

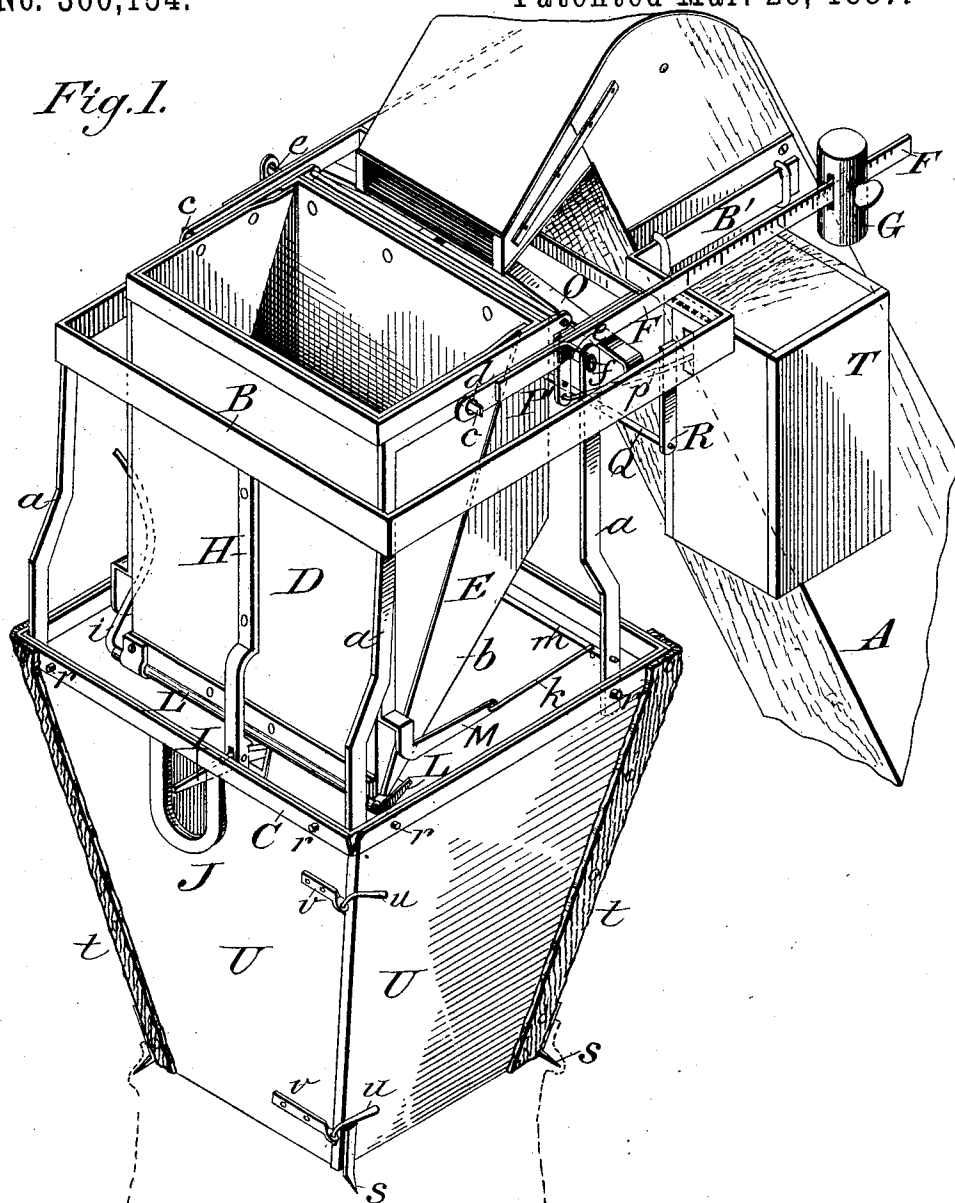
H. HODGES.

GRAIN WEIGHING APPARATUS.

No. 360,154.

Patented Mar. 29, 1887.

Fig. 1.



Witnesses

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Fig. 2.

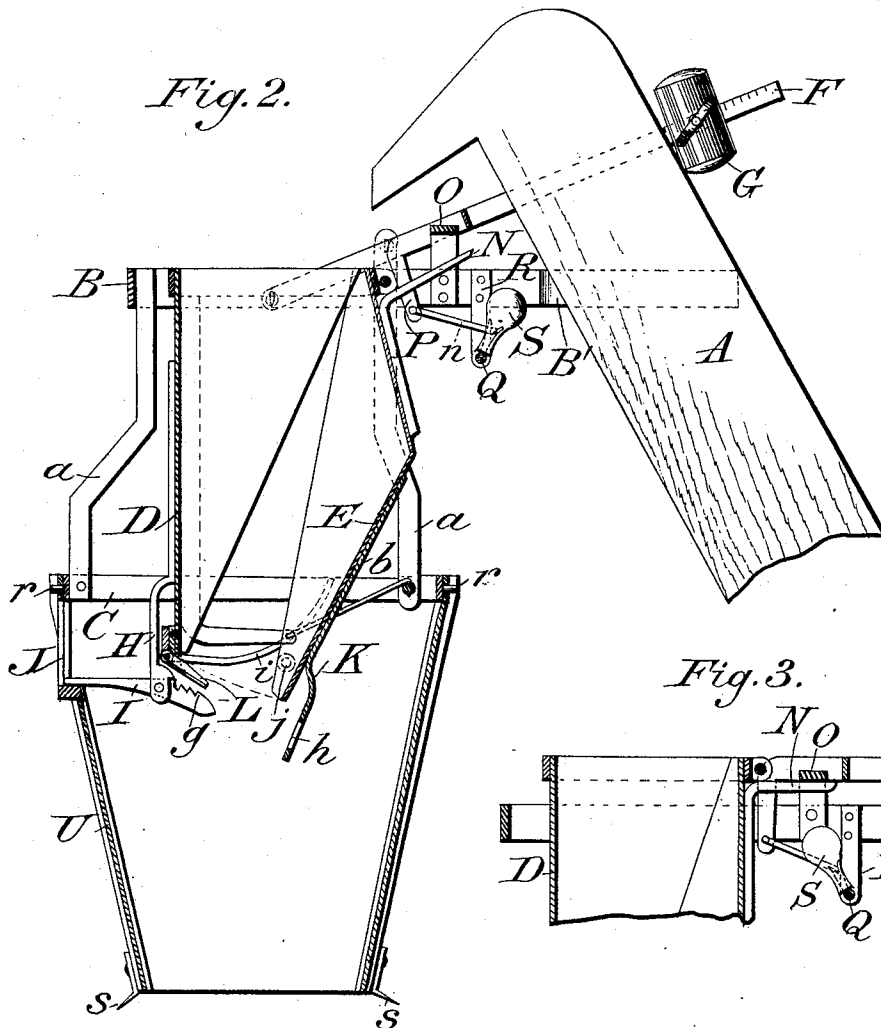


Fig. 3.

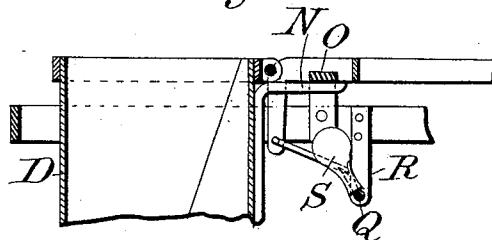


Fig. 6.

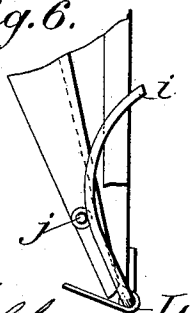


Fig. 4.

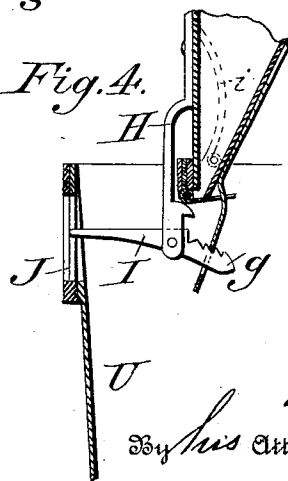
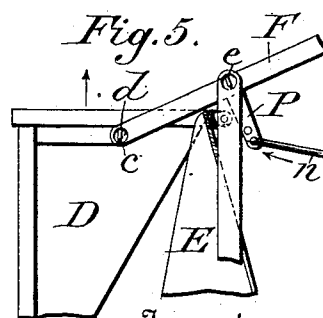


Fig. 5.



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UNITED STATES PATENT OFFICE.

HARLAN HODGES, OF KEOTA, IOWA.

GRAIN-WEIGHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 360,154, dated March 29, 1887.

Application filed June 17, 1886. Serial No. 205,415. (No model.)

To all whom it may concern:

Be it known that I, HARLAN HODGES, a citizen of the United States, residing at Keota, in the county of Keokuk and State of Iowa, have
5 invented certain new and useful Improvements in Grain-Weighing Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it
10 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

15 This invention relates to an improvement in apparatus for automatically weighing grain; and it consists in a construction, arrangement, and combination of parts, as will be hereinafter fully set forth.

20 In the annexed drawings, illustrating my invention, Figure 1 is a perspective view of my improved grain-weighing apparatus. Fig. 2 is a vertical cross-section through the same, showing the grain-box open. Fig. 3 is a detail section of the upper part of the grain-box
25 when closed, showing also the accompanying parts. Fig. 4 is a detail section of the lower end of the grain-box and the mechanism for automatically opening said box. Figs. 5 and
30 6 are detail views of the opening and closing mechanism for the box.

Like letters of reference designate like parts in all the figures.

A represents a grain-elevator of any ordinary construction, to the frame of which is
35 secured a skeleton frame, which incloses and upholds my improved grain-weighing box, said frame consisting, preferably, of upper and lower squares, B and C, the upper square
40 being rigidly secured to the elevator-frame A by means of the horizontal arms B' B', and the upper and lower squares being connected together by the vertical posts a a a a. A grain-elevator is here taken as an example of
45 the application of my invention; but obviously my improved weighing-box is adapted to be located beneath the delivery-spout of divers kinds of apparatus.

Within the skeleton frame is suspended the
50 weighing-box, consisting of the two parts D and E. The upper end of the box is left open,

while the lower end is pointed and normally kept closed. The part or section D of the grain-box has the edges of the sides which present themselves endwise to the section E
55 cut off obliquely, so as to converge to a point at the bottom of said section D; and the section E is likewise provided with oblique-edged end portions, and also with an inclined bottom, b, the bottom and the oblique edges
60 of the ends inclining toward each other at the lowermost edge. (See Fig. 2.) The section E is made sufficiently large to allow its oblique-edged ends to shut by the portion D far enough to form a tight joint. The sections D and E
65 are hinged together at the top, so that they may be closed to form a tight receptacle, as shown in Fig. 1, or opened to deliver the grain, as shown in Fig. 2.

The weighing-box thus described is suspended within the skeleton frame by means of
70 horizontally-projecting knife-edged rods or points, which are secured to the section D. These knife-edges c enter perforations d in the ends of horizontal scale-beams F F, which are
75 located one on each side of the grain-weighing receptacle, and are fulcrumed or balanced by means of horizontal pins e, which enter perforations f in the upper ends of the posts
80 a, as shown in Fig. 1.

The scale-beams F F are graduated in any suitable manner and carry adjustable weights G. It will thus be seen that the weighing-box
85 is hung upon balance-beams in such a manner that the weights upon the beams may be adjusted to allow any amount of grain or other merchandise to be weighed; and, further, the grain-box is so arranged in connection with other mechanism that when a sufficient amount
90 of grain has been deposited therein to counterbalance the weights upon the other ends of the scale-beams and cause the said box to descend the other said mechanism just mentioned will operate automatically to open the
95 box and discharge its contents, and then the box, thus lightened of its weight, will resume its former position by the reaction upon it of the weighted scale-beams.

The mechanism which operates to open the box and discharge its contents, and then to re-
100 close the same, is as follows: The box-section D is provided with a vertical bar, H, secured

thereto and extending below the lowermost edge of said section. The lower extremity of the bar H is slotted, and within the slot is pivoted a bar or lever, I, whose upper edge along the inner half of its length is notched or 5 dentated with a series of notches, *g*. The lower square, C, of the skeleton frame is provided with a metallic loop or stirrup, J, into which the smooth end of the lever I extends. Obviously, when the weight of the grain causes 10 the box to descend, the end of the lever I will strike the loop, and the dentated portion will be thrown downward. To the bottom part, *b*, of the section E is secured a bar or rod, K, which extends below the box and is provided 15 with a slot, *h*. When the two sections D and E are closed together, the dentated portion of the rod I will enter the slot *h* of bar K, and the weight of the smooth end of the lever I will be sufficient to cause the said bar K to be en- 20 gaged by the dentations *g*. The lowermost edge of the section D is provided with a longitudinal shelf or cut-off, L, pivoted thereto in such a manner that it may be inclined upwardly over the space intervening between the 25 lowermost ends of the two sections when closed together, so as to thereby make a tight joint. This shelf is provided on either end with curved arms *i*, and the section E is provided with 30 horizontal pins *j*, upon which the said arms *i* may rest; hence, when the sections are closed together, the pins *j* will drive the curved arms *i* upward into approximately a vertical position, (see Fig. 6,) and thus elevate the shelf or 35 strip L into the inclined position, where it will effect a tight joint, for the lower portion of the box. (See Fig. 1.) The section D is kept correctly in place at the lower end during its vertically-oscillating movements by means of 40 horizontal arms M on each side, which connect by means of rods *k* with a transverse rod, *m*, which is pivoted at each end in the posts *a a* of the skeleton frame. Further, the section E is provided with a rearwardly-extending projec- 45 tion, N, which, when the weighted scale-beams are replacing the box in position after a discharge, will press beneath a cross metallic strap, O, and cause the section E to close together with the section D.

The scale-beams F F are each provided with downwardly-extending projections P and P'. One of these, as P, connects by a link, *n*, with a cross-rod, Q, whose extremities are pivoted 50 in the perpendicular projections R R upon the square B of the skeleton frame. The cross-rod Q carries near its center a weight, S, secured thereto perpendicularly, and this weighted rod is so located and arranged as to control the movement of the grain-box and fa- 55 cilitate its quick descent, so that the lever I will release the section E the instant it strikes the loop or stirrup, and thus effectuate an immediate and complete discharge of the grain. The other one of the projections above men- 60 tioned—viz., P'—connects, by means of a rod, *p*, with the mechanism of a register located inside the tally-box T, so that whenever the

grain-box is lowered and raised at the discharge the rod *p* will actuate the register, so as to keep account of the amount of grain dis- 70 charged.

The operation, therefore, in brief, is as follows: The grain passing through the spout falls into the box until the weight of the latter is equal to the prerequired amount, as indicated by the position of the weights on the 75 scale-beams. The box will then descend until the latch-lever I strikes the stirrup or loop J, which disengages the section E. The rod N having been lowered beneath the cross-bar O, said 80 rod N will not longer keep the box from opening. The box will therefore discharge its grain, then close again and return to its place, under the action of the weights, so as to be in readiness to be refilled. In order to more con- 85 veniently fill the bags with grain when it is discharged from the grain-box, I have provided a hopper consisting of four sections, U U, which are secured together at their edges by means of flexible connections *t*—such as 90 leather strips—that are firmly riveted to the adjoining edges of the plates or sections. These flexible connections are used at three corners of the hopper, the meeting edges at the fourth corner being connected by means 95 of hooks *u* on one edge, that enter perforated strips *v* on the other edge. The hopper as thus constructed is to be folded around the frame C and suspended thereon by means of 100 pins *r* upon the frame, which enter perforations along the upper edge of the hopper, after which the hooks *u* are fastened into the perforated strips *v*. The plates U are made of metal or other suitable material, and have 105 their edges more or less inclined—a construction which causes the inner faces of the hopper to be inclined, and thus enables the grain to be easily directed downward into the bag placed beneath the hopper to receive it. At 110 the lower corners of the hopper are provided hooks *s s*, upon which the bag may be hung.

Having thus described my invention, what I claim as new, and desire to secure by Let- 115 ters Patent, is—

1. In a grain-weighing apparatus, a grain- 115 box consisting of two hinged sections which open vertically with respect to each other at each discharge, substantially as described.

2. The combination of the feed-spout, the skeleton frame, the oscillating grain-box con- 120 sisting of two hinged sections which open vertically with respect to each other, and the scale-beams upon which the grain-box is supported, substantially as and for the purposes set forth.

3. The combination of the scale-beams, the 125 hinged sectional grain-box supported thereby, the pivoted lip or shelf for making a tight joint between the bottom edges of the sections, the skeleton frame, and suitable mech- 130 anism, as described, for opening the box at each discharge.

4. The combination of the grain-box con- 135 sisting of the hinged sections, the pivoted

shelf having curved arms and a latch-lever, the scale-beams upon which said box is suspended, and the skeleton frame inclosing the box and having a stirrup or loop inclosing the latch-lever, all adapted to operate substantially as shown and described.

5 5. The combination, with an oscillating grain-box consisting of two hinged sections which open vertically with respect to each other, and the scale-beams upon which it is suspended, of a cross-rod, Q, provided with a weight, S, for facilitating the operation of the grain-box, substantially as described.

10 6. The combination of the skeleton frame, the grain-box consisting of the hinged sections D and E, and the cut-off L, having arms i, said section E having pins j to actuate said arms, and said section D having a slotted rod, H, carrying a latch-lever, I, for engaging a slotted bar, K, on the section E, and the scale-beams F F, upon which said grain-box is suspended by means of knife-edges, all arranged and operating substantially as shown and described.

25 7. In a grain-weighing apparatus, the folding sectional bagging-hopper, constructed and arranged substantially as described.

30 8. In a grain-weighing apparatus, the combination of the vertically-oscillating sectional grain-box, the scale-beams F F, upon which the grain-box is suspended, the skeleton frame surrounding the grain-box, and mechanism, substantially as described, for automatically opening and closing said box, in the manner shown.

9. The combination, with an oscillating grain-box consisting of two hinged sections, D and E, which open vertically with respect to each other, said section E having pins j, and the scale-beams on which said box is suspended, of the hinged shelf or cut-off L, having a curved arm which comes in contact with pins j to actuate the shelf, substantially as shown and described.

10. The combination of the scale-beams F F, the grain-box consisting of the hinged sections D and E, and the cut-off L, having arms i, said section E having pins j and slotted bar K, and said section D having a slotted rod, H, carrying a latch-lever, I, for engaging bar K, and the cross-rod Q, having weight S, and connecting by link n with projection P on one of the scale-beams, substantially as specified and shown.

11. The combination of the skeleton frame, the hinged sectional grain-box, the scale-beams F F, one having a projection, P, and the other a projection, P', said projection P connecting by a link, n, with a weighted cross-rod, Q, for facilitating the operation of the grain-box, and said projection P' connecting by rod p with the tally-box T, all arranged substantially as shown and described.

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

HARLAN HODGES.

Witnesses:

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A. S. FOLGER.