(No Model.)

W. H. ALLEN.

GRAIN WEIGHING AND REGISTERING MACHINE.

No. 255,832. Patented Apr. 4, 1882.

fig: 1.

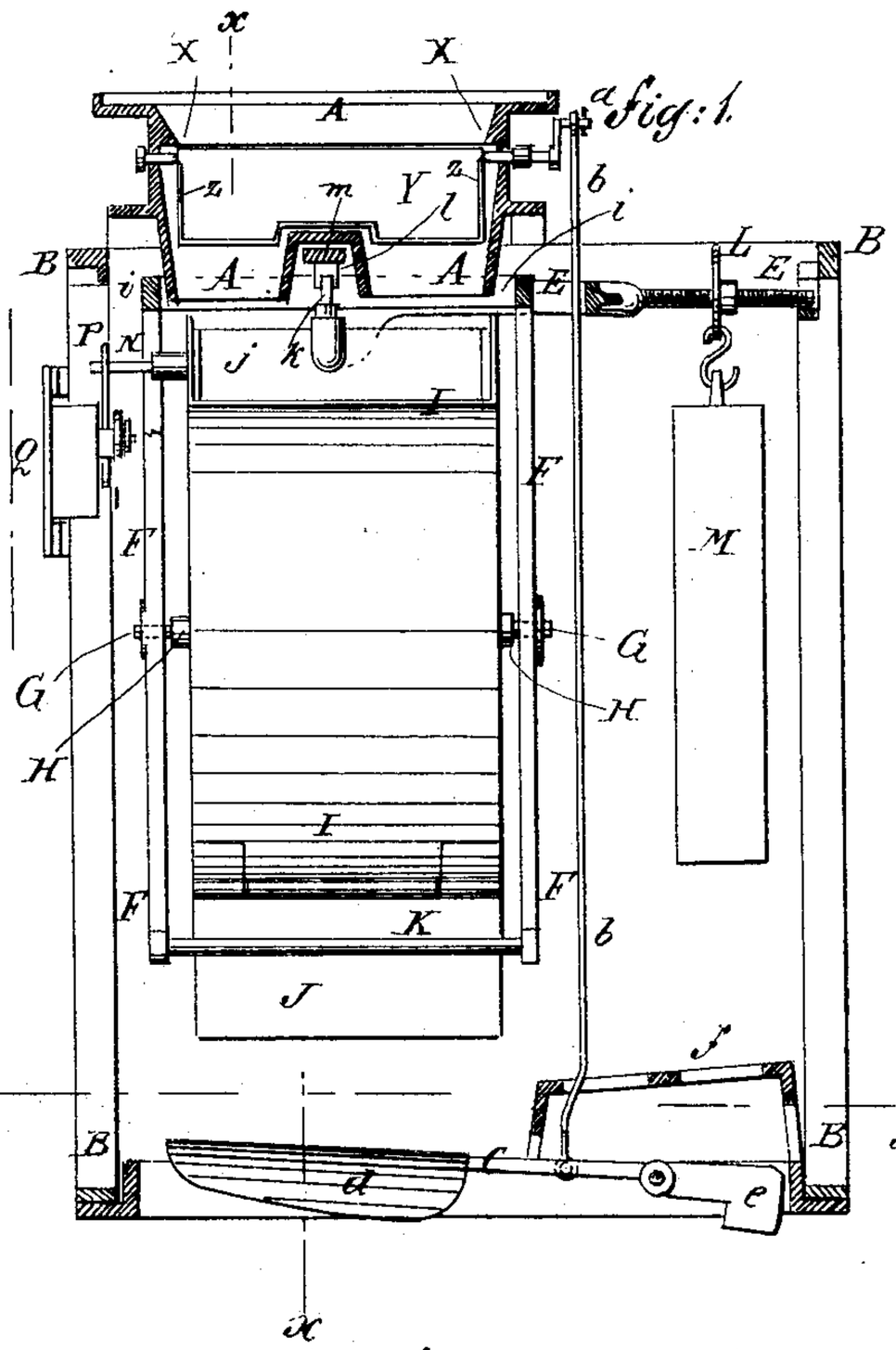

fig: 2.

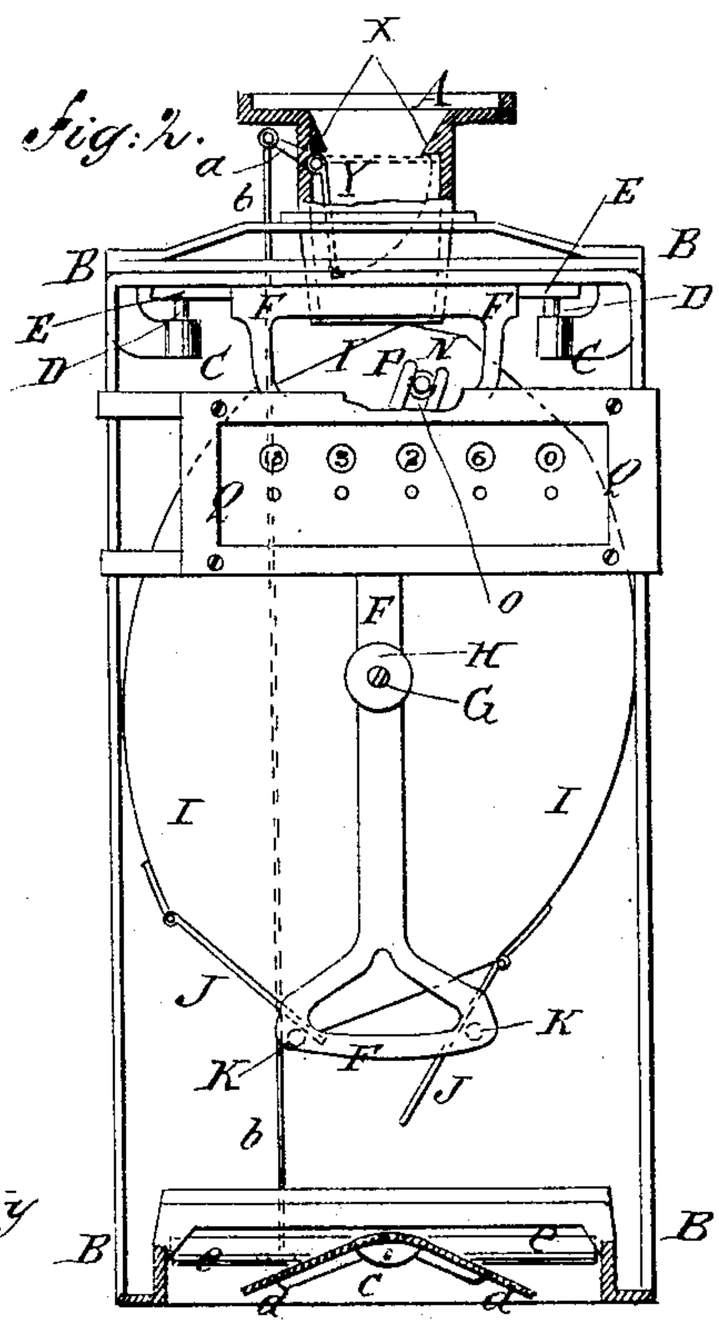

fig: 3.

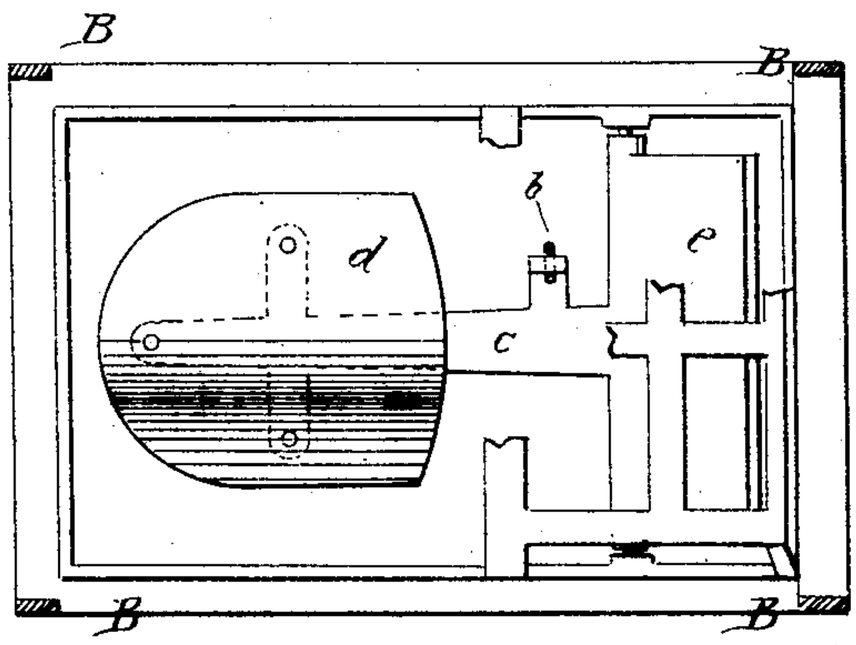

fig: 4.

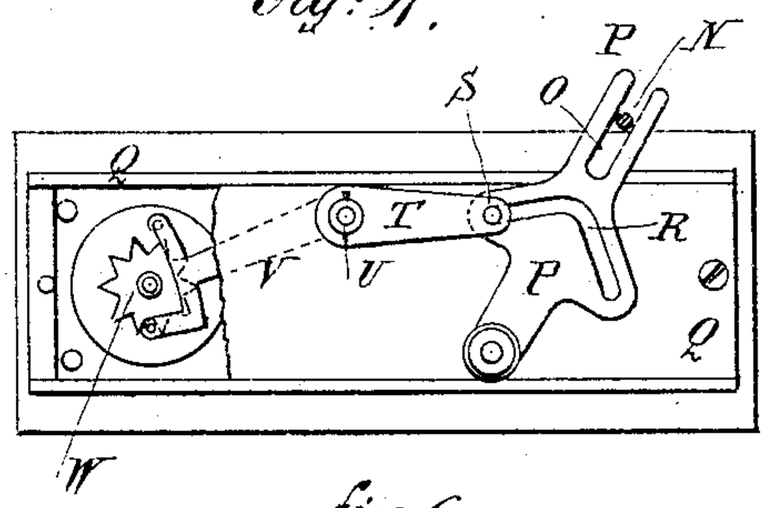

fig: 5.

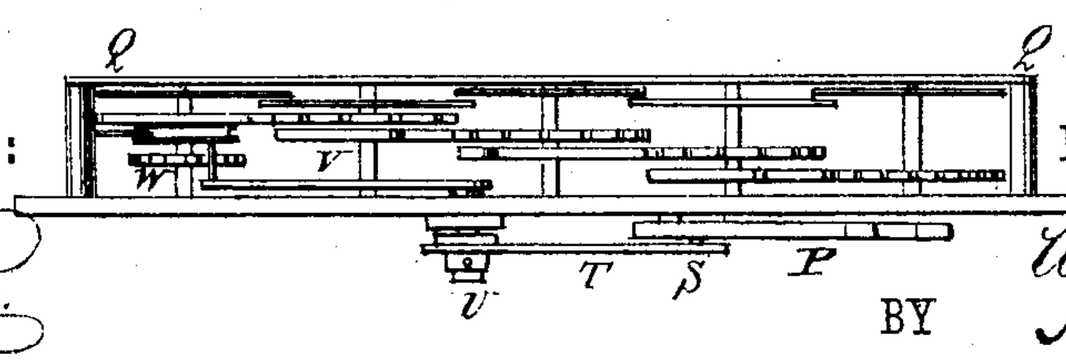

fig: 6.

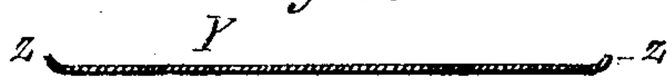

fig: 7.

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GRAIN WEIGHING AND REGISTERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 255,832, dated April 4, 1882.

Application filed July 29, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. ALLEN, of the city, county, and State of New York, have invented a new and useful Improvement in Automatic Grain Weighing and Registering Machines, of which the following is a full, clear, and exact specification.

Figure 1 is a sectional side elevation of my improvement. Fig. 2 is a sectional end elevation of the same, taken through the line *x x*, Fig. 1. Fig. 3 is a sectional plan view of the same, taken through the line *y y*, Fig. 1. Fig. 4 is a rear elevation of the register, part of the back plate being removed. Fig. 5 is a plan view of the register, the top plate being removed. Fig. 6 is a longitudinal section of the cut-off valve. Fig. 7 is a cross-section of the same.

Similar letters of reference indicate corresponding parts.

The object of this invention is to automatically control the delivery of the grain without affecting the accuracy of the weighing and registering.

The invention consists in the combination, with the inlet-spout having interior shoulder and the weighing-box, of the cut-off valve having flange, the crank, the connecting-rod, and the weighted lever having a plate at its forward end, whereby the admission of grain to the weighing-box is regulated automatically; and, also, in the combination, with the vibrating weighing-box having a pin attached to the upper part of its end and the register having saw-toothed ratchet-wheel, of the lever having a straight slot in its upper end and a double-inclined slot in its middle part, and the bent lever, whereby each vibration of the said weighing-box will vibrate the said bent lever twice and move the said ratchet-wheel through the space of one tooth, as will be hereinafter fully described.

A represents the spout through which the grain or other substance enters the machine, and which is attached to the top of the frame B of the said machine. The frame B can be inclosed in a box or casing, if desired. To the opposite side bars of the top of the frame B are attached brackets or hangers C, to which are attached upwardly-projecting points D, to serve as pivots to the forked lever E.

To the ends of the branches of the lever E are pivoted the side bars of the frame *i*, from the end bars of which are suspended two frames or bars, F. To the bars F, a little above their centers, are attached pivots G, which enter sockets H, attached to the vertical ends of the box I, a little above the centers of the said ends. The top of the box I is open, and its sides are curved outward and then inward, as shown in Fig. 2. The box I is divided into two equal compartments by a fixed partition, *j*.

To the lower edges of the sides of the box I are hinged valves J, which are made of such a length that their lower edges will close against the opposite sides of the lower edge of the said central partition. The valves J are supported, when closed, by rods K, pivoted or attached to the lower corners of the frames F. The forward end of the lever E works in a guide-slot in the frame B and rests upon the lower end of the said guide-slot when the box I is empty. The forward part of the lever E has a screw-thread cut upon it to fit into the screw-thread cut in the support L, from which the balancing-weight M is suspended, so that the position of the said weight can be adjusted by moving the support L out or in upon the said lever E.

To the center of the upper edge of the fixed partition *j* is attached a short arm or point, *k*, the upper end of which rests against a catch, *l*, attached to or formed upon the lower side of the cross-bar *m*, formed upon or attached to the top side bars of the frame B. When grain or other substance is being received into one of the compartments of the box I the hinged bottom valve, J, of that compartment is held closed by one of the rods K. As soon as the amount of grain for which the machine has been set has entered the compartment of the box I the said box overbalances the weight M and descends. This movement releases the box from its catch and allows the said box to be oscillated or tilted in the opposite direction by the weight of grain in the loaded compartment. This movement carries the valve J away from the rod K and allows the said valve to swing down and discharge the grain. These various movements occur almost simultaneously, so that the measurement will be very accurate, an allowance being made for the small amount of grain that may pass while the change of position is taking place.

To one end of the box I, near its top, is attached a pin, N, which passes through a lon-

gitudinal slot, O, in the upper end of the lever P, so that the said lever will be vibrated by the oscillations of the box I. The lever P is pivoted at its lower end to the case of the register Q, which is secured to the end of the frame B or to bars attached to the said frame. The middle part of the lever P is widened, and in it is formed a double-inclined slot, R, made in the shape of an inverted V. In the slot R works a pin, S, attached to the end of a bar, T, the other end of which is attached to the outer end of a shaft, U. The shaft U works in a bearing in the case of the register Q, and to its inner end is attached the end of a bar, V, the bars T V and shaft U thus forming a bent lever. The other end of the bar V is forked, and has pins attached to the ends of its branches to engage with the teeth of the ratchet-wheel W, so that the said ratchet-wheel will be turned by the vibrations of the lever T U V. The lever T U V and the toothed wheel W thus operate as a clock-escapement, except that the said wheel is turned by the pressure of the said pins upon the inclined sides of the teeth of the said wheel, the teeth of the ratchet-wheel W being made with equal sides or in the shape of saw-teeth. By this construction each oscillation of the box I will vibrate the lever T U V twice, and thus turn the wheel W through the space of one tooth.

The ratchet-wheel W is attached to the journal of the first wheel of the register Q, so as to carry the said first wheel with it in its movements, and thus give motion to the said register. The register Q is formed of a series of wheels connected together in the ordinary manner, so that the revolution of each preceding wheel will turn the next wheel through the space of one tooth. Each wheel of the register is provided with as many numerals as it has teeth, and the said numerals are seen through small openings in the face-plate of the register-case, as shown in Fig. 2. With this construction a fixed quantity of grain is discharged at each oscillation of the box I, and each of said oscillations vibrates the levers P and T U V and moves the register, so that each discharge of grain will be recorded by the register, and the amount can be read through the apertures in the face-plate of the register.

The machine can be so constructed that the register will be kept in pounds, hundredweights, or bushels, and the register-wheels can be so constructed that the first aperture will show the units, the second the tens, and so on to higher denominations.

The spout A has a shoulder, X, upon the inner surface of its upper part, and to its ends, near one side and just beneath the shoulder X, is hinged the side edge of a cut-off plate or valve, Y, which is made of such a size as to fit into the spout A when turned up into a horizontal position against the shoulder X. The cut-off plate or valve Y has a flange, Z, formed upon its end edges and the edge of its free side to rest against the shoulder X and prevent any kernels of grain from escaping around the said edges. One end of the pivot of the cut-off valve Y projects, and to it is attached a crank, *a*, to which is pivoted the upper end of the rod *b*. The rod *b* passes down at the end of the box I, and is pivoted at its lower end to a lever, *c*, which is pivoted to the base of the frame B in such a position that the forward end of the said lever will be directly beneath the bottom of the box I.

To the forward end of the lever *c* is attached a plate, *d*, the side parts of which are inclined or curved downward slightly, as shown in Figs. 1, 2, and 3. The rear end of the lever *c* has a weight, *e*, formed upon or attached to it, the said weight being of sufficient gravity to hold the forward end of the said lever *c* raised and the cut-off valve Y pressed against the shoulder on the sides of the spout A.

In using the machine it is designed to be placed over a box of any desired capacity. When the contents of a compartment of the weighing-box are discharged they fall upon the plate *d* and press the forward end of the lever *c* downward and hold it there until the said contents have been fed to a run of stone or are otherwise removed, when the forward end of the said lever *c* again rises. The downward movement of the forward end of the lever *c* raises the cut-off valve Y and prevents any more grain from entering the box I until the cut-off valve Y is lowered by the rise of the forward end of the lever *c*. With this construction the grain is weighed and registered faster or slower, according as it is used faster or slower, so that the machine will regulate itself to feed grain to one, two, or more runs of stone, as may be required.

The weighted end of the lever *c* can be covered and protected by a rack or platform.

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

1. In an automatic grain weighing and registering machine, the combination, with the spout A, having shoulder X, and the weighing-box I, of the cut-off valve Y, having flange Z, the crank *a*, the connecting-rod *b*, and the weighted lever *c e*, having plate *d* upon its forward end, substantially as herein shown and described, whereby the admission of grain to the weighing-box is regulated automatically, as set forth.

2. In an automatic grain weighing and registering machine, the combination, with the vibrating weighing-box I, having pin N, and the register Q, having saw-toothed ratchet-wheel W, of the lever P, having straight slot O and double-inclined slot R, and the bent lever T U V, substantially as herein shown and described, whereby each vibration of the said weighing-box will vibrate the said bent lever twice and move the said saw-toothed ratchet-wheel through the space of one tooth, as set forth.

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Witnesses:
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