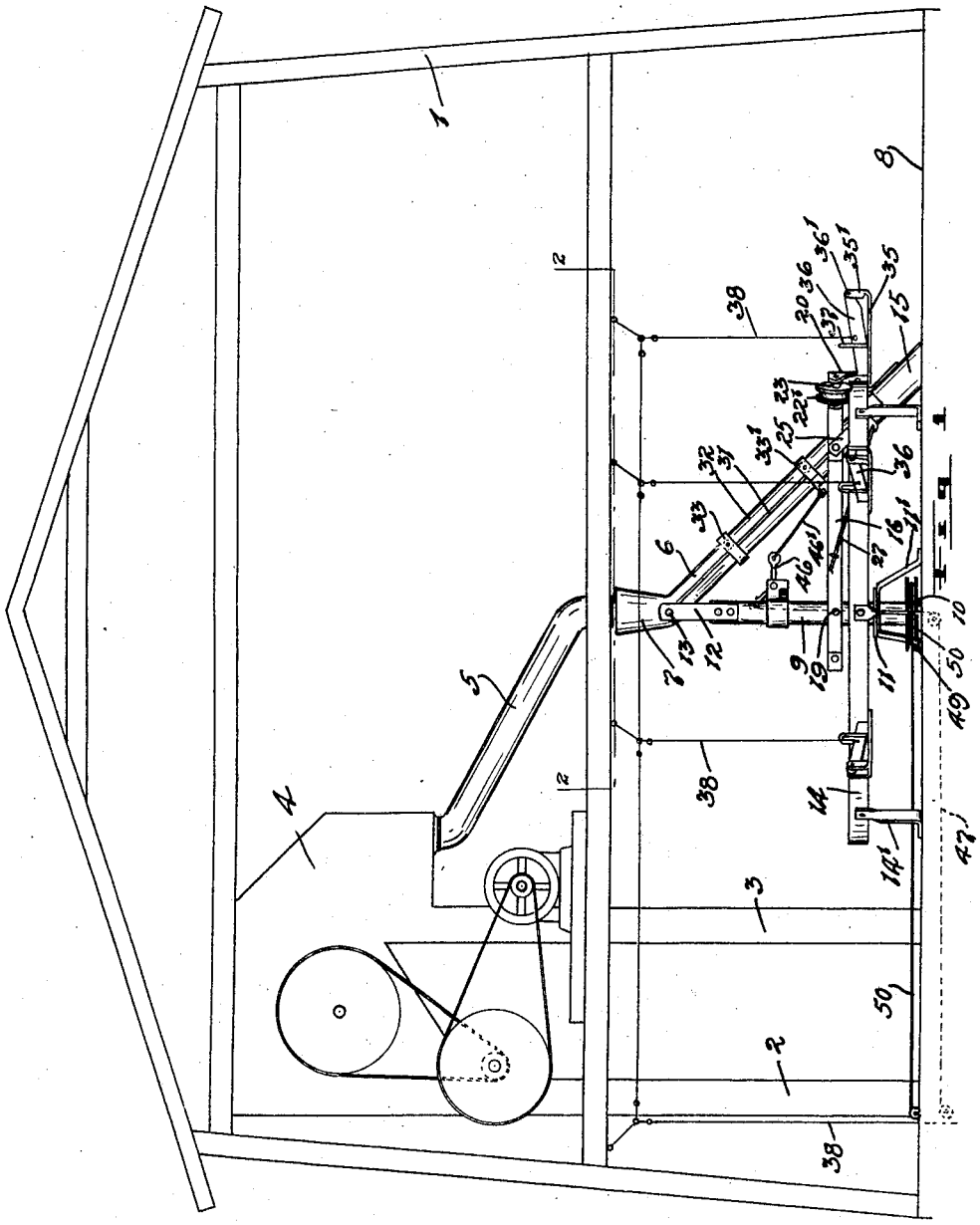
Nov. 10, 1931. C. B. READ 1,831,196

ELEVATOR GRAIN DISTRIBUTOR

Filed July 26, 1930 3 Sheets-Sheet 1

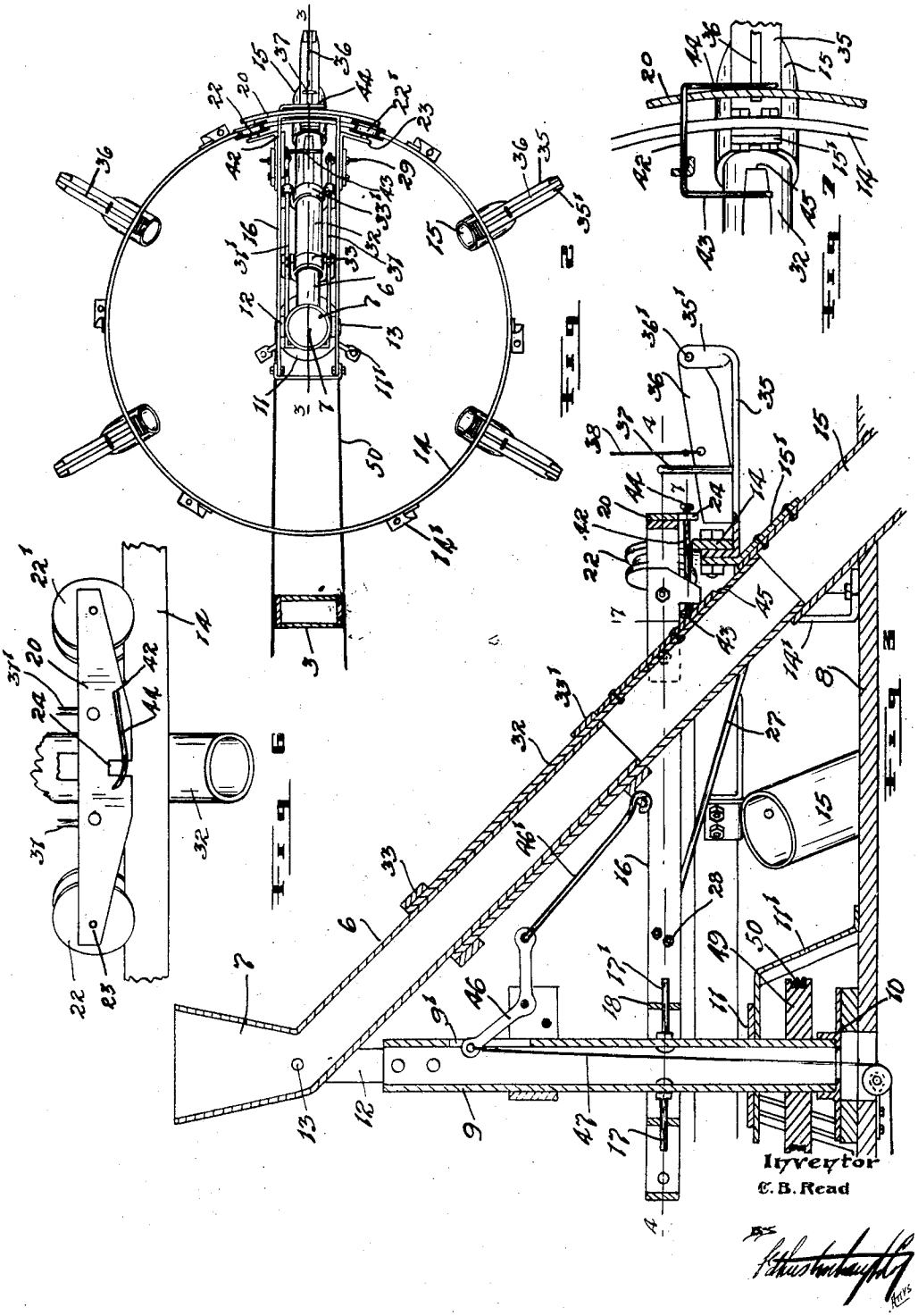


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ELEVATOR GRAIN DISTRIBUTOR

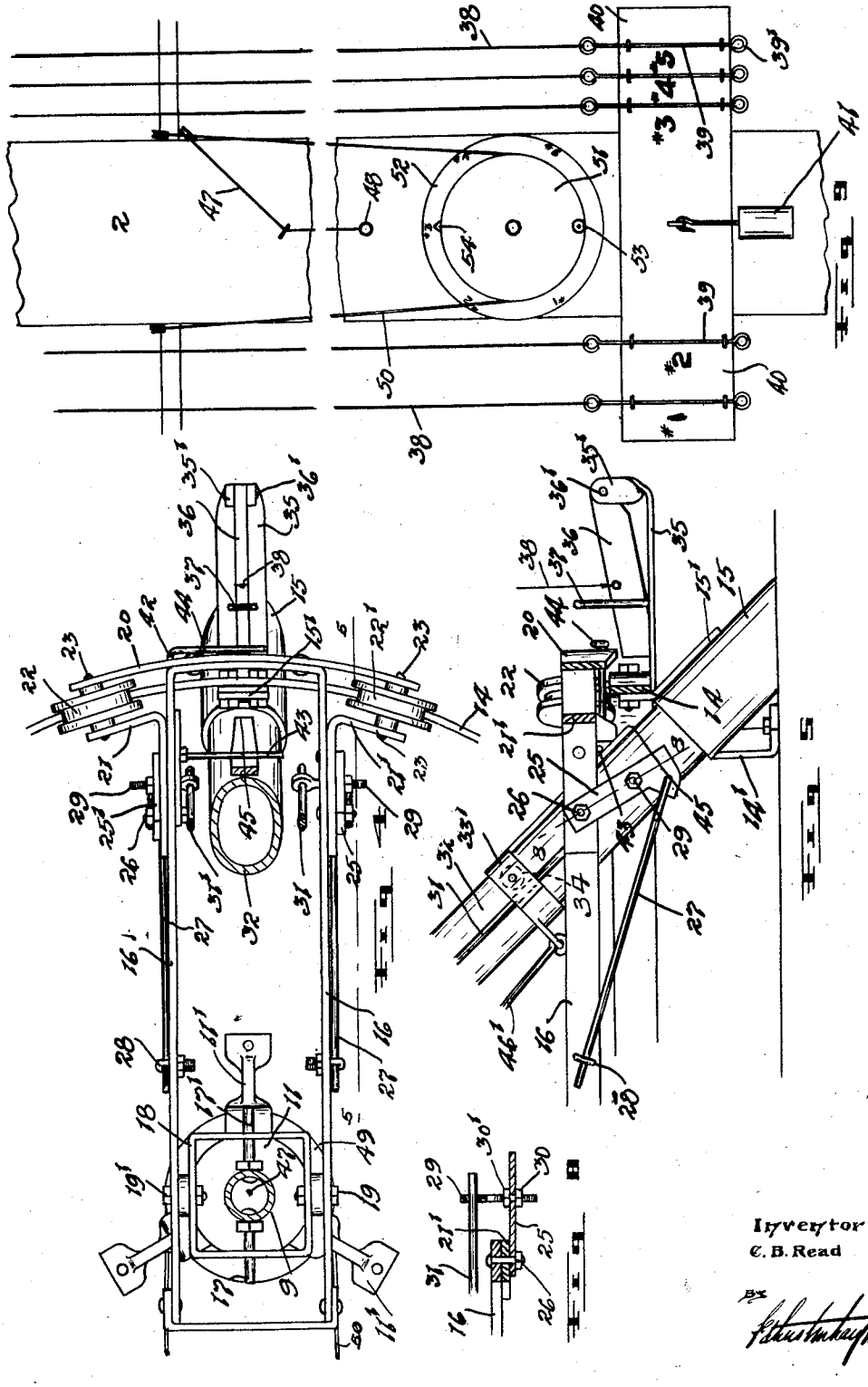
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ELEVATOR GRAIN DISTRIBUTOR

Filed July 26, 1930 3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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ELEVATOR GRAIN DISTRIBUTOR

Application filed July 26, 1930. Serial No. 470,805.

The invention relates to improvements in elevator grain distributors and particularly to a device for selectively discharging the elevated grain into one or other of the various storage bins of the elevator and an object of the invention is to provide means entirely operated from the ground floor of the elevator and under the direct control of the elevator attendant for positively directing the elevated grain into any desired storage bin and without any possibility of grain being spilled or lost.

A more specific object is to provide a distributing spout embodying telescoping sections, the spout receiving grain from the elevator leg head and being pivoted to rotate around a vertical axis and having the lower end of the spout carried by a carriage operating on a suitably supported track positioned concentric to the vertical axis around which the spout turns and to provide also bin spouts for receiving grain discharged through the distributor spout.

A further object of the invention is to provide means operated from the ground floor of the elevator for turning the distributor spout to the desired bin spouts and means for automatically yet releasably locking the carriage and consequently the distributor spout in a discharging position in respect to any one of the bin spouts and also means for automatically lowering the lowermost section of the distributor spout to telescope within the selected bin spout coincident with the locking of the carriage.

A further object is to provide means operable from the ground floor for releasing the locked carriage and for raising the lower section of the distributing spout and also to provide means for releasably locking the latter section in its raised position as it moves upwardly.

A further object is to mount the carriage so that it can accommodate any irregularities which might occur in the track through sagging of the elevator structure and also to mount the lower end of the distributing spout so that it can be adjusted in position in respect to the carriage and actually centre in regard to the means for locking the carriage, such latter insuring of the effective alignment of the distributor spout and of the bin spout when the carriage is in its locked position.

A further object is to mount the lower section of the distributor spout so it will move freely in regard to the upper section when released to drop under gravity or when raised by a manual pull.

A further and more specific object is to associate with each bin spout a latch for automatically locking the carriage in a position such that the distributor spout will when released to drop, positively telescope in the upper end of the bin spout with which the latch is associated and to provide means actuated by the latch as it moves to locking position to release the lower section of the distributor spout to move into telescoped relation with the bin spout.

With the above more important and other minor objects in view which will become more apparent as the description proceeds, the invention consists essentially in the arrangement and construction of parts hereinafter more particularly described, reference being had to the accompanying drawings, in which:—

Fig. 1 is an interior view of the upper part of a grain elevator equipped with my invention.

Fig. 2 is a horizontal sectional view at 2—2 Figure 1.

Fig. 3 is an enlarged detailed vertical sectional view at 3—3 Figure 2.

Fig. 4 is a horizontal sectional view at 4—4 Figure 3.

Fig. 5 is a vertical sectional view at 5—5 Figure 4.

Fig. 6 is an enlarged face view of the carriage.

Fig. 7 is a horizontal sectional view at 7—7 Figure 3.

Fig. 8 is a sectional view at 8—8 Figure 5.

Fig. 9 is a face view of the various latch controlling wires and of the operating board.

In the drawings like characters of reference indicate corresponding parts in the several figures.

As is well known, it is customary in country

elevators to elevate the grain received to the top of the elevator and then distribute it through a distributing spout provided to the various bins of the elevator, the grain being elevated to the top of the elevator by buckets (not herein shown), the buckets operating within the legs 2 and 3 which carry the elevator head 4. An outlet pipe 5 receives the grain discharging from the head and delivers it to a distributing spout section 6 which is provided with a funnel like upper end 7. The section 6 extends angularly downwardly from the funnel and terminates well above the top floor 8 of the elevator.

This floor is carried by the bins and it is well known that the same gets out of plumb due to the sagging of the bins and the construction which I provide accommodates any sagging that might occur while allowing the grain discharging through the spout 6 to be positively delivered to the various bins as desired.

Centrally of the floor and underlying the funnel, I provide an upstanding hollow post 9 in the form of a metal pipe. This post has its lower end rotatably mounted in a socket like bearing plate 10 carried by the floor 8 and above the plate 10 is a further bearing plate 11 also rotatably receiving the post, the bearing plate 11 being supported by suitable legs 11′ fastened to the floor. To the upper end of the post, I permanently connect similar upstanding arms 12 which pivotally support the pipe 6 for vertical swinging movement, the said arms being pivotally attached to the pipe by horizontally aligned pivot bolts 13. Concentric to the post, I locate a circular track 14 suitably carried by supporting brackets 14′ extending upwardly from the floor.

Suitable stationary bin pipes 15 underlie the track and extend through the floor and communicate with the several storage bins of the elevator. The bin pipes are inclined at an angle to the floor as shown and all converge upwardly to a peak point approximately located at the base of the funnel. The upper ends of the bin pipes are connected by brackets 15′ to the track. A substantially rectangular horizontally disposed carriage frame 16 is provided which frame has its inner end spanning the post 9 and connected thereto by a universal joint, the details of which will be later explained. The outer end of the frame is provided with a wheeled carriage operating on the track.

The universal joint just mentioned embodies a pair of aligned horizontally disposed pivot pins 17 and 17′ extending from the post and parallel to the sides of the carriage frame and these bolts pivotally support a band 18 spaced from and surrounding the post and contained within the carriage frame and having the sides thereof pivotally attached by horizontally disposed pivot bolts 19 and 19′ to the sides of the frame 16, the bolts 19 and 19′ being positioned 90° from those 17 and 17′. According to this arrangement, it will be apparent that the carriage frame can rotate in the horizontal plane turning with the post and that it can swing upwardly in the vertical plane turning on the bolts 19 and 19′ and it can rock around its longitudinal axis swinging on the bolts 17 and 17′. In other words, the carriage frame is free to swing in all directions. It will be further noticed that the carriage frame can move endwise as the band 18 can slide in and out on the pins 17 and 17′, this allowing the carriage to ride the track should the radial distance between the post and the track change through sagging or other causes.

The carriage which supports the outer end of frame 16 comprises an outer bar 20 permanently secured to the outer end of the carriage and curved concentric to the post, a pair of similar angle brackets 21 and 21′ permanently fastened to the sides of the frame 16 and a pair of pulleys 22 and 22′ riding the track and mounted on short axles 23 carried by the bar 20 and the angle brackets. Centrally of its length, the bar 20 is supplied in its under side with a vertical slot 24 utilized for a purpose later disclosed, it being here observed that the said bar is located free of the outer side of the track.

The outer end of the frame 16 carries a pair of opposing hangers 25 and 25′, the hangers being pivotally attached by bolts 26 to the sides of such frame. Similar adjusting rods 27 are pivotally attached to the lower ends of the hangers and have their inner ends adjustably fastened by clamps at 28 to the sides of the frame, the arrangement being such that one can adjust the hangers by manipulating the clamping members 28. The lower end of each hanger carries an eye bolt 29 fitted with lock nuts 30 and 30′, the eye bolts being horizontally aligned and being adjustable inwardly and outwardly by manipulating the nuts.

Similar guide rods 31 and 31′ are located at the sides of the pipe 6, such guide rods having their upper ends mounted on the pivots 13 and their lower ends extending through and guided by the eyes of the eye bolts. An extension pipe 32 telescopically receives the lower end of the pipe 6 and such pipe 32 is provided with suitable upper and lower straps 33 and 33′ permanently fastened thereto and carrying side rollers 34 which continuously ride the rods 31 and 31′, such construction freely supporting the pipe 32 for endwise shifting movement in respect to the pipe 6.

It will be particularly observed that the lower end of the pipe 32 can be adjusted laterally within the frame 16 by manipulating the eye bolts and also that one can raise or lower the lower end of the pipe 32 by swinging the hangers upon the release of the

clamps. These two adjustments for the lower end of the pipe 32 permit me to set it accurately so that it will telescope within one or other of the pipes 15 when desired and as later explained.

To the track in a location centrally and directly above each of the pipes 15, I secure permanently an outstanding arm 35 which arm in each instance has its outer end terminating in upturned lugs 35′ to which I pivotally secure by a pin 36′, the outer end of a latch 36. The latch in each instance is contained in the vertical plane which contains the longitudinal axis of the underlying pipe 15 and normally the inner end of the latch rests on the arm 35. The lateral movement of the inner end of the latch is prevented in each instance by an upstanding U-shaped guide member 37 secured to the arm and straddling the latch. This member 37 also limits the up position of the latch.

Means is provided for selectively raising the several latches and the latch when raised is utilized to lock the carriage against movement, the latch at such time being entered in the slot 24. Here it will be observed (see Figure 6) that the plate 20 gradually increases in width in passing from the ends towards the centre and in this connection I might point out that when the latch is in its uppermost position as limited by the member 37, its top edge is adapted to engage with the under side of the plate 20 at either end thereof depending on the direction of travel of the carriage. Accordingly if the latch is held in its upper position, it will be gradually swung down by the inclined lower edge of the plate 20 and will enter the slot 24 provided there is a force acting to lift it.

To each of the latches, I attach a pulling line 38 which is suitably guided by pulleys provided and passes down adjacent one of the elevator legs and terminates adjacent the lower floor of the elevator where it is fastened to a rod 39 slidably mounted on an operating board 40 attached to the leg. The rod is provided at its lower end with an eye 39′ and a weight 41 is provided for attachment to the eye. The weight is herein shown as suitably supported from the board 40 and the operator when desired will remove the weight and catch it in any one of the eyes 39′ depending on which latch he desires to be held up.

The rods 39 are identified by numbers placed on the board as best shown in Figure 9 and these numbers correspond to the numbers of the bins of the elevator. In other words, if it is desired to have the elevated grain discharged into say bin #3, the rod 39 designated by the #3 on the operating board will have the weight attached to it and the weight will operate through the line to raise the latch associated therewith and hold it in its raised position. This specific latch is associated with the bin spout 15 leading to bin #3 and accordingly if the post 9 be rotated and the carriage moved towards the latch, the latch will be struck by the bar 20 and depressed by the inclined lower edge thereof and will then escape into the slot 24 and will lock the carriage against further movement at such time.

At this particular time, the pipe 32 will be axially aligned with the specific pipe 15 leading to the bin #3. If any other rod be manipulated by application of the weight and the carriage moved on the track, the carriage will be automatically locked with the pipe 32 axially aligned with the pipe 15 leading to the desired bin.

The sliding pipe 32 is normally held in an up position with the lower end thereof clear of the upper ends of the pipes 15. A trip is utilized for this purpose and the trip comprises a short shaft 42 rotatably carried by the outer end of the frame 16 and having the ends thereof terminating in levers 43 and 44. The lever 43 overlies the lower end of the pipe 32 and engages with an abrupt shoulder 45 formed on such pipe, the arrangement being such that the lever 43 when engaged with the shoulder prevents down shifting of the pipe under the action of gravity. The free end of the lever 44 is normally more or less horizontal and crosses the lower end of the slot 24.

This trip normally prevents the pipe 32 from gravitating but it will be readily seen that should the lever 44 be swung upwardly, the lever 43 will rise from the shoulder and free the pipe 32 to slide downwardly. The lever 44 is only actuated in an up direction when the latch is escaping into the slot 24 so that actually when any latch is passing to carriage locking position within the slot 24, the sliding spout is simultaneously released by the movement of the trip to slide down with its lower end telescoped within the upper end of the spout 15 underlying that specific latch.

The adjustments provided for setting the lower end of the spout 32 in respect to the frame 16 insure that at the time the latch enters the slot and the trip is actuated, the pipe 32 will be accurately aligned with the selected spout 15. Accordingly, grain discharging from the head 4 of the elevator will be positively directed to the desired bin.

Means operable from the lower floor of the elevator is provided for raising the pipe or spout 32 back to its original upper position and such comprises the following parts.

A bell crank 46 is pivotally attached to the post 9 and has one end connected by an operating link 46′ to the upper end of the spout 32. The upper end of the bell crank enters the open centre of the post through a vertical slot 9′ provided therein and a pulling line 47 is connected to the latter bell crank, ex-

tends downwardly through the post, is suitably guided by pulleys provided and terminates in a ring 48 located adjoining the operating board 40. To reset the spout 32 in its up position, one simply catches the ring 48 and pulls downwardly and this action raises the spout and brings the lever 43 into engagement with the shoulder, the said lever then supporting the spout by engagement with the shoulder.

It is desirable also for the operator on the ground floor to be able to laterally swing the spouts 6 and 32 as he desires to permit them to discharge into any desired bin. To this end, I have secured a pulley 49 permanently to the lower end of the post 9 and have looped an operating line 50 around the pulley and have passed the operating line over suitable guiding pulleys and downwardly to a controlling wheel 51 rotatably mounted on the leg 2 above the board 40. A stationary plate 52 is located to the rear of the pulley and has numbers thereon indicating storage bin numbers. The wheel 51 is supplied with a hand grip 53 and with a pointer 54 and the general arrangement is such that when the pointer is opposite say #3 on the plate 52, the discharge spouts 6 and 32 are in a location where they will deliver to the bin spout 15 leading to bin #3.

While I have only indicated in the drawings, equipment for an elevator having five storage bins, it will of course be understood that the various parts, can be increased to accommodate any number of storage bins without departing from the spirit of the invention.

In order that the general operation of the complete device may be clearly understood, I will now give a short description of the same, assuming that it is desired to discharge grain into elevator bin #3. The operator on the main floor will catch the weight 41 in the eye of the rod on the operating board which is associated with bin #3 as designated by the number on the board 40 and this will raise the latch associated with bin #3. He then turns the operating wheel until the pointer is opposite the #3 on the plate 52 and as the carriage passes over the pipe 15 leading to bin #3, the latch enters the slot of the carriage and locks it and the trip is actuated by the latch to release the sliding spout 32 to gravitate and enter the upper end of the pipe 15 leading to bin #3. Accordingly, any grain subsequently elevated will be discharged into bin #3.

Subsequently when he desires to store grain in say bin #5, he will catch the weight in the eye of the rod on the operating board which controls the latch of bin #5 and obviously the latch of bin #3 will drop down at this time. He will then pull down the ring 48 and this will effect the withdrawal of the pipe 32 from the spout 15 of bin #3 and the subsequent locking of the pipe 32 in its up position due to the engagement of the lever 43 with the shoulder 45. He will then turn the hand wheel 51 to bring the pointer thereof opposite the number on the plate 52 designating the bin #5 and this will swing the discharge pipes and move the carriage over the track until it contacts with the latch of bin #5 which is at such time held up by the weight. This latter latch in the movement of the carriage, will enter the slot 24 and lock the carriage and at the same time, will actuate the trip to release the spout 32 to slide down and telescope in the upper end of the pipe 15 leading to bin #5.

The whole arrangement is very selective and positive and any sagging which might occur in the track is amply provided for by the structure and the whole device is under the ready control of the operator located on the ground floor of the elevator.

What I claim as my invention is:—

1. The combination with a discharge spout leading from an elevator head, of a downwardly inclining distributing spout having the upper end continuously receiving from the discharge spout and pivotally mounted to permit of the swinging of the distributor spout around a vertical axis and the lower end provided with an endwise shiftable telescoping section, a horizontally d sposed suitably mounted circular track positioned concentric to the vertical axis aforesaid, a carriage operating on the track and supporting the distributing spout therefrom, a plurality of suitably spaced upwardly converging bin spouts, means normally locking the lower end of the distributor spout in an up position clear of the bin spouts, means for rotating the distributor spout to bring the lower end thereof into alignment with the bin spouts, means for releasing the lower end of the distributor spout to drop into telescopic relation with the bin spout with which it is aligned and means for subsequently raising the lower end of the bin spout to locked position.

2. The combination with a discharge spout leading from an elevator head, of a downwardly inclining distributing spout having the upper end continuously receiving from the discharge spout and pivotally mounted to permit of the swinging of the distributor spout around a vertical axis and the lower end provided with an endwise shiftable telescoping section, a horizontally disposed suitably mounted circular track positioned concentric to the vertical axis aforesaid, a carriage operating on the track and supporting the distributing spout therefrom, a plurality of suitably spaced upwardly converging bin spouts, means for normally releasably locking the lower end of the distributor spout in an elevated position clear of the bin spouts, means operable from a distant point for rotating the distributing spout to bring it into

axial alignment with the bin spouts, means, automatically actuated, for releasing the aforesaid locking means to permit the lower end of the distributing spout to drop and pass into telescopic relation with the bin spout with which it is aligned and means operable from a distant point for subsequently raising the lower end of the distributor spout to locked position.

3. The combination with a discharge spout leading from an elevator head, of a downwardly including distributing spout having the upper end continuously receiving from the discharge spout and pivotally mounted to permit of the swinging of the distributor spout around a vertical axis and the lower end provided with an endwise shiftable telescoping section, a horizontally disposed suitably mounted circular track positioned concentric to the vertical axis aforesaid, a carriage operating on the track and supporting the distributing spout therefrom, a plurality of suitably spaced upwardly converging bin spouts, means for normally releasably locking the lower end of the distributing spout in an elevated position clear of the bin spouts, means operable from a distant point for rotating the distributing spout to bring it into axial alignment with the bin spouts, means for automatically locking the distributing spout against turning movement around the vertical axis aforesaid when so aligned and for automatically releasing the locking means aforesaid to permit the lower end of the distributing spout to pass into telescoping relation with the bin spout and means operable from a distant point for subsequently raising the lower end of the distributing spout to its original elevated position.

4. The combination with an overhead grain discharging spout, of an inclined distributing spout having the upper end thereof continuously receiving from the discharge spout and mounted to permit of the rotation of the distributing spout around a vertical axis passing through the upper end thereof and the lower end thereof provided with an endwise shiftable telescoping section, a horizontally disposed suitably mounted circular track positioned concentric to the vertical axis aforesaid, a horizontally disposed carriage frame supporting the distributing spout and having the outer end thereof mounted for rotation around the vertical axis aforesaid, a carriage carried by the outer end of the carriage frame and operating on the track, a plurality of suitably spaced upwardly converging bin spouts underlying the track, means releasably locking the telescoping section of the distributing spout in an up position clear of the bin spouts, manually actuated means operable from a distant point for rotating the distributing spout around its vertical axis to bring the lower end thereof into axial alignment with the bin spouts, means for automatically locking the carriage against movement on the track upon the telescoping section of the distributing spout being brought into alignment with the bin spouts, means for automatically releasing the telescoping section of the distributing spout to drop into telescoping relation with the bin spout upon the carriage being locked against movement and manually actuated means operable from a distant point for subsequently raising the telescoping section of the distributing spout to its original locked position.

5. The combination with an overhead discharge spout, of a vertically disposed rotatably mounted post underlying the discharge spout, an inclined distributing spout having the upper end carried by the upper end of the post and continuously receiving from the discharge spout and the lower end provided with a telescoping section, a horizontally disposed track mounted concentric to the post, a carriage operating on the track and supporting the distributing spout and without interfering with the telescoping movement of the lower section, a plurality of upwardly converging bin spouts underlying the track, means releasably locking the lower end of the distributing spout in a normal elevated position clear of the bin spouts, manually actuated means operable from a distant point for rotating the post to bring the distributing spout into axial alignment with the bin spouts, means for automatically locking the carriage to the track when the said latter spouts have been so aligned and for releasing the telescoping section of the distributing spout to drop into telescoped relation with the bin spout and manually actuated means operable from a distant point for subsequently raising the telescoping section to its original elevated locked position.

6. The combination with an overhead discharge spout, of a vertically disposed rotatably mounted post underlying the discharge spout, an inclined distributing spout having the upper end carried by the upper end of the post and continuously receiving from the discharge spout and the lower end provided with a telescoping section, a horizontally disposed track mounted concentric to the post, a carriage frame having one end supported by the post and the other end spanning the distributing spout, a carriage formed at the outer edge of the latter frame and operating on the track, means adjustably supporting the distributing spout from the carriage frame, a plurality of upwardly converging bin spouts underlying the track, means releasably locking the lower end of the distributing spout in a normal elevated position clear of the bin spouts, manually actuated means operable from a distant point for rotating the post to bring the distributing spout into axial alignment with the bin spouts,

means for automatically locking the carriage against movement when said latter spouts have been so aligned, means for coincidently and automatically releasing the aforesaid distributing spout locking means to permit the lower end of the spout to drop into telescoped relation with the adjacent bin spout, means for subsequently unlocking the carriage and manually actuated means operable from a distant point for subsequently raising the telescoping lower end of the distributing spout to its original elevated locking position.

7. The combination with an overhead discharge spout, of a vertically disposed rotatably mounted post underlying the discharge spout, an inclined distributing spout having the upper end pivotally carried by the upper end of the post and continuously receiving from the discharge spout and the lower end provided with a telescoping section, a horizontally disposed circular track mounted concentric to the post, a carriage frame spanning the post and the distributing spout, said carriage frame having the inner end connected to the post by a universal joint permitting of the up swinging of the frame and of the lateral rocking of the same, a wheeled carriage operating on the track and supporting the outer end of the frame, means adjustably supporting the distributing spout from the carriage frame, a plurality of upwardly converging bin spouts underlying the track, means normally locking the distributing spout section in an up position clear of the bin spouts, manually actuated means operable from a distant point for rotating the post to bring the distributing spout into axial alignment with the bin spouts, a pivoted locking latch associated with each bin spout, said latch being normally clear of the moving carriage and having stop means associated therewith limiting its upward travel, a line connected to each latch and passing to a distant point, a weight for attachment to a selected line to effect the raising of the latch to its limiting position, said latch in its raised positon being engageable with the moving carriage and adapted in the movement of the carriage to enter a notch provided in the carriage and when so entered to lock the carriage with the distributing spout axially aligned with the adjacent bin spout, means for automatically releasing the distributing spout section to drop and telescope within the adjacent bin spout coincident with the locking of the carriage by the latch and manually actuated means operable from a distant point for subsequently raising the distributing spout section to its upper locked position.

8. In combination, a vertically disposed rotatably mounted post, a horizontally disposed circular track located concentric to the post, a downwardly inclined distributing spout having the upper end supported by the post to permit of the vertical swinging of the lower end of the spout and to effect the turning of the spout with the post, said distributing spout being provided at its lower end with a telescoping spout section, a plurality of upwardly converging suitably spaced bin spouts underlying the track, a horizontally disposed carriage frame spanning the post and the spout and having one end connected by a universal joint to the post to permit of the up swinging and of the lateral tilting of the frame, said frame turning with the post, a wheeled carriage riding the track and supporting the outer end of the frame, means carried by the carriage and engaging with the spout section and normally releasably locking the spout section in an elevated position clear of the bin spouts, a pair of rods located at the sides of the distributing spout and having their upper ends pivotally attached to the sides of the distributing spout and their lower ends slidably supporting the distributing spout section and means adjustably supporting the lower ends of the rods from the carriage frame to permit of the adjustment of the lower end of the distributing spout in respect to the frame.

9. In combination, a horizontally disposed track, an inclined distributing spout having its upper end mounted concentric to the track, a horizontally disposed carriage frame pivotally mounted concentric to the track, means effecting the simultaneous turning of the frame and the spout, a wheeled carriage operating on the track and supporting the outer end of the frame, a plurality of upwardly converging suitably spaced bin spouts underlying the track, means adjustably supporting the lower end of the distributing spout from the frame, said means permitting of the free end shifting of the spout section, means normally releasably locking the spout section in an elevated position clear of the bin spouts, means for locking the carriage against movement upon the distributing spout being brought to a position aligned with one of the bin spouts and means for coincidently and automatically unlocking the distributing spout section to drop into telescoping relation with the adjacent bin spout.

10. In combination, a horizontally disposed circular track, an inclined distributing spout mounted concentric to the track, a plurality of upwardly converging suitably spaced bin spouts underlying the track, a carriage operating on the track and supporting the distributing spout therefrom, means for rotating the distributing spout to bring it into axial alignment with one or other of the bin spouts, an extension spout section mounted on the lower end of the distributing spout and normally locked in an elevated position clear of the bin spouts, means for automatically locking the carriage against movement upon the distributing spout extension sec-

tion being brought to a position axially aligned with the bin spouts and automatically operated means for unlocking the bin spout to drop into telescoping relation with the bin spout subsequent to the locking of the carriage.

Signed at Regina this 29th day of April, 1930.

CHARLES B. READ.