(No Model.) 2 Sheets—Sheet 1.

A. N. CALKINS.

GRAIN METER.

No. 476,608. Patented June 7, 1892.

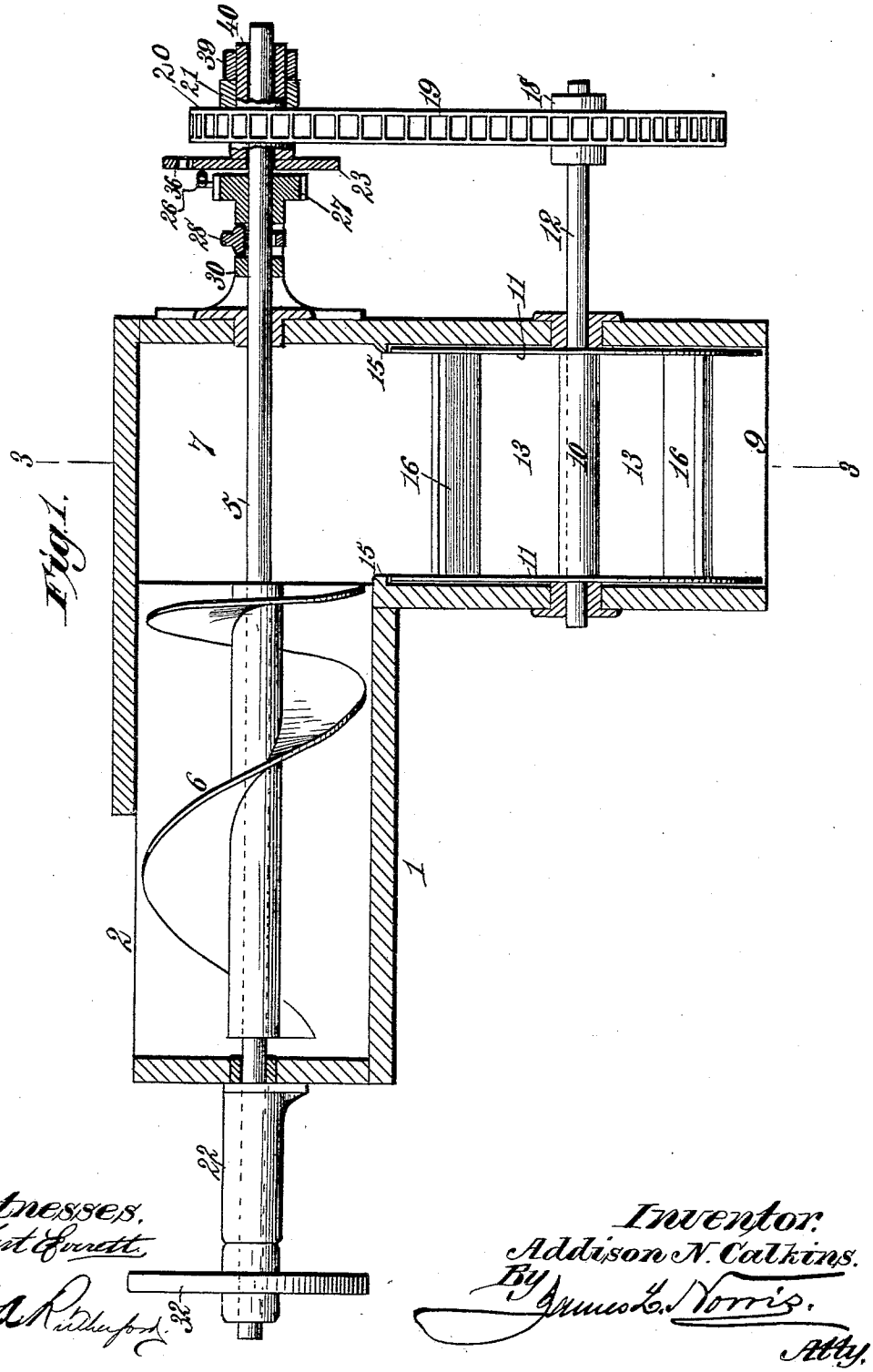

Fig. 1.

Witnesses.
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By Munn & Norris.
Atty.

(No Model.) 2 Sheets—Sheet 2.

A. N. CALKINS.

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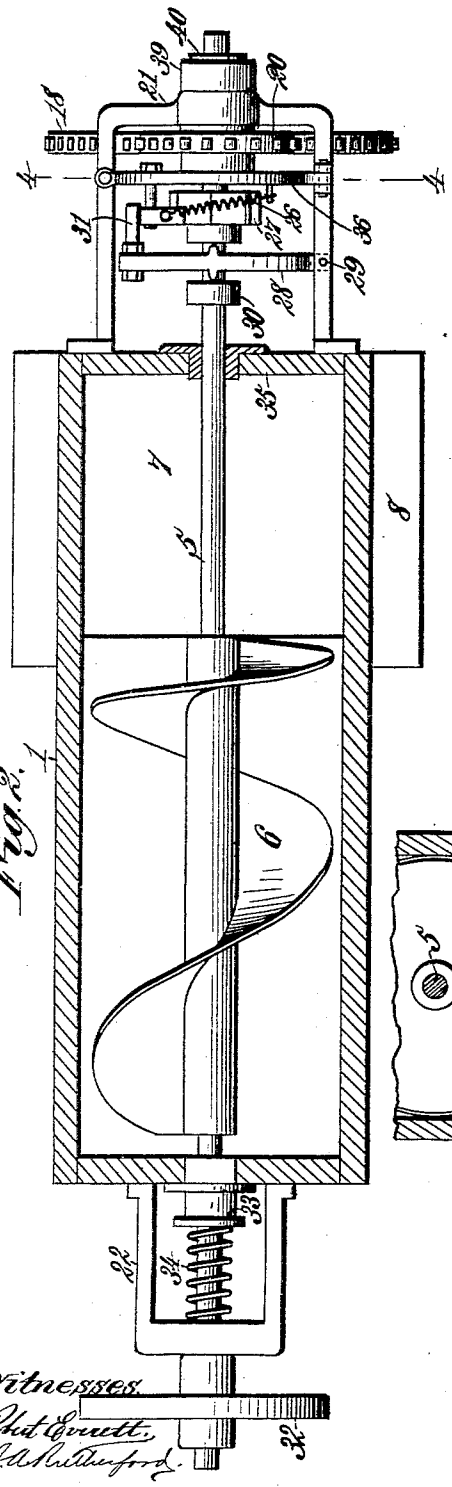

Fig. 2.

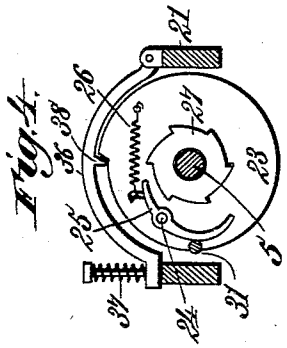

Fig. 4.

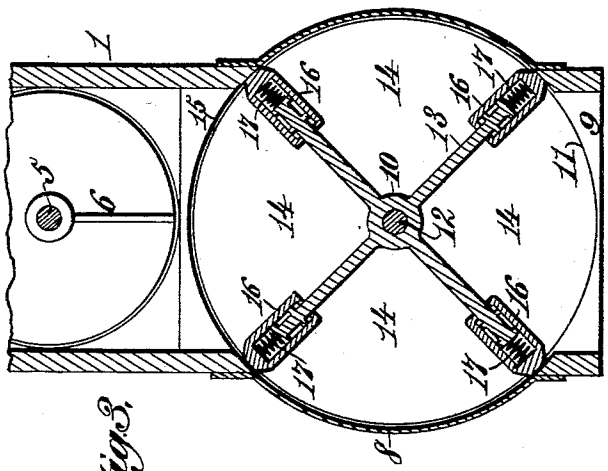

Fig. 3.

Witnesses.
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By James L. Norris.
Atty.

UNITED STATES PATENT OFFICE.

ADDISON N. CALKINS, OF QUINCY, ILLINOIS.

GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 476,608, dated June 7, 1892.

Application filed January 27, 1892. Serial No. 419,442. (No model.)

To all whom it may concern:

Be it known that I, ADDISON N. CALKINS, a citizen of the United States, residing at Quincy, in the county of Adams and State of Illinois, have invented new and useful Improvements in Grain-Meters, of which the following is a specification.

The object of my invention is to provide a simple and accurately-operating automatic meter particularly adapted for measuring grain as it comes from a thrashing-machine or separator.

My invention consists in the construction, arrangement, and combination of parts in an automatic grain-measuring apparatus, as hereinafter described and claimed.

In the annexed drawings, illustrating the invention, Figure 1 is a vertical longitudinal section of my improved grain-meter. Fig. 2 is a horizontal section of the same. Fig. 3 is a vertical transverse section on the line 3 3 of Fig. 1, and Fig. 4 is a transverse section on the line 4 4 of Fig. 2.

Referring to the drawings, the numeral 1 designates a box having in the upper portion of one end an opening 2 for the reception of grain or other dry material to be measured. In the box 1 is supported a longitudinally movable and rotary shaft 5, on one end of which is secured a screw conveyer 6, that is adapted to feed the grain or other material from beneath the inlet-opening 2 into a chamber 7 at the other end of the box. Beneath the chamber 7 and communicating therewith is a casing 8, having an outlet 9 at its lower end, through which the measured material is discharged. In this casing 8 is arranged a measuring-wheel 10, composed of two disks 11, securely mounted on a shaft 12 and connected by radial partitions 13, that divide the wheel into a series of measuring-compartments 14 of equal capacity, as shown in Fig. 3. The measuring-wheel 10 occupies the whole of the space within its casing 8, and the disks 11, that close the ends of said wheel, are arranged in close proximity to the end walls of said casing, which is provided internally with lips or ledges 15, Fig. 1, that serve to prevent the passage of grain or other material into the slight space outside the disks. The end of each radial partition 13, adjacent to the casing, is inclosed in a yielding cap 16, pressed outward and in close contact with the casing by means of springs 17, located in each of said caps. By this construction the measuring-wheel when rotated moves in close contact with the casing 8, and the yielding caps prevent any wedging or obstruction to the action of the wheel in the event of any grain passing between said caps and the casing. It is obvious that if the partitions 13 were in rigid contact with the casing the free movement of the measuring-wheel would be liable to obstruction from wedging of the grain in the angles between said partitions and casings. On one end of the wheel-shaft 12, outside the casing 8, is secured a sprocket-wheel 18, which is connected by a chain 19 with a sprocket-wheel 20, loosely mounted on the shaft 5 of the screw conveyer. The opposite ends of the shaft 5 project from the box 1, as shown in Figs. 1 and 2, and are journaled in frames or boxing 21 and 22, secured to the ends of the box 1, as shown. To the hub of the loose sprocket-wheel 20 on the shaft 5 is secured a disk 23, Fig. 4, having projecting from one side a pin 24, on which is pivoted a pawl 25, to one end of which is connected a spring 26, that has its other end fastened to the disk 23, and by which spring said pawl can be brought into engagement with a ratchet-wheel or clutch 27, which is fast on the conveyer-shaft. It is obvious that when the pawl 25 and ratchet 27 are thus engaged the disk 23 and attached sprocket-wheel 20 will receive motion from the conveyer-shaft 5 and transmit the same through the chain 19 and sprocket-wheel 18 to the shaft 12 of the measuring-wheel. An arm or lever 28 is pivoted at 29, Fig. 2, to the frame 21, and is held between the hub of the clutch or ratchet-wheel 27 and a collar 30, fast on the conveyer-shaft. This arm or lever 28 carries a pin or lug 31, which normally projects over and bears on the pawl 25, so as to hold it away from the ratchet-wheel 27 against the action of the spring 26, while a compartment of the measuring-wheel 10 is receiving grain from the chamber 7, into which it is fed by the conveyer. The screw-conveyer 6 is continuously operated by means of power applied, for instance, through a pulley 32 on the shaft 5, that carries the conveyer.

On the shaft 5, within the frame 22, is a collar 33, Fig. 2, which forms a bearing for one end of a spiral spring 34, the other end of which bears against the frame 22, and by means of this surrounding spiral spring 34 the shaft 5 is forced lengthwise and held in proper position to cause the pin 31 to bear on the pawl 25 and hold it out of engagement with the ratchet 27, so that the measuring-wheel 10 will remain at rest while the compartment that is immediately beneath the chamber 7 is being filled with grain. When the chamber 7 and the uppermost compartment 14 of the measuring-wheel 10 are full, the pressure of the grain against the end of the box 1 at the point 35 will react on the screw conveyer and force its shaft 5 backward against the pressure of the spring 34, thereby compressing said spring and at the same time moving the pivoted lever 28 backward, so as to withdraw the pin 31 from contact with the pawl 25. The spring 26 now draws the pawl 25 into engagement with the ratchet 27 on the rotary shaft 5, thereby actuating the disk 23 and connected gearing to the shaft of the measuring-wheel 10, so as to partially rotate said wheel and bring one of its empty compartments into communication with the conveyer. As soon as the pressure of the grain in the chamber 7 is thus relieved, the spring 34 returns the shaft 5 to its former position at the same time that the rotation of the disk 23 brings its pawl beneath the pin 31, and thus the movement of the measuring-wheel is arrested until another compartment thereof is filled. By the continuous rotation of the conveyer-shaft 5 these operations are repeated and the several compartments of the measuring-wheel 10 are successively filled and discharged. The capacity of the wheel-compartments being known, the grain or other material can thus be accurately measured.

If desired, any suitable registering device can be connected with the apparatus; but this is not essential and forms no part of my invention.

For the purpose of preventing any liability of the disk or plate 23 working backward and partially engaging its pawl 25 with the ratchet-clutch 27 a brake 36, Figs. 2 and 4, may be pivoted to the frame 21 and provided with a spring 37, as shown in Fig. 4. The disk or plate 23 may be made slightly eccentric, as shown, and the brake provided with a lug 38 to exert sufficient friction at the irregular portion of said disk to cause immediate stoppage of the loose sprocket-wheel 20 when the pawl 25 and ratchet 27 are disengaged; but this may not be essential if the speed of the machine is properly regulated. A collar 39 may be provided on the hub 40 of the loose sprocket-wheel 20 and arranged to have a bearing against the outer end of the frame 21, so as to prevent movement of said sprocket-wheel and attached disk 23 inward along the conveyer shaft. The sprocket-wheels 18 and 20 are so proportioned (the former being four times larger than the latter) that each revolution of the sprocket-wheel 20 will cause one of the four compartments in the measuring-wheel 10 to be emptied. As soon as an empty compartment 14 of the measuring-wheel is brought into communication with the chamber 7 it begins to fill, and when the pressure of material in the said communicating chamber and wheel-compartment is relieved the mechanism for partially rotating the measuring-wheel is immediately and automatically put into operation, as already described.

What I claim as my invention is—

1. In a grain-meter, the combination, with a measuring-wheel having radial partitions and a casing inclosing said wheel and provided with inlet and discharge openings, of yielding caps placed on the outer ends of the wheel-partitions and having yielding contact with the wheel-casing, substantially as described.

2. In a grain-meter, the combination of a box for receiving the material to be measured, a screw conveyer mounted in said box, a vertically rotary measuring-wheel having closed ends and an open periphery and provided with radial partitions forming a series of compartments that are adapted to communicate successively with the screw conveyer, and gearing connecting the shafts of said screw conveyer and measuring-wheel and automatically actuating said wheel, substantially as described.

3. In a grain-meter, the combination of a screw conveyer having a rotary longitudinally-movable shaft, a box inclosing said conveyer, a vertically rotary measuring-wheel having radial partitions and compartments open at the periphery and adapted to be brought successively into communication with one end of the box inclosing the conveyer, a shaft for said measuring-wheel provided with a fast sprocket-wheel, a loose sprocket-wheel on the conveyer-shaft, a chain connecting said sprocket-wheels, clutch mechanism on the conveyer-shaft, and means for causing the pressure of the grain to move the conveyer-shaft endwise and automatically clutch and unclutch the loose sprocket-wheel and intermittingly actuate the measuring-wheel, substantially as described.

4. In a grain-meter, the combination of the screw conveyer 6, having a longitudinally-movable shaft 5, provided with clutch-ratchet 27, the loose sprocket-wheel 20, mounted on said shaft and provided with a disk 23, having a spring-actuated pawl 25, adapted to engage said ratchet, a spring 34 on the other end of said shaft, a lever 28, actuated from the shaft 5 and having a pin 31 to hold the pawl away from the ratchet, the vertical measuring-wheel 10, having a shaft 12, provided with a fast sprocket-wheel 18, and the chain 19, connecting the sprocket-wheels 18 and 20, substantially as described.

5. In a grain-meter, the combination of the box 1, having inlet 2 at one end, the casing

8, communicating with the other end of said box and provided with discharge-opening 9, the vertical measuring-wheel 10, mounted in said casing in communication with the box 1 and having a shaft 12, provided with a fast sprocket-wheel 18, a screw conveyer 6, inclosed in the box 1 and provided with a longitudinally-movable shaft 5, having a ratchet 27, the loose sprocket-wheel 20, mounted on said shaft and provided with a disk 23, carrying a spring-actuated pawl 25, adapted to engage the ratchet 27, the lever 28, actuated from the shaft 5 and carrying a pin 31, adapted to hold the pawl 25 away from the ratchet 27, the spring 34 on the shaft 5, and the chain 19, connecting the sprocket-wheels 18 and 20, substantially as described.

6. In a grain-meter, the combination of the casing 8, having discharge-opening 9, the vertical measuring-wheel 10, provided with radial partitions 13 and intermediate compartments 14, the yielding caps 16 on the outer ends of said partitions, and the springs 17 for forcing said caps into yielding contact with the casing, substantially as described.

7. In a grain-meter, the combination of the screw conveyer 6, having a longitudinally-movable shaft 5, the loose sprocket-wheel 20, mounted on said shaft and adapted to be clutched therewith, a brake 36, the vertical measuring-wheel 10, having a shaft 12, provided with a fast sprocket-wheel 18, and the chain 19, connecting said sprocket-wheels 18 and 20, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

ADDISON N. CALKINS. [L. S.]

Witnesses:
GEORGE W. FOGG,
JOSEPH KURZ.