Sept. 30, 1952 W. F. ALTENPOHL 2,612,265

TRACK SCALE FOR AUTOMATIC WEIGHING AND SORTING MACHINES

Filed Oct. 28, 1948 2 SHEETS—SHEET 1

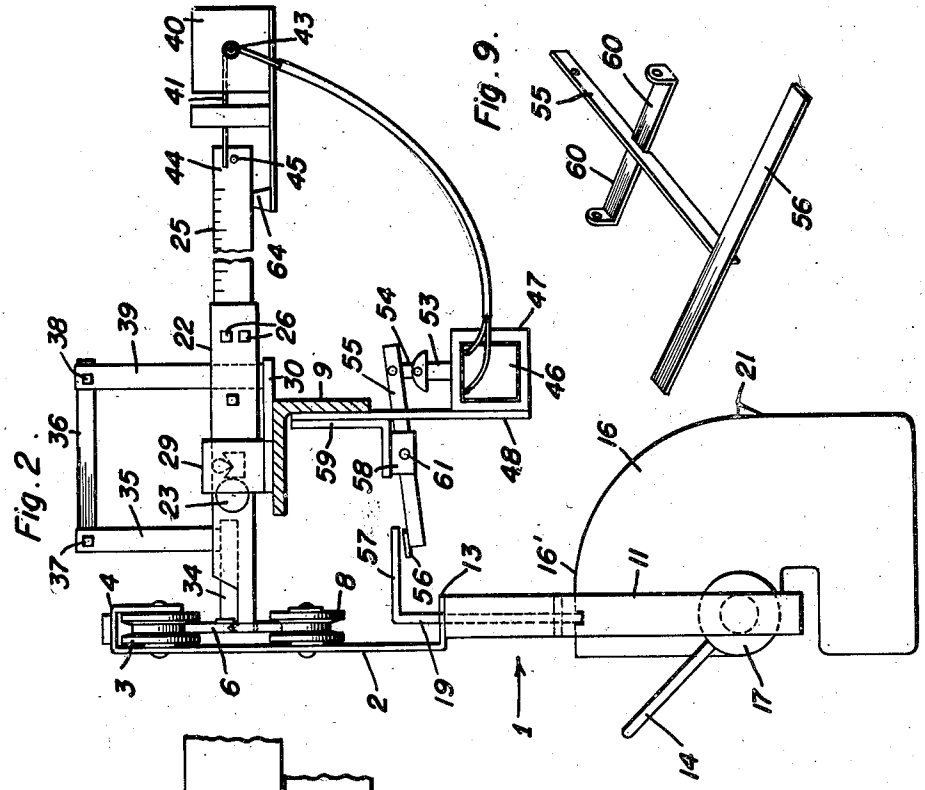


Fig. 2.

Fig. 9.

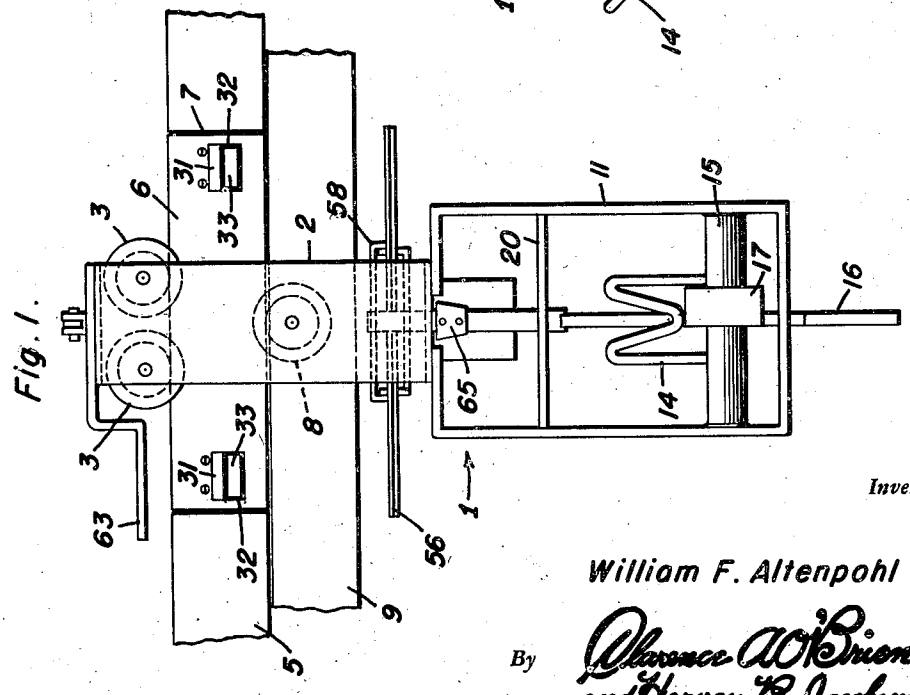


Fig. 1.

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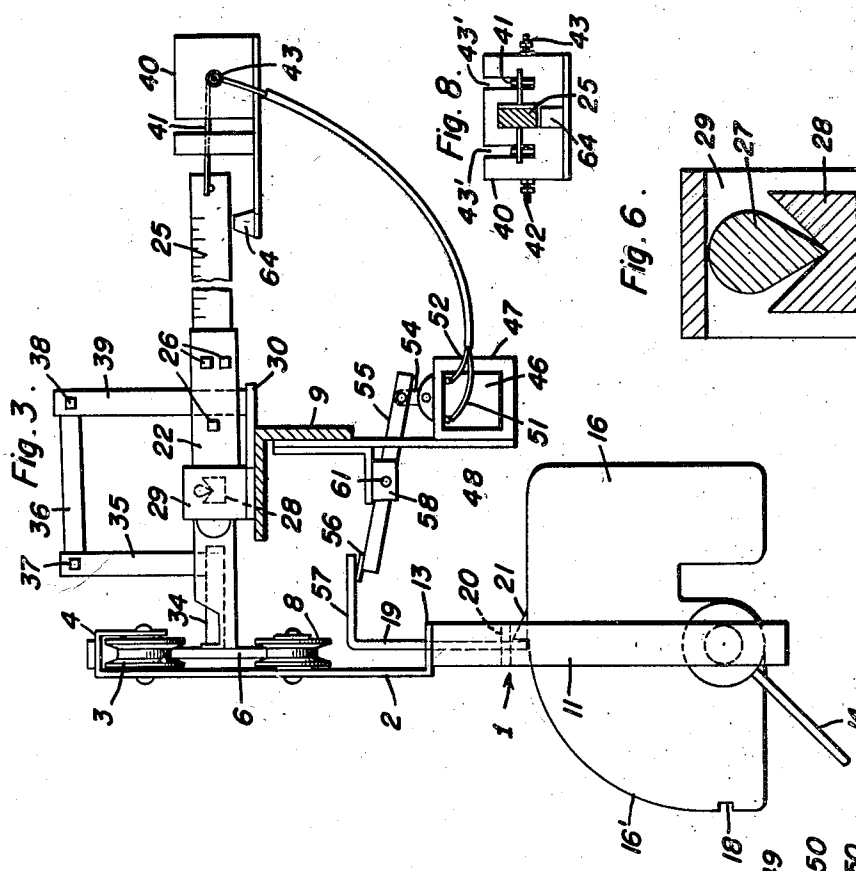


Fig. 3.

Fig. 8.

Fig. 6.

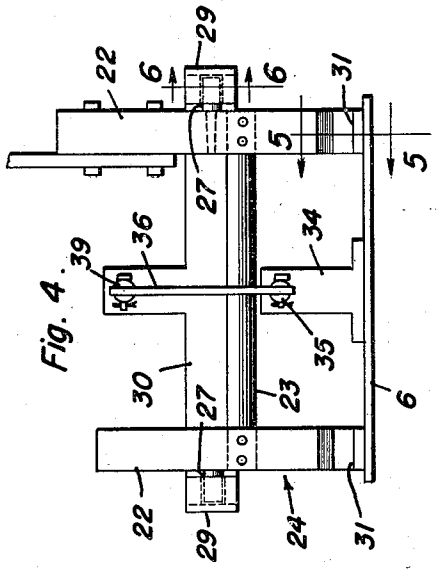


Fig. 4.

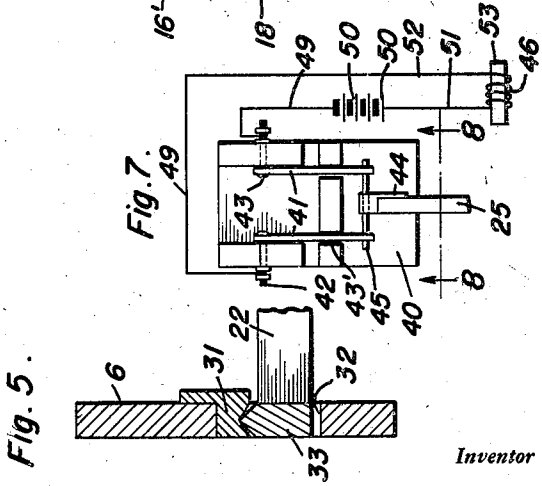


Fig. 5.

Fig. 7.

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Patented Sept. 30, 1952 2,612,265

UNITED STATES PATENT OFFICE

2,612,265

TRACK SCALE FOR AUTOMATIC WEIGHING AND SORTING MACHINES

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Application October 28, 1948, Serial No. 57,076

4 Claims. (Cl. 209—121)

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My invention relates to track scales for automatic weighing and sorting machines of the type forming the subject matter of my co-pending application Serial No. 719,516, filed December 31, 1946, now Patent No. 2,471,711, and over which the present invention is designed as an improvement.

By way of premise, in the machine of my co-pending application "supra" poultry weighing and sorting track scales are disclosed embodying trolley carriages including self-dumping poultry carriers and which are propelled along a track comprising vertically movable track sections forming part of scale balance beams which, when overbalanced by the load on the carrier permit the track sections and carriages to descend and operate to trip mechanism releasing the carriers for self-dumping.

The primary object of the present invention is to provide in such scales for accelerating tripping of the carriers and dumping thereof so as to speed up operation of the machine.

Another object is to obviate swinging of the carriages laterally of the track and track sections while the same are being lowered, and as a result of dumping of the carriers, so that such movement of the carriages will not interfere with the tripping operation.

Still another object is to obviate lost motion in operation of the scales during tripping of the carriers so as to accomplish quick dumping and reduce wear on the parts.

Still another object is to provide in such scales for mounting the moving parts so that the scales will be absolutely accurate.

Other and subordinate objects, within the purview of my invention, together with the precise nature of my improvements will be readily understood when the succeeding description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a fragmentary view in front elevation of my improved track scales in the preferred embodiment thereof, with the parts shown in normal position;

Figure 2 is a view in side elevation, partly in section, of the same;

Figure 3 is a similar view with the parts shown in tripping and dumping position;

Figure 4 is a fragmentary view in plan of the mounting for the track section and the stabilizing means for the track section;

Figure 5 is a view in vertical section taken on the line 5—5 of Figure 4 and drawn to a larger scale.

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Figure 6 is a view in vertical section taken on the line 6—6 of Figure 4 and drawn to a larger scale;

Figure 7 is a view in plan of the switch stand and also illustrating the circuit for the solenoid;

Figure 8 is a view in transverse section taken on the line 8—8 of Figure 7;

Figure 9 is a view in perspective of the trip lever.

Referring to the drawings by numerals, the track scale with which my improvements are concerned comprises a trolley carriage 1 embodying a rectangular hanger plate 2 suspended in upright position by a pair of horizontally spaced trolley wheels 3 in an upper end channel housing 4 on said plate. The trolley wheels 3 are adapted to run on the upper edge of a horizontal flat track 5 with a vertically movable track section 6 therein bridging a gap 7 in the line of the track and forming a part of the scales, in a manner presently seen. A feature of my invention, is that a stabilizing trolley wheel 8 on the hanger plate 2 runs along the bottom edge of the track 5 and the track section 6 and together with the trolley wheels 3 coacts with the track section 6 to stabilize the carriage 1 against swinging laterally relative to said section. The track 5, with the exception of the track section 6, and, as will be understood, is suitably supported in horizontal elevated position. The track 5 extends parallel to a frame angle bar 9, the purpose of which will presently be seen.

According to the present invention, a poultry carrier forms part of the trolley carriage 1 and includes a rectangular carrier frame 11 depending from the hanger plate 2 in a plane parallel therewith, with an upper end suitably fixed to a lower end lateral flange 13 on said plate 2. A crotched carrier yoke 14, in the form of an M-shaped rod, is suitably secured at its ends in upstanding position on a horizontal cross shaft 15 in the lower end of the carrier frame 11 having its ends suitably journaled in said frame 11 for oscillation therein to swing said yoke member 14 into a forwardly and upwardly inclined, normal, position relative to said frame 11, or, into a downwardly and forwardly inclined dumping position relative to said frame. In the normal, load supporting, position thereof, the carrier yoke 14 functions to support a fowl, not shown, by the neck or feet, in the crotch of said yoke to slide out of the crotch in the dumping position of said yoke.

A counter-balance plate 16 is fast on a collar 17 suitably fixed to the cross shaft 15 so that said plate 16 extends perpendicular to said shaft in

the vertical center of the carrier frame 11 and is rearwardly offset relative to said shaft, whereby said shaft 15 is normally overbalanced, together with the carrier yoke 14 so as to swing said yoke into its normal position. The weight of the fowl on the carrier yoke 14 tends to overbalance the counter-balance plate 16 and to rotate the same, by means of the cross shaft 15, so that said yoke 14 will swing into dumping position. The counter-balance plate 16 has an upper sector end 16' with a notch 18 therein for a purpose to be explained.

A vertical latch bar 19 is slidably mounted in the flange 13 of the hanger plate 2 and in an upper cross bar 20 in the hanger frame 11 to descend, under the influence of gravity, into the notch 18 and latch the counter-balance plate 16 against revolving and the carrier yoke 14 in normal load supporting position. A stop lug 21 on the counter-balance plate 16 engages the cross bar 20 and limits rotation of the counter-balance plate 16 to establish the dumping position of the carrier yoke 14.

The track section 6 is mounted, in a manner presently specifically described, adjacent its ends on the front ends of a pair of yoke arms 22 connected together in parallel laterally spaced relation by a cross shaft 23 to form a yoke 24. A graduated scale beam member 25 extends rearwardly from one yoke arm 22 for the usual poise, not shown, and is bolted to said arm, as at 26, so that the yoke 24 and the beam member 25 form a scale beam. The yoke 24 is mounted on the angle bar 9, crosswise thereof, for vertical rocking movement by means of a pair of lateral knife edge bearing studs 27 on said arms 22 intermediate the ends of the arms and which rest in V-notched bearing lugs 28 on upstanding, right angled ends 29 of a bearing bar 30 extending along the top of the bar 9 opposite the gap 7 and which is suitably secured to said bar 9. The ends 29 cover the bearing studs 27 and the lugs 28 to protect the same.

The beforementioned mounting for the track section 6 comprises a pair of V-notched bearing blocks 31 set into end openings 32 in said section 6 and suitably secured therein, and a pair of knife edge front end bearing members 33 on the yoke arms 22 and in said openings 32 and on which the bearing blocks 31 set so that the track section 6 may be stabilized against lateral tilting about a longitudinal pivotal axis thereof during vertical swinging of said section with the scale beam, and whereby the carriage 1 is stabilized, when on the track section 6, against lateral swinging relative to said section. The advantage of this will presently become apparent.

Stabilizing means for the track section 6 is provided and comprises a horizontal lateral arm 34 extending rearwardly from said section 6 and suitably secured rigidly thereto, said arm 34 terminating forwardly of the axis of rocking movement of the yoke 24, or scale beam, in an upstanding post 35 which is rigidly secured on the arm. A link 36 is pivoted at one end, as at 37, to the upper end of the post 35 with the other end of the link pivoted, as at 38, to a post 39 upstanding rigidly from the bearing bar 30 in the rear of the pivotal axis of the yoke 24, or scale beam. As will be seen, when the yoke 24 rocks vertically and the track section 6 ascends or descends, the post 35 is maintained by the link 36 parallel with the post 39 to maintain the arm 34 horizontal and stabilize the track section and the carriage 1 against lateral swinging. As will also be seen, by thus stabilizing the track section 6 and the carriage 1, the load is always suspended from the track section 6 at the same distance from the pivotal axis of the yoke 24, or the scale beam of which the yoke forms a part. Manifestly this provides for accuracy in weighing by the scales.

The described scale controls electro-magnetically operated tripping mechanism for tripping the latch bar 19 by lifting the same so as to free the carrier yoke 14 for dumping operation in timed relation to the travel of the carriage 1 onto the track section 6. This mechanism comprises a trough-like switch stand 40, of insulation material, suitably secured on a stationary support, not shown, in the rear of the beam member 25 with a pair of contact bars 41 pivoted on binding posts 42, 43 on opposite sides of the stand for independent vertical swinging movement upon opposite sides of the beam member 25 from a normal horizontal position. The contact bars 41 normally rest in vertical slots 43' in the switch stand 40. The beam member 25 is provided with a rear end cap member 44, of insulation material, through which there is extended and fixed therein a conductive bridge rod 45 normally underlying the front ends of the contact bars 41, in spaced relation thereto, when the scale beam formed by the yoke 24 and the beam member 25 is overbalanced into a rest position by the poise, not shown. As will now be seen, the beam member 25 forms with the conductive bridge rod 45 and contact bars 41 a switch and the scale beam forms a switch arm vertically movable at its rear end upwardly to bridge the contact bars 41, by means of the conductive bridge rod 45 and thereby close the switch. The contact bars 41 are swingable upwardly to compensate for upward movement of the conductive bridge rod 45 so as not to interfere with the operation of the scale beam.

The described switch is interposed in a suitable circuit for energizing a solenoid 46 carried by a suitable casing 47 on the lower end of a hanger bar 48 depending from and suitably fixed to the bar 9 behind the carriage 1. The circuit, as shown in Figure 7, may comprise a line 49 from the binding post 43 to one side of a battery 50 connected on its other side by a line 51 to one side of the field of the solenoid 46, the other side of said field being connected by a line 52 to the other binding post 42.

The core 53 of the solenoid 46 is operatively connected by a pivoted link 54 to one end of a horizontal trip lever 55 arranged at a right angle to the path of travel of the carriage 1 and pivotally mounted, in a manner presently described, for vertical swinging movement. The trip lever 55 embodies a cross rail 56 on its front end adapted to underlie a right-angled arm 57 on the latch bar 19, when the carriage 1 travels onto the track section 6, the arrangement being such that the trip lever 55 is adapted to be rocked by the core 53 to elevate the rail 56 under the arm 57 of the latch bar 19 to lift said latch bar into unlatching position. The mounting for the trip lever 55 comprises an inverted U-shaped bracket 58 suspended in horizontal position by a plate 59 suitably fixed to the hanger plate 48, and a pair of aligned lateral arms 60 on the trip lever 55 pivoted at the outer ends thereof, as at 61, in said bracket 58.

The numeral 63 designates an attaching arm on the carriage 1 for coupling to a suitable carriage propelling chain, or the like, not shown.

A stop 65 on the latch bar 19 engages the

flange 13 and establishes the unlatching position of said bar.

The operation of the described invention will be readily understood. The described scale beam is designed to be over-balanced by the poise, not shown, for a given weight of fowl plus the weight of the carriage 1 and to align the track section 6 with the track 5. A suitable stop, such as shown at 64, on the stand 40 is adapted to be engaged by the beam member 25, when the scale beam is thus over-balanced to limit downward movement of the over-balanced end of the scale beam and hold the track section 6 level with the track 5. With a fowl suspended, as described, in the carrier yoke 14 and said yoke, together with the counter-balance plate 16 latched in normal position, as shown in Figures 1 and 2, by the latch bar 19, and the scale beam over-balanced as described, when the carriage 1 travels onto the track section 6, if the fowl is of the given weight, the track section 6 will be depressed under the weight of the load thereon causing the scale beam to swing so as to lift the beam member 25, as shown in Figure 3. This lifting of the beam member 25 will engage the conductive bridge rod 45 with the contact arms 41, as shown in Figure 3, and close circuit to the solenoid 46. The solenoid 46, when thus energized, will retract the core 53 and rock the trip lever 55 to elevate the cross rail 56 thereby lifting the latch bar 19 into tripped unlatching position, also as shown in Figure 3. The carrier yoke 14 will now swing or rotate into dumping position in the manner previously described, and as shown in Figure 3, to dump the fowl off said yoke. The carrier yoke 14 will then be over-balanced by the counter-balance plate 16 and return to normal load-supporting position. As soon as the carriage 1 travels off the track section 6 onto the track 5 the arm 57 of the latch bar 19 will slide off the cross rail 56 so that the latch bar 19 may return, under the influence of gravity into latching engagement with the notch 18 of the counter-balance plate 16. At this point, the scale beam is free to return to over-balanced position to lower the conductive bridge rod 45 out of contact with the contact bars 41 and break circuit to the solenoid 46. When this occurs, the trip lever 55 and the core 53 are returned to normal position by weight of the cross rail 56 which over-balances the trip lever 55 into normal position, thus causing the core 53 to assume normal position. By stabilizing the track section 6 and the carriage 1, in the manner already described, the arm 57 of the latch bar 19 is held in proper position for tripping by the trip lever 53 since the tendency of the carriage 1 to swing laterally under the offset load thereon, and also as a result of the dumping operation, is completely neutralized. As will be manifest, the described scales are mounted for operation with the minimum of friction and with exceptional accuracy in weighing.

The foregoing will, it is believed, suffice to impart a clear understanding of my invention, without further explanation.

Manifestly, the invention, as described, is susceptible of modification, without departing from the inventive concept, and right is herein reserved to such modifications as fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. The combination with a horizontal track having a track section depressible therein, a pivotally mounted scale beam carrying said section on one end thereof and swingable on its pivot by depression of said section, and a load supporting carriage for travel along said track onto said section to depress said section, of a load supporting yoke on said carriage pivotally mounted for vertical swinging by the weight of the load thereon from load supporting to load dumping positions, a counter-balance plate rotatable about the pivotal axis of said yoke to swing the same into load supporting position, releasable latch means for holding said plate against rotation, and means for releasing said latch means controlled by swinging movement of said beam.

2. The combination with a horizontal track having a track section depressible therein, a pivotally mounted scale beam carrying said section on one end thereof and swingable on its pivot by depression of said section, and a load supporting carriage for travel along said track onto said section to depress said section, of a load supporting yoke on said carriage pivotally mounted for vertical swinging from load supporting into load dumping positions, a counter-balance member rotatable in one direction about the pivotal axis of said yoke to swing the same into load supporting position, a latch bar on said carriage for latching said member against rotation in the opposite direction and being movable into unlatching position, and electro-magnetic means for moving said latch bar when the carriage travels onto said section including a switch closed by said other end of said beam when said beam is swung.

3. In combination, a horizontal frame bar, a horizontal track extending alongside said bar and including a flat sided elongated track section depressible therein, a load supporting carriage suspended from said track to hang free below the same and travel onto said section to depress said section, a scale beam pivoted between its ends on said bar for vertical tilting, means pivotally mounting said section at its ends on said beam for swinging about a horizontal axis to stabilize the same in a vertical plane during tilting of said beam, and pivotal connections between said section and bar stabilizing said section.

4. The combination according to claim 3 wherein said connections comprise a lateral arm on said section having an upright post thereon and a pivoted link connecting said post to said bar and holding said post in vertical position.

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