(No Model.)

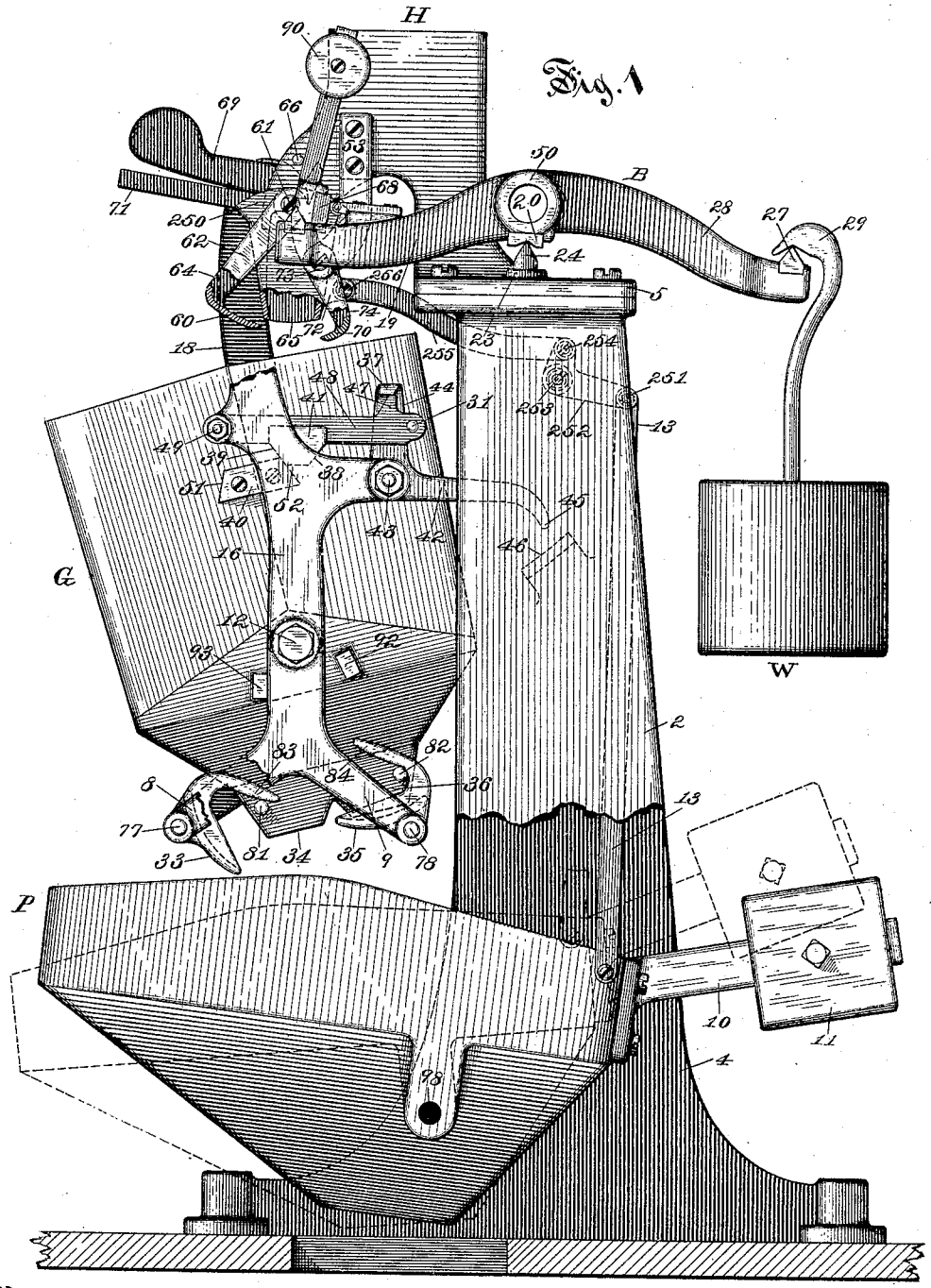
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F. H. RICHARDS.

GRAIN WEIGHER.

No. 442,717. Patented Dec. 16, 1890.

Fig. 1



Witnesses:

W. M. Yorkman

Henry L. Rickard.

Inventor:

F. H. Richards.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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F. H. RICHARDS.

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Fig. 2

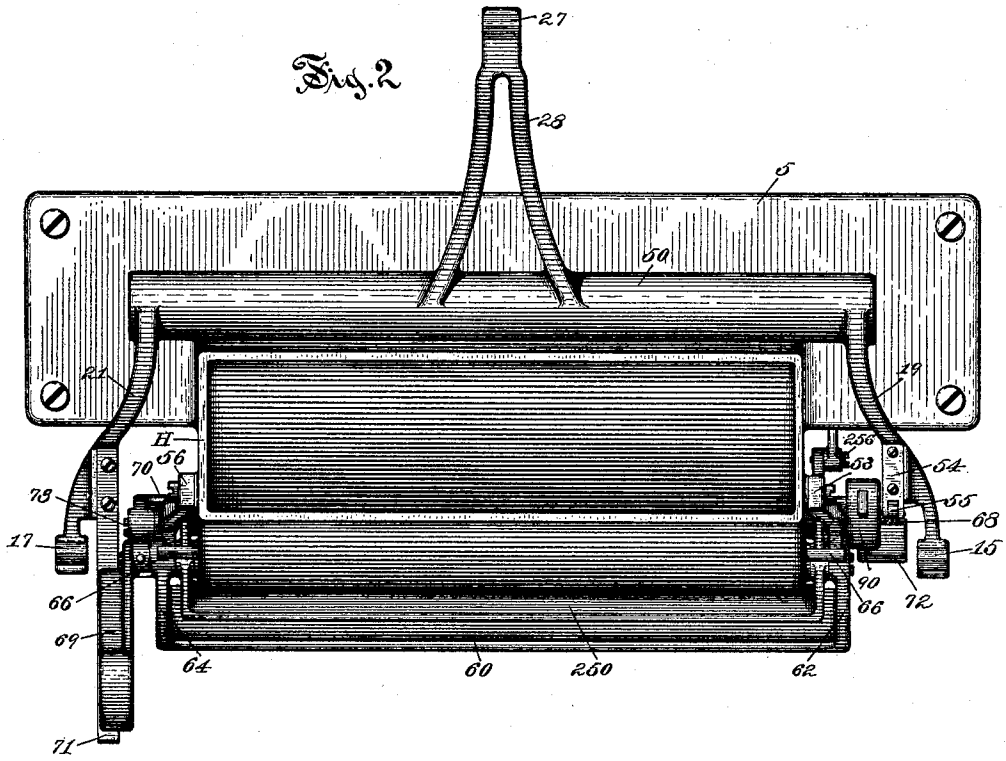
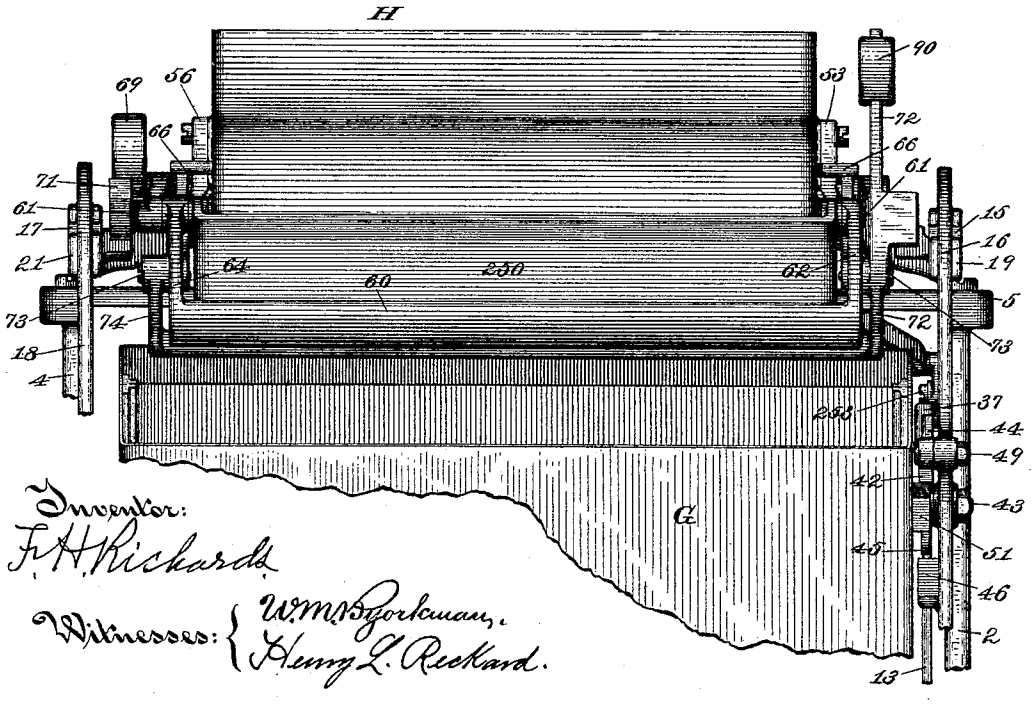


Fig. 3



Inventor:
F. H. Richards

Witnesses: { W. M. Bjorkman,
Henry L. Reckard.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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F. H. RICHARDS.

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Fig. 5

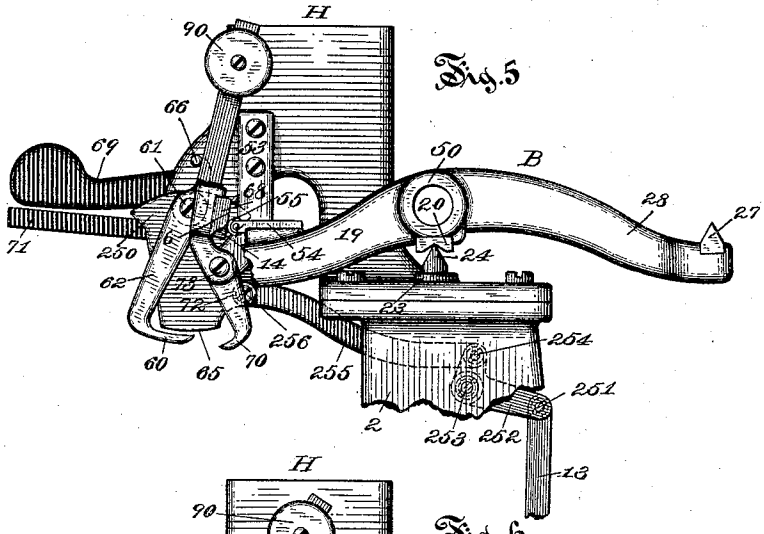


Fig. 6

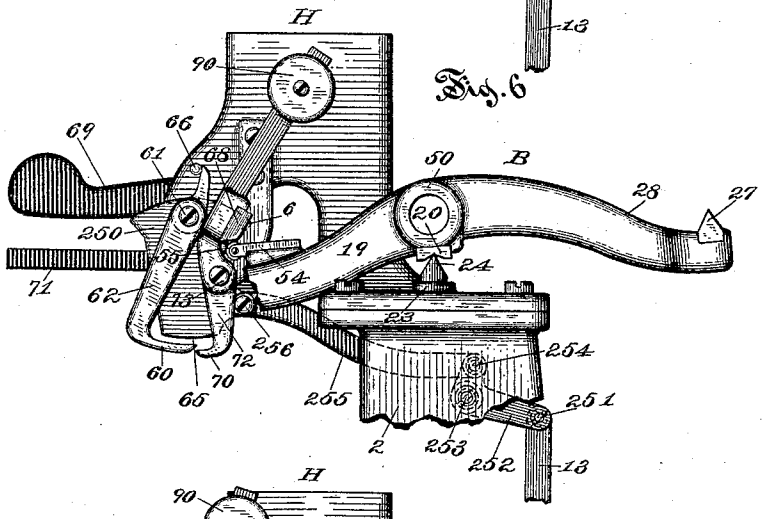


Fig. 7

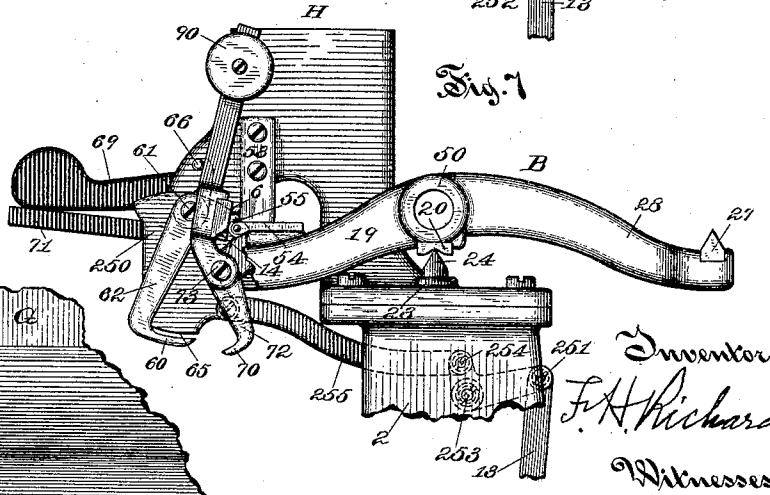
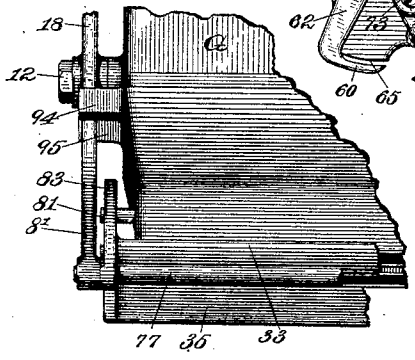


Fig. 4



Inventor:
F. H. Richards

Witnesses:
Wm. Bjorkman,
Henry L. Reckard.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE PRATT & WHITNEY COMPANY, OF SAME PLACE.

GRAIN-WEIGHER.

SPECIFICATION forming part of Letters Patent No. 442,717, dated December 16, 1890.

Application filed March 4, 1890. Serial No. 342,656. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Grain-Weighers, of which the following is a specification.

This invention relates to regulator grain-weighers of the two-valve class operated automatically by the power or weight of the grain weighing.

The invention has for its principal object to furnish an improved machine of this class in which the regulation shall be effected without the use of a separate regulator-valve and without a shifting-valve actuator or a shiftable valve carrier.

In the drawings accompanying and forming a part of this specification, Figure 1 is a side elevation of an automatic grain-weigher embodying my present improvements. Fig. 2 is a plan view of the upper portion of the machine, showing the parts that are carried by the top plate. Fig. 3 is a front elevation of the parts shown in Fig. 2, including a portion of the grain-bucket. Fig. 4 is a front elevation of portions of the grain-bucket, hanger, and bucket-closer. Figs. 5, 6, and 7 are side elevations similar to the upper portion of Fig. 1, illustrating the construction and mode of operation of the reducing and cut-off valves and of the means for regulation.

Similar characters designate like parts in all the figures.

The frame-work for carrying the operative parts of this machine usually, and as shown in the drawings, comprises two side frames or uprights 2 and 4, held together by the top plate 5, carrying the supply-chute H, and by tie-rods. (Not shown.) The grain-bucket G, of the well-known double-chambered type or class, is suspended under the chute H and discharges its loads of grain intermittingly, in the manner substantially as shown in Letters Patent of the United States, No. 403,988, granted to C. H. Cooley, May 28, 1889.

The grain-bucket G is journaled at 12 in the hangers 16 and 18, which are suspended by V-shaped bearings on the pivots or knife-edges 15 and 17, respectively, of the principle arms 19 and 21 of the scale-beam B. This beam has V-shaped bearings 20 and 22, one at each end of the hollow shaft 50 thereof, which rest on the pivots or knife-edges 24 and 26, that are suitably supported, as by bearings 23 and 25, on the frame-work. Opposite to arms 19 and 21 an arm 28 extends rearwardly of the scale-beam shaft 50, and is provided with a pivot or knife edge 27, on which the main weight W (also designated as the "counter-weight") is suspended by a hook 29. The oscillation of the bucket G within the hangers is limited by two pairs of suitable stops 92 and 94 and 93 and 95; but said stops may be of any of the well-known kinds, which are shown in prior Letters Patent for like purpose. Extending to the bottom of the bucket the hangers 16 and 18 are there divided into arms 8 8′ and 9 9′, to whose ends are attached the closers 33 and 35 for the discharge-chutes 34 and 36, respectively, of the grain-bucket. These closers 33 and 35, which are preferably formed cup-shaped the better to hold the grain, are pivoted at 77 and 78 to the hanger-arms 8 8′ and 9 9′, respectively. On the swinging over of the bucket G to one side or the other, as the case may be, the closer lever or arms 83 83 and 84 84 engage with the pins 81 81 and 82 82, that are fixed in the bucket and operate to close one or the other of said closers, as the case may be, they being opened by gravity.

For detaining the bucket in place I employ a system of levers and beveled catches, whereby easy working is secured. The first detent latch or lever 42, which is pivoted at 43 to the hanger 16 and whose outer end 45 is arranged to strike the latch bracket or stop 46 on the frame-work, has a short arm 44, which extends upward, and has a projection or hook 37, engaging with the catch 47 of the lock arm or lever 48, that is pivoted at 49 to the hanger 16. Said arm or lever 48 has a detent block or catch 41 fixed to or formed thereon, having the angular detent-faces 38 and 39, corresponding to and adapted to engage with the similar faces 51 and 52 of the bucket-catch 40, that is secured to the bucket by screws, as shown, or by other suitable means, as rivets or the like. The angles of said faces

38 39 and 51 52 are such that the pressure of the catch 40 on the block 41 tends to lift the lever 48, but with a greatly-reduced force. Besides this the lever 48, being prolonged to the catch 47, secures another leverage and a corresponding reduction of force at the latter point. The catch 47 lies under the hook 37, which is normally held in place by the weight of lever 42. On the descent of the bucket and hangers the bracket 46 has only to overcome the friction of the hook 37 on said catch 47, when the lever 48 will be free to rise, and thus allow the bucket to swing over, the aforesaid beveled faces being suitably shaped to so operate said lever. A stop 31 in lever 48 limits the downward movement of the lever 42.

The valve mechanism for reducing and for cutting off the flow of grain to the bucket is actuated from and by the scale-beam. The reducing-valve 60 is carried by the arms 62 and 64, that are carried on the pivots 61, said valve being furnished with suitable stops 66 to regulate or limit its closing movement. This valve 60 closes under the outlet 65 of the chute H somewhat more than half the width thereof. The valve is actuated by the lever 69 from the valve-actuating arm 71 of the beam B. The construction and mode of operation of this reducing-valve in its preferred form are fully set forth in the prior application of C. H. Cooley, Serial No. 338,818, filed January 31, 1890, to which reference may be had.

The cut-off valve 70 is carried by the arms 72 and 74, pivoted at 73 to suitable supports, as 53 and 56, which are carried by the supply-chute H. The arm 72 is continued above the pivot 73 and carries the cam 68 and some suitable weight, as 90. The construction and mode of operation of this cut-off valve, together with the said weight, are fully set forth in the joint application of C. H. Cooley and F. H. Richards, Serial No. 339,967, filed February 11, 1890, to which reference may be had. In this application Figs. 1, 5, 6, and 7 show successive steps in the operation of the valves. The valve-actuator 55, which in this case is a small roller, is carried by a stem 54, that is fixed on the beam-arm 19, as shown in the drawings.

It will have been observed that the cam 68 has two faces 6 and 14. The part 6 of the cam-face is used during the closing of the reducing-valve and during the poising, and the part 14 is used to cut off the drip and to effect the discharge of the grain after the manner set forth in the aforesaid prior application Serial No. 339,967.

For the purpose of regulation the lower part or spout 250 of the chute H is made laterally movable contiguous to the upper surface of the valve 60, being actuated by some suitable connection with a regulator operated by the accumulation of discharged grain. In the drawings the regulator consists of the hopper P, which is more fully described and claimed in the application of C. H. Cooley and F. H. Richards, Serial No. 340,284, filed February 13, 1890, to which reference may be had. Said hopper is supported between the uprights 2 and 4 of the frame-work by suitable pivots at 98 and has attached thereto in any well-known manner the arm 10, carrying the counter-weight 11. To the said hopper is pivotally connected the rod 13, which is pivoted at 251 to the angle-lever 252, which is pivoted at 253 to the frame-work and at 254 to one end of the rod 255, whose opposite end is pivotally attached at 256 to the swinging spout 250. This spout is shown in the drawings pivoted at 61 to the supply-chute H, and is operated by means of said connections from the regulator-hopper P.

The ordinary or normal operation of the machine is shown in Figs. 1, 5, and 6. In Fig. 1 both valves are open and the bucket is supposed to be receiving a full column of grain. In Fig. 5 the major part of the load has been received and the reducing-valve closed, the beam being brought to the poising-point. In Fig. 6 the beam is carried down and both valves are closed. During all these successive steps the spout 250 has stood in the same and in its normal position.

In Fig. 7 the valves are in the same position as in Fig. 5, the reducing-valve being closed and the cut-off valve open; but in this figure the spout 250 is thrown forward so that its outlet is entirely over the said reducing-valve and is fully closed. This movement of the spout, which is effected through the connections by the descent of the hopper P to the position thereof, (shown by dotted lines in Fig. 1,) stops the machine. When by the continued discharge of its load the hopper P rises, the spout 250 is swung back to its position in Fig. 5, thus partially opening its outlet and starting the machine, and thus the operations of the machine continue so long as it is supplied with grain and the discharge therefrom in not wholly obstructed.

When reference is herein made to the movement of the "scale-beam," the movement of the bucket-supporting arms thereof is meant, this coinciding, of course, with that of the bucket itself.

Having thus described my invention, I claim—

1. In a grain-weigher, the combination, with the hangers suspended from the scale-beam, of the oscillating bucket supported in the hangers and having discharge-spouts, substantially as described, said hangers having pivot-bearings for bucket-closers, the oscillating closers pivotally supported in said bearings below said spouts, and means, substantially as described, operatively connecting the closers with the bucket to open one closer simultaneously with the closing of the other closer on the movement of the bucket in the hangers.

2. In a grain-weigher, the combination, with the hangers suspended from the scale-beam, of the oscillating bucket supported in the

hangers and having the discharge-spouts 34 and 36 and the closers 33 and 35 for said spouts, respectively, and pivoted below said spouts in the hangers, each said closer having a lever, as 83 and 84, operatively connecting with the bucket to close one and open the other closer on the movement of the bucket in the hangers.

3. In a grain-weigher, the combination, with the hangers and the oscillating bucket supported thereby, of the bevel-faced catch on the bucket and the latch-lever carried by the hangers and engaging said bucket-catch, and detent devices carried by the hangers and engaging said latch-lever, whereby the pressure on the detent-catch is reduced below that on the bucket-catch.

4. In a grain-weigher, the combination, with the hangers and the oscillating bucket supported thereby, of the catch 40 on the bucket, bevel-faced, as set forth, the lever 48, carried by the hangers and engaging said catch, the detent-lever carried by the hangers and constructed to engage said lever 48, and the stop set to operate said detent-lever on the descent of the bucket.

5. In a grain-weigher, the combination, with reducing and cut-off valves, of a laterally-movable spout contiguous to the upper surface of the reducing-valve, and regulator devices operating the spout independently of the operation of the valves.

6. In a grain-weigher, the combination, with reducing and cut-off valves, of the laterally-swinging spout contiguous to the upper-surface of the reducing-valve, the regulator-hopper, and connections controlling the movement of the spout from said hopper.

7. In a grain-weigher, the combination, with the reducing and cut-off valves actuated from the beam to close in succession, as set forth, of the laterally-movable spout contiguous to the upper side of the reducing-valve, and regulator devices operating to close the spout by moving said spout over the reducing-valve when this is closed.

FRANCIS H. RICHARDS.

Witnesses:
HENRY L. RECKARD,
W. M. BYORKMAN.