplicate compartments G' and G<sup>2</sup>, and has gudgeons H secured to its 35 middle girt-band, I', that pass through perforations F<sup>2</sup> in the lower ends of the pendent arms by which it is swung. The beam is supported on standards J, which rise vertically from their forked bases J', and connect 40 to and operate in the perforations K of said standard on knife-edges L, and is confined laterally by a vertical slotted guideway, M. A set-screw, C', fastens the slide-weight C.

- 45 The weighing-receptacle is firmly bound by girt-bands I, I', and I<sup>2</sup>. Pins I<sup>3</sup>, projecting from the last-mentioned band, carry anti-friction rollers I<sup>4</sup>, which work in slotted ways J<sup>2</sup> in forks of the standard, and, while they 50 allow the necessary vertical rise and fall, prevent lateral movement of the weighing-receptacle.

N and N' represent a double trap-valve that works on a rock-shaft, O, and alternately opens and closes the ports P P of the two compartments of the weighing-receptacle. An oscillating rod, Q, rises vertically from the rock-shaft to catch pins R R, each provided with anti-friction rollers R' R', which lock the oscillating bar in each of its alternate positions, 60 with alternating changes of open and closed ports to the compartments of the weighing-receptacle, said trap being automatically operated in a manner hereinafter described. The oscillating rod has a thread cut around its upper portion, on which is adjusted a weight, Q', whose effect upon the twin valves varies 65 according to its position upon said rod. A circumlinear or partially curved rod, S, is pivoted to one of the trap-valves at S' at the bottom of the weighing-receptacle, and to the chute at S<sup>2</sup> above the said weighing-receptacle.

T represents the alternating chute that works on a rock-shaft, T', receiving the grain from the supply-spout U above it. 75

The operation of my automatic weighing-machine is as follows: It will be seen that the rocking chute has simultaneous action with the trap-valve, to which it has pivotal connection through the rod S, so that the compartment into which it discharges for the time being is the one whose trap-valve is closed. I show the machine adjusted to weigh three thousand pounds, (which is equivalent to fifty bushels of wheat;) but I do not confine myself to any 85 particular weight, for it is evident that it can be set to weigh smaller or heavier amounts without departing from the essential features of my invention. Having adjusted the weight or weights to the amount desired for each tally, 90 the slide in the supply spout is withdrawn and the grain falling into the chute is discharged into the compartment of the weighing-receptacle whose trap-valve is closed. When sufficient grain is received to tip the beam, it is 95 evident the weighing-receptacle must drop sufficiently to allow the oscillating or trigger rod Q to pass down out of contact with the catch-pin R, when the weight of the grain immediately forces the trap-valve open, and by 100 the operation of the rod S the discharge of the rocking chute is changed to the other compartment of the weighing-receptacle. As the connection of the twin trap-valves is rigid, as

load the other closes and retains the grain that is now discharging from the reversed chute into its compartment of the weighing-receptacle.

5 At the same time the oscillating trigger-rod Q, being assisted in its pendulum motion by the weight Q', has passed in line for engagement with the other catch-pin, R, and as the weight in the weighing-receptacle is decreased

10 the balance-beam raises it and the rod engages the catch-pin, holding the trap-valve tight until the weighing-receptacle having again received the given weight, it again drops and the trap-valves again reverse their action.

15 The weight Q' is made adjustable upon the rod Q, for the reason that it is designed to counter-balance to some extent (before the rod Q is engaged by the pin R) the weight of the material in the weighing-receptacle, and as the

20 machine is adapted for weighing loads widely differing in weight it is evident that the power exerted by the weight upon the valves should be correspondingly varied; hence in measuring small loads the weight is moved nearer

25 to the axis of motion than when weighing larger ones, and vice versa. The pins I<sup>3</sup> on the bottom band of the hopper work in slots J<sup>2</sup> near the base of the standard and limit the rise and fall of the weighing-receptacle and prevent

30 lateral movement. The adjustable weight Q' on the oscillating rod assists its pendulum motion as it passes from engagement with one catch-pin to the line of engagement with the other; also, anti-friction rollers on the catch-

35 pins assist to release the hold of the rod on the one and its fresh engagement on the other. The set-screw in the slide-weight secures it from displacement, which might otherwise vary the weight.

40 It will be seen that the machine is entirely automatic in its action, so that as long as grain continues to fall into the weighing-receptacle it will continue to weigh. If it is desired to deliver to the one side instead of underneath,

45 a chute could readily be attached beneath the trap-valves.

I have described my machine as used in weighing grain and set to a given weight; but I do not confine myself to that use only, for

50 it is evident that it could as readily be used in weighing other articles, and also with larger or smaller weights, and the machine itself made of suitable capacity to the use to which it is applied.

55 Any suitable registering device may be used for keeping tally of the number of drafts.

I am aware that in automatic weighing-

and twin valves, substantially as herein described, a segment having two notches has been secured to the rock-shaft to which the valves are fixed, one or the other of said notches being engaged when the receptacle is in elevated position by a movable detent located directly over the center of oscillation of the

60 said valves, said detent being held in engagement by means of a spring or by gravity, and lifted therefrom by contact with the frame or a fixed projection therefrom as the weighing-receptacle descends.

I do not claim, broadly, means for locking the one or the other of the twin valves which is for the time being in operative position, and do not regard devices heretofore employed for this purpose as the equivalents of that

70 herein shown and described.

I claim as my invention—

1. In an automatic weighing-machine, the combination, with the standard, the beam, the weighing-receptacle suspended from the beam

80 and divided into two compartments, the oscillating chute, and the oscillating twin valves, of the arm or trigger-rod projecting from the rock-shaft of said valve, and the weight secured to said trigger-rod, substantially as and for the

85 purposes set forth.

2. The combination, with the standard, the beam, and the weighing receptacle having a dividing partition, of the oscillating chute journaled over said partition, the twin valves

90 journaled beneath said partition, and the rod connecting said chute and valves upon opposite sides of their respective journals, as set forth.

3. The combination, with the standard, the

95 beam, and the receptacle having two compartments, of the twin valves N N', the arm or trigger-rod Q, secured thereto, and the stops or studs R R, projecting from the standard and having the rollers R' R', substantially as

100 and for the purposes set forth.

4. In an automatic weighing-machine, the combination, with the standard, the beam, the weighing-receptacle suspended from the beam and divided into compartments, the oscillating

105 chute, and the oscillating twin valves, of the arm or trigger-rod projecting from the rock-shaft of said valve, and a weight adjustable on said rod, substantially as and for the purpose set forth.

JOHN F. MILLIGAN.

In presence of—

SAML. KNIGHT,  
BENJN. A. KNIGHT.