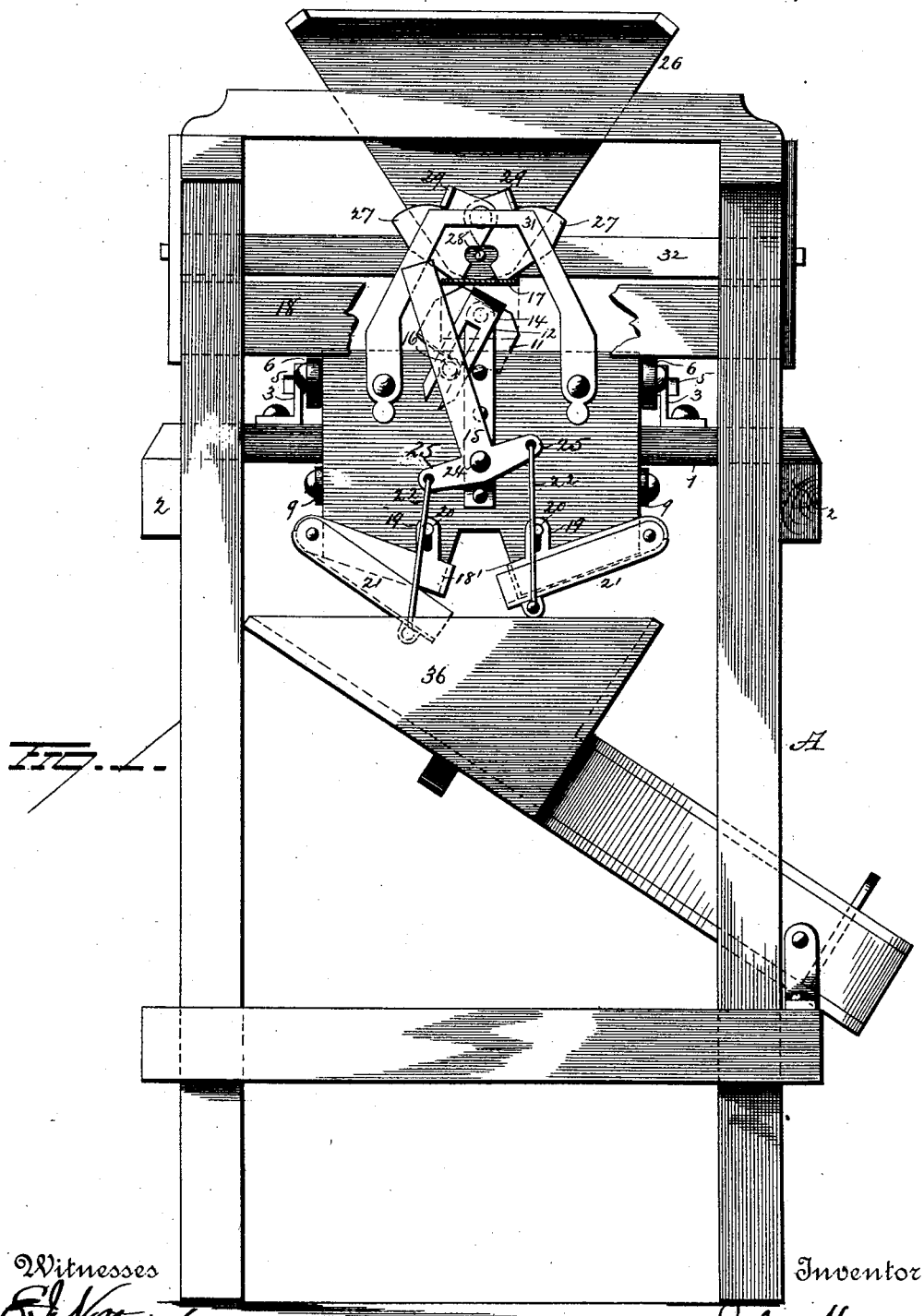
(No Model.) 4 Sheets—Sheet 1.

J. HENRY.

GRAIN METER.

No. 418,795. Patented Jan. 7, 1890.



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(No Model.) 4 Sheets—Sheet 2.

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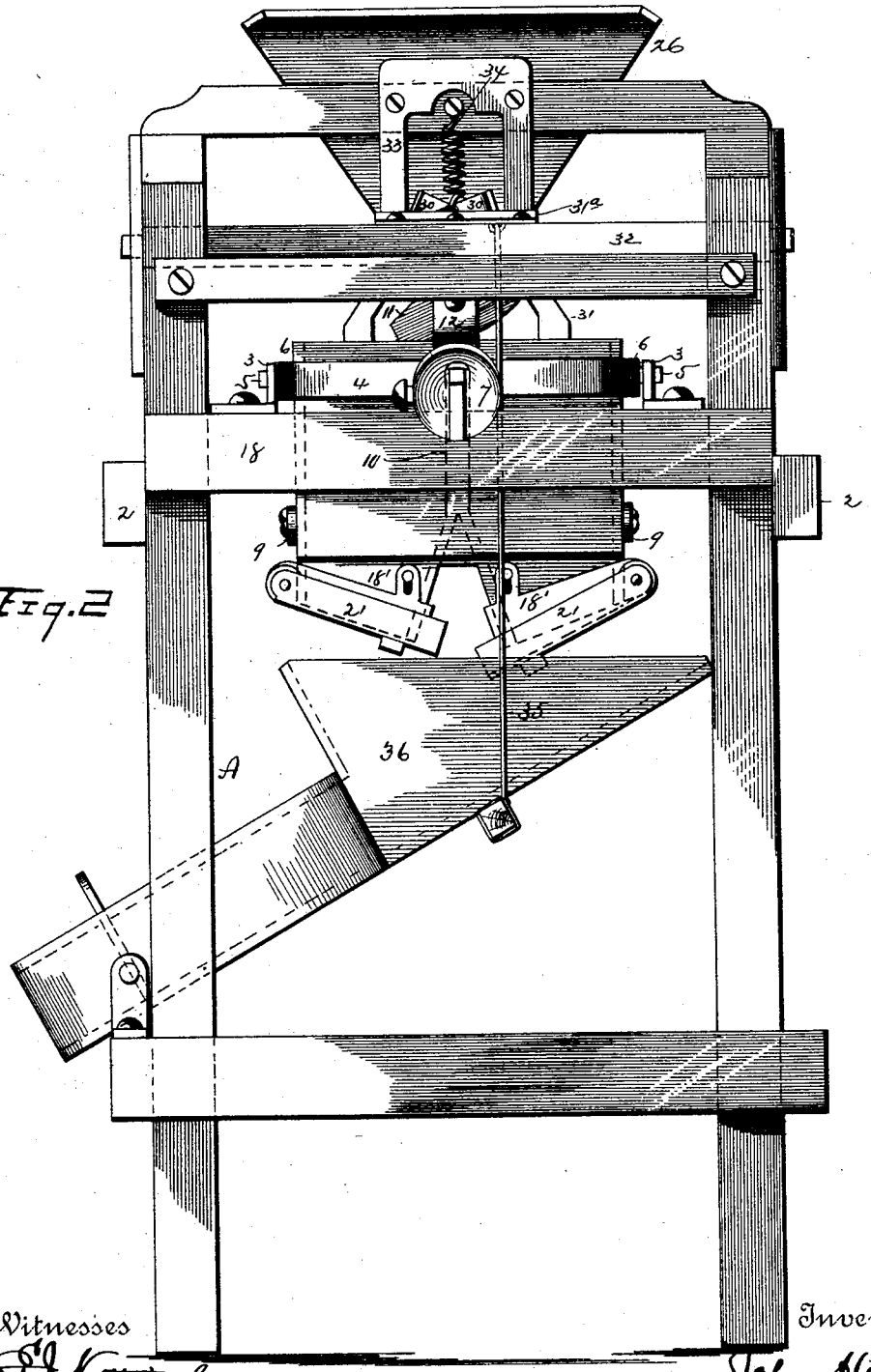

Fig. 2

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(No Model.) 4 Sheets—Sheet 3.

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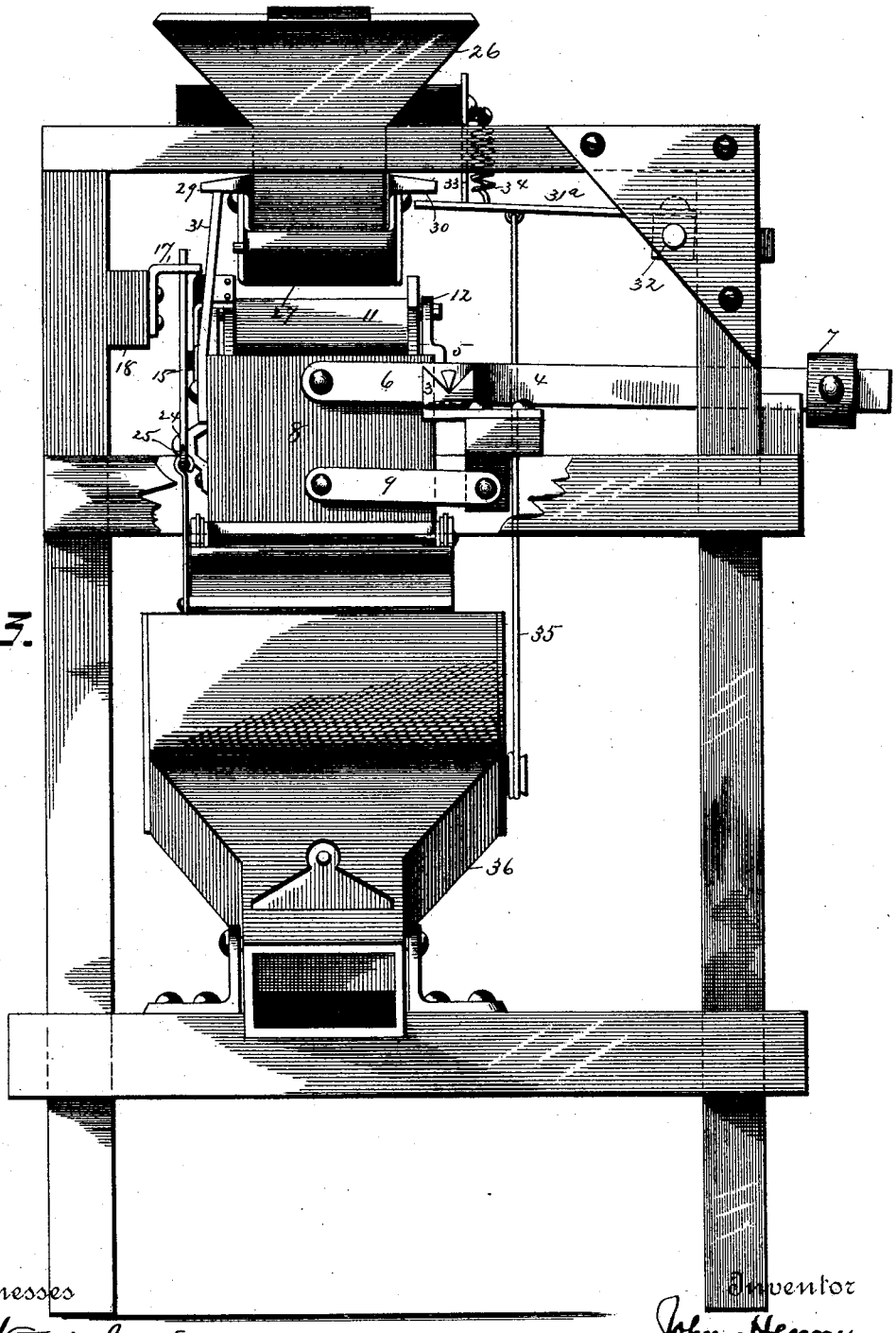

Fig. 3.

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GRAIN METER.

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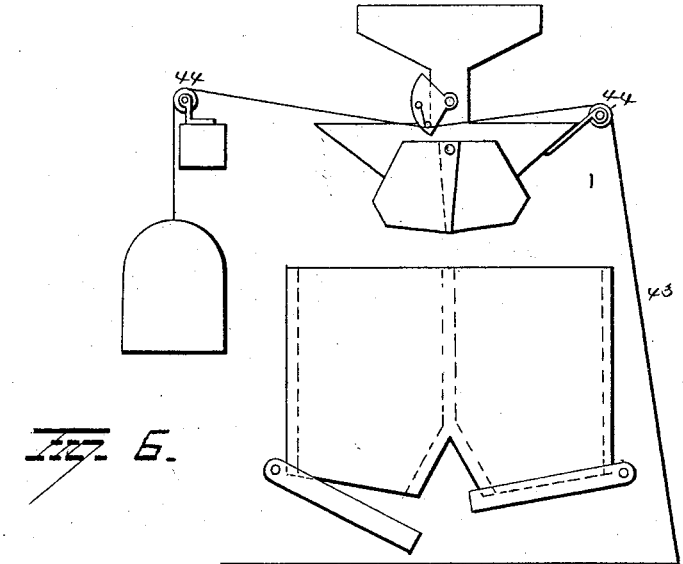

Fig. 6.

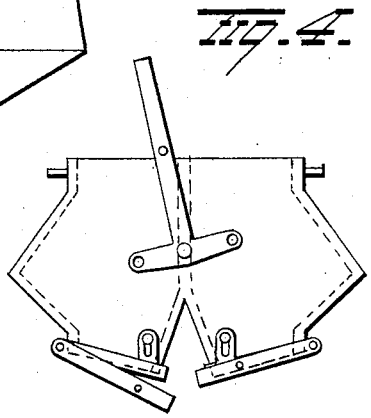

Fig. 4.

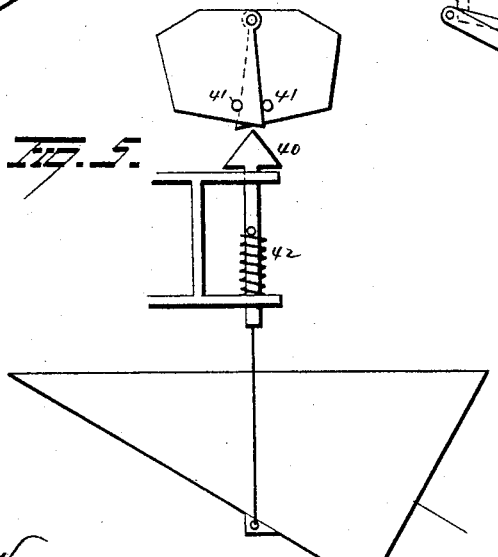

Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN HENRY, OF ARDOCH, (DAKOTA TERRITORY,) NORTH DAKOTA, ASSIGNOR OF ONE-HALF TO JOHN GEORGE NEILSON, OF SAME PLACE.

GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 418,795, dated January 7, 1890.

Application filed July 2, 1889. Serial No. 316,348. (No model.)

To all whom it may concern:

Be it known that I, JOHN HENRY, of Ardoch, in the county of Walsh and State of North Dakota, 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.

My invention relates to an improvement in grain-meters, the object being to provide an apparatus for automatically weighing grain, regulating its discharge into and out of the machine, and cutting off the feed in case of a blockade or other irregularity in the flow of the grain; and a further object is to provide a device which, besides being effectual, regular, and accurate in its operation, shall be simple in construction and may be manufactured and placed on the market at a slight cost.

With these ends in view my invention consists in certain novel features of construction and combinations of parts, as will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is a view of the opposite side. Fig. 3 is a view in end elevation, portions of the frame-work being broken away; and Figs. 4, 5, and 6 are views in side elevation of modified forms.

A represents the frame of the machine within which the weighing apparatus is supported. The shelf 1 reaches across the frame and rests at its ends upon the cross-bars 2 2, and on it the V-shaped bearing-plates 3 3 are secured. The forked scale-beam 4 has a knife-edged bearing 5 on each of its arms 6 6, which rest in the V-shaped bearings 3 3, where a fulcrum is formed for the scale-beam. The arm of the beam is graduated in the usual manner and furnished with a movable weight 7.

The grain-measuring receptacle 8 is pivotally supported near its upper edge in the forked end of the scale-beam, so that it always maintains a vertical position due to its own weight, but to always insure a vertical movement of the receptacle and prevent lateral vibration the links 9 9 loosely connect the ends of the receptacle with the shelf or other convenient support. This grain-measuring receptacle is divided into two equal-sized compartments by means of a partition 10, extending across its middle, and the lower ends of this partition preferably incline outward slightly to receive the guard-rims, hereinafter described.

A dividing-board 11 is pivoted at its ends in the ears 12 12, immediately above the partition 10. The board is usually shaped about as shown—that is, it is curved or hollowed out a little through the middle where the grain strikes it, and its axis is located some distance above it, so that it has a swinging as well as a rocking motion, which prevents the throwing of grain. A slotted plate 14 is secured to one end of the dividing-board 11, and its slotted end extends down alongside the grain-receptacle.

An inverted-T-shaped lever 15 is located on the end of a shaft 24, and is provided with arms 25 25. The long arm of the T-shaped lever is provided with a lug or pin 16, which projects inwardly and works in the elongated slot in plate 14. The guard-plate 17 projects inwardly from the cross-bar 18 in a position to be engaged by the upper arm of the T-shaped lever, first by one edge and then by the other, as it vibrates.

The guard-rims 18′ 18′ extend loosely around the spouts of the grain-receptacle. These are pivoted at one end, and at the other end are provided with elongated loops 19 19, which receive the pins 20 20. Thus the rims are given a slight upward and downward movement, they being flush with the lower edge of the spouts when raised, and extending a little below this point when dropped to prevent the grain when discharging from flying out at the sides.

The doors 21 21 are hinged at the same point where the rims are pivoted, and connecting-rods 22 22 extend from the free or inner ends of these hinged bottoms to the short arms 25 25 of the T-shaped lever, so that as the latter rocks backward and forward beneath the guard-plate 17 with the weighing of each receptacle full of grain the bottoms are alternately opened and closed, the one toward which the dividing-board deflects the

grain always being closed, because the lug or pin 16, by working in the slot in plate 14, throws the latter simultaneously with the discharge of grain from the loaded chamber of the receptacle.

The object of providing a means for regulating the discharge from the receptacle is to ease the scale-beam as it comes back to rest. If the hinged doors were allowed to open wide, the whole contents of the receptacle would discharge at once, and the scale-beam would fall back with a heavy jar; but by restricting the discharge the beam comes back lightly. However small this discharge-opening is made, though, it must be remembered that the flow at this point should be greater than the flow from the hopper above.

Hopper 26, located at the top of the frame over the grain-receptacle, tapers down to a narrow opening at its bottom, and the cut-offs 27 27 are pivoted to the lower end of this hopper in such a manner that they close by their own weight, if unobstructed, and when they do close one shuts inside the other until they are stopped by striking against the pin 28 on the side of the hopper. The cut-offs are each provided at their upper ends with outwardly-projecting ears 29 29 and 30 30. The ears 29 29 on one side are struck by the rest 31, projecting upwardly from one side of the grain-receptacle when the latter is up and being filled, the effect of this contact being to hold the cut-offs open to their utmost until enough grain has emptied into the closed chamber of the grain-receptacle, in order, with the combined weight of the cut-off supported upon the rest 31, to lower the receptacle sufficiently far to withdraw the rest from beneath the ears 29 29, in which position the receptacle remains until it has received its full complement from the hopper to make up the subtracted weight of the cut-off the weight of which previously combined to help depress the grain-receptacle. As soon as the receptacle begins to descend and the rest which held the cut-offs open is withdrawn, of course the cut-offs tend to close, or, at least, partly close, thus making the flow from this time very slight, until the balance of the grain necessary to tip the scale-beam is discharged into the receptacle, so that when the receptacle lowers to its utmost and discharges its contents and the parting-board turns the flow of grain is so restricted that it does not become uncontrollable, overflow, or back up, or cause inaccuracy in weight. The cut-offs are prevented from entirely closing by the ears 30 30 striking the plate 31ª. The plate is preferably held on a rocking beam 32, and held against the stops 33 by the spring or elastic device 34, or by means of a weight suspended on a cable extending over a pulley. The length of these stops is regulated by the position of the ears 30 30, and it is desirable that they should prevent the cut-off from entirely closing; but the great object of this plate is to allow the cut-off to entirely close in case of a blockade. To this end a cord or similar flexible device 35 extends from the plate 31ª to the spout 36 and supports the free end of the latter. The tension of the spring 34 is adequate to just support the spout when a measure of grain is dropped into it, and even then the spout gives a little. This motion only facilitates the discharge of the grain, but in the event of a blockade forming in the spout the weight lowers the latter, and then the cut-offs automatically close, they having nothing to sustain or keep them open. At the mouth of the spout a slide is furnished to open and close the spout.

It is usually intended to have some kind of registering device connected with the scale-beam or other part of the machine, and I do not care to be limited to any particular kind.

In operation the grain is discharged into the hopper, and thence into one or the other of the chambers in the grain-measuring receptacle, until the scale-beam is tipped, the discharge of grain diminishing with the first downward movement of the receptacle. The weight of the grain being all upon the hinged bottom, tends to open it; but this cannot take place until the receptacle lowers far enough for the long arm of the T-shaped lever to escape the guard-plate 17. As soon as it does lower the long arm of this lever swings beneath and past the guard-plate, closing the opposite hinged bottom for the next load of grain turning the parting-board. When the grain is all discharged from the receptacle, or during the discharge, the receptacle rises and the long arm of the T-shaped lever is locked on the proper side of the guard-plate17, where it is held until the next quantity is measured. Meanwhile the cut-offs are controlled, as previously explained.

In case it becomes necessary to weigh or measure very heavy drafts of grain it sometimes becomes desirable to make the hinged bottoms of the chambers of the grain-measuring receptacle small, as shown in the modification illustrated in Fig. 4. This receptacle is made large above this point.

In the modification shown in Fig. 5 another mode is displayed for opening and closing the cut-offs. It consists of a pointed device 40, which is normally held between pins 41 41 on the cut-off by the action of a spring 42, and which is so connected at its lower end to the spout that any depression of the latter allows the cut-offs to come together and to entirely close when the pointed device is withdrawn from contact between the pins 41 41.

In the modification shown in Fig. 6 the cut-offs are controlled by a cable 43, passing over pulleys 44.

It may be said, in addition to what has already been mentioned, that my meter is particularly designed to receive grain from an

elevator and to weigh and transfer it to a car or other means of conveyance for shipping it away.

It is evident that other slight changes than those referred to might be resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the particular construction herein set forth; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a grain-meter, the combination, with a frame and a scale-beam fulcrumed thereon, of a grain-measuring receptacle pivotally supported on the beam, gravity cut-offs, a stationary device carried by the measuring-receptacle and adapted to gradually open the cut-offs as the receptacle rises, and a pivoted spout connected with the cut-offs, so that it closes them when it is depressed, substantially as set forth.

2. In a grain-meter, the combination, with a frame and a scale-beam fulcrumed thereon, of a grain-measuring receptacle pivotally supported on the beam, gravity cut-offs controlled by the receptacle, and a spring-sustained stop for ordinarily preventing a complete closure of the cut-offs, and a pivoted discharge-spout connected with the stop, substantially as set forth.

3. In a grain-meter, the combination, with a frame, a forked scale-beam fulcrumed therein, a grain-measuring receptacle supported on the beam, and links for retaining the receptacle in position, of a parting-board pivoted on the receptacle, hinged bottoms, a lever connected with the bottoms and parting-board, gravity cut-offs, a stationary device carried by the measuring-receptacle and adapted to gradually open the cut-offs as the receptacle rises, and a pivoted spout connected with the cut-offs for closing them with the depression of the spout, substantially as set forth.

4. In a grain-meter, the combination, with a frame, grain-hopper, and pivoted gravity cut-offs pivoted on the latter, of a scale-beam, a grain-measuring receptacle supported on the beam, a rocking parting-board, hinged bottoms on the receptacle, a pivoted lever having connection with the parting-board and the hinged bottoms, a guard-plate for regulating the position of the lever, and a rest projecting from the receptacle and adapted to open the cut-offs by engagement therewith, substantially as set forth.

5. In a grain-meter, the combination, with a frame, a hopper, and gravity cut-offs pivoted on the lower end of the latter, said cut-off having ears or projections thereon, of a parting-board pivoted on the receptacle, hinged bottoms on the receptacle, an inverted-T-shaped lever connected to the receptacle, said lever having pivotal sliding connection with the parting-board, rods connecting the short arms of the lever with the hinged bottoms, a guard-plate for controlling the swing of the lever, and a projecting rest on the receptacle adapted to engage the ears on the cut-offs to open the latter, substantially as set forth.

6. In a grain-meter, the combination, with a frame, a hopper, and gravity cut-offs pivoted on the lower end of the latter, said cut-offs having ears thereon, a scale-beam fulcrumed in the frame, a measuring-receptacle supported thereon, the latter having compartments, and links for retaining the latter in position, of a parting-board pivoted on the receptacle and having a slotted plate on one end, hinged bottoms on the receptacle, a T-shaped lever located on a shaft extending through the receptacle, two arms of which are connected to the hinged bottoms, and one arm of which has a projection which works loosely in the slotted plate on the parting-board, a guard-plate against which this arm of the lever abuts, and a projecting rest on the receptacle adapted to engage the ears of the cut-offs to open them, substantially as set forth.

7. In a grain-meter, the combination, with a frame, a hopper, and a movable spout, of a cut-off on the hopper, a movable spring-actuated support for normally holding said cut-off partly open, and a connection between said support and spout, whereby the cut-off is closed by the depression of the spout.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN HENRY.

Witnesses:
W. T. SHEPPARD,
JOHN PAYET.