

UNITED STATES PATENT OFFICE.

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WEIGHING APPARATUS.

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To all whom it may concern:

Be it known that I, JOHN M. WHITE, residing at Tobias, in the county of Saline and State of Nebraska, have invented certain useful Improvements in Weighing Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention has relation to a novel improvement in weighing apparatus.

The object of my invention is more particularly to provide a grain-weighing machine.

In the accompanying drawings I have shown in Figure 1 the side elevation, with parts broken away, of a weighing apparatus embodying my invention, while Fig. 2 shows a top view thereof with portions removed.

The aim of my invention is to provide an automatic grain-weighing apparatus into which the grain may be fed from a suitable hopper and which shall be sufficiently light and portable so that the same cannot only be placed in any suitable mill or elevator, but be movable therein, so that my apparatus could be readily moved from place to place.

My invention embodies, essentially, the supporting-frame comprising a set of sills 3, having upwardly-extending standards 2, which above are secured by means of the transverse connecting-bar 11, as is shown in the drawings.

Fixed to the upper supports 1 and pending therefrom is a bin A, having a circular bottom with an opening *a* therein, which opening *a* is closed by means of a radially-swinging slide 12, which slide 12 is secured to and forms part of two arms. Upon one side one of these arms has secured to it certain operating mechanisms, so that while upon one side a simple straight bar is sufficient, extending from a lug 11 to the plate 12, upon the remaining side, as is shown in Fig. 1, an approximately Y-shaped arm is shown having an upper nosing 13 and further being provided with two upwardly-extending pins 15 and 16, while a spring 14 normally exerts a force to draw the upper end of this Y-shaped sup-

porting-arm in one direction, so as to bring the plate 12 below the bin to close its opening.

Positioned above and being pivotally secured to the side of the bin A is a weighted lever 4, which normally rides upon or against the upward nosing 13 of the Y-shaped hanger D', as is clearly shown in Fig. 1.

Pivotally swinging between the supporting-frame of my weighing-machine is a rectangular frame comprising the end bars 43 and the side bars C, which frame is supported by means of an ordinary rod 10, passing through the supporting-standard, as is shown in Fig. 1.

Swinging between the end within the supporting-standard is an ordinary hopper B, which hopper is supported by means of the pins 9, while the bottom is formed by means of the plates 28, each plate having two extending arms 27, provided at the end with the gear-sector 25, said arms being supported by means of ordinary pins 26. In Fig. 1 but one of said arms is shown, they being exactly alike upon the opposite side. To normally hold the bottom sections 28 in a closed condition, I provide an ordinary spring 24, so that the bottom of this hopper B may be securely closed during certain periods. Secured to the supporting-frame at a suitable point is an ordinary crank-shaft D, which shaft is provided with the pulley 37, over which passes a suitable belt 38, so that this pulley, which is loosely mounted upon the shaft D, may be continuously revolved. In the drawings but one portion of this wheel 37 is shown and so also only a portion of the power-transmitter belt 38. This shaft D is held within suitable boxings 1'.

Journaled to the crank of the shaft D are two loop pitman-rods, (marked 18 and 32,) the one marked 18 being considerably longer than the one marked 32, the loop-ended bar working through the pin 16, secured to the hanger D', while the short loop-ended bar 32 works upon the pin 29, which pin is secured to and forms part of one of the extending arms 27, as is shown in the drawings.

Fixed to the shaft D is an ordinary ratchet-wheel 36, adjacent to which works a shield 34, fixed to the axle, and which shield carries a pawl 30, the pawl being pivoted to the shield

by means of a pin 35, the head of this pawl being normally thrown into engagement with the ratchet-wheel 36 by means of an ordinary leaf-spring 50, secured to the shield 34, as is shown in Fig. 1.

Secured to a suitable post by means of a pin 22 is a lever 21, which lever is provided with a nosing 37, which nosing is positioned within the path of the pawl 30, in Fig. 1 the pawl 30 being shown as arrested and supported by means of this lever 21.

Extending from one of the hangers D', pivotally secured thereto by means of a pin 15, is an ordinary connecting-bar 19, which bar 19 is provided with a series of openings, so that said bar can be adjustably secured to a pin 20, forming part of the lever 21, as will be noticed in Fig. 1.

The tilting frame C is provided at its end opposite to the hopper B with a series of openings adapted to removably hold the rod 39, from which rod is suspended a suitable weight 40, so that the contents of the bin may be weighed, the weight within one opening representing the measure of oats, within the next opening a like amount of corn, and in the third a similar measure of wheat, the ratio between quantity and weight varying.

This weighing apparatus of mine is supposed to be positioned within the elevator or structure within which it is to be used in such a way that the wheel 37 may be easily given the driving power, this wheel being normally revolving.

When the working parts have been properly constructed and arranged, the operation of my device would be as follows: The tilting frame revolves by virtue of the weight 40, carries the hopper B upward, in which condition the bottom of the bin A would be open, the hanger B being held in a locked position by means of the trigger-lever 4, as is shown in Fig. 1, in which condition the hanger D' would be held against the tension of the spring 14. In this condition the loop-ended bar 18 would rest upon the pin 16, the crank of the shaft preferably being pendent, as shown in Fig. 1, the hopper B would have its bottom closed, as the spring 24 would be forcing the plates 28 together, while the trip-lever 21 would be in a position to support one end of the pawl 30, so that said pawl were thrown out of engagement with the ratchet 36, which pawl, as has been set forth, is normally in engagement with said ratchet by virtue of the spring 50. The driving power would next be applied to the wheel 37, so that this wheel would be continuously revolving, the belt 38 passing in the direction of the arrow *z*. The parts all being properly adjusted, the grain would be permitted to feed into the bin A, going in the direction of the arrow *w*, as is shown in Fig. 1. As this bin has the opening *a* within it in this unclosed position, the grain would readily escape from the bin A into the hopper B, with its bottom closed.

Now as the grain gradually overbalanced the weight 40 the hopper would begin to sink, and in its downward movement the tilting frame C would gradually carry with it the releasing-bar 7, which is provided with the loop end 6, within which loop is held one end of the counterbalanced trigger-lever 4, this lever 7 passing downward in the direction of the arrow *z*. Now as this bin began to fall the trigger-lever 4 would gradually be carried upward, so that the nosing 13 would escape, allowing the hanger D' to snap forward, being operated by the spring 14 to close the bottom of the hopper A. This movement of the hanger D' would have carried upward the rod 19, and this rod 19 being connected to the trip-lever 21 this lever would actuate one end to pass upward in the direction of the arrow *s*, as is shown in Fig. 1. As soon as the trip-lever were carried upward the pawl 30, which had been supported by this trip-lever, would be released, so that the spring 50 would quickly throw the pawl into engagement with the ratchet 36, which ratchet, as has been set forth, is fixed to and forms part of the wheel 37, so that the minute the ratchet were engaged the pawl 30 would be whirled in a circular path following the revolution of the shaft D. As this shaft revolved it would carry outward its crank, so that the loop-ended bar 32 would engage the pin 29 to open the bottom plates 28 and so empty the contents of the hopper B. Now as the crank of the shaft were being carried forward the two loop-ended bars 18, would also be actuated, so that the pin 16, which had shifted to the opposite end of its loop, would be carried forward by this bar 18 so that the bottom 21 of the bin A were again opened, the hanger D' being operated against the tension of the spring 14, the nosing 13 of the hanger D' working below and supporting the counterbalanced trigger-lever 4 until it snapped into a locked position, as is shown in Fig. 1. This locking of the hanger D' would have carried downward the bar 19, and this downward movement would have carried upward the nosing 31 to bring the same into the path of the pawl 30, upon striking which the pawl would be thrown out of engagement with the ratchet 36, which would instantly arrest the movement of the shaft D. Of course as the bottom plates 28 had been carried outward to dump the load within the hopper, which had been accomplished by means of the loop-ended bar 32, the tilting frame would of course have promptly been carried into one of its extreme positions by virtue of the weight 40, which would have carried upward the releasing-bar 7, which would leave the instrumentalities in the position as illustrated in Fig. 1. As long as material would be allowed to feed into the bin A so long would the apparatus be in operation, being of course understood that the wheel 37 is continuously being revolved. This releasing-bar 7 is attached to the scale-beam

by means of an ordinary ear 8, through which a suitable bolt passes, as is shown in Fig. 1.

Any suitable recording mechanism can be attached to the tilting frame C, so that the same can be actually recorded.

Now, having thus described my said invention, what I claim as new, and desire to secure by United States Letters Patent, is—

1. The combination with a suitably-supported tilting frame, of a drive-shaft, a normally-revolving ratchet-wheel loosely upon said drive-shaft, a pawl fixed to said shaft, a bin, a shifting bottom secured to said bin, a hopper held within said tilting frame, a shifting bottom secured to said hopper, a bar extending from said shifting hopper-bottom and secured to said drive-shaft, a bar extending from said bin-bottom secured to said drive-shaft, a trip-lever positioned within the path of said pawl, a rod connecting said trip-lever to said shifting bin-bottom, and a releasing-bar secured to said tilting frame adapted to actuate said trigger-lever, all arranged substantially as and for the purpose set forth.

2. The combination with a suitably-supported tilting frame, a counterpoise at one

end of said frame, a hopper within the other end of said tilting frame, a shifting bottom normally closing said hopper, a crank-shaft, a normally-revolving ratchet-wheel secured to said shield and normally adapted to engage said ratchet, a pivoted trip-lever within the path of said pawl, a bin positioned above said hopper, an arm-supported shifting bottom secured to said bin, said bin-bottom being normally closed, a trigger-lever working against the arm of said bin-bottom to retain the same in an open position, a rod extending from the arm of said bin-bottom to said trip-lever, a loop-ended bar extending from the crank of said shaft and secured to the arm of said bin-bottom, a second loop-ended bar secured to the crank of said shaft and secured to said normally-closed hopper-bottom, and a releasing-bar secured to said tilting frame to actuate said trigger-lever all arranged substantially as and for the purpose set forth.

JOHN M. WHITE.

In presence of—

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