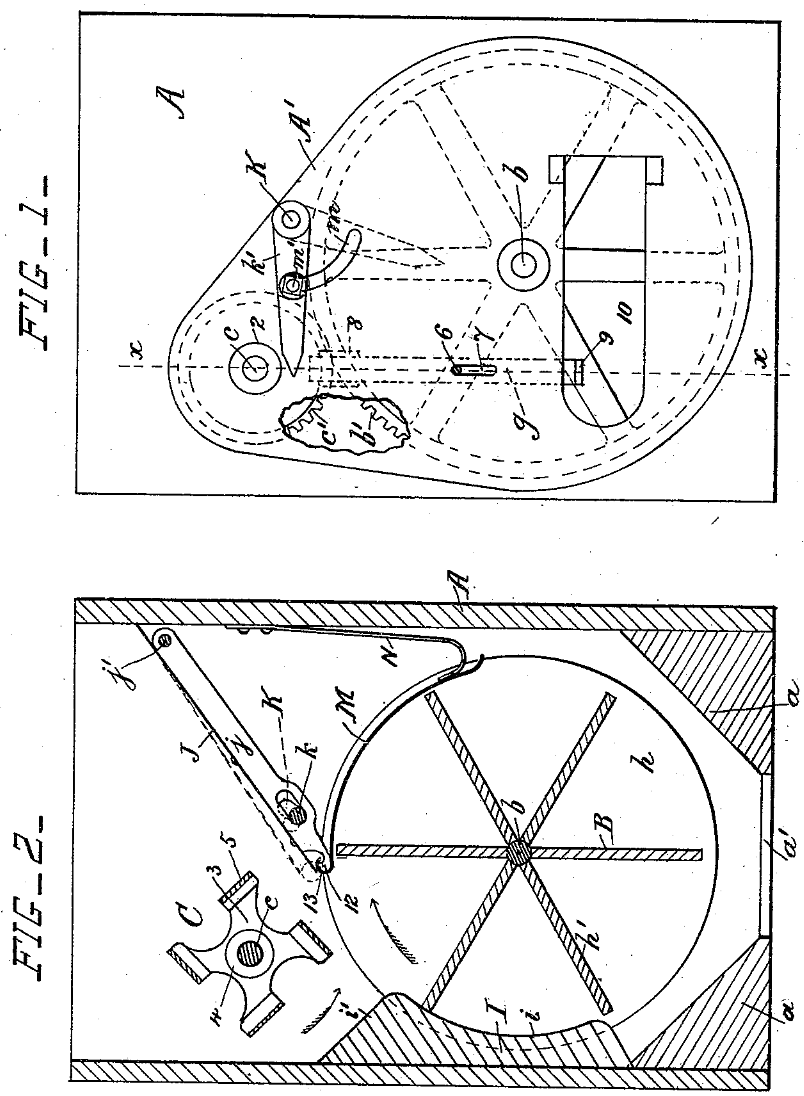
(No Model.) 3 Sheets—Sheet 1.

A. B. LANDIS.

ROTATING GRAIN METER.

No. 492,869. Patented Mar. 7, 1893.



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(No Model.) 3 Sheets—Sheet 2.

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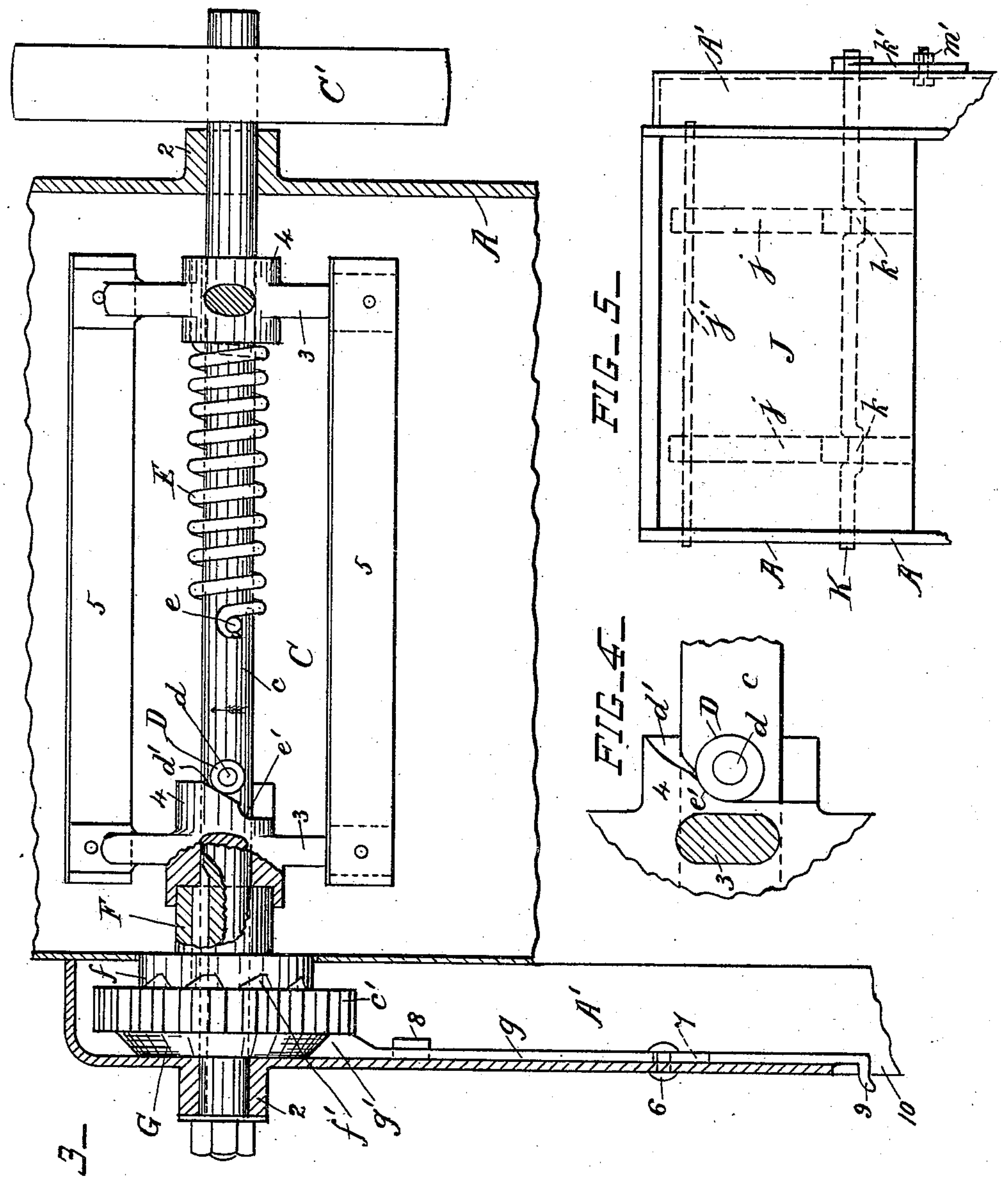

FIG_3_

FIG_5_

FIG_4_

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(No Model.) 3 Sheets—Sheet 3.

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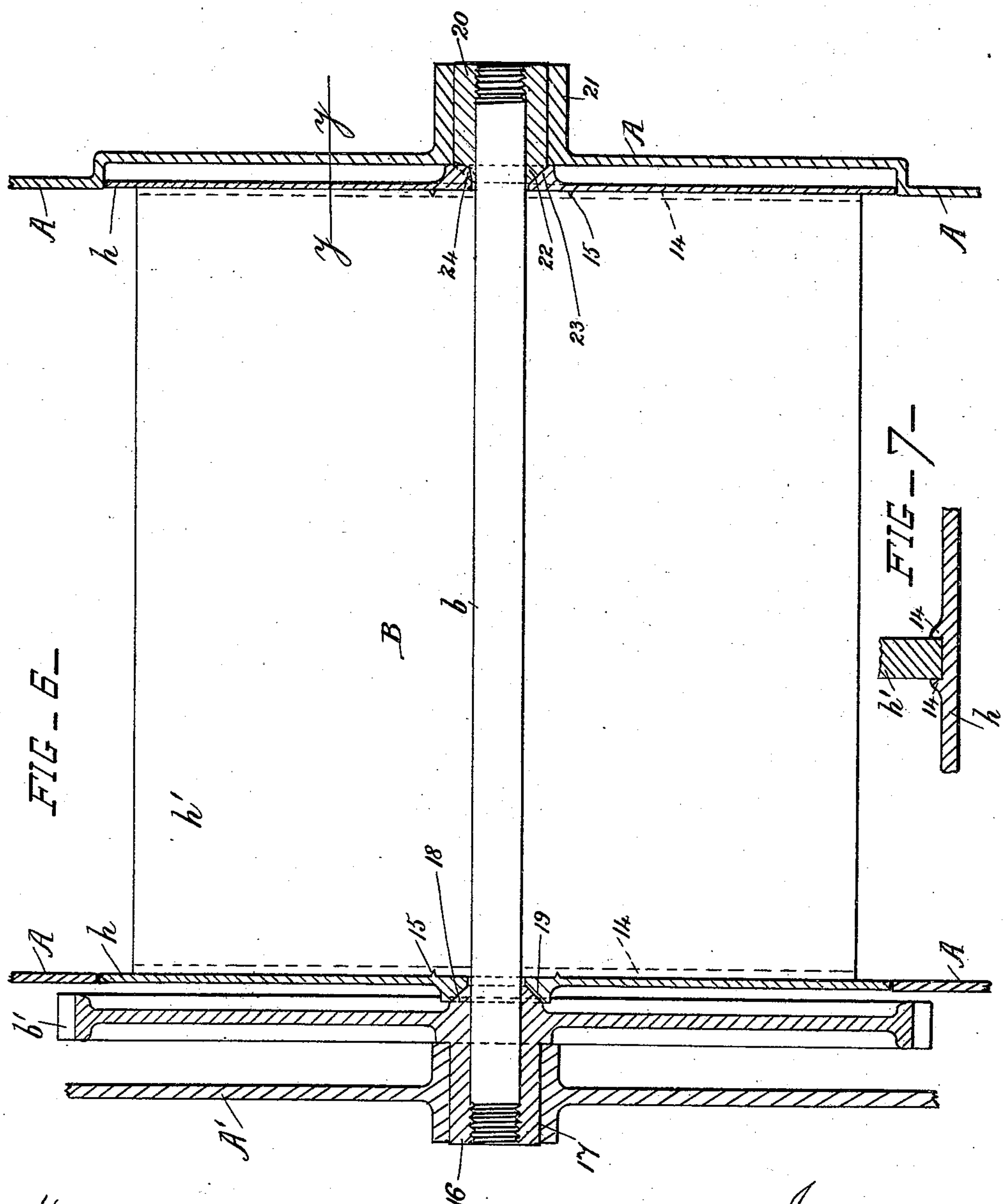

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UNITED STATES PATENT OFFICE.

ABRAHAM B. LANDIS, OF WAYNESBOROUGH, PENNSYLVANIA.

ROTATING GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 492,869, dated March 7, 1893.

Application filed July 5, 1892. Serial No. 439,035. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM B. LANDIS, a citizen of the United States, residing at Waynesborough, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Grain-Meters; and I do hereby declare the following to be 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.

This invention relates to grain meters; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings: Figure 1 is a side view of the grain meter, with a portion of the casing for the driving wheels broken away. Fig. 2 is a cross-section through the grain meter. Fig. 3 is a detail side view of the packer, showing the casing in section on the line $x\ x$ in Fig. 1, and drawn to a larger scale. Fig. 4 is detail view of the roller and cam on the packer, shaft showing them in their normal positions. Fig. 5 is a detail plan view of the pivoted guide plate for the grain. Fig. 6 is a longitudinal section through the measuring wheel, drawn to a larger scale. Fig. 7 is a cross-section taken on the line $y\ y$ in Fig. 6.

A is the casing of the meter, consisting of a plain rectangular box provided with the inclined guides a and the outlet a' at the bottom.

B is the measuring wheel mounted on the shaft b, and driven by the toothed wheel b' secured on the said shaft.

C is the packer mounted on the packer shaft c above the measuring wheel, and c' is a toothed pinion mounted on the shaft c and gearing into the said wheel b'.

C′ is a belt pulley secured on the packer shaft, outside the casing A, for driving the said packer and measuring wheel.

A′ is the casing, for the toothed wheels, secured upon one side of the casing A. The packer shaft c is journaled in the bearings 2 on the casings. The packer consists of the arms 3 provided with hubs 4 journaled on the packer shaft, and the longitudinal bars 5 secured to the said arms.

D is a roller journaled on the pin d projecting from the packer shaft c, and d' is an inclined-face cam formed on one of the hubs 4 and adapted to engage with the said roller.

E is a spiral spring surrounding the shaft c. One end of this spring is secured to the packer, and the other end engages with a pin e projecting from the shaft c. This spring normally holds the roller D in the pocket e' at the bottom of the inclined surface of the cam d', as shown in Fig. 4.

F is a sleeve splined upon the shaft c and bearing against the end of the hub of the packer arm behind the cam. A circular clutch jaw f provided with inclined teeth is formed on one end of the sleeve F and is adapted to slide back and forth in a circular hole in the casing A. A similar clutch jaw f' is formed on the pinion c', for the clutch jaw f to engage with.

G is a cone formed on the other side of the pinion c' from the clutch jaw f'. A rod g is provided with a wedge-shaped end g' and is adapted to bear against the cone G as shown in Fig. 3. This rod G is connected to the casing A′ by the rivet 6, and is provided with a longitudinal slot 7 which permits it to slide back and forth on the rivet. The upper part of the rod g is guided by the lugs 8 projecting from the casing A′, and the lower part of the rod is provided with a projection 9 which projects outwardly through a hole 10 in the casing A′ and affords a means for raising the rod by hand.

The measuring wheel B consists of two disks h and a series of radial plates h' secured between the two disks. The disks revolve in openings in the casing A as shown in Fig. 6.

I is a guide secured to one side of the casing A. This guide is provided with the curved surface i for the ends of the plates h to slide against, and an inclined surface i' at its top, under the packer, for the grain to slide off into the chambers of the measuring wheel.

J is an inclined guide plate at the opposite side of the casing A from the guide I. The guide plate J is secured to two arms j, the upper ends of which are pivoted on the bar j', which passes crosswise through the casing A. The lower ends of the arms j are carried by the cranks k of the crankshaft K which is journaled in the casings. A pointer k' is secured on the end of the crankshaft outside the casing A′, and affords a means for turning the crankshaft and indicating the position of the arms *j*. A curved slot *m* and a bolt *m′* are provided for holding the pointer in any desired position. The lower ends of the arms *j* are provided with circular lugs 12.

M is the strickle consisting of a curved plate provided with a tubular front end 13 which is hinged upon the lugs 12 as shown in Fig. 2.

N is a spring secured to the casing and adapted to press the free end of the strickle against the grain in the measuring wheel.

In order that the measuring wheel may run true and be very inexpensive to make, the disks *h* are provided with lugs or with ribs 14, as shown in Fig. 7, between which the plates *h′* are slid. The plates bear against the shaft *b*, and 15 are points projecting from the disks between the lugs 14 and adapted to secure the said plates in position.

The toothed wheel *b′* is provided with a hub 16 upon one side of it. This hub is screwed upon one end of the shaft *b*, and runs in the bearing 17 on the casing A′. A cone 18 is formed on the other side of the wheel from the hub 16, and engages with a conical seat 19 in one of the disks *h*. A hub 20 is screwed on the other end of the shaft *b* and runs in a bearing 21 on the casing A. This hub 20 is provided with a cone 22 which engages with a conical seat 23 on the other disk *h*. The said cones and conical seats insure the measuring wheel being mounted true upon the shaft, and the movement of the toothed wheel in driving the shaft tends to draw the two cones together, and thereby prevents the measuring wheel from slipping.

The hub 20 is provided with a notch for a lug 24 in the conical seat 23 to engage with, so that the hub 20 always turns with the measuring wheel.

The measuring wheel discharges the same amount of grain at each revolution, and a counter of any approved construction is provided for registering the number of revolutions made by the measuring wheel, so that the amount of grain passed through the meter may be ascertained. This counter is not shown in the drawings as it is not a part of the present invention.

The action of the grain meter is as follows: The grain is poured into the upper part of the casing A and falls into the chamber of the measuring wheel which is under the space between the guides I and J. The packer shaft is revolved by the belt pulley and revolves the packer through the spring E. The packer packs the grain into the chamber of the measuring wheel underneath it until the resistance of the grain to the bars 5 holds back the packer against the spring E, and causes the cam *d′* to slide upon the roller D and press the teeth of the clutch into gear with the clutch teeth on the pinion *c′*. This puts the measuring wheel in motion and the grain is measured out as long as the measuring wheel continues to be packed with grain of a certain pre-arranged density. This density is materially greater than the normal density of grain poured into a measuring vessel. When the supply of grain is reduced so that this density of the grain in the measuring wheel is not attained, the inclined teeth of the clutch jaws separate automatically and the measuring wheel stops. The packer however continues to revolve and packs more grain into the measuring wheel or vessel. The packer is so proportioned, and has its bars 5 arranged at such an angle, that when it has packed the grain to the desired density it continues to revolve in the grain which surrounds it without producing any effect on it other than to stir it, and the toothed wheels *c′* and *b′* are proportioned so that there may be as little slipping of the packer as possible.

When the measuring wheel stops, it is necessary to empty the meter of all the grain remaining in it before the meter can be used for another sort of grain. This is accomplished by raising the rod *g* and forcing the pinion to slide on the shaft, by means of the wedge *g′* and the cone G, until the clutch jaws engage, and holding the clutch jaws thus engaged until the measuring wheel has revolved sufficiently to empty all the grain out of the meter. The tubular end 13 of the strickle evens over the grain in the chambers of the measuring wheel so that they all hold the same quantity of grain. The object in pivoting the arms *j* so that they may be raised to the position indicated by the dotted lines in Fig. 2, is to enable the capacity of the chambers to be varied to a slight extent for the purpose of correction. This enables the machine to deliver correct weight as well as correct measure, as different sorts of grain require a slight variation of measure to deliver the same weight.

What I claim is—

1. In a grain meter, the combination, with a measuring vessel, of a packer provided with arms and longitudinal bars secured to the arms substantially as shown, and driving mechanism operating to revolve the packer continuously in the grain and to cause it to pack the grain into the said vessel.

2. In a grain meter, the combination, with an intermittently revolving measuring-wheel, of a continuously revolving packer operating to increase the normal density of the grain in the measuring-wheel, a driving shaft, a spring connecting the packer to the said shaft, and automatic clutch mechanism and driving devices connecting the said packer and measuring-wheel so that they revolve simultaneously as long as the increased density of the grain in the measuring-wheel is sustained.

3. In a grain meter, the combination, with the end disks of the measuring wheel provided with ribs and projecting points, of the plates arranged between the said ribs, a driving shaft provided with screwthreaded ends,

and hubs screwed on the said ends and operating to press the said plates onto the said points, substantially as set forth.

4. In a grain meter, the combination, with the end disks of the measuring wheel, and the radial plates secured between the said disks, of the driving shaft provided with screw-threaded ends, and the hubs screwed on the said ends and provided with cones engaging with seats in the said disks, whereby the measuring wheel is held true and is secured upon the said shaft.

5. In a grain meter, the combination, with a measuring wheel, of a strickle consisting of a curved plate arranged circumferentially of the wheel, adjusting devices for varying the position of the front end of the plate, and a spring operating to press the rear end of the plate against the measuring wheel, thereby preventing the grain from being prematurely discharged from the wheel.

6. In a grain meter, the combination, with a measuring wheel provided with chambers, of a packer for pressing the grain into the chambers, and a strickle adapted to even the compressed grain, whereby the said wheel is caused to discharge the same amount of grain at each revolution.

7. In a grain meter, the combination, with a measuring wheel, of the inclined arms pivoted at their upper ends above the said wheel, the guide plate secured to the said arms, the strickle hinged to the lower ends of the said arms, and a spring adapted to press the strickle against the measuring wheel, substantially as set forth.

8. In a grain meter, the combination, with a measuring wheel, of the inclined arms pivoted at their upper ends above the said wheel, the guide plate secured to the said arms, the crankshaft provided with cranks engaging with the said arms, and the adjustable spring-pressed strickle hinged to the lower ends of the said arms, substantially as and for the purpose set forth.

9. In a grain meter, the combination, with the pinion for driving the measuring wheel said pinion being provided with a clutch jaw, of the driving shaft, the packer mounted on the driving shaft and provided with an inclined-face cam, a projection on the said shaft for the said cam to press against, a spring connecting the packer to its shaft, and a sleeve splined to the said shaft and provided with a clutch jaw, whereby the said pinion is revolved by the packer shaft when the resistance to the packer causes it to move longitudinally on its shaft and to couple the said clutch jaws, substantially as set forth.

10. In a grain meter, the combination, with the pinion for driving the measuring wheel, said pinion being provided with a cone and a clutch jaw, the driving shaft, the packer operatively connected to the said shaft, and the sleeve splined to the said shaft and provided with a clutch jaw, of a sliding rod supported by the casing and provided with a wedge-shaped end bearing against the said cone, whereby the said clutch jaws may be coupled for the purpose of emptying the meter, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ABRAHAM B. LANDIS.

Witnesses:
ALF. N. RUSSELL,
JNO. B. RUSSELL.