

(No Model.)

F. H. RICHARDS.
AUTOMATIC GRAIN SCALE.

No. 548,842.

Patented Oct. 29, 1895.

Fig. 2.

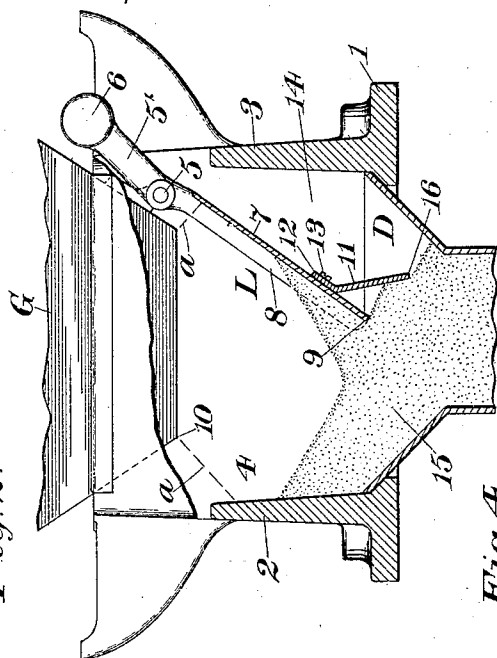


Fig. 4.

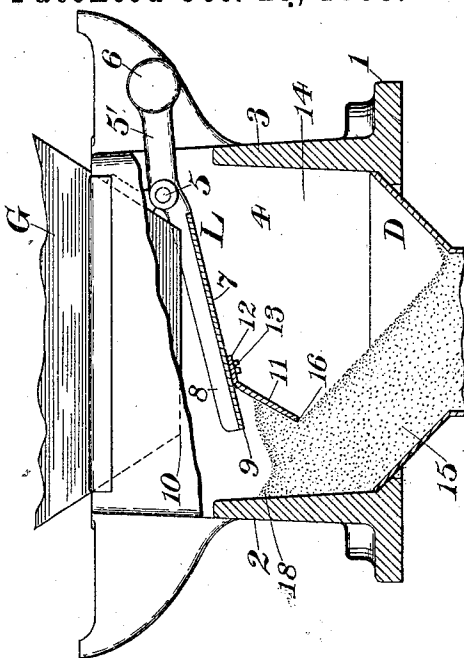


Fig. 1.

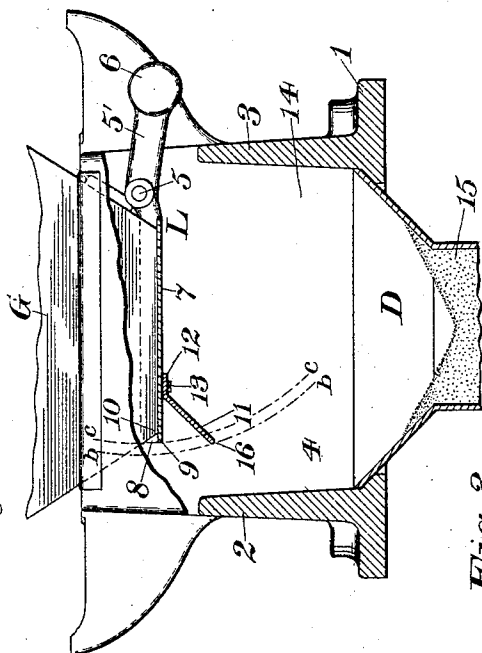
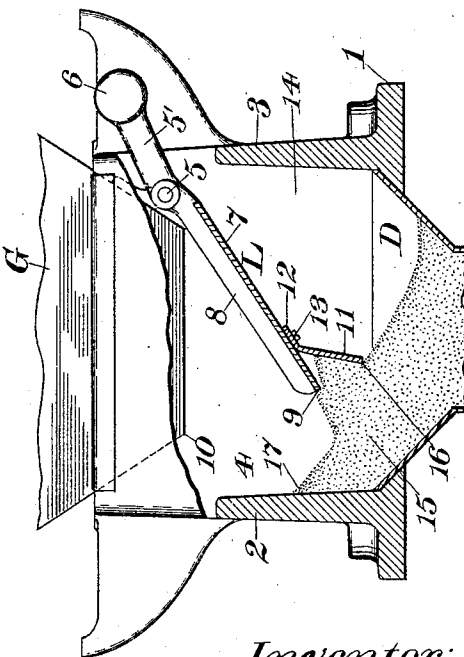


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

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AUTOMATIC GRAIN-SCALE.

SPECIFICATION forming part of Letters Patent No. 548,842, dated October 29, 1895.

Application filed March 9, 1895. Serial No. 541,086. (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 Automatic Grain-Scales, of which the following is a specification.

This invention relates to an improvement in bucket-closers for use in connection with grain-buckets of grain-scales, the object being to provide a combined bucket-closer and regulator adapted for being operated by the material being weighed and for acting on the upper portion of each successive mass or load of material discharged by the grain-bucket, so as to retard the closing movement of the closer.

In the drawings accompanying and forming part of this specification, Figure 1 is a side elevation, with parts broken away and in section, of the lower portion of a weighing-machine and the bucket thereof, the closer being shown as closing the bucket. Figs. 2, 3, and 4 are similar views showing the bucket-closer in different positions and the action of the upper portion of the material weighed on the regulator-blade of the closer.

Similar characters designate like parts in all the figures.

For the purpose of illustrating the present improvement it is shown applied to the bucket of a weighing-machine of the class described and claimed in my application, Serial No. 541,087, of even date with this application, and only those parts of a weighing-machine will be described which are convenient to successfully demonstrate the operation of the present improvements.

A suitable base is shown at 1, it being provided with means (not shown) for attaching it to a floor or other foundation. The framework for sustaining some of the superimposed working parts of the apparatus is shown composed of the side walls 2, 3, and 4, which constitute a chamber.

The grain-bucket is designated by G, it being in the present instance of the "single-chambered" type.

The bucket-closer is designated by L, and it is shown pivoted or hinged at 5 to the bucket. The closer is shown in flat plate form pro-

vided with an integral substantially-straight arm 5', which terminates in a counterbalance 6 to return the closer to its normal position to close the bucket. The closer proper is shown as consisting of a plate at 7, with up-turned sides 8 to prevent leakage of material from the sides of the bucket G when receiving material therein. The closer is also shown with the lip 9 projecting beyond the point 10 of the bucket, which further assists in preventing the accidental escape of grain in the bucket.

The regulator-blade is shown at 11 as consisting of a plate which is substantially of obtuse-angular form in cross-section, the portion 12 of the blade being shown secured to the closer by screws at 13. The main or relatively-larger portion of the blade is shown as disposed at such a relative angle to the closer as to temporarily receive and retain a certain indeterminate portion of the material discharged by the bucket, the portion of grain resting on the blade tending to relatively impede or retard the closer throughout the return or closing movement.

A chamber or compartment composed by the walls of the framework is shown at 14, this chamber constituting the upper portion of the conduit. This chamber receives the material immediately after it is discharged by the bucket G, the material being thrown against the side wall 2, and prior to its entrance into the conduit, (designated by D.)

The conduit is shown with its mouth relatively larger than the remaining portion thereof, which construction produces a slight temporary stoppage of the material in the throat of the conduit. This stoppage of the grain produces at about the point where the material enters the small portion of the conduit a relatively-larger cross-sectional area than at the point farthest from said entering-point, which enables the angularly-disposed regulator-blade to secure a firmer hold on the material shown at 15.

The sidewall 2 of the framework constitutes a vertically-disposed guard-plate, it being shown in immediate proximity to the path of the closer and its regulator-blade, as well as to the discharge-opening of the bucket G, so that during the closing movement of the closer the material will be carried upwardly

against said guard-plate, which tends to resist the same. This is important, as it sufficiently prolongs and regulates the period of control of the material by the regulator-blade to enable said blade to retain a firm hold on the material throughout the closing movement of the closer.

The peculiar coaction existing between the side wall 2 and the closer L is shown more clearly in Fig. 4, and although the closer has nearly returned to its normal position the uppermost point 18 is shown as higher than the points 17 in Fig. 3, although the closer is shown in the latter figure as just commencing its closing movement.

Referring now to Fig. 1, it will be assumed that the bucket G has just discharged its load of material, the bucket-closer L being shown as closing the bucket G and the latter in the act of returning to its uppermost position to receive another load of material. This figure shows the relative disposition of the closer L and the regulator-blade 11, the latter being at such an angle to the closer that when the closer is in a horizontal position all particles of the material will readily slip from the blade.

Referring now to Fig. 2, this view shows approximately the position assumed by the closer L when open its full length and the cross-sectional upper outline of the mass or load of material just discharged by the bucket G, the material being shown as having passed nearly below the closer, so as to permit the return movement thereof. The limits of the mass or load of material discharged by the bucket are shown by the dotted line *a a* in said Fig. 2. The material discharged by the bucket is thrown forward, or toward what is here shown as the left-hand side, against the guard-plate formed by the wall 2 of the framework by the force of the closer in opening. It will be observed on reference to said Fig. 2 that a relatively-large proportion remains on the closer as compared with that resting on or impacted against the regulator-blade.

As the closer L turns on its pivot 5 in the act of closing, the regulator-blade 11 takes a still firmer hold in the material, carrying it upwardly against the side wall 2, and the material resting on or lying in the space formed by the regulator-blade and the closer gradually increases in weight, while at the same time the material is gradually slipping from the closer, thereby decreasing the weight of the material on the closer.

In Fig. 3 the closer is shown as just discharging the last particles of grain, and the mass of grain engaged by the regulator-blade is shown as being proportionately greater than that shown in Fig. 2. As the closer L closes, the mass of grain, which impedes the closing movement of the closer by resting against the angularly-disposed regulator-blade 11, gradually increases, until the closer has nearly assumed a horizontal position, or in a plane at an extremely-acute angle to the plane of the lower edge of the bucket.

In Fig. 4 the closer is shown as being nearly in a horizontal position, or as closing the bucket. It will be observed that the closer has discharged all particles of the material which rested thereon, as shown in Fig. 3; but the mass of material resting upon, or impacted against the regulator-blade 11 is shown as being relatively larger, gradually increasing in size until the point 16 of the regulator-blade is nearly opposite the uppermost portion 18 of the grain and nearly in horizontal line therewith. When the regulator-blade reaches this point, the mass of grain resting thereon gradually decreases in weight by slipping from the blade but not sufficiently to too rapidly close the bucket. When the point 16 of the blade is above uppermost portion 18 of the grain, the closer is nearly in a horizontal position, so that a relatively-small space exists between the point 10 of the bucket and the lip 9 of the closer. When the closer assumes a horizontal position, all portions of the material will slip from the regulator-blade by reason of its angular disposition.

In Fig. 1 the regulator-blade 11 is shown as having wholly discharged all particles of the material and the closer is shown closed, the bucket being in the act of rising to receive another load or mass of material.

While the angular disposition of the blade 11 relative to the closer L shown in the drawings is a convenient one, it is obvious that it may be increased or decreased to any extent, so long as the peculiar tendency of said blade 11 to carry up the material against the side wall 2 throughout the closing movement of the closer is present, which, owing to its proximity to the closer L and the discharge-opening of the bucket, permits this result from the time the closer has commenced its closing movement.

Referring now to Fig. 1, the dotted lines *b b* and *c c* indicate the relative radial movements of the closer and blade, the pivot of the former being the center. The radial movement of the blade 11 is shown projecting relatively beyond that of the closer L, which enables the blade 11 to secure a firm hold on the material in advance of the closer L, as well as materially assisting in carrying the material upwardly against the side wall or guard-plate 2.

By reason of the angular disposition of the blade 11 it is apparent that a relatively-wide blade can be used by securing said blade to the closer at a relatively-remote distance from its edge 9; at the same time enabling the blade to project beyond the said edge 9, during the closing movement of the closer. This is important, as it insures the blade 11 retaining sufficient of the material to retard the closer during and throughout its closing movement and renders it more efficient than a relatively-narrow blade.

Having thus described my invention, I claim—

1. In a mechanism of the class specified, the

combination, with a bucket having a discharge opening, and with a side wall adjacent to said opening; of a swinging-closer for the bucket; means for normally closing the closer; 5 and a regulator-blade on the closer, and in position and adapted to retain hold of the discharged material, after the same has passed from the closer: whereby said material is carried upwardly against said side wall by the 10 regulator-blade, and the duration of resistance of the discharged material, to the closing movement of the closer, is prolonged, and said closing movement regulated, substantially as described.

15 2. In a mechanism of the class specified, the combination with a bucket having a discharge opening, and with a side wall adjacent to said opening; of a normally self-closing closer for said opening; and a regulator-blade 20 extending downwardly from the closer, and at an angle thereto, and made of a width to extend beyond the radius of movement of the closer: whereby said regulator-blade retains hold of the mass of discharged material, after 25 the same has passed from the closer; and whereby said mass is carried upwardly against

said wall by the regulator-blade, and the duration of resistance of the discharged material, to the closing movement of the closer, is prolonged for regulating said closing movement, 30 substantially as described.

3. In a mechanism of the class specified, the combination, with a bucket having a lower discharge-opening, and with a side wall adjacent to said opening; of a closer for the bucket; 35 means for normally closing the closer; and a regulator-blade extending downwardly from the closer, and set thereon remote from the discharge edge of the closer, and at an angle thereto, and made of a width to extend beyond 40 the radius of movement of the closer, for retaining hold of the discharged material as this leaves the closer; whereby said material is carried upwardly against said side wall by the regulator-blade, and the duration of resistance 45 of the discharged material, to the closing movement of the closer, is prolonged and regulated, substantially as described.

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