Dec. 19, 1961 L. E. MEYER 3,013,622

AUTOMATIC WEIGHER FOR CATTLE FEED AND THE LIKE

Filed Jan. 20, 1960 3 Sheets-Sheet 1

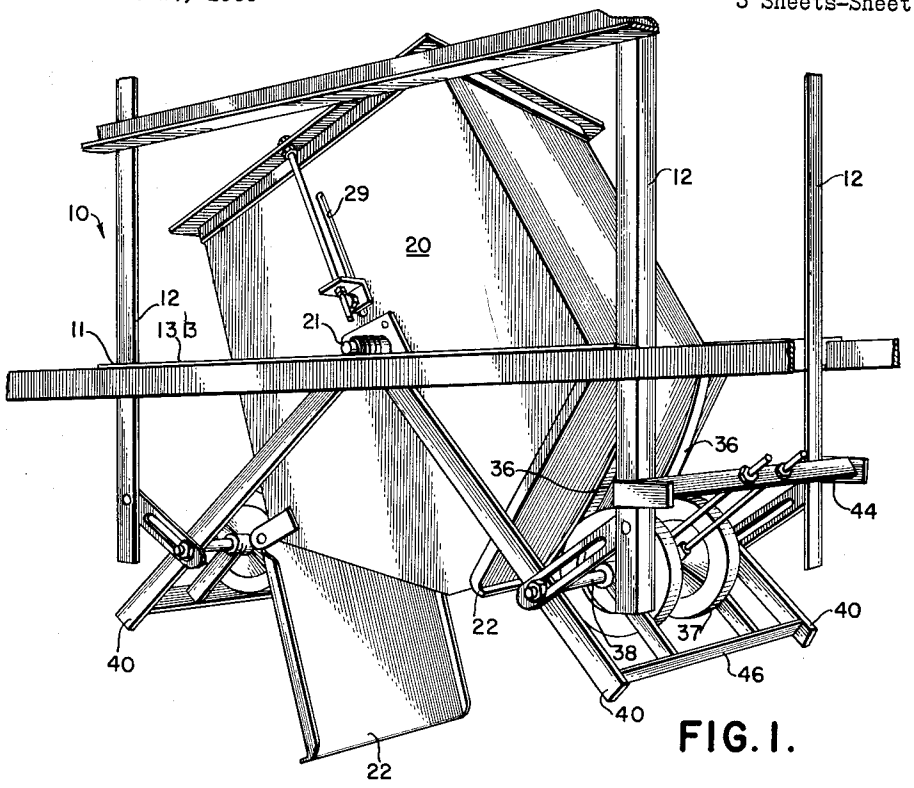


FIG. 1.

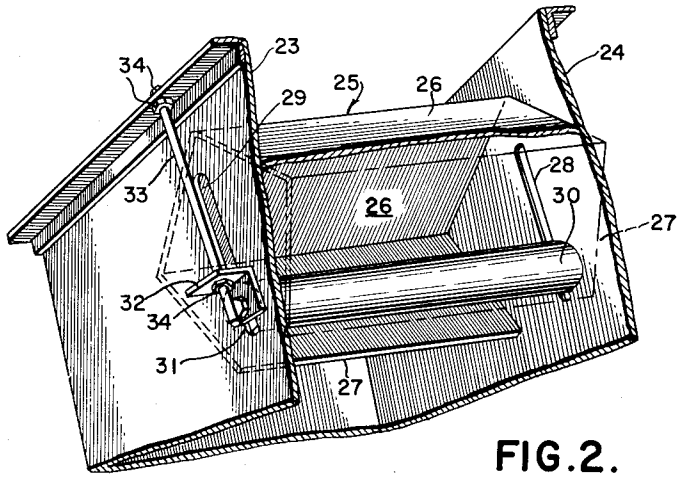


FIG. 2.

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Filed Jan. 20, 1960 3 Sheets-Sheet 2

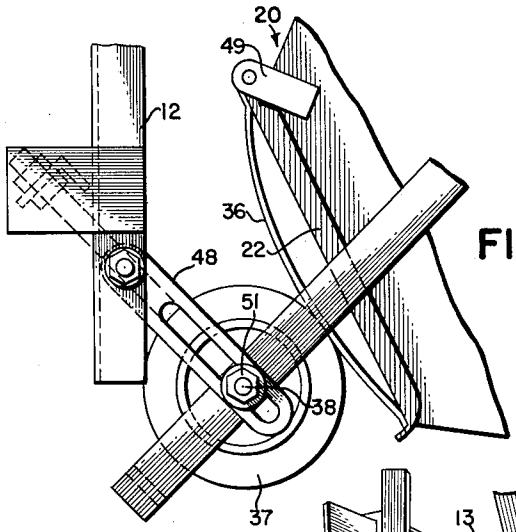


FIG. 4.

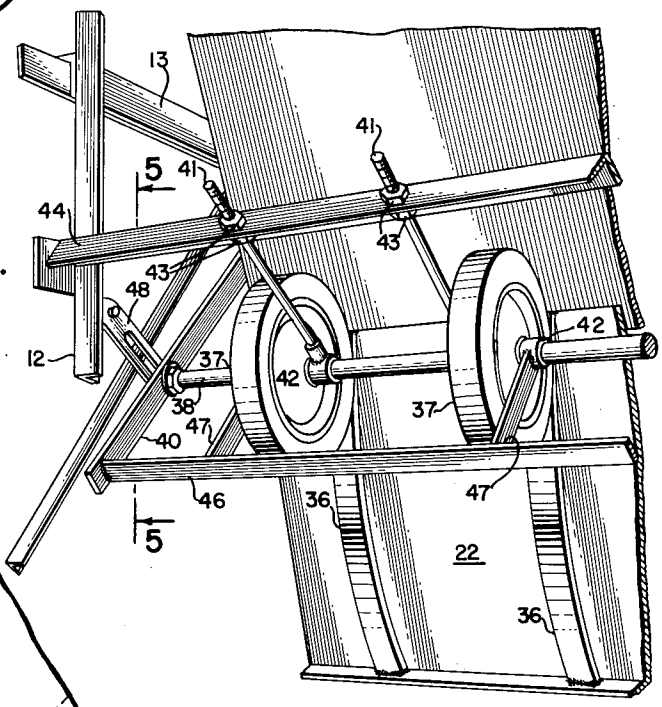


FIG. 3.

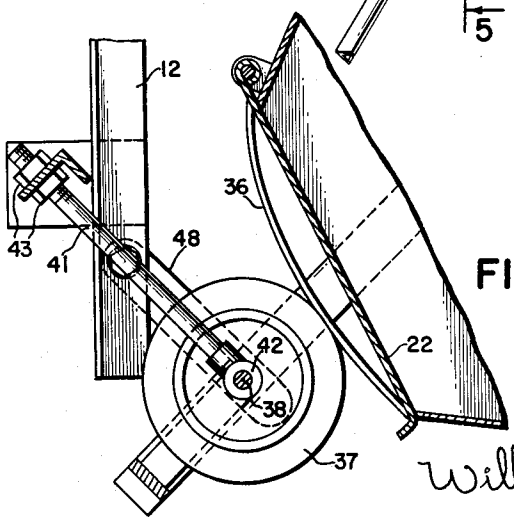


FIG. 5.

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AUTOMATIC WEIGHER FOR CATTLE FEED AND THE LIKE

Filed Jan. 20, 1960 3 Sheets-Sheet 3

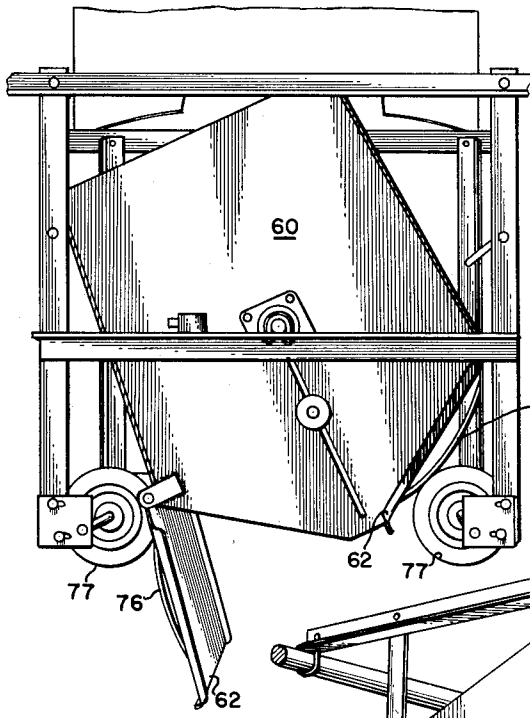


FIG. 7.

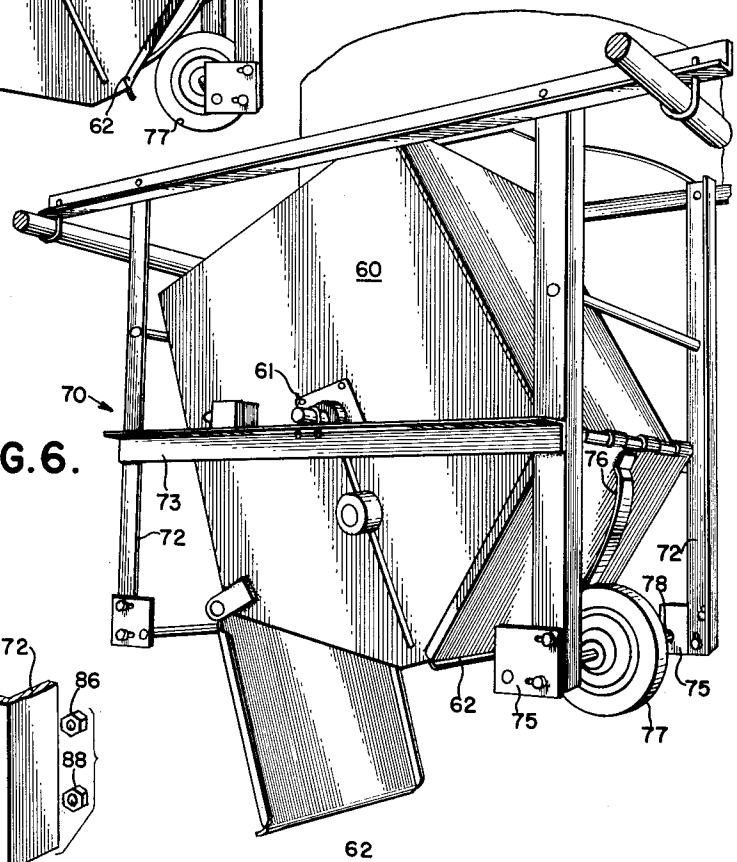


FIG. 6.

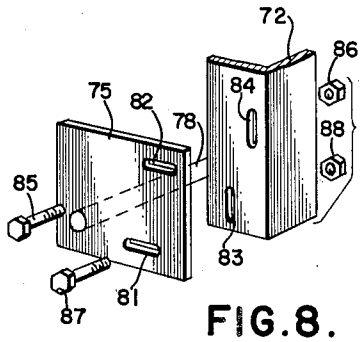


FIG. 8.

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3,013,622

AUTOMATIC WEIGHER FOR CATTLE FEED AND THE LIKE

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Filed Jan. 20, 1960, Ser. No. 3,530
9 Claims. (Cl. 177—96)

The present invention relates to an automatic weigher for cattle feed and the like, and more particularly to such an automatic weigher in which a weight is housed within the weigher, shielded by a deflector and readily adjustable from the outside of the weigher, and to a weigher in which wheels that are used to close gravity-opened doors may be readily adjusted.

Automatic weighers for bulk materials having a two-compartment hopper and a pair of gravity-opened, detent-shut doors are known. These weighers are mounted for oscillatory motion beneath a discharge spout, and the action is such that one compartment of the hopper is filled, with its discharge door closed, while the other compartment of the hopper is being emptied, with the discharge door thereof in an open position. While such weighers have proven highly useful and have gained wide acceptance, particularly for weighing out silage and the like, it has been found that it has not always been easy to change the weight of the material discharged from each of the compartments of the hopper.

In many of the prior art automatic weighers, no means whatsoever was provided to enable the weight discharged to be adjusted, while in other known weighers, the adjustment of the discharged weight has been accomplished less readily than is desirable.

An object of the present invention is to provide an automatic weigher in which the weight of the material discharged may be readily varied.

Another object of the present invention is the provision of an automatic weigher having an internally housed readily adjusted weight.

Still another object of the present invention is to provide an automatic weigher having an internally housed weight, in which the weight will not interfere with the movement of material through the weigher.

A further object of the present invention is the provision of an automatic weigher in which the weight discharged may be controlled by readily varying the position at which the discharge doors open and close.

Yet another object of the present invention is to provide an automatic weigher in which door closing parts may be readily disassembled for repair.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views.

FIGURE 1 is a perspective view of an automatic weigher in accordance with the present invention;

FIGURE 2 is a perspective view, with parts broken away, of a part of the hopper of the weigher of FIGURE 1;

FIGURE 3 is a perspective view, taken from below, of the door-closing wheels and attendant assembly portion of the automatic weigher of FIGURE 1;

FIGURE 4 is an elevational view of the parts shown in FIGURE 3;

FIGURE 5 is a cross-sectional view taken on the line 5—5 of FIGURE 3;

FIGURE 6 is a perspective view showing another embodiment of a weigher in accordance with the present invention.

FIGURE 7 is an elevational view, on a reduced scale, of the weigher of FIGURE 6.

FIGURE 8 is an exploded detail view of a part of the automatic weigher of FIG. 6.

Referring now to the drawings and particularly to FIGURE 1, there may be seen an automatic weigher generally designated **10**. There is provided a framework **11**, made up of vertical members **12** and horizontal members **13**. The horizontal members **13** support a hopper **20**, hopper **20** having stub shafts **21**, only one of which is shown in FIGURE 1, which rests upon the horizontal members **13**. Thus, the hopper **20** may oscillate about the axis of shaft **21**.

Hopper **20** receives material into an upper receiving opening, not shown, and discharges the material through a pair of bottom discharge openings which are controlled by the doors **22**.

To control the weight of material which the hopper **20** will discharge from each of its compartments, there is provided, as may be seen in FIG. 2, a weight **30**. Weight **30** is in the form of a cylindrical mass that extends from the side **23** of hopper **20** to the side **24** thereof. These sides **23** and **24** also have extending between them a deflector **25** that is formed by the two downwardly divergent plates **26**. At their lower ends, the plates **26** have downwardly converging plates **27**, one of which is indicated in phantom lines.

In the sides **23** and **24** there are provided slots **28** and **29** which extend downwardly from adjacent the apex of the deflector **25**.

As is clearly shown in FIG. 2, the weight **30** is housed within the plates forming the deflector **25**, and has a bolt **31** threaded into one end thereof, the other end being substantially identical. Bolt **31** extends through the slots **29**, and through an angle plate **32**. An adjusting rod **33** extends parallel to slot **29**, and through the other part of angle plate **32**. The upper end of adjusting rod **33** is secured to the top of side **23**, as by the nuts **34**. Adjusting rod **33** being threaded, it will be readily understood that the nuts **34** may be turned to adjust the position of angle plate **32** upwardly or downwardly, the position of angle plate **32** in turn determining the position of weight **30**.

Referring again to FIG. 1, there may be seen a pair of arcuate tracks **36** on the underside of the right-hand door **22**. A pair of wheels **37** engage with the tracks **36**, the wheels **37** being supported upon an axle **38**, which is in turn carried by the two supporting frame members **40**. Frame members **40** are pivotally secured, about their upper ends, to the shaft **31**, and it may be seen that the weigher **10** will comprise four such supporting frame members **40**.

Referring now to FIG. 3, there may be seen the aforementioned wheels **37**, axle **38** and one of the frame members **40**. The position of the frame member **40**, and hence of the axle **38**, is adjusted by a pair of threaded adjusting rods **41** which are secured at their lower ends to bearing sleeves **42**, only one of which may be seen in FIG. 3. The upper ends of the adjusting rods **41** are secured, as by the nuts **43**, to an angle iron **44** which extends between two of the vertical members **12** of the frame **11**, only one of which vertical members **12** is shown in FIG. 3.

Suitable bracing for the axle **38** and supporting frame member **40** is provided by a transverse member **46** extending between the two supporting frame members **40**, transverse member **46** being connected to the two bearing sleeves **42** by the braces **47**. A slotted brace member **48** may also be seen in FIG. 3 to be pivotally secured to the vertical member **12**.

As may be seen from FIGS. 4 and 5, when the hopper **20** has oscillated from the position shown in FIG. 3, wherein door **22** is open, the wheels **37** will engage the tracks **36** that are attached to the door **22**, and due to the pivotal connection of door **22** to the hopper **20**, as

shown at 49, the door 22 will swing shut. The axle 38 is secured in the supporting frame members 40 by the nut 51, shown in FIG. 4, which nut is on the outside of brace member 48. By loosening the nuts 51, the axle 38 may be quickly and readily withdrawn from the sleeves 42, to thereby permit the ready replacement of any parts, as may be necessary from time to time.

To adjust the point at which the doors will be opened and closed during the oscillatory movement of the hopper 20, it is only necessary to manipulate the adjusting nuts 43 on the rods 41, to thereby displace the axle 38 and the wheels 37 carried thereby. This may be readily accomplished, as will be understood, due to enlarged openings in the angle iron 44. As will be apparent, only simple tools are required for effecting the adjustment.

Referring now to FIG. 6, there may be seen a hopper 60 of the two-compartment type having pivoted doors 62. The hopper 60 has a stub shaft 61 carried by the horizontal member 73 of a frame generally designated 70. The horizontal members 73 are supported by vertical members 72. At their lower ends, the vertical members 72 have secured to them support plates 75. A pair of the support plates 75 carry an axle 78 which in turn has journaled thereon a wheel 77. Wheel 77, as in the case of wheel 37 in the embodiment of FIGS. 1 through 5, engages with a track 76 that is secured on the underside of the door 62.

Referring now to FIG. 7, the hopper 60 may be seen to be inclined, with the left-hand door 62 in the open position and the right-hand door 62 held closed by the engagement of the right-hand wheel 77 with the track 76 of the right-hand door 62. As will be appreciated, the doors 62 will open when their tracks 76 are not in engagement with the wheels 77, during the oscillations of hopper 60. Therefore, variation of the point at which the wheels 77 release the doors 62 will vary the amount of material in each discharge of the hopper 60.

To accomplish the weight variation in the embodiment shown in FIGS. 6, 7 and 8, the support plates 75, as may be seen in FIG. 8, have a pair of horizontally extending slots 81 and 82, and the lower end of vertical member 72 has a pair of vertically extending slots 83 and 84. Plate 75 is secured to vertical member 72, in an adjustable manner, by a bolt 85 which passes through the slots 82 and 84 and is secured by a nut 86, and by a bolt 87 that passes through the slots 81 and 83 and is secured by a nut 88. As will be understood, the provision of the slots 81, 82, 83 and 84 permit the support plate 75 to be adjusted, and to thereby adjust the position of the wheel 77 carried by the axle 78. This adjustment will in turn permit variation of the position in which the door 62 is released from engagement with the wheel 77 and thus opens.

In operation of the several embodiments of the invention herein disclosed, the position at which the wheels 37 or 77 no longer engage the tracks 36 or 76 may be readily varied, so that the release of the doors 22 and 62 may be effected at different positions of the hoppers 20 and 60. The weight of material being fed into the hopper compartment having the door thereof closed then causes the hopper 20 or 60 to oscillate, and thereby serves to effectively discontinue the filling of that one hopper; hence, the weight of material in the hopper is thereby controlled.

The adjustment of the weight 30, in the embodiment as shown in FIG. 2, shifts the center of gravity of the entire load, thus causing the hopper 20 to oscillate to the opposite position when there is more or less material in the hopper compartment. As will be understood, raising the weight 30 will provide for a greater discharge weight in each of the hopper compartments.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

What I claim is:

1. An automatic weigher for silage comprising a two-compartment hopper adapted to be disposed beneath a silage discharge spout, means mounting said hopper for oscillatory movement to enable said compartments to sequentially register with a spout, said hopper including an upper receiving opening and a pair of bottom discharge openings, a pair of doors pivotally secured to said hopper for closing said discharge openings and adapted to normally open and close by gravity as said hopper oscillates, means for alternately engaging said doors as said hopper oscillates for retaining said doors in the closed position thereof, a deflector in said hopper adjacent said upper opening comprising a pair of downwardly divergent plates and a pair of downwardly convergent plates at the lower ends of said first mentioned plates, slots in said hopper extending downwardly from adjacent the apex of said deflector, a weight within the space provided by said deflector having ends extending through said slots, a pair of adjusting rod means on the exterior of said hopper connected to said weight and to said hopper for supporting said weight, and means for adjusting the effective length of said rod means, whereby material entering said hopper will be deflected by said deflector away from said weight and whereby said weight may be supported in any of a plurality of positions.

2. An automatic weigher for silage comprising a two-compartment hopper adapted to be disposed beneath a silage discharge spout, means mounting said hopper for oscillatory movement to enable said compartments to sequentially register with a spout, said hopper including an upper receiving opening and a pair of bottom discharge openings, a pair of doors pivotally secured to said hopper for closing said discharge openings and adapted to normally open and close by gravity as said hopper oscillates, means for alternately engaging said doors as said hopper oscillates for retaining said doors in the closed position thereof, a deflector in said hopper adjacent said upper opening comprising a pair of downwardly divergent plates, slots in said hopper extending downwardly from adjacent the apex of said deflector, a weight beneath said deflector plates having the ends thereof extending through said slots, a pair of adjusting rod means on the exterior of said hopper connected to said weight and to said hopper for supporting said weight, and means for adjusting the effective length of said rod means, whereby material entering said hopper will be deflected by said deflector away from said weight and whereby said weight may be supported in any of a plurality of positions.

3. An automatic weigher for silage comprising a two-compartment hopper adapted to be disposed beneath a silage discharge spout, means mounting said hopper for oscillatory movement to enable said compartments to sequentially register with a spout, said hopper including an upper receiving opening and a pair of bottom discharge openings, a pair of doors pivotally secured to said hopper for closing said discharge openings and adapted to normally open and close by gravity as said hopper oscillates, means for alternately engaging said doors as said hopper oscillates for retaining said doors in the closed position thereof, a deflector in said hopper adjacent said upper opening comprising a pair of downwardly divergent plates, slots in said hopper extending downwardly from adjacent the apex of said deflector, a weight beneath said deflector having the ends thereof extending through said slots, and adjustable supporting means exteriorly of said hopper engaging said weight, whereby material entering said hopper will be deflected by said deflector away from said weight and whereby said weight may be supported in any of a plurality of positions.

4. An automatic weigher for silage comprising a two-compartment hopper adapted to be disposed beneath

a silage discharge spout, means mounting said hopper for oscillatory movement to enable said compartments to sequentially register with a spout, said hopper including an upper receiving opening and a pair of bottom discharge openings, a pair of doors pivotally secured to said hopper for closing said discharge openings and adapted to normally open and close by gravity as said hopper oscillates, means for alternately engaging said doors as said hopper oscillates for retaining said doors in the closed position thereof, a weight within said hopper, and adjustable supporting means exteriorly of said hopper for said weight whereby said weight may be supported in any of a plurality of positions to vary the weight of material discharged by said hopper at each oscillation thereof.

5. An automatic weigher for silage comprising a two-compartment hopper adapted to be disposed beneath a silage discharge spout, means mounting said hopper for oscillatory movement to enable said compartments to sequentially register with a spout, said hopper including an upper receiving opening and a pair of bottom discharge openings, a pair of doors pivotally secured to said hopper for closing said discharge openings and adapted to normally open and close by gravity as said hopper oscillates, means for alternately engaging said doors as said hopper oscillates for retaining said doors in the closed position thereof, means for adjusting the position at which said door engaging means releases said doors to permit the opening thereof, a weight within said hopper, and adjustable supporting means exteriorly of said hopper for said weight whereby said weight may be supported in any of a plurality of positions to vary the weight of material discharged by said hopper at each oscillation thereof.

6. In an automatic weigher for silage, a frame, a two-compartment hopper adapted to be disposed beneath a silage discharge spout, shafts extending from said hopper and supported by said frame for oscillatably supporting said hopper, said hopper including an upper receiving opening and a pair of bottom discharge openings, a pair of doors pivotally secured to said hopper for closing said discharge openings and adapted to normally open by gravity as said hopper oscillates, arcuate tracks on the undersides of said doors, supporting frame members pivotally secured about and diverging downwardly from said shafts and carrying a pair of axles, wheel means carried by said axles and engageable with said tracks on said doors as said hopper oscillates, and means for adjusting the positions of said axles in an arc about said shafts comprising a sleeve about each of said axles, a rod secured to each of said sleeves, and means for securing said rods to said frame in any of a plurality of positions.

7. In an automatic weigher for silage, a frame, a two-compartment hopper adapted to be disposed beneath a

silage discharge spout, shafts extending from said hopper and supported by said frame for oscillatably supporting said hopper, said hopper including an upper receiving opening, and a pair of bottom discharge openings, a pair of doors pivotally secured to said hopper for closing said discharge openings and adapted to normally open by gravity as said hopper oscillates, arcuate tracks on the underside of said doors, supporting frame members pivotally secured about and diverging downwardly from said shafts and carrying a pair of axles, wheel means carried by said axles and engageable with said tracks on said doors as said hopper oscillates, and means for adjusting the positions of said axles in an arc about said shafts comprising a sleeve about each of said axles, and means connected to each of said sleeves for retaining said sleeves and axles in any of a plurality of positions.

8. In an automatic weigher for silage, a frame, a two-compartment hopper adapted to be disposed beneath a silage discharge spout, shafts extending from said hopper and supported by said frame for oscillatably supporting said hopper, said hopper including an upper receiving opening, and a pair of bottom discharge openings, a pair of doors pivotally secured to said hopper for closing said discharge openings and adapted to normally open by gravity as said hopper oscillates, arcuate tracks on the undersides of said doors, supporting frame members pivotally secured about and diverging downwardly from said shafts and carrying a pair of axles, wheel means carried by said axles and engageable with said tracks on said doors as said hopper oscillates, and means for retaining said axle in any of a plurality of positions in an arc about said shafts.

9. In an automatic weigher for silage, a frame, a two-compartment hopper adapted to be disposed beneath a silage drainage spout, means for oscillatably supporting said hopper on said frame, said hopper including an upper receiving opening, and a pair of bottom discharge openings, a pair of doors pivotally secured to said hopper for closing said discharge openings and adapted to normally open by gravity as said hopper oscillates, arcuate tracks on the undersides of said doors, a pair of axles, wheel means carried by said axles and engageable with said tracks on said doors as said hopper oscillates, means for securing said axles in any of a plurality of door releasing positions, whereby the weight of material discharged by said weigher may be adjusted, and weight means in said hopper adjustable exteriorly of said hopper for supporting said weight in any of a plurality of positions.

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