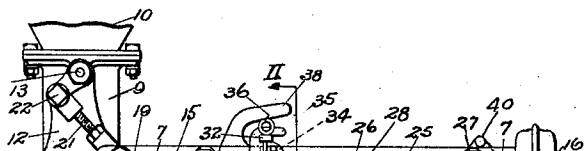
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AUTOMATIC FEEDER

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AUTOMATIC FEEDER.

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The present invention relates to certain new and useful improvements in automatic feeders of the class adapted to control the flow of material from the discharge aperture of a suitably disposed spout, or hopper, into a succession of moving receptacles.

It is the especial object to provide a feeder of the class described having operating mechanism arranged to be actuated by the receptacle moving devices, and adapted to be conveniently adjusted to or from operating positions.

A further object is to provide devices of the class described adapted to be conveniently adjusted to vary the amount of material discharged into each successive receptacle.

These and other objects will be fully set forth in the following specification, reference being had to the accompanying drawings of which

Fig. 1, is a side elevation of the preferred embodiment of my invention arranged to control the loading of the buckets of a conveyor of the well known pivoted bucket type.

Fig. 2, is a cross sectional view taken along the line II—II of Fig. 1.

Fig. 3, is a plan view of the valve actuating mechanism.

Fig. 4, is a side elevation of the devices illustrated in Fig. 3.

Fig. 5, is a side elevation of the devices illustrated in Fig. 1 showing the material controlling valve in its open position.

Fig. 6, is a fragmentary plan view of the operating lever certain parts being broken away to reveal other parts.

Fig. 7, is a detail of the supporting bracket for the actuating mechanism.

Like numerals refer to similar parts in the several figures.

In the drawings I have shown the preferred embodiment of my invention, associated with a conveyor of the well known pivoted bucket type, comprising a series of buckets 1 each of which is provided at each end with a trunnion 2, which trunnions are journaled in apertures of the side bars 3 of a pair of parallel matched endless chains 4 and 5. The adjacent ends of the side bars 3 are connected together by pintles 6 which extend between the chains 4 and 5 to hold them in spaced parallelism. Journaled upon the pintles 6 are flanged rollers 7 adapted to travel along the track rails 8 which support and guide the buckets 1 through the desired path of travel. As conveyors of this type are well known in the art, and as they form no part in the present invention, further description is not thought to be required at this time.

Positioned above the conveyor is a nozzle 9 adapted to be connected to any convenient source of material supply, such as a spout 10, or the like, and arranged to direct the flow of material therefrom into the buckets of the conveyor. The flow of material from the nozzle 9 is controlled by the valve which comprises a plate 11, at each end of which are upwardly projecting wings 12 having apertures through which project the bolts 13 by which the valve 11 is pivotally connected to the walls of the nozzle 9. The valve plate 11 is curved concentrically with the pivot bolts 13, and the proportions of the parts are such that said plate will normally swing into position directly below said nozzle to close it. A flange 14, at the rearward side of the nozzle 9, engages the valve plate 11 to limit its rearward movement, and when in its closed position this flange prevents leakage of material between the edges of the valve plate and nozzle.

Movement of the valve 11 is effected by the operating lever 15 positioned directly above, and cooperating with the conveyor chain 4. The lever 15 is pivotally supported by the bracket 16 which is attached directly to the track rail 8, or to its supporting foundation, in such a manner as to insure the desired relation between the lever 15 and the chain 4. A depending lug 17 formed on the bracket 16 carries the pivot bolt 18 upon which the lever 15 is supported without obstructing the space between said chain and lever. The operating lever 15 extends forwardly from the supporting bracket 16, in the direction of travel of the conveyor chain, and at its forward end, adjustably secured in a longitudinally extending slot 19, is a wrist-pin 20 to which is connected the lower end of the connecting rod 21. The upper end of the rod 21 engages a crank pin 22 fixed to the wing 12 of the valve 11.

The operating lever 15 is composed of two parallel spaced apart bars 23 and 24 which are joined together in any suitable and convenient manner. Between the bars 23 and 24 there is positioned a cam member 25

adapted to be adjusted to either of two positions, the lower, or operating position extending well into the path of travel of the chain rollers 7, and the upper, or idle position entirely outside of that path of travel. Formed in the cam 25 is an elongated longitudinally extending slot 26 through which projects a bolt 27 which also passes through similar slots 28 formed in the side bars 23 and 24. The bolt 27 may be secured in any preferred position of adjustment longitudinally of the slots 26 and 28 by the nut 29 which is screw threaded to said bolt. The pivot bolt 27 serves to support the rearward end of the cam 25 and by its adjustment longitudinally of the slots 26 and 28 the relation of these parts may be so varied as to change the time of opening the valve 11 relative to movements of the buckets 1 and the period of time during which said valve remains open.

Formed on the forward part of the cam 25 are laterally extending lugs 30 adapted to engage the notches 31 of the side bars 23 and 24 when the cam is in its operating position, to prevent movement of said cam longitudinally of said side bars, and a locking finger 32 is provided to secure said cam in operative position. The finger 32 is pivotally attached to the side bar 24 by a bolt 33, and when in locked position engages the lug 34, formed on the cam, and a hook 35 formed on the side bar 23 to resist upward movement of said cam. A latching pin 36 vertically slidable in an aperture of the locking finger 32, is adapted to engage the lug 37 formed on the side bar 23 to hold said finger in locked position. A handle 38 formed on the cam 25 serves as a convenient means for lifting said cam from its operating to its idle position, and a notch 39 formed in the cam 25, is arranged to engage the locking finger 32 to support the cam in its idle position.

During operation of the feeding mechanism the cam 25 stands in its lower, operative position extending into the path of travel of the chain roller 7, to contact therewith, and is locked in that position by the locking finger 32. The advancing chain rollers 7 engage the under surface of the cam 25 and crowd it upwardly, thereby rotating the lever 15 about its pivot 18 and transmitting a thrust to the connecting rod 21 which swings the valve plate 11 to its open position permitting material to flow from the nozzle 9. The arrangement and proportions of the parts are such that the valve 11 will not open until a bucket 1 is in position beneath the nozzle 9 to receive material flowing therefrom, and said valve will be again closed before said bucket has passed from under said nozzle, thereby preventing material being spilled between adjacent buckets of the conveyor.

Adjustment of the pivot bolt 27 longitudinally of the slots 26 and 28 changes the relation of the cam 25 to the operating lever 15 to vary the timing of the valve 11, movement from the pivot 18 retarding, and movement in the opposite direction causing earlier opening of the valve.

By the adjustment of the wrist-pin 20 longitudinally of the slot 19, and by the elongation or contraction of the connecting rod 21, the distance through which the valve 11 will swing may be varied, thereby affording means to control the amount of material which will be discharged into each successive bucket as it passes beneath the nozzle 9.

The lugs 40, formed on the cam 25 near its rearmost end, are adapted to engage the side bars 23 and 24 to insure against injury to the apparatus by the accidental movement of the rearward end of the cam into the path of travel of the chain rollers 7 while the parts are being adjusted.

I claim:

1. In a device of the kind described, the combination with a series of travelling receptacles, a spout adapted to direct material to said receptacles and a valve controlling said spout; of valve operating means comprising a lever operatively connected at one end with the valve, means travelling with said receptacles adapted to rock said lever to operate said valve, and means for varying the rocking period of said lever without variation of the extent of its angular movement.

2. In a device of the kind described, the combination with a series of travelling receptacles, a spout adapted to direct material to said receptacles and a valve controlling said spout, of valve operating means comprising a lever having one of its ends in operative connection with said valve, a cam element carried by said lever, means travelling with said receptacles and adapted to abut said cam element to rock said lever, and means whereby the abutting period of said cam may be varied without variation of the extent of angular movement of said lever.

3. In a device of the kind described, the combination with a series of travelling receptacles, a spout adapted to direct material to said receptacles and a valve controlling said spout, of valve operating means comprising a lever in operative connection with said valve, a cam element mounted on said lever and projecting laterally therefrom, adjustable means for securing said cam element to said lever whereby the longitudinal extent of the cam projection may be varied, and means travelling with said receptacles adapted to abut said cam element whereby said lever is rocked to operate said valve.

4. In a device of the kind described, the combination with a series of travelling receptacles, a spout adapted to direct material

to said receptacles and a valve controlling said spout; of valve operating means comprising a lever in operative connection with said valve, an elongated cam element pivoted adjacent one end to said lever and projecting laterally of the latter, the other end of said cam being swingable across said lever and adjustably securable thereto to vary its longitudinal extent of projection, the lateral extent of projection remaining substantially constant, and means travelling with said receptacles and adapted to abut said cam element to rock said lever.

5. In a device of the kind described, the combination with a series of travelling receptacles, a spout adapted to direct material to said receptacles and a valve controlling said spout; of valve operating means comprising a lever operatively connected at one end with the valve, means traveling with said receptacles adapted to rock said lever to operate said valve, means for varying the rocking period of said lever without variation of the extent of its angular movement, and means adjustable to vary the extent of opening of said valve.

6. In a device of the kind described, the combination with a series of travelling receptacles, a spout adapted to direct material to said receptacles and a valve controlling said spout, of valve operating means comprising a lever having one of its ends in operative connection with said valve, a cam element carried by said lever, means travelling with said receptacles and adapted to abut said cam element to rock said lever, means whereby the abutting period of said cam may be varied without variation of the extent of angular movement of said lever, and means adjustable to vary the extent of opening of said valve.

7. In a feeder of the class described, the combination of a series of receptacles, driving means to move said receptacles along a predetermined path, a nozzle positioned to direct material to said receptacles, a closure for said nozzle, a pivotally mounted closure actuating lever, and a lever operating cam mounted and angularly adjustable on said lever and adapted to engage said driving means to operate said lever and closure.

8. In a feeder of the class described, the combination of a series of receptacles, driving means to move said receptacles along a predetermined path, a nozzle positioned to direct material to said receptacles, a closure for said nozzle, a pivotally mounted closure actuating lever, and a lever operating cam mounted on said lever and projecting laterally therefrom, said cam being adjustable relative to said lever to vary its longitudinal extent of projection and adapted to engage said driving means to operate said lever and closure.

9. In a feeder of the class described, the combination of a series of receptacles, driving means to move said receptacles along a predetermined path, a nozzle positioned to direct material to said receptacles, a closure for said nozzle, a pivotally mounted closure actuating lever, a lever operating cam angularly adjustable on said lever and adapted to engage said driving means to operate said lever and closure, and means to hold said cam out of engaging position with said driving means.

10. In a device of the kind described, the combination with a series of travelling receptacles, a spout adapted to direct material to said receptacles, and a valve controlling said spout; of valve operating means comprising toggle levers having their free ends connected respectively with said valve and an external support, means travelling with said receptacles adapted to actuate said toggle levers to operate said valve, and means whereby the operative period of said valve may be varied without variation of the operative stroke of said levers.

11. In a device of the kind described, the combination with a series of travelling receptacles, a spout adapted to direct material to said receptacles, and a valve controlling said spout; of valve operating means comprising toggle levers having their free ends connected respectively with said valve and an external support, a cam element carried by one of said levers; means travelling with said receptacles and adapted to abut said cam element whereby said toggle levers are actuated to operate said valve, and means whereby the abutting period of said cam may be varied without variation of the operative stroke of said levers.

12. In a device of the kind described, the combination with a series of travelling receptacles, a spout adapted to direct material to said receptacles, and a valve controlling said spout; of valve operating means comprising toggle levers having their free ends connected respectively with said valve and an external support, said levers having a shiftable intermediate joint whereby their normal angularity may be regulated, one of said levers being adjustable as to length whereby displacement of the other lever from normal position may be compensated upon shifting said intermediate joint, and means travelling with said receptacles and in a uniform path adapted to actuate said toggle levers to operate said valve.

13. In a device of the kind described, the combination with a series of travelling receptacles, a spout adapted to direct material to said receptacles, and a valve controlling said spout; of valve operating means comprising toggle levers having their free ends connected respectively with said valve and an external support, a cam element carried by one of said levers and projecting later-

ally therefrom, adjustable means for securing said cam element to said lever whereby the longitudinal extent of the cam projection may be varied, and means travelling with said receptacles in a uniform path adapted to abut said cam element whereby said levers are actuated to operate said valve.

14. In a device of the class described, the combination with a series of travel receptacles, a spout adapted to direct material to said receptacles, and a valve controlling said spout; of valve operating means comprising toggle levers having their free ends connected respectively with said valve and an external support, an elongated cam element pivoted adjacent one end to one of said levers and projecting laterally of the latter, the other end of said cam being swingable across said lever and adjustably securable thereto to vary its longitudinal extent of projection, the lateral extent of projection remaining substantially constant, and means travelling with said receptacles and in a uniform path adapted to abut said cam element whereby said levers are actuated to operate said valve.

In testimony whereof, I affix my signature.

ALEXIS W. LEMMON.