

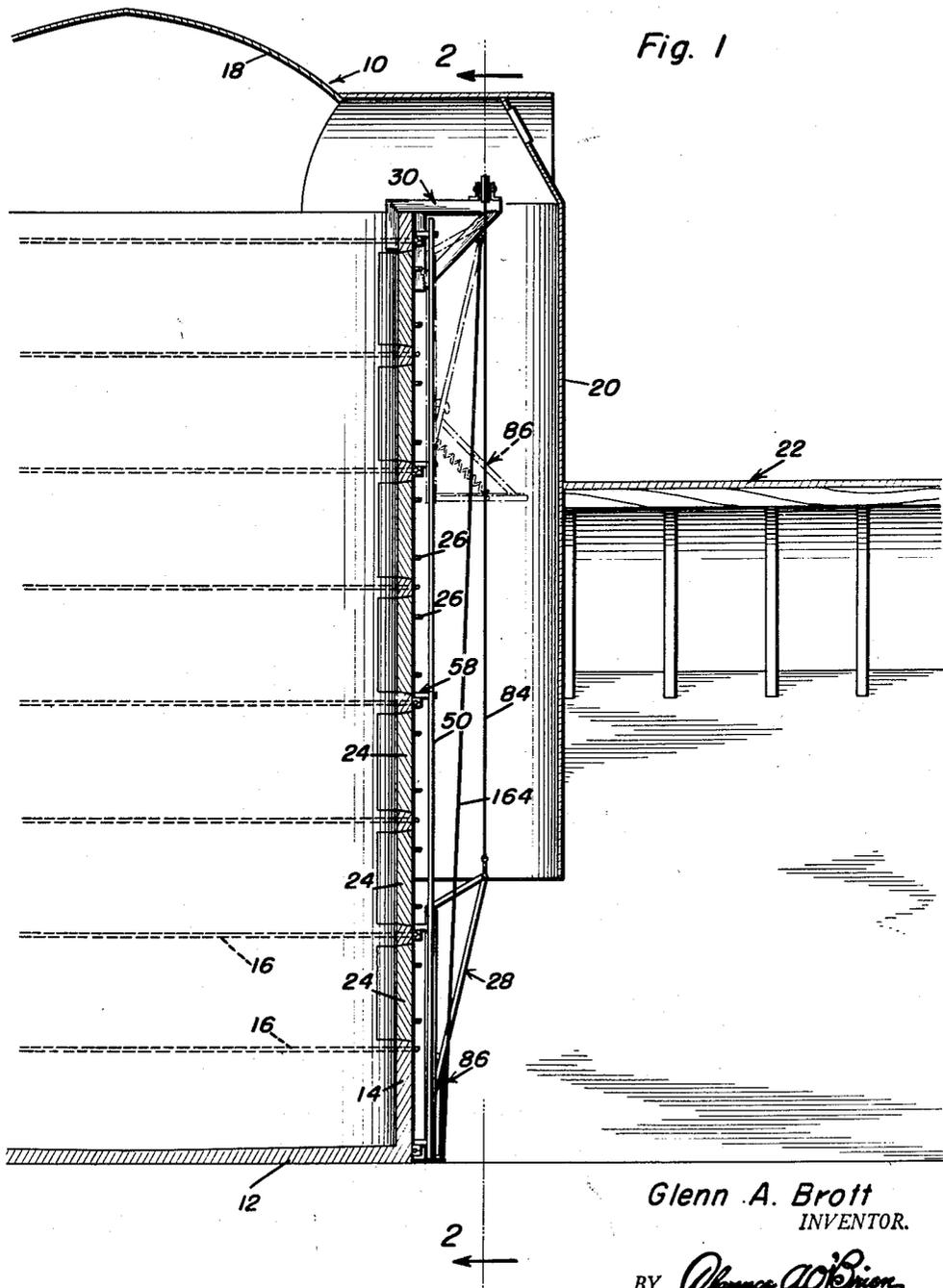
Feb. 19, 1957

G. A. BROTT
SILO ELEVATOR

2,781,865

Filed March 24, 1954

4 Sheets-Sheet 1



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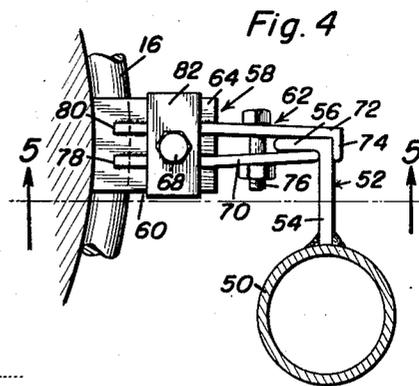
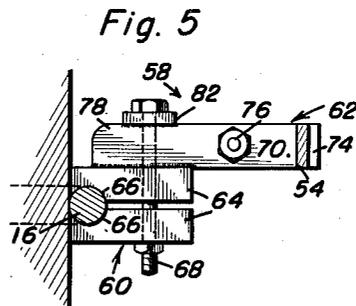
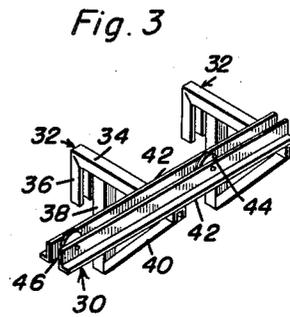
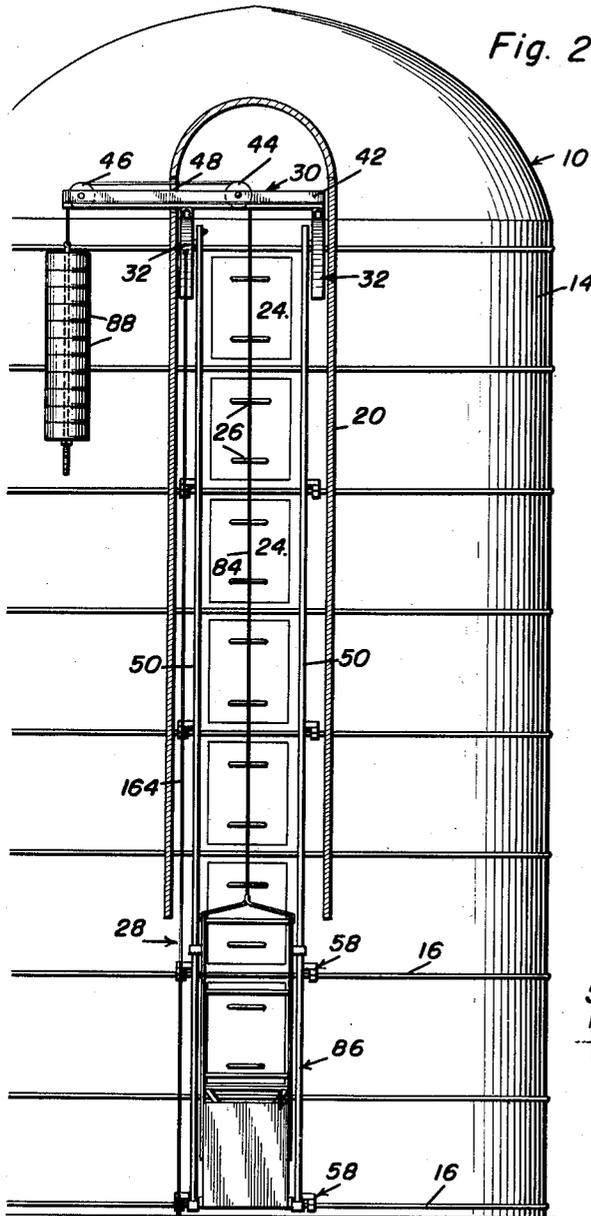
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4 Sheets-Sheet 2



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4 Sheets-Sheet 4

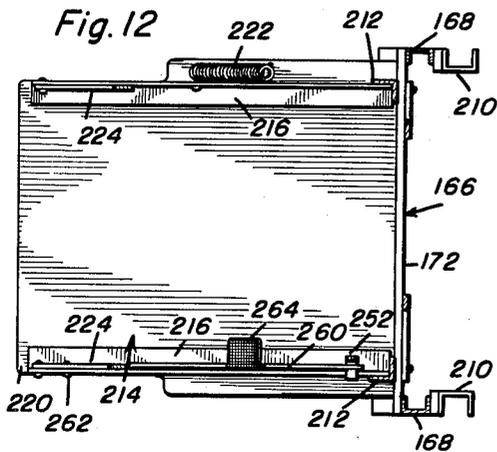


Fig. 13

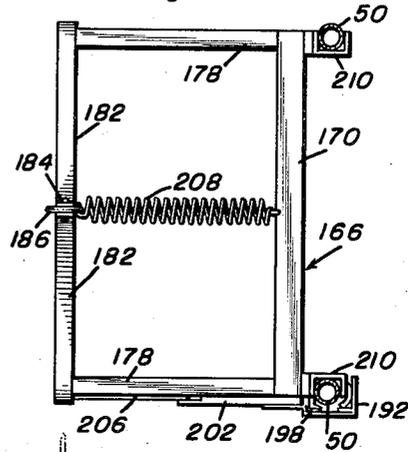


Fig. 11

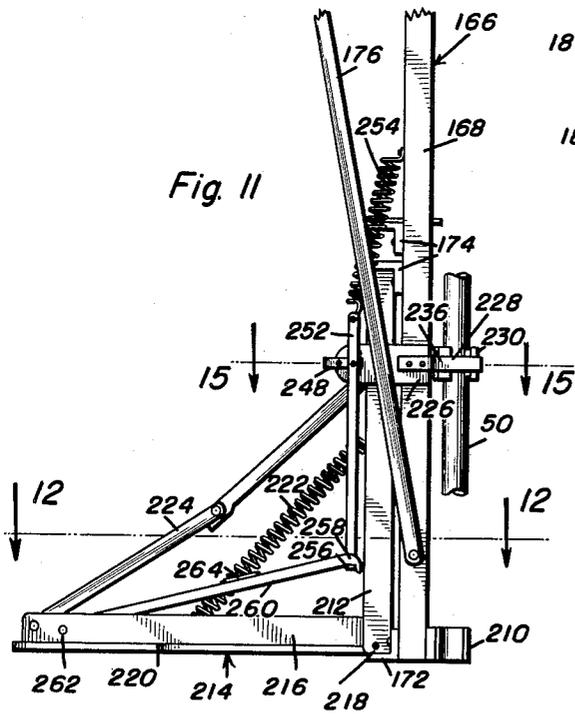


Fig. 14

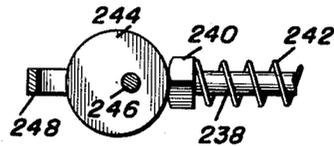
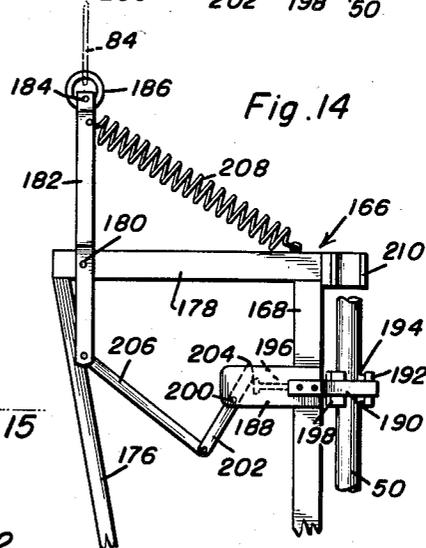
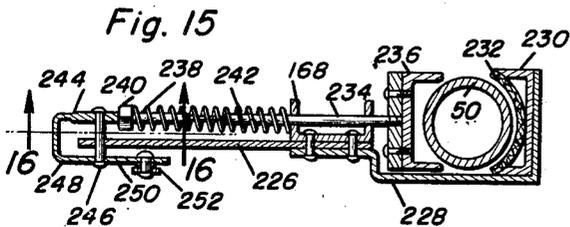


Fig. 16



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1

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SILO ELEVATOR

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Application March 24, 1954, Serial No. 418,354

3 Claims. (Cl. 187—6)

This invention relates in general to improvements in farm machinery and more specifically to an improved elevator construction for silos.

The average silo is formed with a chute which is communicated with the interior of the silo by a plurality of vertically spaced removable doors. In order that the feed stored within the silo may be removed, it is necessary that a farmer climb up into the silo through an external chute which is in alignment and which forms an enclosure around the doorways. Next it is necessary for the farmer to remove the necessary doors and then to throw the feed out through the doorway down through the chute. Inasmuch as the chute is relatively confined, it is difficult for a farmer to climb up into the silo through the chute carrying the necessary implements for the job.

It is therefore the primary object of this invention to provide an elevator for silos, the elevator being of such a nature whereby it may be conveniently positioned within a silo chute for movement up and down therethrough to selectively carry a farmer and the necessary implements into and out of the silo.

Another object of this invention is to provide an improved silo elevator intended for travel within a silo chute, the elevator including a carriage having a formable platform whereby a farmer may be lifted on the carriage up into the silo and at the same time sufficient clearance is provided within the chute for the removal of the fodder within the silo.

Another object of this invention is to provide an improved mounting bracket for a carriage trackway whereby the trackway may be easily and quickly secured to an elevator by utilizing external hoops thereof.

Another object of this invention is to provide an improved silo elevator structure which includes a pulley mounting bracket, the pulley mounting bracket being of such a construction whereby it may be quickly and easily disposed over an upper edge of the vertical wall of the silo and may be utilized to support a flexible member which has opposite ends thereof connected to the carriage of the elevator and a counter-balance.

A further object of this invention is to provide an improved emergency brake structure for a silo elevator, the emergency brake structure including a bridle for the carriage of the elevator, the bridle being pivotally mounted and spring urged to a brake setting position whereby when a supporting cable for the carriage breaks, the emergency brake will automatically be set.

A still further object of this invention is to provide an improved brake structure for a carriage of a silo elevator, the brake structure being of such a nature whereby the elevator is normally retained in a locked position relative to an associated trackway, the carriage being provided with manually operable means for releasing the brake.

Still another object of this invention is to provide an improved silo elevator which is so constructed and arranged whereby it may be quickly and easily connected to a conventional silo of the type which utilizes external

2

tension hoops without making any alterations whatsoever on the silo.

These, together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a fragmentary sectional view taken through a barn structure which has connected thereto a silo, the silo being communicated with the barn structure through the use of the silo chute, the silo chute being provided with a silo elevator conforming to the spirit of the invention, an upper position of a carriage of the silo elevator being shown by dotted lines;

Figure 2 is a fragmentary sectional view taken substantially upon the plane indicated by the section line 2—2 of Figure 1 and shows the general details of the silo elevator and the relationship thereof with respect to the silo and the silo chute;

Figure 3 is a perspective view of a pulley mounting bracket which is removably placeable over an upper edge of the vertical wall of a silo for supporting a flexible cable which is utilized for supporting both a carriage and a counter-balance;

Figure 4 is an enlarged fragmentary sectional view through the vertical wall of the silo and a track which forms a portion of the guiding trackway for the carriage of the silo elevator and shows the manner in which the track is releasably clamped to a tension hoop of the silo;

Figure 5 is an enlarged fragmentary sectional view taken substantially upon the plane indicated by the section line 5—5 of Figure 4 and shows the manner in which the clamp is releasably secured to the tension hoop;

Figure 6 is an enlarged front elevational view of the carriage of the silo elevator and shows the general details thereof, the trackway for the silo elevator being shown in phantom lines;

Figure 7 is an enlarged side elevational view of one side of the carriage of Figure 6 and shows the general details thereof;

Figure 8 is an enlarged side elevational view of the opposite side of the carriage of Figure 6 and shows the general details of the brake carried by the carriage;

Figure 9 is an enlarged fragmentary side elevational view of the carriage as viewed in Figure 8 and shows the specific details of the brake actuating means, a lifting bar on the carriage being omitted for purposes of clarity;

Figure 10 is an enlarged fragmentary sectional view taken substantially upon the plane indicated by the section line 10—10 of Figure 9 and shows the relationship of the brake with respect to a track of the guiding trackway for the carriage;

Figure 11 is an enlarged fragmentary side elevational view of the lower portion of a modified form of carriage and shows the general details of brake means and a foldable platform carried thereby;

Figure 12 is an enlarged fragmentary horizontal sectional view taken substantially upon the plane indicated by the section line 12—12 of Figure 11 and shows the general structure of the carriage of Figure 11;

Figure 13 is an enlarged sectional view taken through the trackway supporting the carriage of Figure 11 and shows the relationship of the carriage with respect thereto, the carriage being viewed in plan;

Figure 14 is an enlarged fragmentary side elevational view of the upper portion of the carriage in Figure 11 and shows the general detail of an emergency brake carried thereby;

Figure 15 is an enlarged fragmentary sectional view taken substantially upon the plane indicated by the section

line 15—15 of Figure 11 and shows the general details of the brake carried by the lower portion of the carriage in Figure 11; and

Figure 16 is an enlarged fragmentary sectional view taken substantially upon the plane indicated by the section line 16—16 of Figure 15 and shows the relationship of a cam actuator for the brake of Figure 15 with respect to an arm supporting a clamping shoe of the brake means.

Referring now to the drawings in detail, it will be seen that there is illustrated a conventional silo construction which is referred to in general by the reference numeral 10. The silo construction 10 includes a bottom wall 12 which has extending upwardly therefrom a cylindrical vertical wall 14. The cylindrical vertical wall 14 is reinforced by tension hoops 16 which circumferentially are spaced at spaced vertical intervals.

The silo 10 also includes a roof construction 18 which has formed integral therewith a chute 20. The chute 20 extends vertically along the vertical wall 14 and communicates with the interior of the silo 10 through the roof 18 above the vertical wall 14.

The silo 10 is illustrated as being in combination with a barn which is referred to in general by the reference numeral 22. The barn 22 is of a conventional construction and need not be explained in more detail.

In order that feed stored within the silo 10 may be removed therefrom with a minimum of effort, that portion of the vertical wall 14 enclosed by the chute 20 is provided with a plurality of vertically spaced doors 24. The doors 24 are removably mounted to permit ease of access to the interior of the silo 10 at different elevations. Carried by the vertical doors 24 are rod elements 26 which are normally utilized to attain access to the upper portion of the silo 10 within the confines of the chute 20.

In order that access to the interior of the silo 10 may be more readily attained, there is provided the silo elevator which is the subject of this invention, the silo elevator being referred to in general by the reference numeral 28. The silo elevator 28 is disposed in alignment with the doors 24 and is within the general confines of the chute 20.

The silo elevator 28 includes a pulley mounting bracket which is referred to in general by the reference numeral 30. The pulley mounting bracket 30 is formed of a pair of spaced identical supporting brackets which are referred to in general by reference numeral 32. Each supporting bracket 32 includes an upper horizontal member 34 which is provided at its rear end with a depending leg 36. Secured to the horizontal member 34 in depending relation therefrom is a leg 38 which is disposed in spaced parallel relation forward of the rear leg 36. The leg 38 is braced by a diagonal brace 40 which extends downwardly and rearwardly from the forward end of the horizontal member 34. It will thus be seen that each of the support brackets 32 is provided with a generally U-shaped area in which is received the upper edge portion of the vertical wall 14 of the silo, as is best illustrated in Figure 1.

The support brackets 32 are connected together by a pair of transversely extending support arms 42. The support arms 42 overlie the forward end of the horizontal members 34 and are suitably secured thereto in spaced parallel relation. The support arms 42 extend to the left of a support bracket 32, as is best illustrated in Figures 2 and 3.

Journalled between the support arms 42 for rotation with respect thereto is a first pulley 44. The first pulley 44 is so positioned whereby an edge portion thereof remote from the projecting ends of the support arms 42 is in alignment with the center of the distance between the support brackets 32. A second pulley 46 is rotatably journalled between the support arms 42 at the projecting end thereof.

As is best illustrated in Figure 2, when the pulley mounting bracket 30 is properly positioned on the verti-

cal wall 14 of the silo 10, the support brackets 32 are centered relative to the chute 20. Also, it will be seen that the support arms 42 extend through an opening 48 in the side wall of the chute 20 so that the pulley 46 may be disposed exteriorly thereof.

Secured to the silo 10 and extending upwardly within the confines of the chute 20 in spaced parallel relation are a pair of tracks 50 which form a trackway. Each of the tracks 50 is preferably tubular and has secured thereto in vertically spaced relation an ear which is referred to in general by the reference numeral 52. Each ear 52 includes a rearwardly extending leg 54 and a flange 56, the flange 56 being disposed at right angles to the leg 54.

Securing each of the ears 52, 50 one of the tension hoops 16 is a clamp which is referred to in general by the reference numeral 58. The clamp 58 includes a first clamp portion which is referred to in general by the reference numerals 60 and a second clamp portion which is referred to in general by the reference numeral 62. The first clamp portion 60 includes a pair of spaced clamp bars 64 which are provided with opposed recesses 66 for receiving a hook 16. The clamp bars 64 are releasably clamped together by a fastener 68.

A second clamp portion 62 is formed by a pair of clamp bars 70 and 72. It will be noted that the clamp bars 70 and 72 are in spaced relation and that the clamp bar 72 is longer than the clamp bar 70 and includes a flange 74 which is disposed at right angles to the general plane thereof. The relationship of the clamp bars 70 and 72 is such that the clamp bar 70 has one end thereof disposed in embodying relation with respect to the flange 56 while the clamp bar 72 has one end thereof in abutting engagement with the opposite side of the flange 56. Further, the flange 74 is in abutting engagement with an outer end portion of the leg 54. The clamp bars 70 and 72 are adjustably clamped together by a fastener 76. It will be noted that the clamp bars 70 and 72 are provided with spaced parallel ends 78 and 80, respectively, which overlie the uppermost one of the clamp bars 64. The ends 78 and 80 are clamped to the uppermost clamp bar 64 by a clamp plate 82 which is retained in position by the fastener 68. In it is to be understood that the second clamp portion 62 may be pivoted with respect to the first clamp portion 60 about the axis of the fastener 68 to provide adjustment for the track 50.

Entrained over the pulleys 44 and 46 are intermediate portions of a flexible member such as a cable 84. The cable 84 has secured to the lower end thereof a carriage which is referred to in general by the reference numeral 86. The carriage 86 is intended to support a farmer who is desirous of entering the silo 10 and the weight of both the carriage 86 and the farmer is counter-balanced by a plurality of weights 88 secured to the opposite end of the cable 84.

Referring now to Figures 6 through 10, inclusive, it will be seen that the carriage 86 includes a generally rectangular frame formed by a pair of spaced parallel vertical frame members 90 which are connected together at their upper ends by an upper transverse frame member 92. The lower ends of the frame members 90 are connected together by a lower transverse frame member 94. The frame members 90 are further connected together by intermediate transverse frame members 96 which are vertically spaced.

Connected to each of the frame members 90 adjacent the lower end thereof is an upwardly and forwardly projecting lifting bar 98 which extends above the upper ends of the frame members 90. The upper ends of the lifting bars 98 are connected thereto upwardly and forwardly extending braces 100 whose upper ends are pivotally connected to the upper ends of the frame members 90. Extending between the upper ends of the lifting bars 98 and pivotally connecting the lifting bars 98 to their respective braces 100 is a transverse shaft 102. Also pivotally connected to the upper ends of the lifting bars 98 by the

5

shaft 102 are bridle forming members 104 whose upper ends are connected together by a pin 106. Carried by the pin 106 is a lifting ring 108 to which is connected the lower end of the cable 84.

In order that the carriage 86 may be guided by the tracks 50, there is carried by the upper and lower ends of the frame members 90 U-shaped guide shoes 110 which partially surround the tracks 50 as is best illustrated in Figure 6.

In order that a farmer, or other workman, may be carried by the carriage 86, there is carried at the lower ends of the frame members 90 a workman supporting platform 112. The platform 112 includes a pair of spaced parallel platform frame members 114 whose rear ends are pivotally connected to the lower ends of auxiliary vertical frame members 116 by pivot pins 118. The auxiliary vertical frame members 116 extend between the lower transverse frame member 94 and the lowermost intermediate transverse frame member 96 and are offset inwardly of the frame members 90. Secured to the underside of the frame members 114 is a plate 120.

In order that the platform 112 may be retained in a workman supporting position, there is provided at opposite sides thereof formable braces 122 which are terminally pivotally connected to the frame members 116 and the frame members 114. The platform 112 is normally urged to a collapsed position by a coil spring 124 fastened at one side thereof between one of the frame members 114 and an adjacent one of the frame members 116. The braces 122 may be collapsed to permit the folding of the platform 112 to an out-of-the-way position for a purpose to be set forth in more detail hereinafter.

Carried by the right-hand frame member 90, as viewed in Figure 6, immediately below the lowermost intermediate transverse frame member 96 is an angle bracket 126. Secured to the angle bracket 126 is a brake shoe 128 which is provided with a lining 130.

Also carried by the right-hand frame member 90, in alignment with the angle bracket 126, is a guide plate 132 which has extending therethrough an L-shaped support arm 134. Carried by one end of the L-shaped support arm 134 in spaced aligned relation with the brake shoe 128 is a slidably mounted brake shoe 136 which is provided with a lining 138.

As is best illustrated in Figure 9, pivotally connected to an upper portion on the right-hand frame member 116, as viewed in Figure 6, is a cam plate 140. The cam plate 140 is generally diamond shaped in outline and has pivotally connected to one corner thereof by a pivot pin 142, one end of the arm 134. The opposite corner of the cam plate 140 is pivotally connected to its associated frame member 116 by a pivot pin 144.

In order that the brake shoe 136 may be continuously urged towards the brake shoe 128 to effect clamping of the track 50 disposed between the two brake shoes, there is provided a brake setting arm 146. The brake setting arm 146 is pivotally mounted by a pivot pin 148 on the associated frame member 116 and has its lower end pivotally connected to the cam plate 140 by a pivot pin 150 disposed at a corner thereof between the corners where the pivot pins 142 and 144 are located. The brake setting arm 146 is generally angular in elevation with the point of bend being at the position of the pivot pin 148. Connected to the upper end of the brake setting arm 146 is a tension spring 152 whose upper end is connected to the right-hand frame member 90.

It will be seen that as the tension spring 152 pivots the brake setting arm 146 in a clockwise direction about the pivot pin 148, the cam plate 140 is also pivoted in a clockwise direction about the pivot pin 144 which results in the movement of the arm 134 to the left to set the brake. This is the normal position of the brake.

In order that the brake may be selectively released, there is pivotally carried by the lower end of the right-hand frame member 90 a brake releasing lever 154. The

6

brake releasing lever 154 is provided at its free end with a foot engageable pedal 156. It will be noted that the pedal 156 and the brake releasing lever 154 are so positioned whereby they are out of the way of the platform 112 so as to permit folding thereof.

Pivotally connected to the brake releasing lever 154 as at 158 is the lower end of a brake releasing arm 160. The upper end of the brake releasing arm 160 is connected to the fourth corner of the cam plate 140 by a pivot pin 162. It will be seen that when the brake releasing arm 160 is moved downwardly, the cam plate 140 is pivoted in a counter-clockwise direction against the tension of the spring 152 to release the brake.

Referring once again to Figures 1 and 2, it will be seen that carried by the left-hand support bracket 32, as viewed in Figure 2 is a cable 164. The cable 164 has the lower end thereof secured to the bottom portion of the silo 10 and extends in spaced parallel relation to the left-hand track 50. The cable 164 is so positioned whereby when a farmer or a workman is standing on the platform 112, he may easily reach the cable 164. Inasmuch as the weights 88 are such as to balance the combined weight of the carriage 86 and the workman standing on the platform 112, it will be seen that little effort will be required to move the carriage 86 either upwardly or downwardly. This is accomplished by either pulling on or lifting on the cable 164 to move the carriage 86 in a desired direction. Inasmuch as the brake carried by the carriage normally retains it against vertical movement, it is necessary for the operator of the carriage 86 to release the brake by stepping on the pedal 156. After the workman has gained access to the interior of the silo 10 and it is desired to toss out grain or other feed stored therein, the platform 112 is moved to the forward position best illustrated in Figure 1 so that sufficient space is provided within the chute 20 for the passage of the feed.

Referring now to Figures 12 to 16, inclusive, it will be seen that there is illustrated a modified form of carriage which is referred to in general by the reference numeral 166. The carriage 166 includes a pair of vertical spaced parallel frame members 168 which are connected together at their upper ends by an upper transverse frame member 170. The lower ends of the vertical frame members 168 are connected together by a transverse frame member 172. The frame members 168 are also connected together intermediate their ends by intermediate transverse frame members 174.

Secured to each of the vertical frame members 168 adjacent its lower end is an upwardly and forwardly extending lifting bar 176. The upper end of the lifting bar 176 is braced by a horizontally disposed forwardly extending brace 178 which is connected to the upper end of its associated vertical frame member 168.

Pivotally connected to each of the braces 178 by a pivot pin 180 is a bridle forming member 182. The upper ends of the two bridle forming members 182 are connected together by a pin 184 which also secures in place a lifting ring 186 which is in turn connected to the lower end of the cable 84.

Carried by the upper portion of the right-hand vertical frame member 168, as viewed from the front of the carriage 166 is a plate 188 which extends forwardly from its associated vertical frame member 168. The plate 168 has secured to the rear portion thereof a rearwardly arm 190 to which is rigidly secured a fixed brake shoe 192 which is provided with a lining 194 selectively engageable with one of the tracks 50.

Guidingly carried by the frame member 168 to which the plate 188 is attached for sliding movement is a horizontally disposed arm 196 which carries at its rear end a movable brake shoe 198. The arm 196 and the brake shoe 198 are spring urged to the left by a spring (not shown) carried by the arm 196.

Pivotally carried by the plate 188 as at 200 is an intermediate portion of an operating lever 202. The op-

crating lever 202 is provided with a cam surface 204 which engages the forward end of the arm 196. The operating lever 202 is connected by a link 206 to the lower end of one of the bridle forming members 182.

Connected to the upper portions of the bridle forming members 182 is a downwardly and rearwardly extension spring 208. The tension spring 208 has the rear end thereof connected to the intermediate portion of the upper transverse frame member 170, as is best illustrated in Figure 13. It will be noted that the tension on the cable 84 will retain the bridle forming members 182 in substantially vertical positions. However, in the event the cable 84 breaks, the tension spring 208 will pivot the bridle forming members 182 in a clockwise direction about the pivot pin 180 with the result that the actuating lever 202 will also be pivoted in a clockwise direction and that the pivot pin 200 to urge the arm 196 and the brake shoe 198 to the right to clamp the track 50 so as to form an emergency brake for the carriage 168.

In order that the carriage 166 may be suitably guided with respect to the track 50, the upper and lower ends of the vertical frame members 168 have secured to the rear surfaces thereof U-shaped guide members 210. The guide members 210 engage the tracks 50, as is best illustrated in Figure 13.

The carriage 166 includes a pair of spaced parallel auxiliary vertical frame members 212 which are disposed at the bottom of the carriage 168 and which are offset inwardly and forwardly of the lower portions of the vertical frame members 168. The frame members 212 extend vertically between the lower transverse frame member 172 and the lowermost of the intermediate transverse frame members 174.

Carried by the lower ends of the frame members 212 is a workman supporting platform which is referred to in general by the reference numeral 214. The workman supporting platform is identical with the workman supporting platform 112 and includes a pair of frame members 216 which are pivotally connected as at 218 to the lower ends of the vertical frame members 212. The workman's platform also includes a plate 220 which is secured to the underside of the frame members 216.

Extending between one of the frame members 216 and its associated frame member 212 is a tension spring 222 which normally urges the workman's platform 214 to a collapsed position. Extending between the frame members 216 and 212 are formable braces 224. The braces 224 normally retain the platform 214 in a workman receiving position, as is best illustrated in Figure 11, against the upward urge of the spring 222. However, when the braces 224 are collapsed, the spring 222 will move the workman's platform 214 into a foldable position and retain it in such position.

Carried by the right-hand vertical frame member 168, as viewed from the front of the carriage 166, immediately below the lowermost intermediate frame member 174 is a forwardly extending horizontal plate 226. The plate 226 has secured thereto a rearwardly extending angulated arm 228 which carries at the rear end thereof a fixed brake shoe 230. The brake shoe 230 is provided with a suitable lining 232 which is adapted to engage the surface of an associated track 50.

Guidingly carried by the vertical frame member 168 to which the plate 226 is secured is a slidably mounted arm 234. The arm 234 is in alignment with the plate 226 and the arm 228 and has secured to the rear end thereof a slidable brake shoe 236. It is to be understood that the construction of the arm 234 is identical with the construction of the arm 196.

The arm 234 is provided at the forward end thereof with an adjustable extension 238 which terminates at its forward end in a head 240. Carried by the arm 234 between the head 240 and the forward portion of the associated vertical frame member 168 is a coil spring 242 which urges the arm 234 to a forwardmost position.

In order that the arm 234 may be moved rearwardly so that the brake shoes 230 and 236 will graspingly clamp the track 50 disposed therebetween, there is provided a cam 244 which is pivotally mounted relative to the plate 226 on a pivot pin 246 carried by the forward portion of the plate 226. The cam 244 is retained in engagement with the head 240 in the manner best illustrated in Figure 16. In order that the cam 244 may be selectively rotated, there is connected thereto a U-shaped operator 248 which has a leg 250 in spaced parallel relation to the cam 244. The leg 250 is also pivotally mounted on the pivot pin 246.

Pivotally connected to the rear portion of the leg 250 is a vertically extending actuating lever 252. The actuating lever 252 has secured to the upper end thereof a tension spring 254 whose upper end is secured to an associated one of the vertical frame members 168. The coil spring 254 urges the cam 244 to rotate in a counterclockwise direction, as viewed in Figure 16, so as to set the brake shoes 230 and 236. In this manner the brake of which the brake shoes 230 and 236 are parts, remains in the set position except when released.

In order that the brake may be released, the lower end of the operating lever 252 is provided with a horizontal flange 256. The flange 256 has overlying the same a hooked rear end 258 of a control lever 260. The control lever 260 at its forward end thereof is pivotally connected as at 262 to the right-hand one of the frame members 216 and is provided intermediate its ends with a pedal 264. When the pedal 264 is engaged by a workman's foot, the operating lever 252 is moved downwardly so as to rotate the cam 244 in a clockwise direction and release the cam.

It is to be understood that the cam 244 is illustrated in a neutral position at which time the brake is released. However, the normal position of the cam 244 is a position in a counterclockwise rotated direction from that of Figure 16 due to the urging of the tension spring 254.

Although the control lever 260 is pivotally connected to the platform 214, the relationship thereof with respect to the actuating lever 252 is such that the platform 214 together with the control lever 260 may be moved to a firmer position.

Although the carriage 86 has not been illustrated as being provided with an emergency brake, such as the brake illustrated in Figure 14, it is to be understood that if it is so desired, it may be so provided. It is to be understood that the only changes required would be the pivotal mounting of the bridle and the addition of the brake structure.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. In a combination with a silo of the type including an external chute and tension hoops, a silo elevator, said silo elevator comprising a vertical trackway mounted within said chute and secured to said hoops, a pulley mounting bracket mounted at an upper edge of a vertical wall of the silo in alignment with said chute, a first pulley carried by said mounting bracket in alignment with said chute, a second pulley carried by said mounting bracket in spaced relation to said first pulley, a flexible member entrained over said pulleys, one end of said flexible member being disposed within said chute, a carriage disposed within said chute in guided engagement with said trackway, said carriage being secured to said one end of said flexible member in supported relation, a counter-balance carried by an opposite end of said flexible

9

member externally of said chute, said trackway being formed by spaced parallel tracks, each of said tracks being provided at spaced intervals with ears, a clamp releasably securing each ear to one of said hoops, said clamp including a first clamp portion releasably clamping one of said hoops, a second clamp portion releasably clamping one of said ears, said second clamp portion being adjustably supported by said first clamp portion.

2. In combination with a silo of the type including an external chute and tension hoops, a silo elevator, said silo elevator comprising a vertical trackway mounted within said chute and secured to said hoops, a pulley mounting bracket mounted at an upper edge of a vertical wall of the silo in alignment with said chute, a first pulley carried by said mounting bracket in alignment with said chute, a second pulley carried by said mounting bracket in spaced relation to said first pulley, a flexible member entrained over said pulleys, one end of said flexible member being disposed within said chute, a carriage disposed within said chute in guided engagement with said trackway, said carriage being secured to said one end of said flexible member in supported relation, a counter-balance carried by an opposite end of said flexible member externally of said chute, said carriage being provided with a brake, said brake being normally sprung urged into engagement with said trackway to retain said carriage in an adjusted position, said brake including a brake shoe fixedly carried by said carriage, a clamping shoe slidably carried by said carriage, an arm supporting said clamping shoe, a cam member in engagement with said arm for sliding said arm relative to said carriage, said cam member being pivotally mounted, operator means connected to said cam member for selectively urging said clamping shoe out of engagement with said

10

trackway, said operator means including an operating link pivotally connected to said cam member.

3. In a combination with a silo of the type including an external chute and tension hoops, a silo elevator, said silo elevator comprising a vertical trackway mounted within said chute and secured to said hoops, a pulley mounting bracket mounted at an upper edge of a vertical wall of the silo in alignment with said chute, a first pulley carried by said mounting bracket in alignment with said chute, a second pulley carried by said mounting bracket in spaced relation to said first pulley, a flexible member entrained over said pulleys, one end of said flexible member being disposed within said chute, a carriage disposed within said chute in guided engagement with said trackway, said carriage being secured to said one end of said flexible member in supported relation, a counter-balance carried by an opposite end of said flexible member externally of said chute, said carriage including a lifting bridle, an emergency brake carried by said carriage for engagement with said trackway, said bridle being pivotally mounted, operating means for said emergency brake connected to said bridle, spring means connected to said bridle continuously urging said bridle to a brake actuating position.

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