

Jan. 14, 1941.

S. E. FINCH

2,228,595

GRAIN MEASURING AND SACKING DEVICE

Filed April 3, 1940

2 Sheets-Sheet 1

Fig. 1.

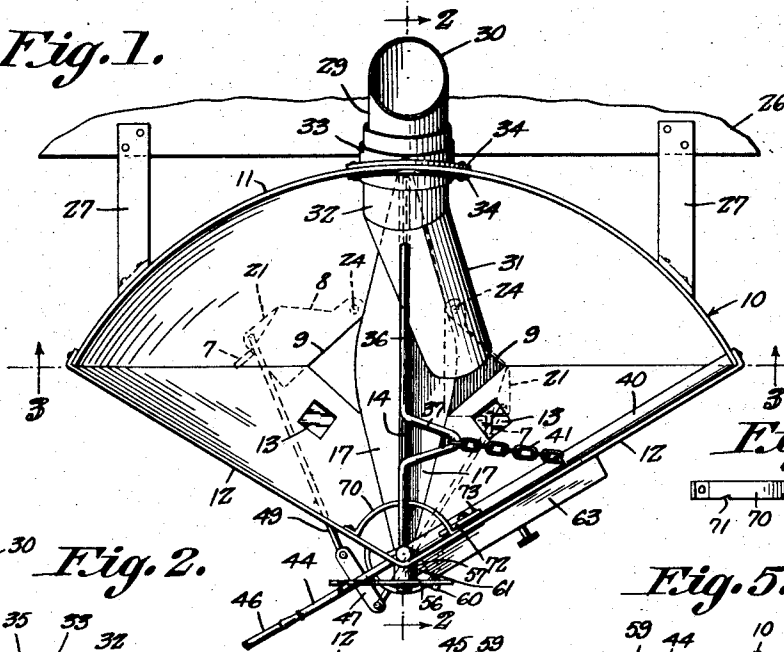


Fig. 12.

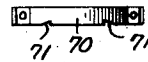


Fig. 2.

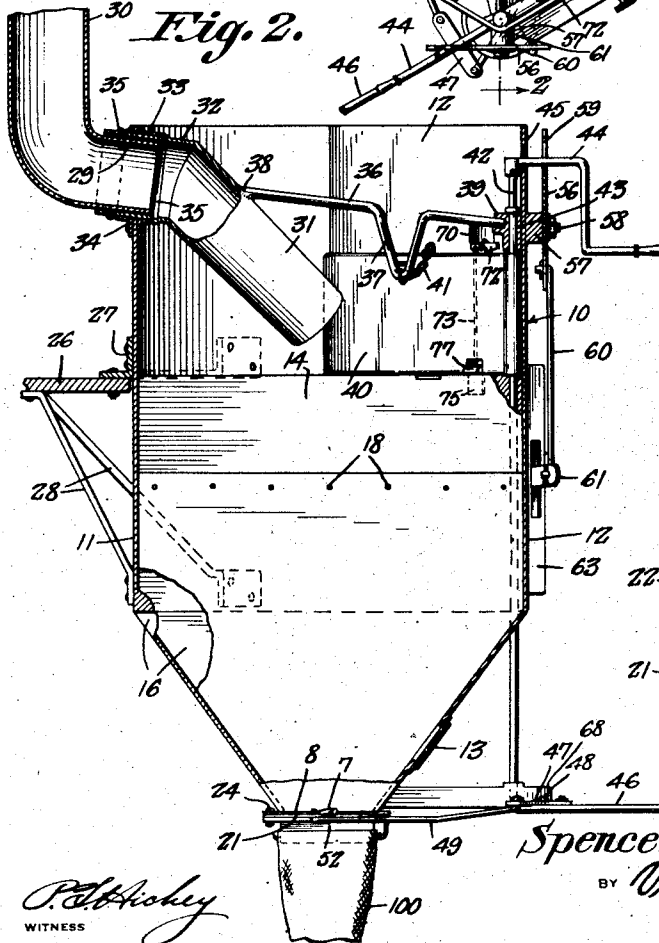


Fig. 5.

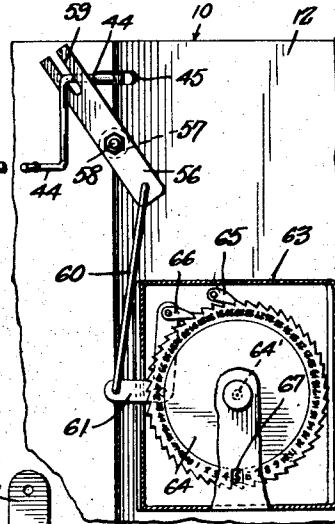
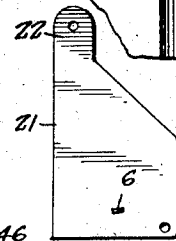


Fig. 9.



Spencer E. Finch, INVENTOR

BY Victor J. Evans & Co.

ATTORNEYS

P. H. Ashby
WITNESS

Jan. 14, 1941.

S. E. FINCH

2,228,595

GRAIN MEASURING AND SACKING DEVICE

Filed April 3, 1940

2 Sheets-Sheet 2

Fig. 3.

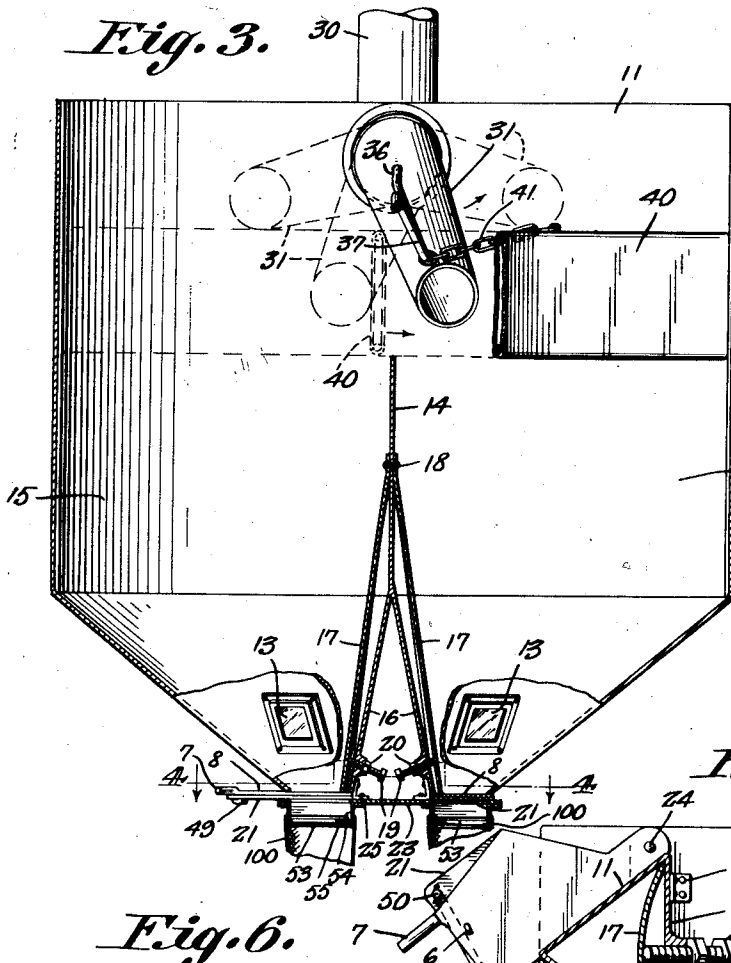


Fig. 10.

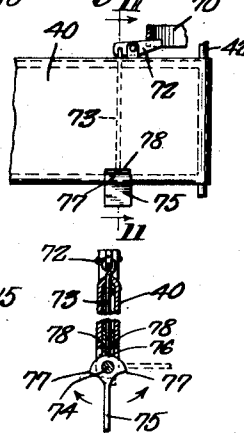


Fig. 11.

Fig. 4.

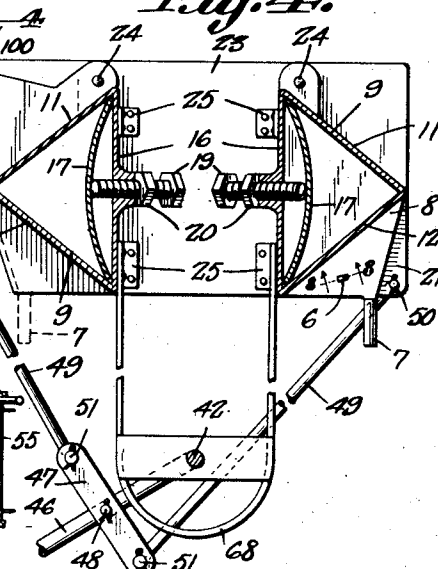


Fig. 6.

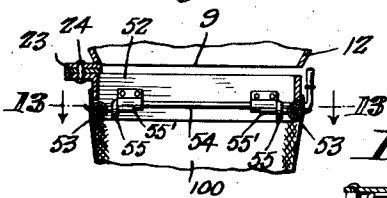


Fig. 13.

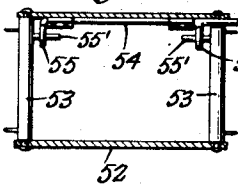


Fig. 7.

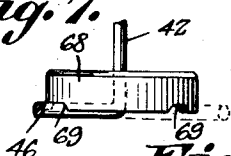


Fig. 8.



Spencer E. Finch, INVENTOR

BY Victor J. Evans & Co. ATTORNEYS

P. H. Hickey
WITNESS

UNITED STATES PATENT OFFICE

2,228,595

GRAIN MEASURING AND SACKING DEVICE

Spencer E. Finch, Bailey, N. C.

Application April 3, 1940, Serial No. 327,709

7 Claims. (Cl. 221—95)

This invention relates to a grain measuring and sacking device particularly adapted to combines and has for an object to provide a device of this character having a hopper divided into two compartments of one- or two-bushel capacity, one of which may be filled while the contents of the other is being bagged, there being a single swingably mounted spout for alternately filling the compartments, said spout being moved to operable position by a manually operable leveler blade adapted to level off the top of a filled compartment as it moves the spout to the delivery position over the other compartment.

A further object is to provide a device of this character having a deformable partition wall in each compartment and means for deforming the wall to vary the cubical content of the compartment.

A further object is to provide a device of this character having a single vertically disposed shaft which may be operated from the top or from the bottom, and which is connected to the leveler blade for swinging the leveler blade to either of its two limits of movement, there being a shaft above the first-named shaft and disposed horizontally in the casing for mounting the spout and to be turned on a horizontal axis when struck by the leveler blade.

A further object is to provide a device of this character having a centrally pivoted rocking link connected to a handle on the upper end of the vertically disposed shaft and connected to counting mechanism for counting the number of bushels in filled bags.

A further object is to provide a device of this character having pivoted valves connected to the lower end of the vertically extending shaft and adapted to close the outlet opening of one of the compartments and unseal the outlet opening of the other compartment simultaneously with movement of the spout to compartment filling position.

A further object is to provide apparatus of this character which will be formed of a few strong simple and durable parts, which will be inexpensive to manufacture, and which will not easily get out of order.

With the above and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings forming a part of this specification:

Figure 1 is a plan view of a grain measuring and sacking device constructed in accordance with the invention.

Figure 2 is a longitudinal sectional view of the device taken on the line 2—2 of Figure 1.

Figure 3 is a cross sectional view of the device taken on the line 3—3 of Figure 2 showing the delivery spout dotted in various positions of its swinging movement.

Figure 4 is a cross sectional view of the device taken on the line 4—4 of Figure 3, showing the valves for controlling the outlet openings and showing the deformable partitions and their adjusting means for varying the cubical contents of the compartments.

Figure 5 is a front elevation of the counting device with the cover removed.

Figure 6 is a detail sectional view of one of the bag holders.

Figure 7 is a detail front elevation of the catch for yieldably holding the vertically disposed shaft rocked axially to either limit of its movement.

Figure 8 is a detail cross sectional view taken on the line 8—8 of Figure 4 showing the locking means between one of the mechanically operated valves and associated manually operated valve.

Figure 9 is a plan view of one of the mechanically operated valves for controlling a respective delivery opening.

Figure 10 is a detail sectional view of the leveler blade locking device and grain operated control flap therefor.

Figure 11 is a cross sectional view taken on the line 11—11 of Figure 10.

Figure 12 is a rear elevation of the notched bar of the leveler blade locking device.

Figure 13 is a cross sectional view of the bag holder taken on the line 13—13 of Figure 6.

Referring now to the drawings in which like characters of reference designate similar parts in the various views, 10 designates a hopper having an arcuate rear wall 11 and two converging front walls 12, all of the walls being inclined toward the vertical axis of the hopper at the bottom as shown in Figures 2 and 3. Windows 13 are formed near the bottom of the front walls through which the interior of the hopper may be viewed. A vertical partition 14 is disposed centrally in the hopper to divide the hopper into two compartments 15. The partition is provided at the bottom with diverging branch walls 16, which co-act with the inclined bottom portions of the rear and front walls to

form triangular discharge openings 9, as best shown in Figures 1 and 4.

A pair of deformable partition walls 17, preferably formed of resilient sheet metal, are secured at the upper ends to the partition wall 14 by rivets 18, or other connectors, and these deformable walls extend downward to the bottom of the hopper compartments inside of a respective branch wall 16. Adjusting screws 19 are threadedly engaged in threaded bosses formed on the diverging branch walls 16 and engage the deformable partition walls 17 to bow out the walls and vary the cubical capacity of each compartment. Lock nuts 20 are disposed on the adjusting screws.

The discharge openings are controlled by respective valves 21 in the nature of plates of the general shape shown best in Figure 9. Each valve is provided at one end with a hinge lug 22 which is pivotally secured to a base plate 23 by a pivot pin 24. The base plate is secured to the inclined branch walls 16 by angular brackets 25 and is cut away to expose the discharge opening 9. The valves 21 are mechanically operated as will presently be described to slide laterally on the base plate 23 and respectively open one of the discharge openings and seal the other discharge opening.

Superposed on each valve 21 is a manually operable valve 8 of substantially the same shape as the valve 21. The valve 8 is mounted on the pivot pin 24 of the valve 21 and is provided with a handle 7 to close the valve independently of the valve 21. Interfitting pressed-up catches 6, best shown in Figure 8, yieldably hold the valves 21 and 8 for operation as a unit.

The hopper 10 is adapted to be secured to a combine 26 by angle bracket 27 and brace rods 28 which co-act to support the hopper vertically on the delivery end of the combine. The elbow portion 29 of the delivery pipe 30 of the combine extends downwardly through an opening in the rear wall 11 of the hopper at the top of the hopper, as best shown in Figures 1 and 2.

A delivery spout 31 is provided at the upper end with an upwardly inclined elbow portion 32 which telescopically receives the downwardly inclined elbow portion 29 of the combine delivery pipe. The elbow portion 32 is rotatably received in a sleeve bearing 33 which is secured by angle clamp rings 34 to the edge portions of the opening which receives the discharge elbow of the combine delivery pipe, as best shown in Figures 1 and 2. Pressed-out annular ribs 35 are formed on the elbow portion 32 of the delivery spout 31 and engage opposite ends of the sleeve bearing to hold the delivery spout against endwise movement in the bearing while permitting free rotation of the delivery spout in the nature of a pendulum from the top of one compartment to the top of the other compartment, as shown by dotted lines in Figure 3.

A shaft 36, provided with a crank 37, is fixed at one end as shown at 38 to the delivery spout and is journaled at the opposite end in a bearing 39 disposed at the meeting longitudinal edges of the front walls 12, as best shown in Figure 2. This shaft provides means for pulling the delivery spout from one operative position to the other operative position as will now be described.

A leveler blade 40, formed of a substantially rectangular blank of sheet metal folded upon itself as shown in Figure 3, is disposed above the top of the partition 14 and is pivoted at the bearing 39 to swing horizontally across the hopper from one front end wall 12 to the other front end

wall 12 for the purpose of leveling off grain in a too full compartment and scraping the excess into the empty compartment. A link chain 41 is connected to the crank 37 of the shaft 36 and is connected to the top of the leveler blade at the center of the blade, as best shown in Figure 1 to permit the blade to pull the spout 31 to operative position above either compartment.

A vertically disposed shaft 42 is mounted to turn axially in a vertical bearing opening 43 formed in the bearing 39 and is fixed to the blade to form a pivot for the blade. A handle lever 44 is fixed to the upper end of the shaft and projects through a horizontal slot 45 in the hopper above the bearing 39 to rock the shaft 42 axially.

When the handle lever is swung to the left the shaft 42 will turn axially and will swing the leveler blade 40 horizontally to the right across the top of the partition 14 to its limit of movement against the inner face of the right front wall 12 as shown by full lines in Figure 1. However, before the leveler blade has reached its limit of movement it will have taken up the slack in the chain 41 and turned the shaft 36 to swing the delivery spout pendulum-wise to extend above the right compartment of the hopper. During the initial movement of the leveler blade from the dotted-line position shown in Figure 3, it will strike against the spout and start the pendulum-like swinging movement of the spout to the right and will ride underneath the spout when the spout reaches the top of its pendulum swing, then will continue on to its way to its final lodging place against the front end wall 12 of the hopper, meanwhile pulling the chain taut to hold the spout above the top of the right compartment.

When the handle lever 44 is moved to the right instead of the left, the above-described movements of the leveler blade and spout are reversed to lodge the leveler blade against the left front wall 12 of the hopper and to dispose the delivery spout 31 to overhang the left compartment of the hopper.

When the delivery spout 31 is discharging into one of the compartments the valve 21 controlling the delivery opening of that compartment must be closed while the valve of the other compartment must be open to permit the contents of the said other compartment being bagged while the first-named compartment is filling. To accomplish this the lower end of the vertically disposed pivot shaft 42 is equipped with a handle lever 46. A transversely disposed link 47 is pivotally secured intermediate its end to the handle lever 46 as shown at 48. Rods 49 are pivotally connected to respective valves 21 as shown at 50 and are pivotally connected to respective ends of the link as shown at 51.

As best shown in Figure 4 when either the handle lever 44 or the handle lever 46 is rocked to the left to swing the delivery spout to overhang the right compartment of the hopper, the rod 49 of the valve 21 controlling the delivery opening in the right hopper will be pulled forwardly to rock the valve 21 to closed position. Simultaneously the rod 49 which is connected to the other valve 21 will be pushed rearwardly and will open the other valve 21 to permit the contents of the left compartment in the hopper to be discharged and bagged while the right compartment in the hopper is being filled with grain.

For securing empty bags 100 in position to be filled below each discharge opening 9 of the hopper a rectangular frame 52 is bolted to the

plate 23. Rollers 53 are journaled in the frame and are provided with spurs which are hooked through the material of the mouth of the bag to hold the bag open while it is being filled. A manually operable shaft 54 is journaled in the frame and is provided with crank eyes 55 which receive crank arms 55' which project from the rollers. By turning the shaft in one direction the spurs are engaged with the bag and by turning the shaft in the opposite direction the spurs are released from the bag.

Mechanism for counting the filled bags is shown best in Figure 5. A rock link 56 is pivoted on a bracket 57, shown best in Figure 1, which is disposed on the outer faces of the meeting longitudinal edges of the front wall 12 as shown at 58. The upper end of the link is provided with a fork 59 to receive the upper handle lever 44 which latter rocks the link on its pivot each time the handle lever is operated to swing the spout from one compartment to the other compartment. A rod 60 is connected to the lower end of the link and is connected to the outer end of a bell crank lever 61 which is pivoted on a pivot pin 62 which projects from one of the front walls 12 within a casing 63.

A counting wheel 64, in the nature of a ratchet wheel, is loosely mounted on a shaft 64' which projects from the wall of the hopper. A dog 65 is pivoted on the wall of the hopper and engages the ratchet wheel to prevent the ratchet wheel from turning backward. A pawl 66 is pivotally connected to the bell crank lever 61 and engages the ratchet wheel to advance the ratchet wheel one step each time the delivery spout is moved from one compartment to the other compartment. The teeth of the ratchet wheel are numbered consecutively and a sight opening 67 formed in the front wall of the casing exposes the numbers consecutively as the ratchet wheel is turned to indicate the number of filled bags.

For yieldably latching the delivery spout in operative position and simultaneously yieldably latching one of the valves 21 closed and the other valve open an arcuate bar 68 is secured to the inclined partition walls and projects across the top of the lower handle lever 46. The bar is provided in its lower edge with spaced notches 69 which receive the handle lever when swung to its right or to its left limit of movement and which yieldably hold the handle lever stationary until the handle lever is manually dislodged.

For permitting the leveler blade to be manually operated only when there is a full compartment of grain in the hopper, and thus preventing false counting by the counting wheel, an arcuate bar 70 is secured at the ends to the front walls 12 of the hopper and is disposed below the shaft 36, as best shown in Figure 1. The bar is provided in its bottom edge with notches 71, as best shown in Figure 12. A latch bar 72, best shown in Figure 10, is pivoted intermediate its ends on the upper edge of the leveler blade and rides with its free end beyond the bottom edge of the bar 70 to lodge in either one of the notches 71. The notches 71 are so positioned that the blade may move a short distance before it arrives into a notch and the notches have inclined sides which permit the blade to be moved back again if the compartment is not filled with grain. A link 73 is connected to the free end of the latch bar 72 and is engaged between the double walls of the leveler blade, as best shown in Figure 11. Pivotally mounted on the lower frame rod 74 of the leveler blade is a control flap 75 provided with a

cam head 76 having oppositely disposed high points 77. The lower end of the rod 72 rests upon the cam head and the side walls of the leveler blade are provided with recesses 78 which will permit the high points of the cam head riding onto the leveler blade.

When the compartment is full, the leveler blade may be manually swung and during the initial swinging movement the grain in the top of the filled compartment will swing the flap 75 upwardly to the dotted line position shown in Figure 11 to push up the rod 73 and release the latch bar 72 from the notch that it may be in, so that the swinging movement of the level blade may be continued. However, if the compartment is only partly full the control flap will not move and when an attempt is made to swing the leveler blade the latch bar 72 will lodge in one of the notches and prevent the completing of the swinging of the blade across the top of the compartment.

When one of the mechanically operated valves is in closed position and the compartment thereabove is filling, the other mechanically operated valve is, of course, open. The operator may close the manually operated valve 9 of the open valve to prevent any grain spilling out of the delivery opening should the compartment which is being filled overflow. By glancing through the windows 13 from time to time the operator may determine when a compartment is full by noting that grain is falling into an empty compartment. But this grain cannot be wasted since the manually operated valve is closed. He may now grasp either the handle 44 or the handle 46 and swing the vertically disposed shaft 43 to rock the leveler blade over the top of the filled compartment to level off the surplus grain and push it ahead of it into the empty compartment as the blade moves the delivery spout to delivery position over the empty compartment. During this movement of the blade the automatically operated valve of the empty compartment is, of course, automatically closed as above described and latches itself to the closed manually operated valve to carry the latter with it as a unit to open position when the empty compartment is filled and ready to be delivered into the bag.

Since the operation of the parts has been described as the description of the parts progressed, it is thought the invention will be fully understood without further explanation.

What is claimed is:

1. A grain measuring and sacking apparatus comprising, a hopper having spaced compartments, a swingably mounted spout on the hopper for alternately filling the compartments, a leveler blade in the hopper adapted to level off the top of a filled compartment and to move the spout to delivery position over the empty compartment, means for moving the blade, valves controlling respective discharge openings in the bottom of the compartments, and means connected to the leveler blade and adapted to close the valve of an empty compartment and open the valve of a filled compartment as the leveler blade moves the spout to delivery position over the empty compartment.

2. A grain measuring and sacking apparatus comprising, a hopper having spaced compartments, a swingably mounted spout on the hopper for alternately filling the compartments, a leveler blade in the hopper adapted to level off the top of a filled compartment and move the spout to delivery position over an empty compartment,

means for moving the blade, a deformable partition wall in each compartment, means for deforming the wall to vary the cubical capacity of the compartment, valves controlling respective discharge openings in the bottom of the compartments, and means connected to the leveler blade and adapted to close the valve of an empty compartment and open the valve of a filled compartment as the leveler blade moves the spout to delivery position over the empty compartment.

3. A grain measuring and sacking apparatus comprising, a hopper having spaced compartments, a swingably mounted spout on the hopper for alternately filling the compartments, a horizontally disposed leveler blade in the hopper adapted to level off the top of a filled compartment and move the spout to delivery position over an empty compartment, a vertically disposed shaft on the hopper connected to the blade for swinging the blade laterally, a lever on the bottom of the shaft for turning the shaft, a rock link pivoted centrally on the lever, valves controlling respective discharge openings in the bottom of the compartments, and rods connecting the ends of the rock link to respective valves for closing a discharge opening of an empty compartment and opening the valve of a filled compartment as the leveler blade moves the spout to delivery position over the empty compartment.

4. A grain measuring and sacking apparatus comprising, a hopper having spaced compartments, a filling spout swivelly mounted at one end on the wall in the hopper and inclined downwardly toward the center of the hopper above the compartments, a crank shaft fixed to the downwardly inclined end of the spout and journaled in the hopper oppositely from the spout, a horizontally swinging leveler blade in the hopper adapted to level off the top of a filled compartment and adapted to strike the downwardly inclined portion of the spout and move the spout to delivery position over the empty compartment, a chain connected to the blade and to the crank of the crank shaft adapted to permit the blade to pull the spout to delivery position above either compartment as the blade arrives at its limit of movement over the empty compartment, a vertically disposed shaft connected to the blade for actuating the blade, a manually operable lever for turning the vertically disposed shaft axially, valves controlling respective discharge openings in the bottom of the compartments, and means connected to the vertically disposed shaft adapted to close the valve of an empty compartment and to open the valve of a filled compartment as the leveler blade moves the spout to delivery position over the empty compartment.

5. A grain measuring and sacking apparatus comprising, a hopper having spaced compartments, a swingably mounted spout on the hopper for alternately filling the compartments, a leveler blade in the hopper adapted to swing across the top of the compartments and level off the top of a filled compartment and simultaneously

move the spout to delivery position over the empty compartment, means for moving the blade, a plate closing the bottom of the compartments having discharge openings for the compartments, mechanically operated valves pivoted at one corner on the plate controlling a respective discharge opening, a manually operable valve yieldably latched to each mechanically operated valve and carried as a unit with the valve, said manually operable valve being adapted to be moved to closed position independently of the mechanically operated valve to prevent excess grain wasting through the delivery opening, and means connecting the leveler blade to the mechanically operated valves adapted to close the valve of an empty compartment and open the valve of a filled compartment as the leveler blade moves the spout to delivery position over the empty compartment.

6. A grain measuring, sacking and counting apparatus comprising, a hopper having spaced compartments, a swingably mounted spout on the hopper for alternately filling the compartments, a leveler blade in the hopper adapted to swing transversely and level off the top of a filled compartment and to simultaneously move the spout to delivery position over the empty compartment, a vertically disposed shaft for moving the blade, a handle lever projecting horizontally from the top of the shaft for rocking the shaft axially to swing the blade, valves controlling respective discharge openings in the bottom of the compartments, means connected to the bottom of the shaft adapted to close the valve of an empty compartment and open the valve of a filled compartment as the leveler blade moves the spout to delivery position over the empty compartment, a rock link centrally pivoted to the hopper and having the upper end provided with a fork receiving the handle lever, a ratchet wheel controlled counting mechanism, and a rod connecting the rock lever with the lower end of the rock link for advancing the counting mechanism a step each time the leveler blade is swung from one limit of movement to its opposite limit of movement.

7. A grain measuring and sacking apparatus comprising, a hopper having spaced compartments, a swingably mounted spout on the hopper for alternately filling the compartments, a leveler blade in the hopper adapted to level off the top of a filled compartment and to move the spout to delivery position over the empty compartment, means for moving the blade, valves controlling respective discharge openings in the bottom of the compartments, means connected to the leveler blade and adapted to close the valve of an empty compartment and open the valve of a filled compartment as the leveler blade moves the spout to delivery position over the empty compartment, means for locking the leveler blade in released position, and grain operated means for releasing the locking means only when there is a full compartment of grain in the hopper.

SPENCER E. FINCH.