(No Model.) 2 Sheets—Sheet 1.

# B. F. WARNER.

## GRAIN METER.

No. 533,255. Patented Jan. 29, 1895.

Fig. 1.

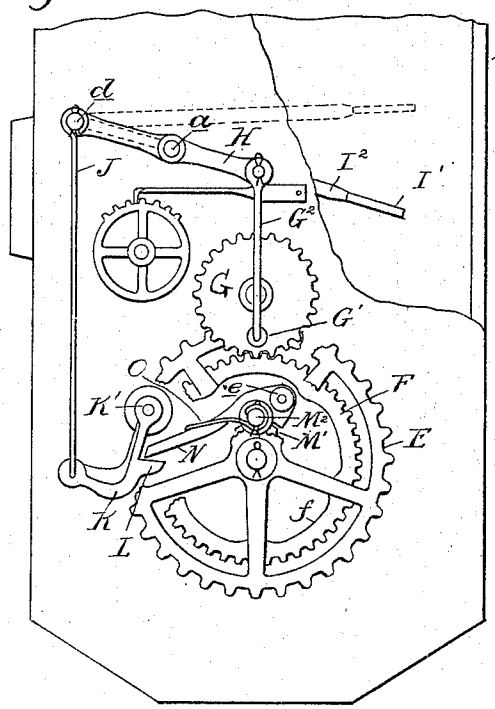



Fig. 2.

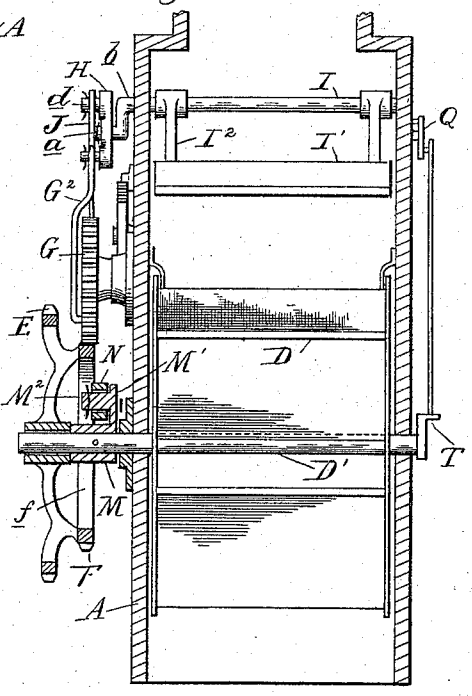



Fig. 3.

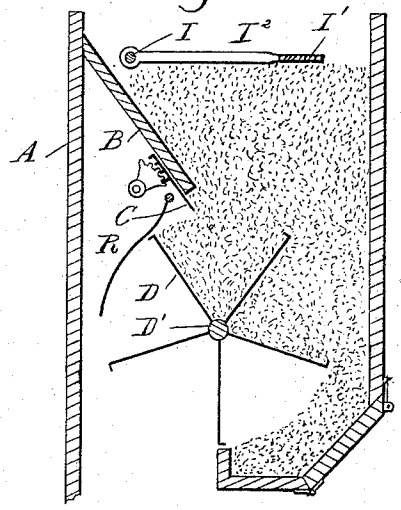
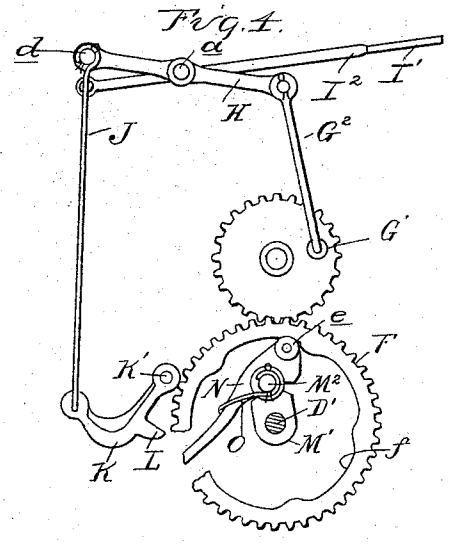



Fig. 4.

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(No Model.) 2 Sheets—Sheet 2.

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## GRAIN METER.

No. 533,255. Patented Jan. 29, 1895.

Fig. 5.

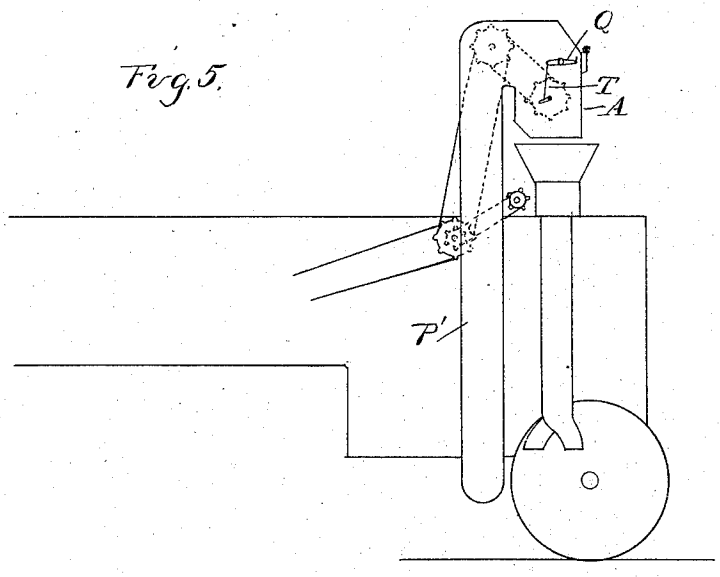



Fig. 6.

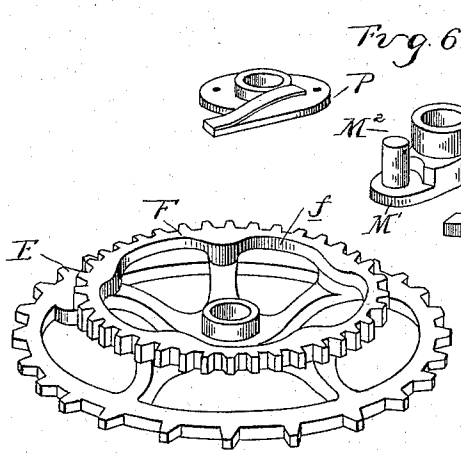
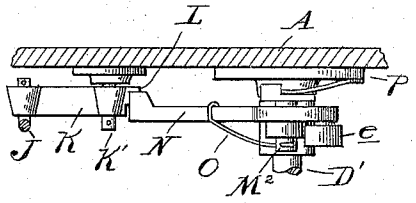



Fig. 7.

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# UNITED STATES PATENT OFFICE.

BEN F. WARNER, OF HOMER, MICHIGAN.

## GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 533,255, dated January 29, 1895.

Application filed June 13, 1894. Serial No. 514,384. (No model.)

*To all whom it may concern:*

Be it known that I, BEN F. WARNER, a citizen of the United States, residing at Homer, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Grain-Meters, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the peculiar construction of a meter wheel, and device for connecting it with the actuating mechanism automatically upon the ingress of sufficient grain into the hopper or casing to insure the filling of the buckets of the wheel and to automatically stop as soon as the grain lowers.

The invention further consists in the peculiar construction, combination and arrangement of the various parts.

In the drawings, Figure 1 is a side elevation of my improved device. Fig. 2 is a vertical, central, longitudinal section therethrough. Fig. 3 is a central section through Fig. 2. Fig. 4 is an elevation of part of the mechanism shown in Fig. 1, showing the parts in different positions. Fig. 5 is a diagram elevation of part of a separator, showing my invention applied thereto. Fig. 6 is a detached perspective view of the parts of the clutch. Fig. 7 is a top plan view of the clutch.

A is the casing or hopper. B is a wall therein forming a hopper at the top in the discharge of which the meter wheel is located. At the foot of the wall B is an adjustable cut-off C having any suitable means of adjustment to or from the meter wheel, to regulate the fullness of the buckets. The buckets are formed between radial blades D secured to a shaft D′ journaled transversely in the casing. On this shaft is sleeved a sprocket wheel E adapted to be driven from some continuously driven shaft on a separator if it is used thereon, or from any other suitable source of power.

Secured to the wheel E, or preferably formed integral therewith is a gear wheel F, which meshes with the pinion G journaled on a stub shaft on the side of the casing. This pinion has a crank pin G′ connected by the pitman $G^2$ to one end of the lever H. This lever has a central bearing engaging over a pin *a* formed at the end of a crank arm *b* (Fig. 2), which crank is formed on or secured to the shaft I extending across the casing near the top thereof, and having secured to it a blade or paddle I′, by means of the arms $I^2$. The lever H has an arm extending beyond the pin *a*, a distance equal to the length of the crank arm *b*, and at its end is provided with a pin *d*, on which is pivotally supported the upper end of the connecting rod J, which at its lower end is connected to one end of the gravity dog K, the other end of which is pivoted upon a stub shaft K′ on the side of the casing. This dog has a tooth or shoulder L, which controls a clutch device for connecting and disconnecting the sprocket wheel to the meter wheel shaft. This clutch I have shown of the following construction:

M is a sleeve fast on the shaft D′ beside the sprocket wheel E. This sleeve has an arm M′ having a lateral pin $M^2$ upon which is pivoted the clutch lever N. This lever at one end has a roller *e* arranged in line with the cam ring *f* on the inner face of the gear wheel F.

O is a spring secured to the pin $M^2$ and acting to throw the roller *e* into engagement with the cam ring.

P is a spring ratchet, engaging a lug on the arm M′, to prevent the meter wheel from turning backward.

The parts being thus constructed and arranged, their operation is as follows: The grain meter is arranged in such proximity to an elevator or a feed spout as to receive the grain in the upper end of the casing. In the drawings, I have shown it arranged on a separator to receive the grain from the elevator P′. The sprocket wheel E continuously revolving will actuate the gear wheel G and through the pitman $G^2$ will rock the lever H. This lever will normally turn about the pin *d* as its fulcrum, as the weight of the gravity latch K and the connecting mechanism will offer more of a resistance than the rocking of the blades I′. Therefore this blade will be oscillated up and down in the casing as shown in dotted and full lines in Fig. 1. The grain will first pass into the buckets of the meter wheel as shown in Fig. 3 and then fill up the hopper or casing until the blade I′ strikes the top of the grain which will prevent its oscillation. When this happens the blade will remain quiet upon the grain, as shown in Fig. 3 and the lever H will rock upon the

pin *a* which will be at or near its highest point due to its oscillation by the previous movement of the lever H. Now the further movement of the lever H will withdraw the gravity dog K into the position shown in Fig. 4, which will disengage the tooth or shoulder L from the lever N. When this happens the spring O will rock the lever in upon its pivot and cause the roller *e* to engage with the cam-bearing on the inner face of the gear wheel and cause the lever to move with that wheel, thereby rotating the meter shaft of the meter wheel. As soon as the grain lowers in the hopper or casing the blade I′ will correspondingly lower and shift the fulcrum *a* downward into the position shown in Fig. 1 and the lever H will again turn about the fulcrum *d* permitting the gravity dog K to move in the path of the lever N which will engage therewith and rock the roller *e* out of engagement with the cam on the gear wheel and thus stop the meter wheel.

By this combination and arrangement of parts it will be seen that the meter wheel will turn once when there is sufficient grain in the hopper or casing to insure that the buckets will be filled. The revolutions of the bucket wheel may be counted in any desired manner.

I have shown a crank T at one end of the meter wheel shaft engaged with a register or counter Q on the casing.

R is a curved apron hinged inside the casing beneath the wall B and acting as a valve to close the buckets of the meter during the first part of the revolution after they are filled so as to prevent their emptying from one side until the other side has passed the cut-off C.

What I claim as my invention is—

1. In a grain meter, the combination with a hopper, of a revolving meter wheel, means for interrupting the movement of the wheel, mechanism for revolving the wheel, and means actuated by said revolving mechanism for removing said interrupting means, substantially as described.

2. In a grain meter, the combination of a hopper, a meter wheel in the discharge therefrom, a beater blade in the hopper, connections from the drive mechanism to said beater blade comprising a rocking lever having a changeable fulcrum, a clutch between the drive mechanism and the meter wheel, and connecting devices between the drive mechanism the beater and the clutch whereby the clutch is thrown into operation when the beater is stopped by the height of the grain and the clutch is disengaged and the beater started when the grain lowers, substantially as described.

3. In a grain meter, the combination of the hopper, the meter wheel in the discharge therefrom, a beater blade in the hopper, a crank on the end of the beater blade shaft, a lever pivoted on the end of said crank, having one arm corresponding in length with the crank, a connecting rod pivoted on one end of the lever extending to a clutch controlling device, a drive connection for continuously rocking said lever pivoted to the opposite end thereof and the clutch between the driver mechanism and the meter wheel, controlled by the clutch trip, substantially as described.

4. In a grain meter, the combination with a hopper, of a meter wheel therein, mechanism for driving the wheel, a beater, and means governed by the beater and actuated by the said driving mechanism for controlling the movement of the wheel, substantially as described.

5. In a grain meter, the combination with a hopper, of a meter wheel therein, mechanism for rotating the wheel, a lever, a clutch for the mechanism, controlling connections from the clutch to the lever, and from the lever to the mechanism, and a beater for shifting the fulcrum of the lever, substantially as described.

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

BEN F. WARNER.

Witnesses:
M. B. O'DOGHERTY,
O. F. BARTHEL.