No. 688,807. Patented Dec. 10, 1901.

E. C. YOUNG.

GRAIN WEIGHER.

(Application filed May 27, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

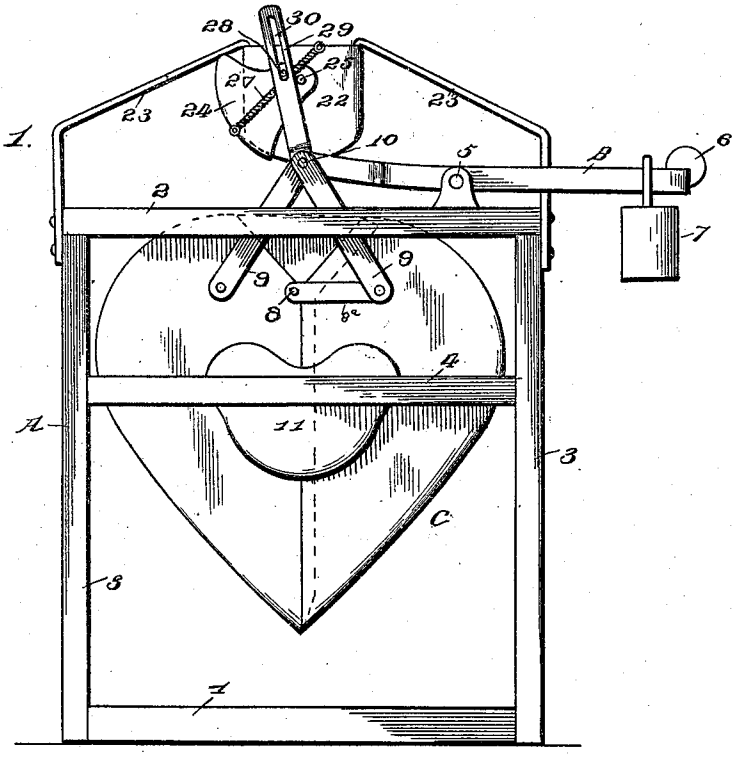
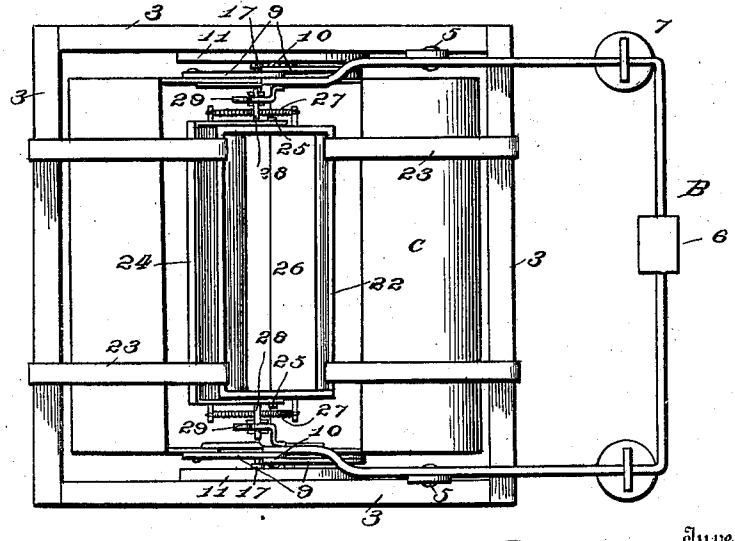


Fig. 2.



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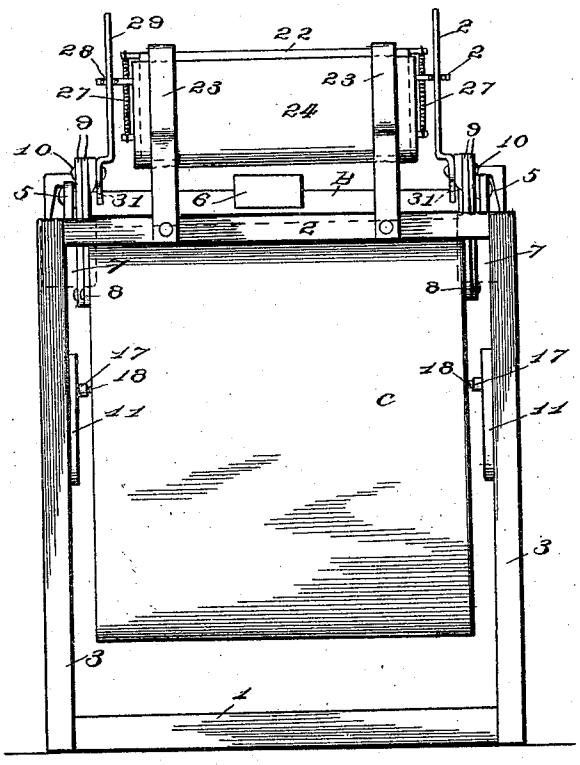


Fig. 3.

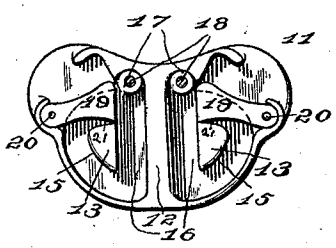


Fig. 4.

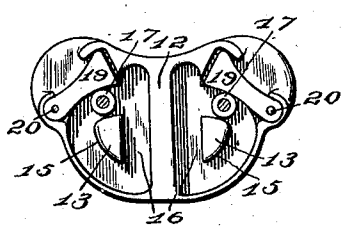


Fig. 5.

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UNITED STATES PATENT OFFICE.

ELMER C. YOUNG, OF PEORIA, ILLINOIS, ASSIGNOR OF ONE-HALF TO WILLIAM T. EATON, OF CHICAGO, ILLINOIS.

GRAIN-WEIGHER.

SPECIFICATION forming part of Letters Patent No. 688,807, dated December 10, 1901.

Application filed May 27, 1901. Serial No. 62,108. (No model.)

To all whom it may concern:

Be it known that I, ELMER C. YOUNG, a citizen of the United States of America, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Grain-Weighers, of which the following is a specification.

My invention relates to an improvement in grain-weighers adapted for use in warehouses, grain-elevators, or, in fact, wherever grain is to be expeditiously and automatically weighed and handled; and a primary object is to provide an automatic weigher which will clear itself of grain at each dump of the hopper and recover quickly, so that no grain escapes unweighed, which quality of my invention obviates an objection common to a large number of grain-weighers heretofore invented.

A further object is to provide a weigher of simple construction comprising few parts so constructed and arranged that they will insure quickness of operation and absolute accuracy of measurement.

With these and other objects in view my invention consists in certain novel features of construction and combinations of parts, which will be hereinafter more fully described, and particularly pointed out in the claims hereto appended.

In the accompanying drawings, Figure 1 is a view in side elevation. Fig. 2 is a plan view. Fig. 3 is a view in end elevation, and Figs. 4 and 5 are detail views showing the positions of rollers on the hopper-sections in the cam-grooves.

A represents a frame or support, which may be erected in any approved manner and comprises, preferably, a base 1, top 2, connecting uprights 3 3 at the corners, and cross-bars 4 4 at the front and rear.

B is the scale-beam, approximately U-shaped in general outline, fulcrumed on bearings 5 5 on the top or at the upper end of the frame, suitably counterweighted, as at 6, if need be, at its outer or free end and provided with one or more adjustable weights 7 7. The weighing-hopper C is suspended from the inner ends of the scale-beams by suitable means, which will presently be described. The hopper is heart-shaped in general outline and consists of two members pivoted together at 8 8 in the vertical center thereof at a point near the upper end, so that the preponderating weight of the members below this pivotal point causes them to normally tend to come together or remain closed. Two links 9 9, pivotally connected at the ends of these hopper-sections, are pivotally connected at a common point 10 on the inner ends of the scale-beam, whereby the hopper is held suspended therefrom. Reinforcing-strips 8^a 8^a, riveted or soldered to the opposite ends of one of the hopper-sections, give strength to the latter, afford support for the pivots at 8 8, and they being the same thickness as the links 9 9 they bring the lower ends of the outside links in the same vertical plane as their upper ends, thus preventing binding of one upon the other as the parts move in the operation of the weigher.

Secured centrally to the cross-bars 4 4 are cam-plates 11 11. These plates are exactly alike and they are shown from the inside in Figs. 4 and 5. This cam-plate is provided with a central web 12, extending vertically therein and dividing the plate into two parts. Lugs 13 13 are located at some distance on each side of this central web, their inner faces 14 14 being parallel with the sides of the central web and their outer faces curved substantially in the arc of a circle, as at 15 15, thus forming two grooves around these lugs 13, one groove on each side of the central web 12. These I will term "guide-grooves" 16 16, their object being to receive each an antifriction-roller 17 on a bearing 18 on the ends of the hopper-sections. Gravity-switches 19 19 are pivoted at their outer ends, as at 20, to the cam-plate, they being adapted to automatically drop at their free ends until caught by a shoulder 21, formed on the upper end of each lug 13 13, whereby their ends form a side of the vertical portion of the guide-grooves 16 16, thus confining the antifriction-rollers in the vertical portion of the guide-grooves during their descent when the grain in the hopper accumulates sufficiently to reach the predetermined weight and tip the scale-beam. In this way the sections of the hopper are held locked together until the rollers reach the lower ends of the lugs 13 13, when, there being no longer an outside lateral support, the sec-

tions fly open, owing to the weight of the grain below the central hinge or pivot 8, which naturally forces the sections of the hopper apart when no longer hindered. The grain or contents thereupon immediately discharges, as the guide-grooves 16 permit the sections of the hopper to open wide at their lower ends to drop the entire contents almost immediately. The grain being now discharged, the hopper immediately ascends, owing to the greater weight of the outer end of the scale-beam, and the antifriction-rollers 17 17 follow the curved outer faces 15 15 of the lugs 13 13, forcing aside the gravity-switches 19 19 and resuming their normal positions at the extreme upper end of the guide-grooves, the switches immediately dropping again to their normal positions to permit a repetition of this operation.

A stationary hopper 22 is secured by means of arms 23 23, extending upwardly from the frame A, immediately over the opening in the weighing-hopper in position to discharge thereinto. A valve 24 is pivoted at its ends, as at 25 25, to the ends of the hopper, and it is adapted to swing over the opening 26 in the bottom of the stationary hopper or aside, as the case may be, a spring 27 at each end normally tending to throw the valve aside to open the bottom of the hopper for the free discharge of grain being fed thereinto from above. The valve is provided on one or both ends with a projection 28 and links 29 29, extending upward from the pivot 10 at the end of the scale-beam and provided with an elongated slot 30 to receive this projection 28 on the valve. The link may also be provided with one or more additional holes 31 to insure the proper relative adjustment upon the pin 10. The object and operation of these parts are to insure the closure of the valve just as the weighing-hopper reaches its lowermost point, the elongated slots in the links permitting this free play of the hopper until its limit of motion is practically reached, causing a momentary closure of the valve, which latter immediately opens again upon the lower end of the slot striking the projection, which brings the action of the springs into play to raise the valve to its elevated position. Thus it will be seen that absolutely no grain escapes from the stationary hopper during the discharge of the contents of the weighing-hopper; but the inpouring grain is caught in the stationary hopper during this discharge, and it is not permitted to flow into the weighing-hopper until the latter shall have been automatically closed as an incident to its ascent or the resumption of its normal position. Suitable stops may be provided for the swinging valve 24, and in its upward movement it may be arrested by striking the arms 23 23 at one side of the hopper.

Changes might, of course, be made in the details of construction of the various parts described without departure from the spirit and scope of the invention set forth, and hence I do not wish to be limited to these precise details herein disclosed; but,

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

1. In a grain-weigher, the combination with a suitable support and a scale-beam fulcrumed thereon, of a weighing-hopper suspended from the scale-beam, said hopper made in two sections hinged or pivoted together at or near their upper ends and cam means for holding the hopper closed until it shall have reached its limit of downward movement and then holding it open until the hopper shall have resumed its normally-elevated position whereupon it becomes positively closed for the reception of more grain.

2. In a grain-weigher, the combination with a suitable support and a scale-beam fulcrumed thereon, of a weighing-hopper suspended from the scale-beam, said hopper made in two sections hinged or pivoted together at or near their upper ends and cam means for holding the hopper closed until it shall have reached its limit of downward movement and then holding it open until the hopper shall have resumed its normally-elevated position, whereupon it becomes positively closed for the reception of more grain and means under the control of the scale-beam for automatically cutting off or discharging grain into the weighing-hopper.

3. The combination with a suitable support having cam-grooves therein, of a weighing-hopper made in two sections hinged together and suspended from a suitable scale-beam, said sections each provided with a projection extending into said cam or guide grooves, whereby the weighing-hopper is permitted to open or positively close according to the position of the scale-beam.

4. The combination with a suitable support, a scale-beam fulcrumed thereto, a stationary hopper and a valve for controlling the outlet of this hopper, of a weighing-hopper made in two sections hinged together, said sections suspended from the scale-beam and provided with projections and a grooved plate having guide-grooves therein adapted to be traversed by these projections whereby to lock the sections of the weighing-hopper against spreading or opening during the descent of the hopper and for holding it open during its ascent.

5. The combination with a suitable support, a scale-beam fulcrumed thereto, a stationary hopper and a valve for controlling the outlet of this hopper, of a weighing-hopper made in two sections hinged together, said sections suspended from the scale-beam and provided with projections, a grooved plate having guide-grooves therein adapted to be traversed by these projections whereby to lock the sections of the weighing-hopper against spreading or opening during the descent of the hopper and for holding it open during its ascent, and means extending from the scale-beam to

the valve for automatically opening the valve with the extreme upward movement of the weighing-hopper and for closing it with the extreme downward movement of the weighing-hopper.

6. The combination with a suitable support, a cam-plate secured thereto and provided with a pair of guide-grooves and gravity-switches for automatically and normally closing one portion of said grooves, of a scale-beam fulcrumed to the support and a weighing-hopper made in two sections hinged together and suspended from the scale-beam, said sections each provided with a projection having an antifriction-roller thereon, which rollers travel in the guide-grooves to regulate the automatic opening and closing of the weighing-hopper.

7. The combination with a suitable support and a scale-beam fulcrumed thereon, of a weighing-hopper heart-shaped in general outline and comprising two sections hinged together at or near their upper ends, and a pair of links pivoted at each end of the hopper on each side of the hinged connection said links extending to a common pivot on the scale-beam.

8. The combination with a suitable support and a scale-beam fulcrumed thereon, of a weighing-hopper heart-shaped in general outline and comprising two sections hinged together at or near their upper ends, a pair of links pivoted at each end of the hopper on each side of the hinged connection, said links extending to a common pivot on the scale-beam, projections on the hopper-sections, a cam-plate having a vertical web at the center, lugs at each side of said center whereby guide-grooves are formed entirely around these lugs to receive said projections and gravity-switches pivoted in position to control the movement of the projections in said grooves.

9. The combination with a suitable support and a scale-beam fulcrumed thereon, of a weighing-hopper suspended from the scale-beam and composed of two sections hinged together, each provided with a projection, a cam-plate having a vertical web at the center, lugs at each side of the center, whereby guide-grooves are formed entirely around these lugs to receive said projections and gravity-switches pivoted in position to control the movement of the projections in said grooves.

10. The combination with a suitable support, a scale-beam fulcrumed thereto and a weighing-hopper suspended from the scale-beam, said hopper made in two sections hinged together said sections each having a projection, of a cam-block divided by a central web and having two lugs, one at each side of said web, the inner faces of these lugs being straight and the outer faces curved, whereby a continuous guide-groove is formed around each of said lugs to receive and guide the projections on the hopper-sections in their downward and upward movements to hold the hopper closed or open accordingly as it descends or ascends, and gravity-switches for insuring the movement of the projections in the straight vertical portions of the guide-grooves during the downward movements of the hopper and capable of being forced aside by said projections during their upward movements.

11. The combination with a suitable support, a stationary hopper and a scale-beam supported thereon, of a weighing-hopper made in sections suspended from the scale-beam, links for connecting the sections to the beam, a valve, pivoted to the stationary hopper for controlling the discharge-outlet at the bottom of said hopper and a link pivotally connected with the scale-beam at the same point where the links are connected and having a loose pivotal connection with the valve for controlling the latter with the extreme movements of the weighing-hopper.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ELMER C. YOUNG.

Witnesses:
JAS. A. THOMPSON,
THOS. F. CARROLL.