

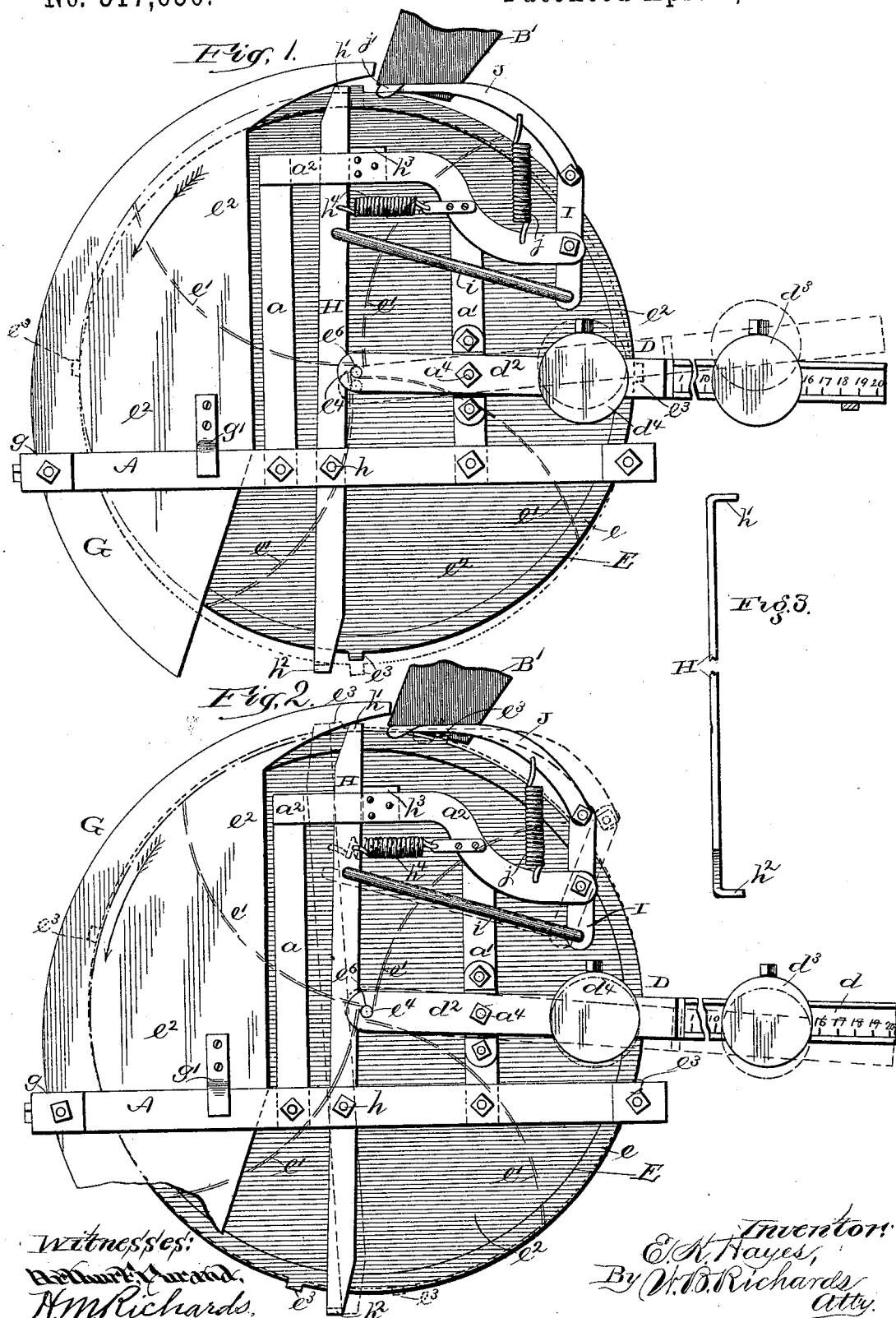
(No Model.)

2 Sheets—Sheet 1.

E. K. HAYES.
ROTATING GRAIN METER.

No. 517,650.

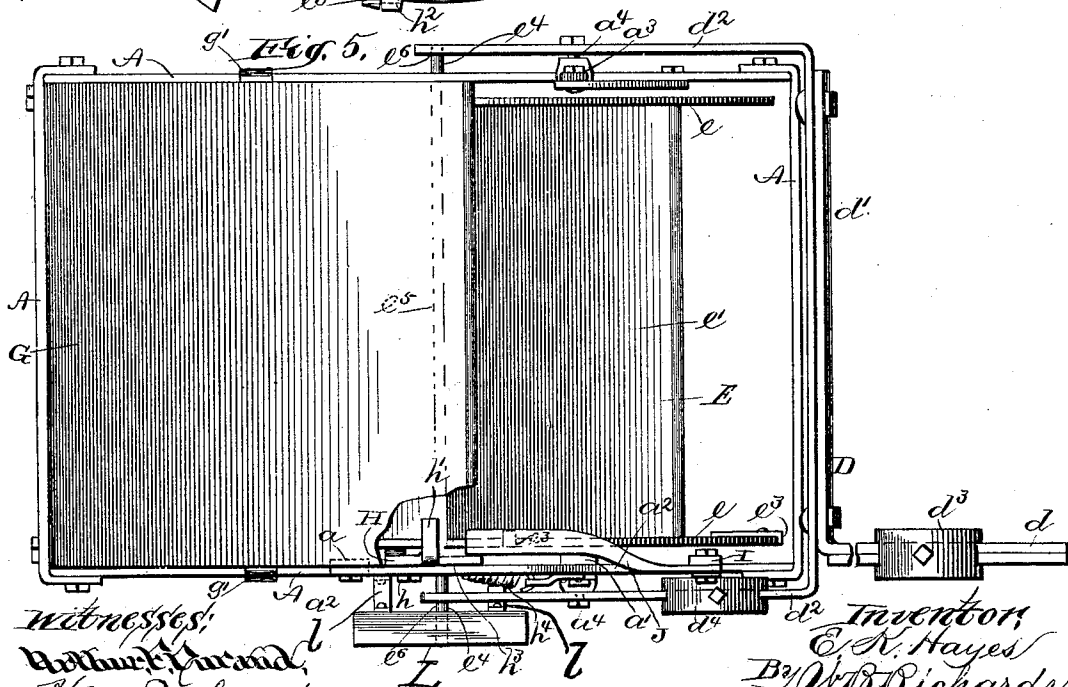
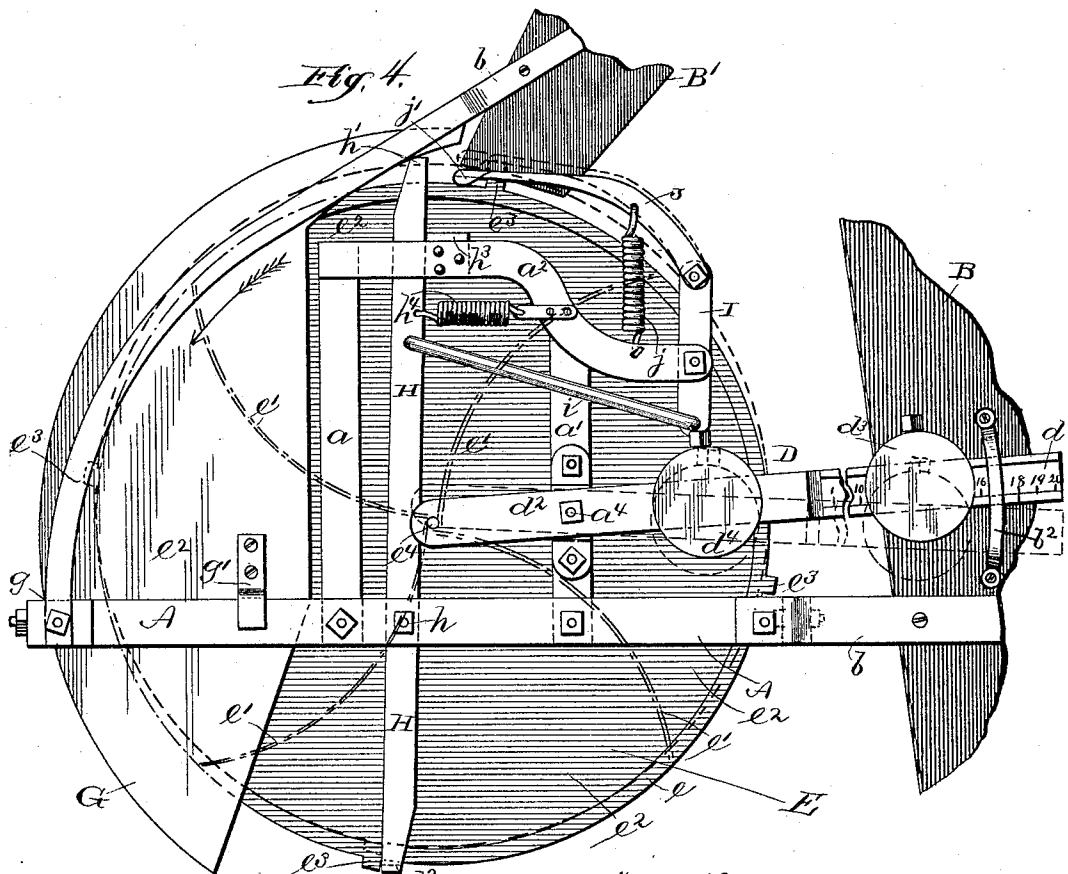
Patented Apr. 3, 1894.



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No. 517,650.

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Witnesses:
Arthur J. Leland,
H. M. Richards.

Inventor:
E. K. Hayes
By O. P. Richards,
Att'y.

UNITED STATES PATENT OFFICE.

EUGENIO K. HAYES, OF GALVA, ILLINOIS.

ROTATING GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 517,650, dated April 3, 1894.

Application filed January 6, 1893. Serial No. 457,464. (No model.)

To all whom it may concern:

Be it known that I, EUGENIO K. HAYES, a citizen of the United States, residing at Galva, in the county of Henry and State of Illinois, have invented certain new and useful Improvements in Grain-Weighers, of which the following is a specification.

This invention relates to improvements in automatic grain weighers, of that class in which a rising and falling grain receiver or bucket wheel having a series of compartments or buckets is poised at one end of a graduated scale beam, and in which said series of buckets is intermittently revolved by the conjoint action of the gravity of the weighed charges of grain in the compartments or buckets, and trip and stop mechanism, and thereby successively presented for filling and discharge; and my present improvement has for its object the production of an efficient automatic grain weigher of said class, and which while having means for protecting its working parts and minimizing the damage and wear, arising from impact or sudden and forcible contact of parts, with each other, will be otherwise structurally strong, and durable, will be simple, efficient, and certain in operation, and economic of manufacture, and the invention consists of constructions and combinations intended to accomplish these objects, and which are hereinafter described, and are summarized in the claims hereto appended.

In the accompanying drawings all my improvements are shown as embodied in the best way now known to me; obviously, however, some of these improvements may be used without the others, and in grain weighers differing in construction and organization from the grain weigher shown by said drawings, in which—

Figure 1 is a side elevation of a grain weigher, embodying my improvements; Fig. 2, same side elevation as Fig. 1, but with the parts in different relative positions from what shown at Fig. 1; Fig. 3, a side elevation of the swinging detent bar; Fig. 4, same side elevation as Figs. 1 and 2, but with the parts in different relative positions from what shown at said figures, and also showing part of a grain elevator leg; Fig. 5, a top plan, showing the parts of the weigher in same relative

positions as at Fig. 4, and also showing top plan of a tally box or registering device.

As shown at Fig. 4, the rectangular frame A is fixed to a grain elevator B by arms *b*, so as to support the weigher beneath its delivery spout B'. It will be understood, however that the weigher can be used to receive grain and weigh it as delivered thereto in a continuous stream or flow from any grain elevator or conveyer, but is more especially designed for use with an elevator or conveyer which receives grain as it is delivered from a thrashing machine, and delivers it in a continuous stream or flow to the weigher.

Vertical bars *a*, *a'*, fixed at their upper ends to a bar *a*² and at their lower ends to the frame A, at one side of the weigher, constitute together with a vertical bar *a*³ which similar to the bar *a'* is fixed to and projects upwardly from the frame A at the opposite side of the weigher, the intermediary supporting frame on which the working parts are mounted, as hereinafter described.

The scale-beam D is of ordinary construction, one of its ends consisting of a graduated bar *d*, and its other end consisting of a bail *d'* having arms or side bars *d*². The scale-beam is poised on suitable bearings *a*⁴ which are fixed to the bars *a'* and *a*³, and is provided with an ordinary weight *d*³, adjustable on the bar *d* for weighing, and an ordinary adjustable weight *d*⁴ on one of the bars *d*² for balancing the multibucket wheel and the scale-beam.

The multibucket wheel E has circular disk side parts *e*, connected by radial plates *e'*, which divide it into compartments or buckets *e*². The radial plates *e'* are of curved form, as shown by the intermittent lines in the side elevations, so that they will retain a portion of the grain as it is discharged from each bucket *e*² to revolve the buckets to a sufficient extent at each discharge of a bucket, to bring another bucket into proper position for receiving its charge of grain. One of the disks *e* has lugs *e*³ projecting from its periphery. There is one lug *e*³ to each bucket *e*², and they are preferably so located with reference to the buckets that two of them diametrically opposite each other are in an approximately vertical plane when the receiver is locked

with a bucket e^2 in proper position to receive grain, as hereinafter described, and as shown at Fig. 1. The ends e^4 of the shaft e^5 , which shaft is fixed to the receiver E axially thereof, are extended and serve as journals which rotate in bearings e^6 in the bars d^2 of the scale-beam, and the multibucket wheel E is thus poised and supported on the scale beam, and within the frame A. A shield G, supported on the frame A by resting thereon at g , and by straps g' , serves to guide the grain discharged from the buckets, after it is weighed, into a wagon or any other suitable receiver therefor. A strap b^2 fixed to the elevator leg B, serves as a guide and guard for the outer end of the scale-beam.

The bar H is vertical, or approximately so, and is pivoted at h to the frame A. This bar is slightly longer than the diameter of the multibucket wheel E, and has a detent or lug h' at its upper end, which lug projects over the adjacent disk e , and has a similar lug or detent h^2 at its lower end, which projects in a similar manner over the same disk. The upper and preferably longer end of the bar H is held with a yielding pressure or force against a stop lug h^3 , fixed to the bar a^2 , by a retractile spring h^4 which is attached at one end to the bar H and at its other end to the bar a^2 .

The bar a^2 extends beyond the bar a' , and has a lever I pivoted thereto at its midlength portion. The lower end of the lever I is pivotally connected with one end of a link rod i , the other end of which is similarly connected with the detent bar H. A detent pawl J is pivotally connected at one end with the upper end of the lever I, and its other end rests upon the adjacent disk e and is adapted to slide over and fall behind the lugs e^3 as the multibucket wheel E is intermittently revolved in operation. The free end, or distal end of the pawl J is held with a yielding pressure in contact with the disk e by a retractile spring j which is connected at one end to the detent pawl, and at its other end to the bar a^2 . The distal end of the detent pawl J is preferably provided with depending ears j' astride the edge of the disk e , for retaining said detent against lateral displacement on the disk e .

Assuming the parts to be in their normal and relative positions shown by full lines at Fig. 1, and the weight d^3 to be adjusted on the scale-beam at such point as will raise the multibucket wheel or series of buckets E to its highest place, limited by the disk e coming in contact with the upper detent lug h' , as shown at said figure, and at such point on the scale-beam as will require a given quantity or weight of grain in the bucket e^2 which is receiving the grain from the spout B', to overbalance the weight d^3 , and cause the multibucket wheel or series of buckets to fall or drop to its lower position, limited by the disk e coming in contact with the detent h^2 , as shown by dot lines at same figure, and thereby release the now uppermost lug e^3 from the detent h' , when the weight or gravity

of the grain in said bucket will then revolve the multibucket wheel or series of buckets E, in the direction shown by the arrow, and thus tilt or turn the bucket charged as last described, into such position that it will discharge its contained grain. As soon as this discharge of grain from the bucket commences, the weight d^3 overbalances the grain remaining in the bucket and raises the multibucket wheel E to its highest position, as shown by full lines at Fig. 2 and dot lines at Fig. 4, so that in its further revolution produced by momentum and by the grain remaining in the bucket, the lug e^3 succeeding the last one disengaged from the detent h' will come in contact with said detent and arrest the revolution of the bucket wheel E with the bucket e^2 succeeding the last one emptied, now presented to the spout B' for filling. Ordinarily the weight d^3 will raise the bucket wheel, as last described, before the lug e^3 succeeding the one last engaged with the detent h' has reached said detent, and thus bring this succeeding lug into contact with the detent h' and thereby arrest the further revolution of the bucket wheel with the next succeeding bucket e^2 presented to the spout B' for its charge of seed, but should the weight d^3 fail from any cause to raise the bucket wheel quick enough to engage the detent h' with the lug e^3 first succeeding the one last passing the detent h' , then the lug e^3 at the lower part of the bucket wheel will engage with the detent h^2 , as shown by full lines at Fig. 4, and arrest the further revolution of the bucket wheel, until such quantity of grain is discharged from the bucket that the weight d^3 will overbalance the bucket wheel E and raise it into the position shown by dot lines at same figure, when the grain remaining in the bucket will further revolve the bucket wheel and bring the proper upper lug e^3 into contact with the detent h' as hereinbefore described. A succession of these operations will carry each bucket e^2 through its orbital revolutions, and present the buckets successively, each in turn, to the spout B' for filling, and successively, each in turn, for discharge of its weighed quantity of grain. The detent pawl J will prevent, except to a limited extent as hereinafter described, any backward movement of the receiver while a bucket is filling, and will rise, as shown by broken lines at Fig. 4, to permit of the intermittent revolutions of the buckets e^2 . The lugs e^3 strike the detent lugs h' , h^2 , which are fixed to the bar H with blows of considerable force, and the yielding spring h^4 interposed as a connector between the upper end of the swinging detent bar H and the fixed bar a^2 , will permit the bar H to yield, as shown by dotted lines at Fig. 2, and the spring h^4 will act as a cushion to minimize the jar to the parts which would in the absence of said spring arise from the concussionary action of such blows, and then to restore the bar H to its normal position, with its upper end rest-

ing against the lug or shoulder h^3 , and when from any cause there is any reverse or backward movement of the bucket wheel E, to cause one of the lugs e^3 to strike the detent pawl J with any degree of force, said pawl will yield backwardly, swing the lever I, and thus by means of the link rod i force the upper end of the detent bar H backwardly, as shown also by the dotted lines at Fig. 2, so that the spring h^4 will act as a cushion to relieve concussion of the parts, and to restore them again to their normal positions with the detent bar H at its upper portion resting against the stop or lug h^3 .

It will be understood from the foregoing description that the lower end of the bar H with its detent lug h^2 can be dispensed with, and that the upper end of said bar with its lug h' and spring h^4 will with the other parts of the weigher constitute a complete working machine, the lower limb of the bar H and its lug h^2 acting only as a safety catch in case the upper lug h' fails to engage a lug e^3 at the proper time, and hence that I do not limit my claims in which the lower end of said bar and its lug h^2 are not included as elements, to any combinations in which said parts are directly or by implication included as an element or elements thereof.

An ordinary register L for registering the number of buckets weighed and discharged, is supported on the frame A by brackets l . One of the shaft ends, e^4 , is extended beyond the bail bar d^2 into the register L, and may be geared with the registering mechanism in any ordinary manner whereby each partial revolution of the receiver E to fill one bucket e^2 and discharge another bucket, will give a partial rotation to the shaft end e^4 and thereby operate the registering mechanism and register the same in an ordinary manner.

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

1. In a grain weigher, in combination substantially as hereinbefore described, with an intermittently revolving grain bucket wheel, having a series of compartments or buckets, and having projecting lugs on its periphery, and a poised scale beam on which said multibucket wheel is revolubly poised and mounted to rise and fall therewith, a bar extending diametrically across the multibucket wheel and provided with a detent lug at each end thereof, adapted to engage with the lugs on the multibucket wheel, substantially as described.

2. In a grain weigher, in combination substantially as hereinbefore described, with an intermittently revolving grain multibucket wheel, having a series of compartments or buckets, and also having projecting lugs on its periphery, and a poised scale-beam on which said multibucket wheel is revolubly poised, and mounted to rise and fall therewith, a pivoted swinging bar extending diametrically across the multibucket wheel and provided

with a detent lug at each end thereof, adapted to engage with the lugs on the multibucket wheel, substantially as described, and a yielding spring connection interposed between said swinging bar and a fixed connection.

3. In a grain weigher, in combination, substantially as hereinbefore described, with an intermittently revolving grain bucket wheel, having a series of compartments or buckets, and also having projecting lugs on its periphery, and a poised scale-beam on which said bucket wheel is revolubly poised, and mounted to rise and fall therewith, a pivoted swinging bar with a detent lug on its upper end, adapted to engage with the lugs on the bucket wheel substantially as described, and a yielding spring connection interposed between said swinging bar and a fixed connection.

4. In a grain weigher, in combination substantially as hereinbefore described, with an intermittently revolving grain bucket wheel having a series of compartments or buckets, and also having projecting lugs on its periphery, and a poised scale-beam on which said multibucket wheel is revolubly poised and mounted to rise and fall therewith, a pivoted swinging bar with a detent lug on its upper end, adapted to engage with the lugs on the multibucket wheel substantially as described, a yielding spring connection interposed between said swinging bar and a fixed connection, and a fixed lug or stop, such as h^3 , to limit the movement of the swinging bar in one direction.

5. In a grain weigher, in combination, substantially as hereinbefore described, with an intermittently revolving grain bucket wheel having a series of compartments or buckets and also having projecting lugs on its periphery, and a poised scale beam on which said multibucket wheel is revolubly poised and mounted to rise and fall therewith, a pivoted swinging bar extending diametrically across the multibucket wheel and provided with a detent lug at each end thereof, adapted to engage with the lugs on the multibucket wheel, substantially as described, a yielding spring connection interposed between said swinging bar and a fixed part of the supporting frame, and a stop, as h^3 , for the swinging bar.

6. In a grain weigher, in combination, substantially as hereinbefore described, with an intermittently revolving grain bucket wheel having a series of compartments or buckets and also having projecting lugs on its periphery, and a poised scale-beam on which said multibucket wheel is revolubly poised and mounted to rise and fall therewith, a pivoted swinging bar with a detent lug at its upper end adapted to engage with the lugs on the multibucket wheel substantially as described, a yielding spring connection interposed between said swinging bar and a fixed part, and a detent pawl J.

7. In a grain weigher, in combination substantially as hereinbefore described, with an intermittently revolving grain bucket wheel

having a series of compartments or buckets, and also having projecting lugs on its periphery, and a poised scale-beam on which said multibucket wheel is revolubly poised to rise and fall therewith, a pivoted swinging bar with a detent lug at its upper end, adapted to engage with the lugs on the multibucket wheel, substantially as described, a yielding spring connection interposed between said swinging bar and a fixed part, a detent pawl J, and a spring j for holding it in contact with the multibucket wheel.

8. In a grain weigher, in combination substantially as hereinbefore described, with an intermittently revolving grain bucket wheel having a series of compartments or buckets and also having projecting lugs on its periphery, and a poised scale-beam on which said multibucket wheel is revolubly poised and mounted, to rise and fall therewith, a pivoted swinging bar with a detent lug at its upper end adapted to engage with the lugs on the multibucket wheel, a yielding spring connection interposed between said swinging bar and a fixed part, a pawl J pivoted to a rocking bar I, and a link rod i connecting said rocking bar with

said swinging bar which has a detent at its upper end.

9. In a grain weigher, in combination, substantially as hereinbefore described, with an intermittently revolving grain bucket wheel having a series of compartments or buckets and also having projecting lugs on its periphery, and a poised scale-beam on which said multibucket wheel is revolubly poised and mounted to rise and fall therewith, a pivoted swinging bar extending diametrically across the multibucket wheel and provided with a detent lug at each end thereof adapted to engage with the lugs on the multibucket wheel, a yielding spring connection between said swinging detent bar and a fixed part, a pawl J pivoted to a rocking bar I, and a link rod i connecting said rocking bar and said swinging detent bar at the end thereof.

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

EUGENIO K. HAYES.

Witnesses:

H. M. RICHARDS,
B. F. HOLCOMB.