

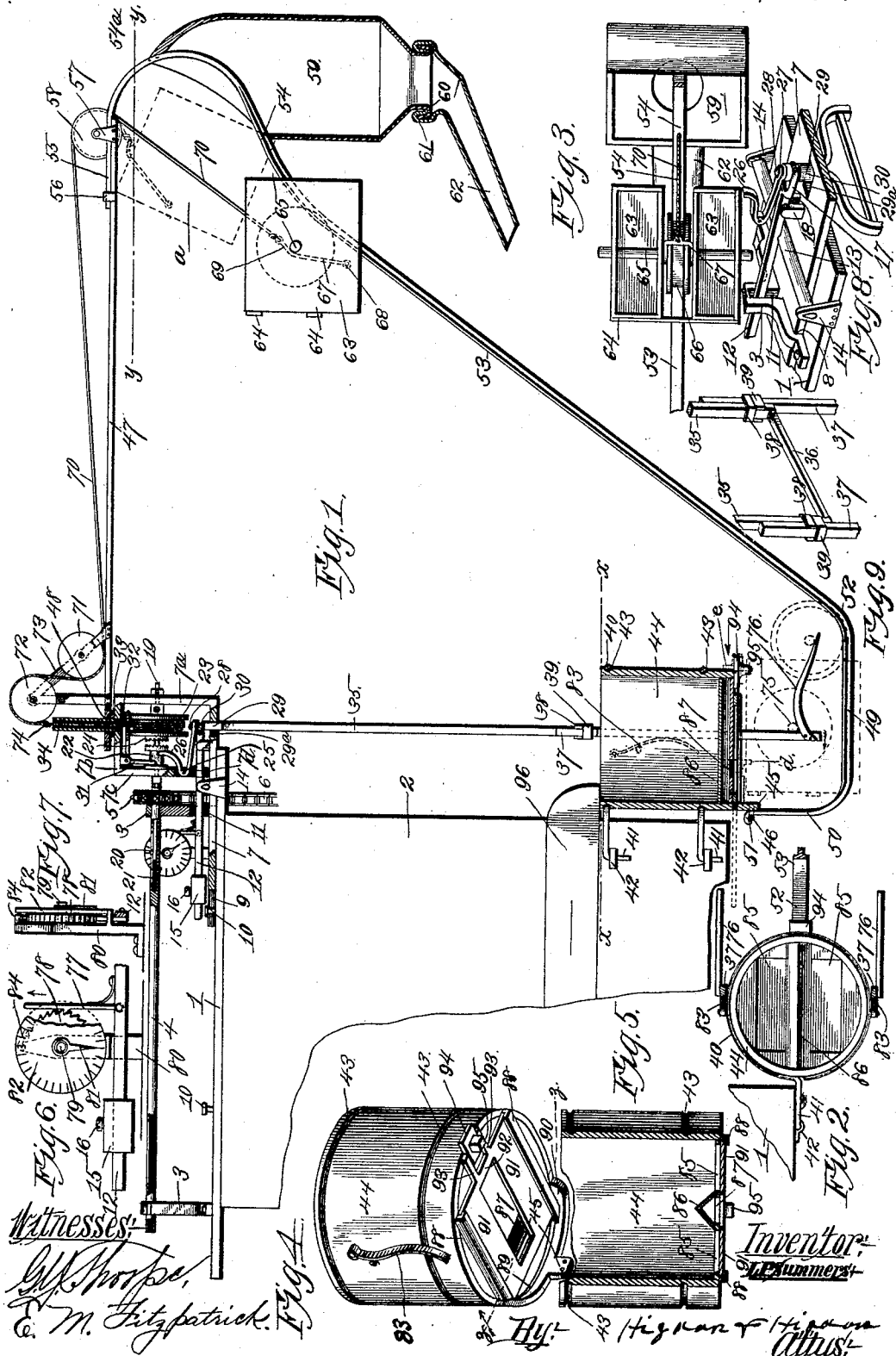
(No Model.)

L. P. SUMMERS.

GRAIN WEIGHING, REGISTERING, AND DISCHARGING MACHINE.

No. 528,403.

Patented Oct. 30, 1894.



UNITED STATES PATENT OFFICE.

LEWIS PRESTON SUMMERS, OF KANSAS CITY, ASSIGNOR OF ONE-TENTH
TO WILLIE S. MEAD, OF SHEFFIELD, MISSOURI.

GRAIN WEIGHING, REGISTERING, AND DISCHARGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 528,403, dated October 30, 1894.

Application filed November 14, 1893. Serial No. 490,951. (No model.)

To all whom it may concern:

Be it known that I, LEWIS PRESTON SUMMERS, of Kansas City, Jackson county, Missouri, have invented certain new and useful
5 Improvements in Grain Weighing, Registering, and Discharging Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

10 My invention relates to machines for weighing, registering and discharging grain, and has for its object to produce a machine of this character which will automatically weigh, register, elevate and discharge grain into a
15 suitable receptacle placed for the purpose.

A further object is to provide such a machine, which may be readily attached to or detached from a thrashing machine, and which is simple, durable and comparatively
20 inexpensive of construction.

My invention essentially consists in the combination with a weighing and registering mechanism, of a swinging frame or track, provided with a hopper or receptacle to receive the grain from the thrasher, and a funnel or receptacle through which the grain is
25 passed to the wagon, bag, or other receptacle to receive it, and an intermediate traveling bucket, which receives the grain from the hopper, and conveys it to the discharge funnel or receptacle, and then returns to its original and normal position beneath the
30 hopper.

My invention also consists in the peculiar
35 and novel construction and combination of its parts, as hereinafter described, claimed and illustrated in the accompanying drawings, in which—

Figure 1, is a partial end view representing a thrashing machine, and showing applied thereto in operative position, partly in section and partly in elevation, a machine constructed in accordance with my invention.
40 Fig. 2, is a horizontal sectional view, taken on the line $x-x$ of Fig. 1. Fig. 3, is a horizontal sectional view, taken on the line $y-y$ of Fig. 1. Fig. 4, is a detail perspective view of the grain receiving hopper or receptacle. Fig. 5,
45 is a vertical sectional view of the same, taken on the line $z-z$ of Fig. 4. Fig. 6, is a detail

view of the grain registering mechanism. Fig. 7, is an edge view of the same. Fig. 8, is a detail perspective view of a portion of the mechanism carried at the upper side or
55 top of the thrashing machine. Fig. 9, is a detail perspective view of a portion of the adjustable frame connected to the registering mechanism.

Referring to the drawings, where similar numerals refer to corresponding parts in all
60 the figures, 1 designates a board which is rigidly but detachably secured upon and transversely of the rear end of the thrashing machine 2. A suitable distance from each
65 end of this board, a pair of vertical bearing brackets 3, are carried, and journaled horizontally above the thrashing machine, is a shaft 4, upon which is mounted near one end a sprocket pinion 5, which is connected
70 through the medium of chain 6 with a power pinion (not shown) upon any convenient part of the thrasher.

A frame consists of a horizontal portion 7 which fits snugly within the recess 8 of one of the bearing brackets 3, and upon the upper
75 side of the transverse board 1. This horizontal portion 7, is also provided with a longitudinal notch 9, in its inner end, which embraces and is guided upon a bolt 10, projecting upwardly from the board 1; the headed
80 end of said bolt resting upon the upper side of the board 7, adjacent to the margin of the notch 9, so as to prevent any vertical movement of said frame. Fitting and adapted to
85 operate vertically in the slot or notch 11 of the said bearing bracket 3, is a lever 12, and this lever extending longitudinally of and above the horizontal portion of the frame referred to, is fulcrumed a suitable distance
90 from its outer end upon the transverse bar 13, which is carried in ears 14 secured rigidly to opposite edges of the board 1. A weight
95 15 is mounted upon the opposite or inner end of said lever, and is adjustable thereon by means of the set screw 16. The lever 12 is guided in its vertical movement, near its
100 outer end, between the vertical and parallel ears 18 rising from the horizontal portion 7, of the frame. The outer portion of this frame which forms a rectangle, consists of the ver-

tical portions or sides 7^a, and 7^c, united at their lower and upper ends by horizontal portions 7, and 7^b. A shaft 19, is journaled horizontally through the side portions 7^a, and 7^c, of said frame, and is of sufficient diameter to fit snugly within the bore or channel of the adjacent end of the shaft 4, said shaft being preferably formed of gas pipe, and the inner end of said shaft is provided with a radial pin or projection 20, which engages a longitudinally extending groove or slot 21, so as to allow of the longitudinal adjustment of the shaft 19. Keyed to slide upon and revolve with the shaft 19, and mounted within the rectangular portion of the frame, is a ratchet clutch-section 22, which is of decreased diameter at its center so as to form an annular flange at each end.

A winding-drum 23, is mounted loosely upon the shaft 19, also within the rectangular portion of the frame, and is provided at its inner face with a ratchet clutch-section 24, which is adapted to be engaged by the clutch-section 22, at times, as hereinafter explained.

Pivotally mounted at 25, within the vertical slot or notch 7^a, in the vertical side 7^c, of the frame, formed to receive the lever 12, is a lever which is provided with an arm 26, bearing against the outermost flange of the clutch-section 22, and with a lower arm which is provided with a longitudinally extending slot 27, which loosely embraces the neck of a vertical bolt 28, which projects upwardly from the cylindrical upper end 29, of a frame hereinafter described, which is adapted to partially rotate, and adapted to have a slight movement in a vertical plane and transversely of the thrashing machine. To allow of this movement a longitudinal slot 29^a, is formed in the horizontal portion 7, of the frame, through which the upper end 29, of this frame projects. The upper end 29 of this frame is also provided with an annular groove 30, which is embraced by the fork 17, formed at the outer end of the lever 12. This annular groove is of sufficient size to allow of the slight swinging movement alluded to, of the frame, as well as a rotatable movement.

A bell crank lever 31, is pivotally carried in the upper corner of the rectangular portion of the framework, and has a depending arm bearing against the outer side of the inner flange of the clutch-section 22, and has its horizontal arm projecting slightly beyond the outer side of the winding drum 23, and provided with a vertical opening 32, for a purpose hereinafter explained. An adjustable collar 33, is mounted upon the upwardly projecting and vertical tube 34, carried by the horizontal portion 7^b, of the frame, and the channel of this tube is vertically above the opening 32, of the lever.

The rotatable and swinging frame hereinbefore mentioned, consists of a pair of parallel bars 35, arranged a suitable distance apart, and braced by cross-bars 36, and these bars

35, converge at their upper ends and are secured together to form the cylindrical portion 29, before alluded to. A pair of similar bars 37, are fitted against the outer sides of the bars 35, and are provided with inwardly projecting loops 38, which embrace their respective bars 35. The lower ends of the bars 35 also carry a pair of outwardly projecting loops 39, which embrace the bars 37. It will be seen by this arrangement, that when the frame is in its normal or extended position, the loops 38, of the lower portion rest upon the loops 39, of the upper portion, and prevent their disconnection, while at the same time the contraction of the frame is not interfered with, because the loops 38, of the lower frame may slide upward upon the bars 35, of the upper frame. This movement is desirable at times, as hereinafter referred to.

A pair of horizontally arranged rings or bands 40, are formed in any suitable manner, and are provided with radially projecting hook portions 41, which engage loops 42, secured to the thrashing machine a suitable distance from its lower end, and these rings or bands 40, loosely engage annular grooves 43, formed exteriorly in a cylindrical hopper or receptacle 44, which is provided with a depending lug or projection 45, carrying a loop or staple 46, which projects outwardly therefrom.

A swinging frame consists of the horizontal bar or portion 47, which is provided near its inner end with an opening 48, which loosely and pivotally embraces the cylindrical tube 34, and rests upon the adjustable collar 33, and a track-portion which is bent to form at its lower end a horizontal portion 49, extending diametrically of and a suitable distance below the hopper 44, the upwardly extending portion 50, terminating in the hook 51, which engages detachably the loop or staple 46, the upwardly and outwardly extending inclined portion 53, which is connected at its lower end by the curved portion 52, to the outer end of the horizontal portion 49, and which is curved to extend at a less angle at its upper end at 54, to join the vertically arranged and semicircular portion 54^a, which is extended inwardly and horizontally at 55, and rests upon the outer end of the bar or portion 47, and is embraced by the loop 56, carried thereby. The side margins of said horizontal portion 55, are also embraced by the vertical ears 57, carried at the outer end of the bar or portion 47, and connecting these ears 57 is a shaft, upon which is mounted a grooved-pulley 58.

A funnel or discharge receptacle 59, is carried by the track portion, and depends vertically from the semicircular curved portion 54^a. This funnel or receptacle is decreased in size at its lower end, and has its lower margin turned up exteriorly to form the circular and annular flange 60.

The spout 62, is formed with an annular and circular hook portion 61, which engages this

groove 60, so that said spout may be rotated thereon, that it may be turned to discharge the grain in any direction desired.

A traveling bucket consists of the vertical 5 and similar rectangular receptacles 63, which are arranged a suitable distance apart, and connected rigidly together at their inner sides by means of the cross-bars 64.

A shaft 65, extends horizontally through 10 said buckets, a slight distance above their center, and a wheel 66, is mounted upon said shaft, and is flanged at either margin, to embrace the opposite edges of the track-rail of the swinging frame.

A bail 67, is pivotally mounted at 68 inward 15 of the shaft 65, and near the lower margin of the inner sides of the receptacle 63, and extending upwardly upon the adjacent or inner side of a shaft, is bent forward slightly as 20 shown at 69, and is connected to the lower end of a cable 70 which passes around the groove pulleys 58, 71 and 72, the two latter being carried by the frame 73, projecting upwardly from the bar or portion 47 of the 25 swinging frame, and then passes vertically downward through the tube 34, and the hole 32 formed in the bell-crank lever 31, and is secured to the winding-drum 23. This cable is formed with a knot or enlargement 74, for 30 a purpose hereinafter explained. When the bucket is in position to receive the grain, the projecting ends of the shaft 65, rest in the crotches 75, formed by the junction of the bars 37, of the frame connected to the lever 35 12, and the guide-bars or arms 76, secured thereto and projecting outwardly therefrom.

It will be seen from the foregoing, that when the bucket receives a certain quantity of grain, the weight 15, will be overbalanced and 40 the bucket automatically and by gravity will descend, thus pivotally operating the lever, and causing its spring-actuated and pivotally carried bar 77, which is provided with a tooth upon its inner side, to move upward and rotate the ratchet-wheel 78, carried upon stub- 45 shaft 79, of standard 80, the distance of one notch, and this rotatable action of the ratchet wheel will be communicated to the indicator 81, also mounted upon said shaft, which will 50 register the weight or quantity of grain upon the face of the dial 82. Simultaneously with this operation, the lever having the arm 26, is operated, and this forces the slidable clutch-section 22, into engagement with the companion section 24, and causes the winding- 55 drum 23 to rotate, which winding the cable thereon, will pull the bucket from its seat upon the guide-arms 76, and cause the roller 66, to travel along the portions 49, 52 and 53, 60 of the track rail, until the inner end of the curved portion 54, is reached. Immediately the roller begins to traverse upwardly the curved portion 54, the cable begins to exert a direct pull upon the pivotal point 68 of the 65 bail, which being eccentric of the center of said bucket, will cause the bucket to begin

to tilt outwardly until the upper corner of the bucket comes in contact with and fulcrums upon the adjacent or inner side of the funnel or receptacle 59. Immediately this 70 takes place, the continued upward pull upon the cable causes the bucket to tilt to the position shown in dotted lines at Fig. 1, and discharge its contents into the funnel or receptacle 59, through which, and also through 75 the spout 62, it passes to a wagon, bag, or other receptacle placed to receive the grain. Immediately the bucket is tilted to its farthest point, the knot 74, passing downward through the tube 34 comes in contact with 80 the upper side of the bell crank lever 31, and being too large to pass through the opening thereof, depresses the outer end of the same, and causes its depending inner arm to slide the clutch-section 22, back to its original position. 85 Immediately this action takes place, the bucket being relieved of the upward pull, by gravity descends upon the track, and the momentum it acquires in such descent is sufficient to cause it to travel upwardly upon the 90 guide arms 76, until its movement is arrested by coming in contact with the bars 37. To break the force of the impact upon said bars, the springs 83 are provided; these springs being carried by the hopper 44, and having their 95 lower and free ends arranged inward of the bars 37, so as to cushion the pivotal movement of said bars, and return them to their vertical position. It will be seen also, that immediately the grain laden bucket is removed from the guide arms 76, the weight 100 15 by gravity causes the lever 12 to pivotally resume its original position, and to prevent any backward rotation of the ratchet 78, I provide a gravity pawl 84, which is pivotally 105 carried at the upper end of the standard 80, and engages the said ratchet-wheel.

I will now proceed to describe the construction of the hopper 44, which is adapted to be 110 open at its lower end when the bucket is below, and which is adapted to be closed to prevent the egress of grain, when the bucket is moved from beneath said hopper. In order to accomplish this, the bottom of the hopper is formed with a pair of elongated openings 115 85, leaving the remainder of the bottom intact. The longitudinally extending portion intermediate of the openings 85, is arched over at 86, and is provided a suitable distance from its inner end with an opening 87. 120

Extending longitudinally of the bottom of the hopper, and marginally of the outer sides of the openings 85, are the grooved cleats 88; these grooved cleats 88, connecting at their inner ends with a slot 89, formed in a depend- 125 ing segmental flange 90.

A slide, consists of the elongated rectangular portions 91, arranged to operate longitudinally in the grooved cleats 88, and against the bottom of the hopper, and these rectangular portions 91, of the slide are united at 130 their opposite ends by cross-bars 92, which

may be integral or not as desired, or if desired, the slide may be formed in one continuous section.

Projecting forwardly from the front margin of the slide, are a pair of arms 93, and pivotally carried by said arms, and of slightly less width than the opening 87, in the bottom of the hopper is a plate 94, which in its normal position rests against the bottom of said hopper, and this plate is provided with a depending lug or projection 95.

When the bucket is in the position shown in full lines in Fig. 1, or in any position not beneath the hopper 44, the slide occupies the position shown in Figs. 1 and 4, and closes the openings 85, formed in the bottom thereof, and prevents egress of grain from the hopper, which is being supplied at this time from the trough or chute 96, of the thrashing machine. This chute of course may be inclined to feed the grain by gravity, or may be provided with a conveyer of the usual or any preferred construction, so as to discharge the grain therefrom into the hopper continuously. After the bucket has dumped or discharged its grain, and descends again, the cross bar 64 at the upper and inner corner thereof comes in contact with the depending lug or projection 95 of the pivoted plate 94, and forces the slide in the direction of the arrow Fig. 1, through the slot 89, of the depending flange 90, to the position shown in dotted lines. As the slide is moved inward, the pivoted plate follows along the bottom of the hopper, and when it reaches the opening 87, its limit of inward travel, the pressure of the top-bar 64 of the bucket causes it to pivotally operate to the position shown at *d*, dotted lines, to allow the bar 64, to pass farther inward, and in position to receive all of the grain descending from the hopper through the openings 85. Immediately the bar 64 passes from contact, the pivoted plate by gravity, resumes its former horizontal position.

When the bucket is filled or contains a predetermined quantity of grain, it overbalances the weight 15, and pivotally operating the lever 12, descends upon the portion 49, of the track-rail and this movement, automatically registers the quantity of grain, and simultaneously causes the revolving clutch-section 22, to engage the clutch-section 24, and winding the cable upon the drum 23, cause the bucket to move first outward along the track-portion 49, and then upward to the point of discharge. When the bucket starts on its outward travel, the inner side of the top cross-bar 64, comes in contact with the lug 95, of the pivoted plate and slides it back to the outer margin of the bucket, where resistance not being offered, it pivotally swings to the position shown in dotted lines at *e*, until the bar has passed from contact, when by gravity, it automatically resumes its original position.

From the pivotal arrangement of the track-frame, the hopper, and the adjustable frame connected to the weighing mechanism, it will

be apparent, that the track-frame may be rotated or swung to either side of its normal position, that the grain may be discharged into different wagons, bins, boxes, &c., without the necessity of moving said articles; thus saving considerable time and labor. By mounting the frame, which carries the weighing and registering mechanism, &c., detachably upon the board 1, it will be apparent that it may be quickly and easily transferred from one side of the thrasher to the other, if it be deemed necessary or desirable.

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

1. In a machine for weighing, registering, conveying and discharging grain, the combination with a grain supply, of a swinging track-frame, a rotatable hopper located at one end of and adapted to rotate with the track frame, and a funnel or receptacle carried near the opposite end of the track frame, and a traveling bucket mounted upon said track-frame and adapted to receive the grain from the hopper, and dump it into the funnel or receptacle, substantially as set forth.

2. In a machine for weighing, registering, conveying and discharging grain, the combination with a thrashing machine, having a discharge chute or feed supply, and a number of bands or rings carried by said thrashing machine, of a hopper rotably supported by said bands or rings, a sliding frame also carried by said thrashing machine, and a track-frame pivotally carried by the sliding frame at one end, and detachably connected to the hopper at its opposite end, and carrying a funnel or receptacle, substantially as set forth.

3. In a machine for weighing, registering, conveying and discharging grain, the combination with a shaft, a drum mounted thereon, a track-frame, and guide-pulleys carried by said track-frame, of a bucket consisting of two receptacles, a shaft extending through said bucket, a flanged roller upon said shaft and engaging the track-frame, a pivoted bail carried by said bucket, and a cable guided over said pulleys, and connecting the said bail, and the winding drum, and means to operate the shaft and cause the roller to travel upward upon the track portion of the track-frame, substantially as set forth.

4. In a machine for weighing, registering, conveying and discharging grain, the combination with a shaft, a ratchet clutch-section mounted to slide upon and revolve with said shaft, and a winding-drum provided with a companion ratchet clutch-section, and loosely mounted upon the shaft, of a track-frame, guide-pulleys carried thereby, a traveling bucket mounted upon said track-frame, a cable guided over said pulleys and connecting the drum and the bucket, and means to cause the slidable clutch-section to engage its companion section carried by the drum, so as to wind the cable upon said drum and elevate the bucket, and means to automatically with-

draw said clutch-section from its engagement with the winding drum clutch-section so as to allow the bucket to descend by gravity to its original position, substantially as set forth.

5 5. In a machine for weighing, registering, conveying and discharging grain, the combination with a frame, a lever carried thereby, and a registering mechanism operatively connected to said lever, of a frame depending
10 from said lever, and provided with guide-arms, a track-frame, and a bucket adapted to travel upon said track-frame and also upon the frame connected to the lever so as to be carried thereby, and adapted when supplied
15 with grain to pivotally operate said lever and the registering mechanism, and to descend upon the track-frame, substantially as set forth.

6. In a machine for weighing, registering,
20 conveying and discharging grain, the combination with a revolving shaft, a clutch-section mounted to slide upon and revolve with said shaft, a winding-drum provided with a companion clutch-section mounted loosely upon
25 said shaft, a track-frame, guide-pulleys carried thereby, a traveling bucket mounted upon said track-frame, and a cable guided over said pulleys and connecting the winding drum and the traveling bucket, of a weighing and registering mechanism, adapted to be
30 automatically operated by the grain laden bucket to throw the slidable clutch-section into engagement with the clutch-section of the winding-drum and elevate the bucket, and a knot or enlargement upon the cable
35 adapted through intermediate mechanism to disengage said clutch-sections, and allow the bucket, by gravity to resume its original position, substantially as set forth.

40 7. In a machine for weighing, registering, conveying and discharging grain, the combination with a hopper having openings in the bottom, a slide closing said openings, and a plate carried by said slide, of a track-frame
45 extending beneath said hopper, a traveling bucket mounted thereon, and a bar carried by said bucket and adapted, when the bucket moves upon the track-frame and beneath the hopper, to engage said plate and move the
50 slide to expose the openings of the hopper, and adapted, when the bucket is moved from beneath said hopper, to engage said plate and move the slide back to its original position, substantially as set forth.

55 8. In a machine for weighing, registering, conveying and discharging grain, the combination with a hopper having openings in its bottom, and an arch or false bottom closing one of said openings, and guide-cleats arranged at the outer margins of the other openings, of a slide frame engaging said guide-cleats and closing said openings, and a pivoted plate carried by said slide-frame, and provided with a depending lug or projection, a
60 track-frame, and a traveling bucket mounted thereon and adapted when moving in one direction to engage the depending lug of the

pivoted plate and force the slide to uncover the openings in the bottom of the hopper, and adapted when moving in the opposite direction to engage the said lug and move the
70 slide back to its original position to prevent the egress of grain from the hopper, substantially as set forth.

9. In a machine for weighing, registering,
75 conveying and discharging grain, the combination with a hopper, and a funnel having a rotatable spout, of an inclined track-frame suitably supported and terminating at its lower end beneath the hopper, and having a
80 curved portion at the inner side of the hopper, of a traveling bucket having a wheel mounted upon the track-frame, a bail pivotally carried by the bucket inward of the axis of said wheel, a drum, a cable suitably guided
85 and connecting the drum and the said bail, and means to wind the cable upon the drum until the bucket fulcrums upon the funnel and discharges its contents therein, substantially as set forth.

10. In a machine for weighing, registering, conveying and discharging grain, the combination with a weighing and registering mechanism, and a frame operatively connected thereto, and provided with guide-arms at its
95 lower end, of a track-frame, and a traveling bucket having a shaft projecting there-through, which is adapted when the bucket descends to ride upward upon the guide arms so that the weight of the bucket shall be sustained by the weighing mechanism, substantially as set forth.

11. In a machine for weighing, registering, conveying and discharging grain, the combination with a weighing and registering mechanism, and a frame operatively connected thereto, and provided with guide-arms at its lower end, of a track-frame, and a traveling bucket having a shaft projecting there-through, which is adapted when the bucket
110 descends to ride upward upon the guide arms so that the weight of the bucket shall be sustained by the weighing mechanism, and springs arranged adjacent to the inner side of the guide-arm carrying frame, and adapted
115 to cushion the impact of the bucket shaft against said frame, substantially as set forth.

12. In a machine for weighing, registering, conveying and discharging grain, the combination with a board mounted upon a thrashing machine, and bearing brackets carried thereby, and a hollow and slotted shaft mounted in said bearing brackets, and headed bolts or pins carried by said board, of a sliding frame, mounted upon said shaft and fitting in a recess in the lower portion of one of said bearing brackets, and having a notched inner end engaging one of said headed bolts, and a shaft mounted in said sliding frame and fitting within the first mentioned shaft,
125 and having a pin engaging a slot thereof, a drum mounted loosely upon said shaft, and provided with a clutch-section, and a second clutch-section mounted to slide upon and re-

5 volve with said shaft, a cylindrical tube carried by said sliding frame, a hopper rotably carried by the thrashing machine, a track-frame rotably mounted at one end upon said tube, and having its opposite end engaging the loop carried by the hopper, a traveling bucket mounted upon the track-frame, a suitably guided cable connecting the bucket and the winding-drum, and means to cause the

bucket to be elevated and to be allowed to descend by gravity, automatically, substantially as set forth. 10

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

LEWIS PRESTON SUMMERS.

Witnesses:

MAUD FITZPATRICK,
G. Y. THORPE.