(No Model.) 2 Sheets—Sheet 1.

H. W. COWAN.

AUTOMATIC GRAIN MEASURE.

No. 395,743. Patented Jan. 8, 1889.

Fig. 1.

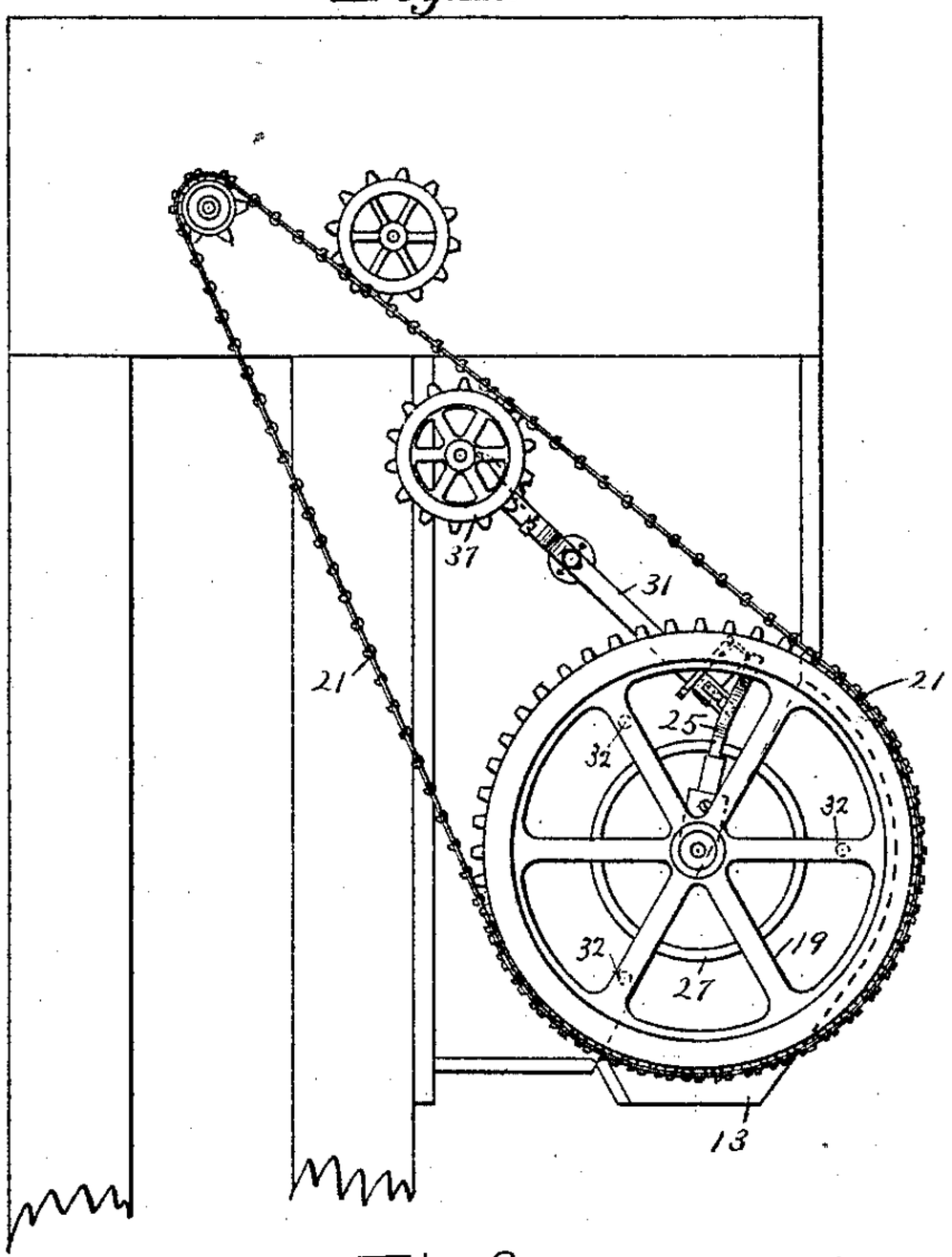


Fig. 2.

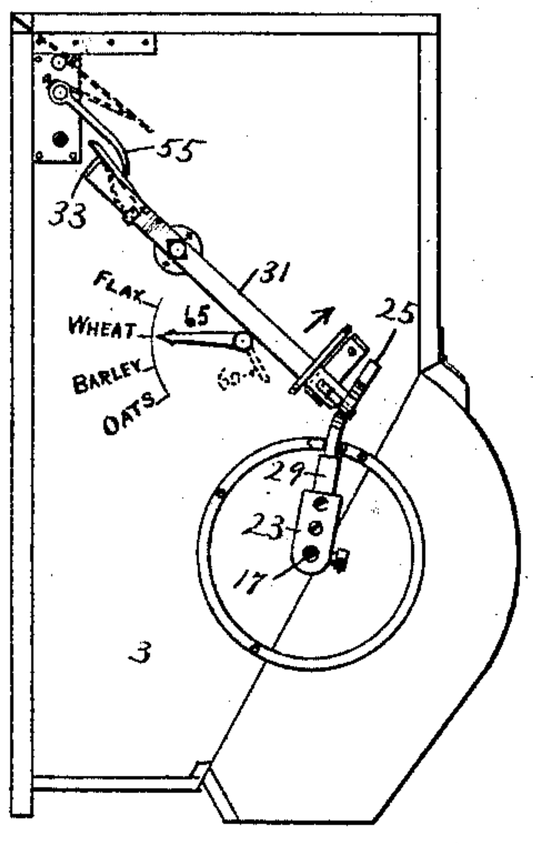


Fig. 5.

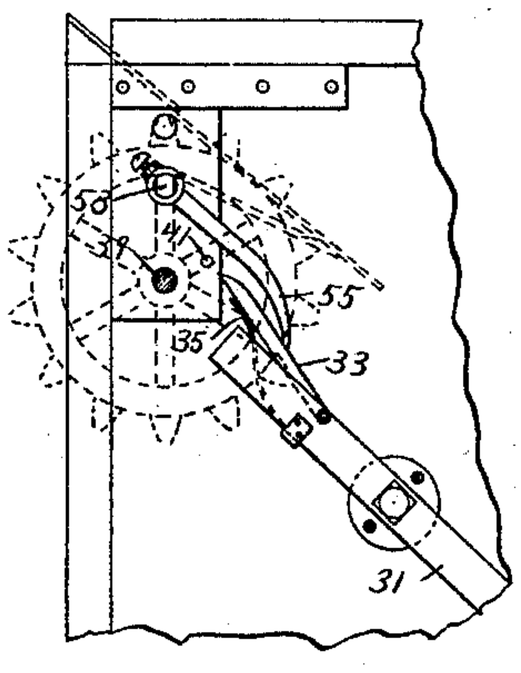
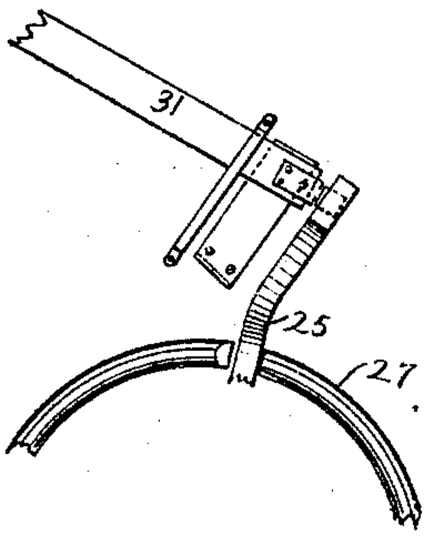


Fig. 6.



Witnesses.
J. Jessen.
A. M. Gaskell.

Inventor.
Harry W. Cowan.
By A. C. Paul Atty

(No Model.) 2 Sheets—Sheet 2.

H. W. COWAN.

AUTOMATIC GRAIN MEASURE.

No. 395,743. Patented Jan. 8, 1889.

Fig. 3.

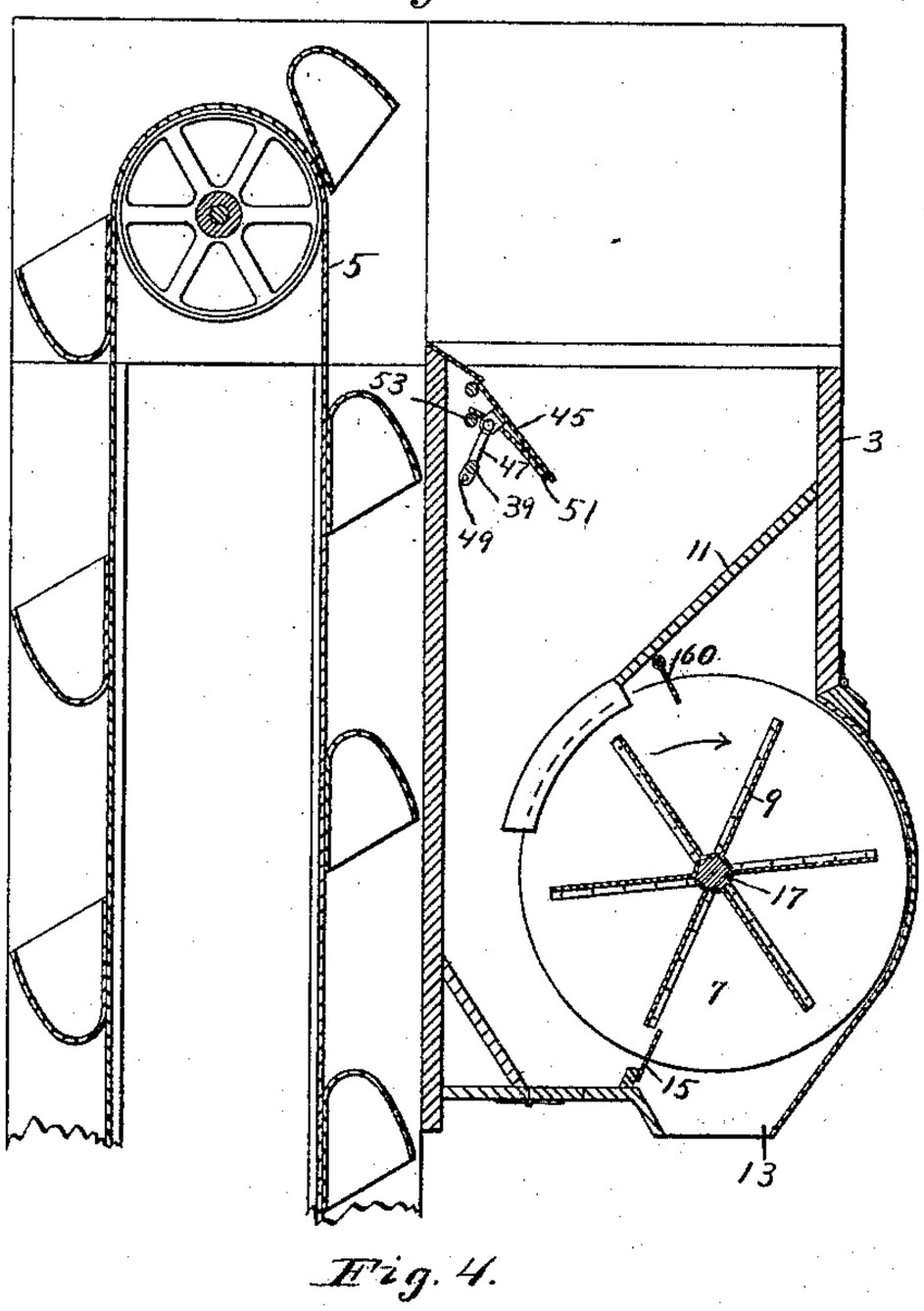
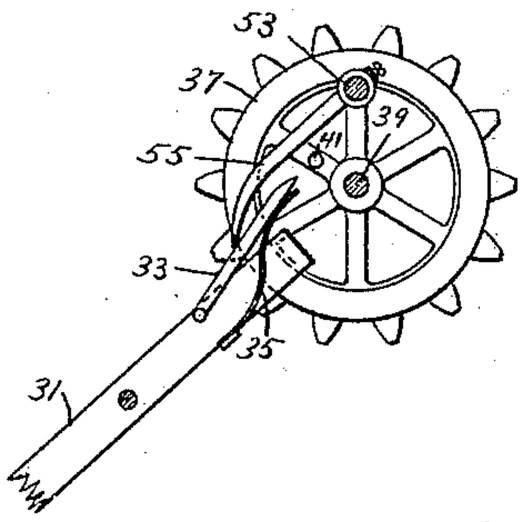


Fig. 4.

Fig. 7.



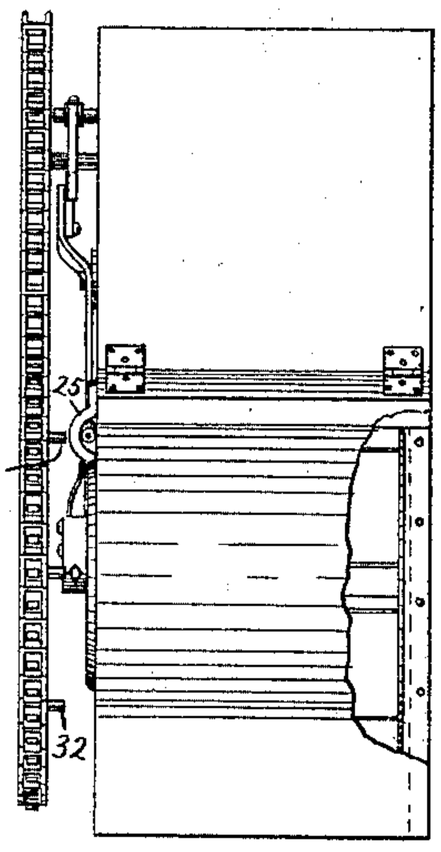
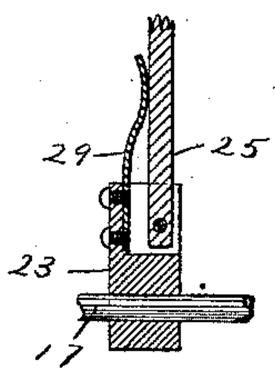


Fig. 8.



Witnesses.

J. Jessen.
A. M. Gaskell

Inventor.

Harry W Cowan.

By his Attorney

D. C. Paul.

UNITED STATES PATENT OFFICE.

HARRY WALLACE COWAN, OF GROS, DAKOTA TERRITORY.

AUTOMATIC GRAIN-MEASURE.

SPECIFICATION forming part of Letters Patent No. 395,743, dated January 8, 1889.

Application filed March 20, 1888. Serial No. 267,903. (No model.)

To all whom it may concern:

Be it known that I, HARRY WALLACE COWAN, of Gros, in the county of Day and Territory of Dakota, have invented certain new and useful Improvements in Automatic Grain-Measures, of which the following is a specification.

My invention relates particularly to a new and useful grain-measure designed to be used especially with thrashing-machines for automatically measuring and discharging the grain; and the objects I have in view are to provide an automatic measuring device that shall be simple in construction and certain and accurate in its operation.

Other objects of the invention will appear from the following detailed description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of my improved measuring device, showing also the manner of connecting it with the elevator of a thrashing-machine. Fig. 2 is a side elevation of the measuring device with the driving-wheels removed. Fig. 3 is a central vertical section showing the interior arrangement of the device. Fig. 4 is an end elevation with a portion of the casing broken away. Figs. 5 and 6 are details. Figs. 7 and 8 are also details showing portions of the tripping mechanism on a larger scale.

The main features of my device are a measuring-wheel that is mounted in suitable bearings in a receptacle into which the grain is deposited from the elevator or other device and an automatic tripping device arranged to be operated by the grain itself when a sufficient quantity has been received in this receptacle to completely fill the measuring-wheel, which is then, through the action of said tripping device, caused to make a single revolution, and thereby to discharge one measure of grain. This measuring-wheel may be connected with any of the well-known forms of counters of registering devices, so that the amount of grain that is discharged from the receptacle will be registered.

As shown in the accompanying drawings, I prefer to provide a suitable receptacle, 3, which may be supported in any suitable manner, and is preferably arranged to receive the grain directly from a suitable elevator, 5. Mounted in suitable bearings in this receptacle is a measuring-wheel, 7, which consists, preferably, of an open cylinder divided into any desired number of apartments by radial partitions 9. A suitable division-board, 11, arranged in the receptacle preferably above the measuring-wheel, prevents the grain from entering the upper portion of the wheel. The outer wall of the receptacle is preferably curved, forming a close fit over the measuring-wheel. A discharge-opening, 13, is provided beneath the measuring-wheel, through which the grain is discharged. A suitable bag-holder might be arranged under this opening, so as to permit the securing of a bag at this point to receive the grain as it passes from the wheel. A stop-board, 15, arranged at one side of the discharge-opening, prevents any grain from escaping under the wheel.

The shaft 17 of the grain-wheel passes through the walls of the receptacle, and upon its end is mounted loosely a driving-wheel, 19, that is driven continually by a belt or chain, 21, from the elevator-shaft or other convenient source of power. While the receptacle 3 is being filled with grain the measuring-wheel remains at rest and the wheel 19 revolves loosely on the shaft of the measuring-wheel. As soon, however, as the receptacle has received sufficient grain to fill the measuring-wheel, the wheel 19 is connected with the shaft of the measuring-wheel by a suitable clutch mechanism, and is then caused to revolve, and thereby to discharge the grain that has been collected in this receptacle.

The clutch mechanism for connecting the wheel 19 with the shaft of the measuring-wheel at proper intervals may be variously constructed. The device which I prefer for this purpose, and which I have shown in the accompanying drawings, is arranged as follows: A block, 23, is fastened upon the shaft 17 by a set-screw or other device, and in this block is pivoted an arm or lever, 25, by a pivot-pin at right angles to the axis of the shaft. This lever is capable of being moved slightly in the direction of the axis of the shaft by being oscillated upon its pivot. A stationary ring, 27, is secured upon the wall of the receptacle 3, surrounding the shaft 17. This ring is provided with a notch or cut-away portion of sufficient width to receive the

lever 25. A spring, 29, secured to the block 23, bears upon the lever 25 and presses it toward the ring 27, and causes it to drop into the notch in that ring whenever the lever passes over it. As long as the lever 25 remains in this position, the grain-measuring wheel is held stationary.

The wheel 19 is provided upon its under side with pins 32, preferably three in number. While the lever 25 remains in the notch in the ring 27 the pins 32 pass over it without touching it. As soon, however, as the end of the lever is raised a sufficient distance to carry it above the surface of the ring 27, it is encountered by one of the pins 32 and is moved along in front of this pin until it again comes over the notch in the ring 27, into which it is caused to drop by the spring 29. While the lever rests upon the unbroken portion of the ring 27 it cannot be moved by the spring 29 out of engagement with the pin 32. The shaft 17 and the measuring-wheel will therefore be given a complete revolution and will then be allowed to remain at rest until the lever is again raised from its engagement with the notch in the ring 27.

The lever 25 is provided with an arched portion, beneath which rests the end of a lever, 31, pivoted upon the wall of the receptacle 3, and preferably provided at its end with a friction-roller adapted to engage the under side of the lever 25. Near its opposite end this lever is provided with a pivoted arm, 33, preferably held in an elevated position normally by a spring, 35. A sprocket-wheel, 37, mounted upon a shaft, 39, is driven by the chain that drives the wheel 19 or by other suitable means. Upon its under side, preferably, this wheel is provided with a lug, 41, which, when the arm 33 is in its normal position, will pass the end of the arm without touching it; but when this arm is depressed against the tension of the spring 35 the lug 41 will engage it and turn the lever 31 upon its pivot, throwing its lower end in the direction indicated by the arrow in Fig. 2.

The tripping mechanism consists, preferably, of the following: Arranged within the receptacle 3 is a plate, 45, hinged at its upper end, preferably, and connected by a link, 47, with the crank-arm 49 on the shaft 39. As the shaft 39 is revolved constantly, the plate 45 is given a continuous vibratory movement. Beneath the plate 45 is a plate, 51, which is secured to a rod, 53, that is mounted in the walls of the receptacle and forms a pivot for the plate 51. Upon the end of this rod outside of the receptacle is an arm, 55, which bears upon the arm 33. The spring 35 holds the arm 33 in an elevated position, as before stated, and thereby also holds the arm 55 and the plate 51 normally in the position shown in Figs. 2, 3, and 5. The grain from the elevator falls upon the vibratory plate 45, passes over it, and enters the receptacle 3. After a time the receptacle becomes filled with grain and a part of it enters the space between the vibratory plate 45 and the plate 51, when the plate 45 is elevated. The next downward movement of the plate 45 will move the plate 51 upon its pivot, owing to the resistance occasioned by the grain interposed between the two plates. The arm 55 will be depressed and will depress the arm 33 against the tension of the spring 35. The lug 41 on the wheel 37 will engage the end of the arm 33 and will move the lever 31 on its pivot, throwing upward its lower end, which, passing under the inclined surface of the lever 25, will cause that lever to be turned on its pivot and thrown outward beyond the surface of the ring 27, where it will be engaged by the pin 32 on the wheel 19. The shaft 17 and the measuring-wheel will be rotated and a wheelful of grain will be discharged. As soon as the grain is lowered in the receptacle 3, that portion which had entered the space between the plates 45 and 51 will fall out. The weight of the lower end of the lever 31 will cause it to fall back to its former position, the plate 51 will be returned to its former position, and as soon as the grain-wheel has made one revolution the lever 25 will drop back into the notch in the ring 27, and the device will thus be automatically reset and placed in readiness for another operation. This will continue as long as power is applied to the machine and grain is put into the receptacle 3.

A pivoted and adjustable stroke-board, 60, is preferably arranged above the grain-wheel, and may be set to stroke off the grain more or less closely, according to the kind of grain that is being measured. This stroke-board is provided upon the outside of the casing with an index-finger or pointer, 65, and a scale is marked upon the casing, over which the pointer is adapted to move as the stroke-board is adjusted. This scale is preferably marked to show the position in which the pointer should be when the stroke-board is set for any desired kind of grain. As here shown, the scale is marked "Flax," "Wheat," "Barley," and "Oats." When the machine is to be used for measuring flax, the pointer is turned opposite this word on the scale, and thereby the stroke-board will be set so as to give a full or heaping measure of flax, and when the machine is to be used for measuring any of the other grains the pointer will be turned and the stroke-board adjusted accordingly. The pointer may also serve as a lever or handle by which the stroke-board may be adjusted.

The relative sizes of the wheels 19 and 37 determines the number of pins or lugs 32 on the wheel 19, as the levers 31 must be thrown up and the lever 25 thrown out once while the wheel 19 is turning a distance equal to the space between any two of the pins 32.

While I have minutely described the construction of the devices shown in the drawings in order that the operation may be readily understood, I do not wish to confine myself to these exact details of construction, as

other and equivalent mechanical devices may readily be substituted for many of the parts here shown without departing from my invention and without materially changing the mode of operation of the machine.

I claim as my invention—

1. The combination, in a device of the class described, of a measuring-wheel provided with a series of compartments, a receptacle constructed to hold a sufficient supply of material to fill all of the compartments of said measuring-wheel and adapted to supply material to said wheel, a driving mechanism adapted to revolve said measuring-wheel, and a tripping mechanism arranged in said receptacle and adapted to be moved by the material therein and to connect said driving mechanism with said measuring-wheel, whereby when said receptacle has received a sufficient supply of material to fill all of the compartments of said wheel said tripping mechanism will be operated by the material and will connect said driving mechanism with said measuring-wheel, as and for the purpose specified.

2. The combination, in a device of the class described, of the measuring-wheel provided with a series of compartments, the receptacle 3, constructed to receive a sufficient supply of material to fill all the compartments of said measuring-wheel, a driving mechanism, a clutch adapted to connect said driving mechanism and said measuring-wheel, and tripping mechanism arranged in said receptacle and adapted to be operated by the material therein when said receptacle has received a sufficient supply of material to fill all the compartments of said measuring-wheel.

3. The combination, in a device of the class described, with the receptacle 3, of the measuring-wheel 7, the driving-wheel 19, mounted loosely upon the shaft of the said measuring-wheel, the clutch mechanism adapted to connect said driving-wheel with said shaft, the pivoted lever 31, the vibratory plate 45, arranged within said receptacle 3, the pivoted plate 51, the arm 55, the pivoted arm 53 upon the lever 31, the spring 35, and the wheel 37, provided with the lug 41, substantially as described.

4. The combination, in a device of the class described, with the measuring-wheel, the driving mechanism, and the clutch mechanism, of the operating-lever 31, provided with the arm 33 and the spring 35, the wheel 37, provided with the lug 41, and the tripping mechanism consisting of the vibratory plate 45, arranged in the grain-receptacle, the pivoted plate 51, and the arm 55, adapted to engage the arm 33, substantially as described.

5. The combination, in a device of the class described, with the measuring-wheel 7 and its shaft 17, of the wheel 19, mounted loosely upon said shaft and provided with the pins 32, the stationary ring 27, surrounding said shaft 17, the pivoted lever 25, the spring 29, and the operating-lever 31, substantially as described.

6. The combination, in a device of the class described, with the revolving measuring-wheel, of the pivoted stroke-board 60, extending across said measuring-wheel and adapted to be adjusted toward or from said wheel, the index on the outside of the casing, and the pointer secured upon the pivot of said board and adapted to be moved over said scale, and thereby to adjust said stroke-board, substantially as described.

In testimony whereof I have hereunto set my hand this 25th day of January, 1888.

HARRY WALLACE COWAN.

In presence of—
F. J. COWAN,
R. G. COWAN.