

(No Model.)

R. R. HOWELL.
GRAIN MEASURING MACHINE.

No. 459,729.

Patented Sept. 15, 1891.

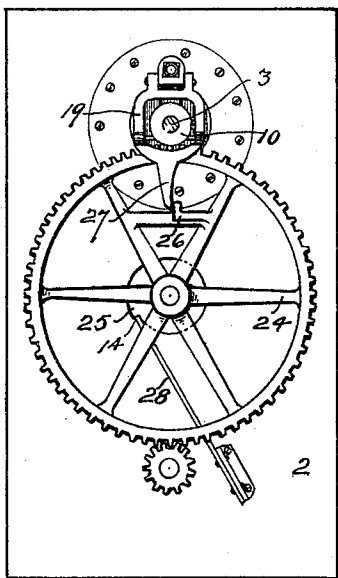


Fig. 1.

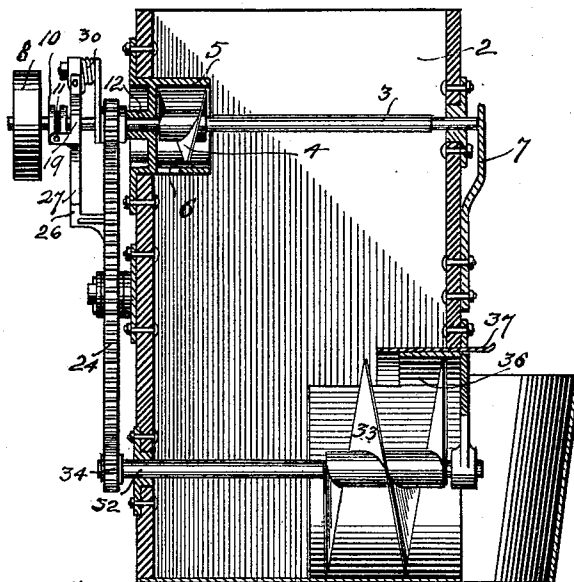


Fig. 2.

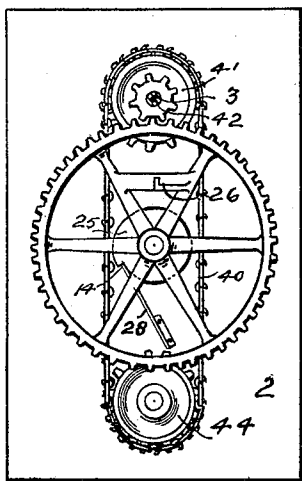


Fig. 5.

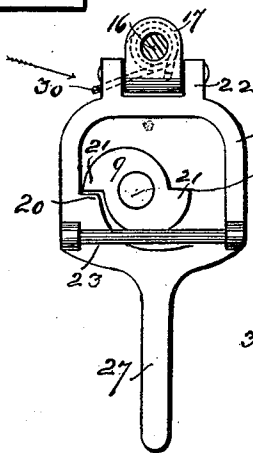


Fig. 4.

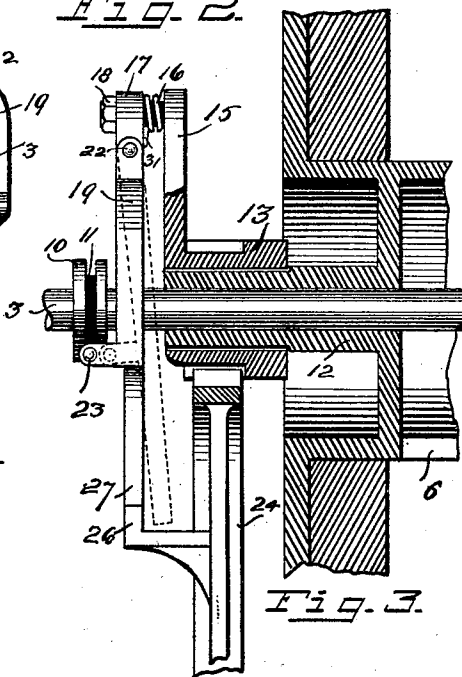


Fig. 3.

Witnesses.
C. E. Vigneron,
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Inventor
Robert R. Howell.
By Paul & Co. Attys.

UNITED STATES PATENT OFFICE.

ROBERT R. HOWELL, OF MINNEAPOLIS, MINNESOTA.

GRAIN-MEASURING MACHINE.

SPECIFICATION forming part of Letters Patent No. 459,729, dated September 15, 1891.

Application filed December 12, 1890. Serial No. 374,472. (No model.)

To all whom it may concern:

Be it known that I, ROBERT R. HOWELL, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain
5 Improvements in Grain-Measuring Machines, of which the following is a specification.

My device relates to improvements in devices adapted for the automatic measuring of grain as delivered from the thrasher or other
10 source; and it consists, generally, in the construction and combination hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming a
15 part of this specification, Figure 1 is an end elevation of my improved machine, showing the driving mechanism. Fig. 2 is a side elevation of the same, the box or reservoir for receiving the grain being shown in section.
20 Figs. 3 and 4 are details. Fig. 5 is an end elevation of the machine, showing a modified form of driving apparatus.

In the drawings, 2 represents a suitable box or receptacle to receive grain as delivered
25 from the thrasher or other source.

3 is a continuously-running shaft journaled in the walls of said box near its top and carrying the screw 4, which is inclosed in the fixed cylindrical case 5, having its inner end
30 open and an opening 6 in its bottom, through which grain can freely pass into the body of the box underneath. The shaft 3 is capable of a slight sliding movement longitudinally in its bearings, being held in its normal position, as shown in Fig. 2, by the spring 7,
35 bearing against the projecting end of the shaft. The oppositely-projecting end of the shaft is fitted with the belt-drum 8, by means of which power is applied to the shaft. Also,
40 rigidly secured to the shaft is the cam 9 and the collar 10, having the peripheral groove 11. Formed preferably integral with the cylindrical case 5 and serving as a journal for the shaft 3 is the sleeve 12, projecting out-
45 wardly from the case or box 2. Journaled loosely upon the sleeve is the pinion 13. The pinion is provided with the crank-arm 15, on the crank 16 of which is loosely held the collar 17, which is secured in its normal position by means of the screw 18, the collar
50 freely turning upon the crank 16.

Hinged transversely upon the collar 17 is

the clutch-ring 19, surrounding the cam 9. The inner diameter of the clutch-ring is greater than the diameter of the cam and is
55 provided with the shoulder or projection 20, adapted to engage the corresponding shoulders 21 of the cam when the machine is thrown into gear, as hereinafter described; but while the machine is "out of gear" the
60 cam turns freely in the ring with the shaft. The clutch-ring is carried to and fro with the sliding movement of the shaft 3, swinging upon the hinge 22 by means of the pin 23, which rides in the groove 11 of the collar
65 10.

Journaled upon the outside of the box 2 and meshing with the pinion 13 is the idler-gear 24, having the notched eccentric hub 25 and the outwardly-projecting pin or stop 26,
70 adapted to bear against the downwardly-projecting finger 27 of the clutch-ring 19. A strong spring 28 is rigidly secured to the box 2, and bearing upon the periphery of the eccentric 25 and engaging the shoulder 14 therein
75 holds the gear 24 from return movement when the stop 26 is in engagement with the finger 27. A light spring 30, coiled about the crank 16, with its free end 31 bearing upon the clutch-ring acting in the direction of the
80 arrow, Fig. 3, tends to force it toward and into engagement with the cam, and thus throws the clutch into gear whenever the finger 27 is freed from the stop 26.

Journaled in suitable bearings near the
85 bottom of the box and parallel with the shaft 3 is the shaft 32, carrying a measuring-screw 33 and having the pinion 34. The bottom of the box 2, adjacent to which the screw 33 revolves, is preferably semi-cylindrical, its curve
90 closely surrounding the screw, and a suitable opening is arranged through the side wall of the box 2 in front of the screw. The screw 33 is partially covered by a semi-cylindrical hood 36, extending inwardly from the wall
95 of the box 2. An adjustable sliding hood or cover 37 rests upon the fixed hood 36 and is adapted to be moved inward over the screw, so as to regulate the amount of grain passing
100 over the screw from above, in order to adjust the machine for use with different kinds or qualities of grain. The heavier and cleaner grain, flowing more easily, requires a smaller opening to deliver a given quantity than the

shrunken and small and lighter grain, such as oats.

In Fig. 5 a sprocket-chain 40 is shown passing over a sprocket-wheel 41, secured on the pinion 42, corresponding to the pinion 13 of the preceding figures, and a sprocket 44, provided on the shaft of the measuring-conveyer in the bottom of the box. The other portions of the machine, however, remain the same.

In operation the box 2 being placed in a suitable position to receive the flow of grain and the shaft 13 being rotated continuously, as the box is gradually filled by the grain until it reaches the screw 4 the screw draws it into the case 5, from which it passes through the opening 6 until the box is filled solidly up to the case 5. The grain, being then carried backward by the screw 4, fills the case 5 and forces the screw forward or out of the case, carrying the shaft 3 and its attachments with it against the tension of the spring 7. As this is done, the clutch-ring 19 being swung on its hinge with the movement of the shaft, the finger 27 is thrown out of engagement with the stop 26, being carried into the position shown by the dotted lines in Fig. 3, and thus throws it forward, bringing its shoulder 20 into engagement with the shoulder 21 of the cam 9. Being thus engaged by the cam the clutch is rotated with the shaft, carrying with it the pinion 13 and in turn driving the wheel 24, the shaft 32, and turning the screw 33, which in its revolution carries the grain which has collected in the box outward through the opening in the side thereof. As the grain is lowered in the box 2, that contained in the case 5 immediately flows out through the opening 6 and the spring 7 returns the shaft 3 and its attachments to their normal position, as shown in Fig. 2. The spring 30 continues to hold the clutch in engagement with the cam, whereby through the connections described the screw 33 is rotated until the idler-gear 24, driven by the intermeshing pinion 13, has made a complete revolution and brought its stop 26 again into engagement with the finger 27 of the clutch 19, whereby as the machinery continues to move the clutch is thrown out of engagement with the cam, thereby stopping the rotation of the pinion 13, together with the shaft 32, until the grain again rises in the box so as to be engaged by the screw 4, and the above-described operation thus repeated.

It is obvious that the capacity of the screw 33 may be made gaged, as desired, and by the proper relative sizes of the pinions and the idler-gear or the sprockets may be given any desired number of revolutions for one revolution of the idler; but the machine being first adapted by the adjustment of the sliding hood 37 to the measurement and delivery of the kind or quality of grain with which it is to be used the operation is automatically and accurately carried on so long as the grain continues to flow into the box.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

1. In a device of the class described, the combination, with a suitable grain-receptacle, of a measuring-screw arranged therein and adapted to carry the grain contained therein out of the receptacle, the continuously-running screw-shaft arranged near the top of said receptacle and adapted when the grain as it is filled into said receptacle is brought into contact with the said continuously-running screw to be moved longitudinally in its bearings by the pressure of said grain, and a mechanism connecting said continuously-running shaft with said measuring-screw and adapted to be thrown into gear by the sliding movement of said shaft, whereby said measuring-screw is rotated a predetermined number of revolutions, substantially as and for the purpose set forth.

2. The combination of a grain-reservoir, a measuring-screw arranged therein adjacent to its outlet, and mechanism, substantially as described, actuated by the pressure of the grain in said reservoir, by means of which said measuring-screw is operated to deliver a predetermined amount of grain, substantially as described.

3. The combination of a grain-receptacle, a measuring-screw arranged therein at its outlet, a continuously-running screw arranged near its top, adapted to be brought into contact with the grain when it has reached a predetermined height in said receptacle and to be moved laterally by the pressure of said grain, and mechanism, substantially as described, adapted to be thrown into gear by the lateral movement of said continuously-running screw, whereby the measuring-screw is operated, substantially as and for the purpose set forth.

4. In a device of the class described, the combination of the grain-reservoir having a measuring-screw arranged therein adjacent to its outlet, a continuously-running slidable shaft journaled near the top of said receptacle, a screw carried by said shaft, and a driving connection between said continuously-running shaft and the shaft of said measuring-screw, adapted to be thrown into gear by the lateral movement of said continuously-running shaft caused by the pressure of the grain upon said screw, with which it is brought in contact, substantially as described.

5. In a device of the class described, the combination of a grain-receptacle having a suitable outlet, a measuring-screw arranged therein adjacent to said outlet and adapted when rotated to deliver grain therefrom, a continuously-running shaft slidably journaled in said receptacle having a screw rigidly secured thereto, driving mechanism, substantially as described, connecting said shaft with said measuring-screw, a clutch arranged upon said shaft adapted when said shaft is moved longitudinally in its bearings to en-

gage said driving mechanism, and a stop-carrying idler geared to said driving mechanism and adapted to throw said clutch out of engagement therewith, substantially as and
5 for the purpose set forth.

6. The combination of the receptacle 2, the measuring-screw journaled therein, the slidable shaft 3, journaled therein near its top, having the screw 4 inclosed in the case 5, the
10 pinion 13, arranged loosely upon said shaft 3, the pinion 34 arranged upon the shaft, the cam 9, rigidly secured to the shaft 3, the swing-

ing clutch-ring surrounding said cam, the gear 24, meshing with said pinions, the stop 26 on said gear 24 and adapted to engage said
15 clutch-ring, the spring 28, and the notched hub 25, substantially as described.

In testimony whereof I have hereunto set my hand, September 4, 1890.

ROBERT R. HOWELL.

In presence of—

C. G. HAWLEY,

A. M. GASKILL.