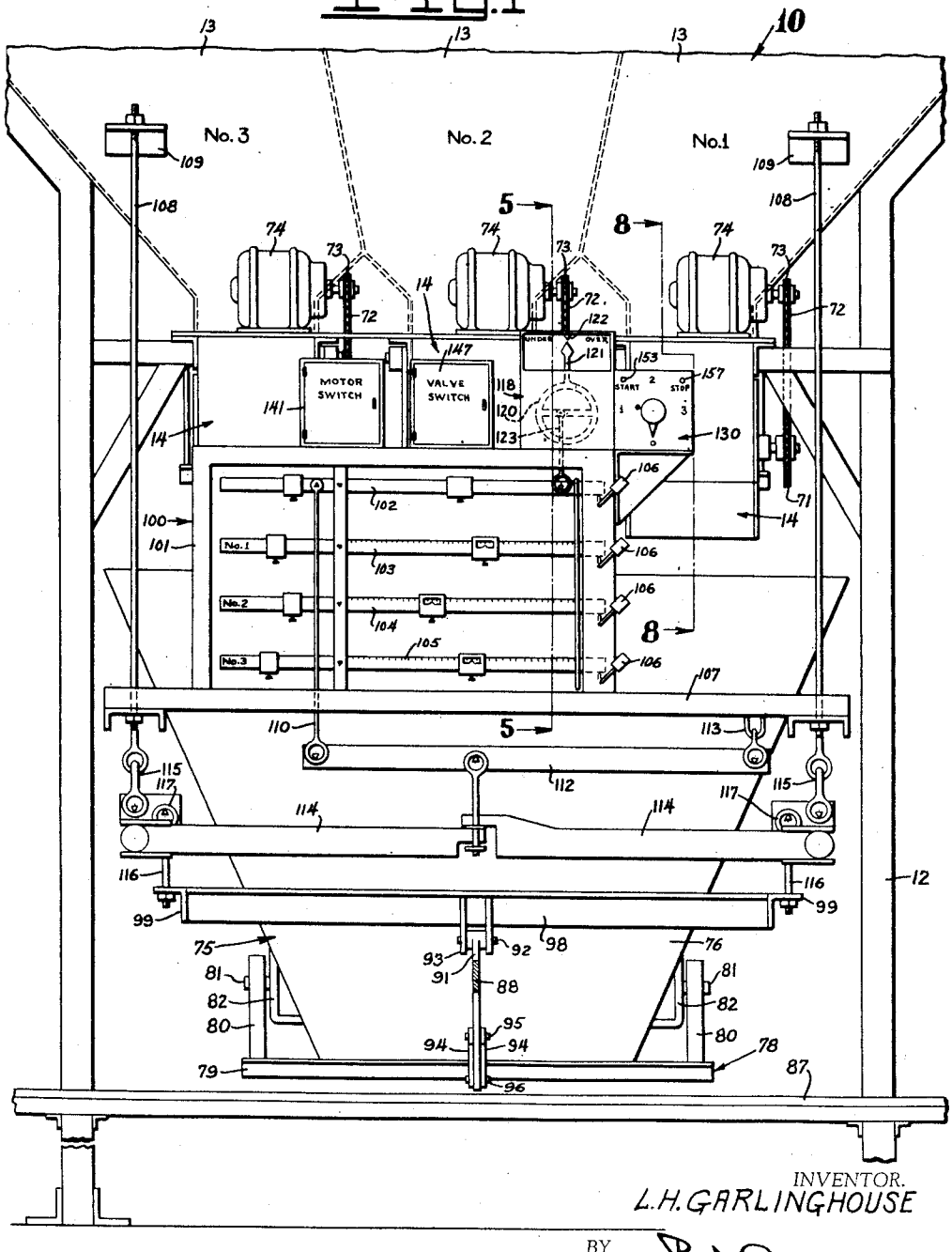
Nov. 2, 1937. L. H. GARLINGHOUSE 2,097,551

BATCHING APPARATUS

Filed June 29, 1934 4 Sheets-Sheet 1

Fig. 1



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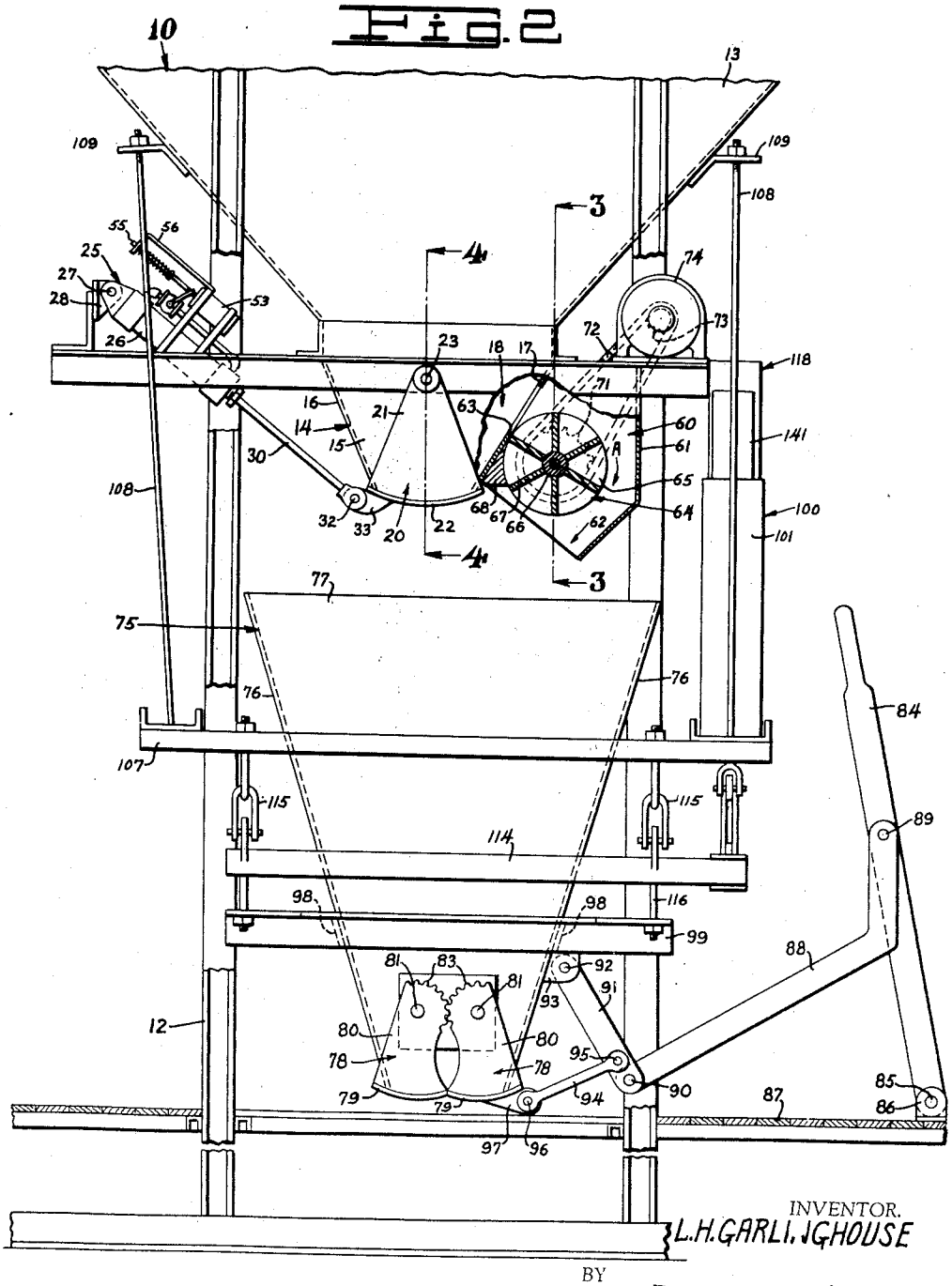
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Fig. 2



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Fig. 3

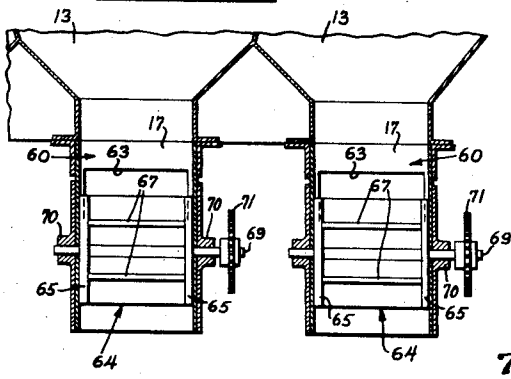


Fig. 4

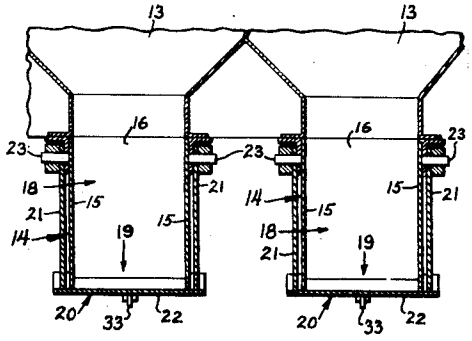


Fig. 5

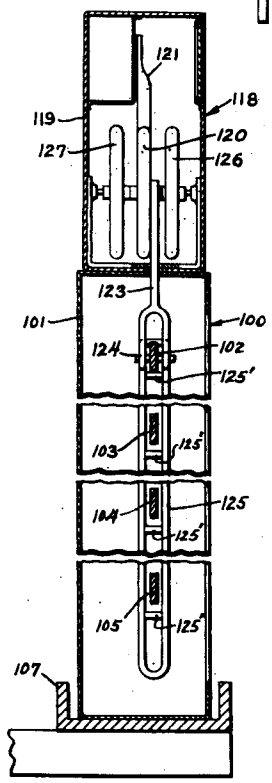


Fig. 6

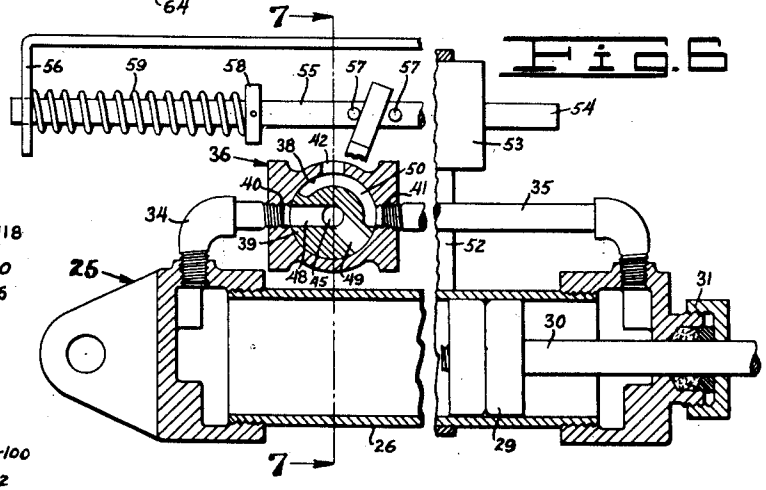


Fig. 8

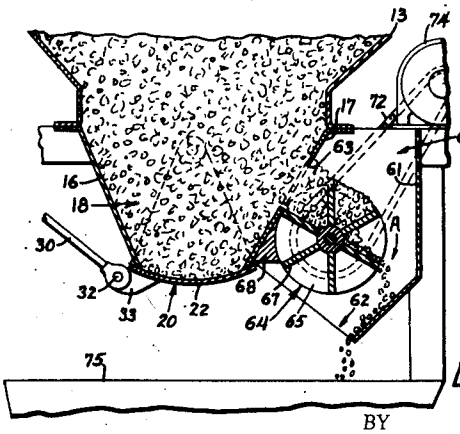
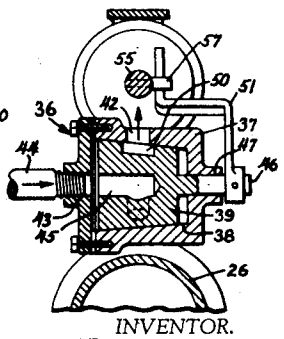


Fig. 7



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Fig. 9

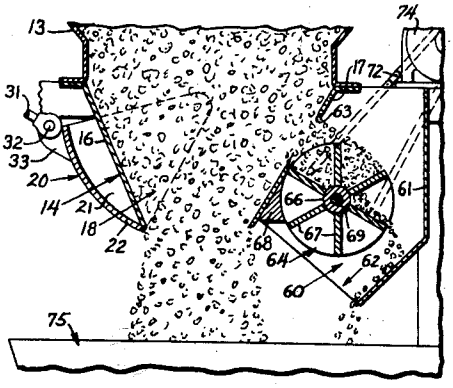


Fig. 11

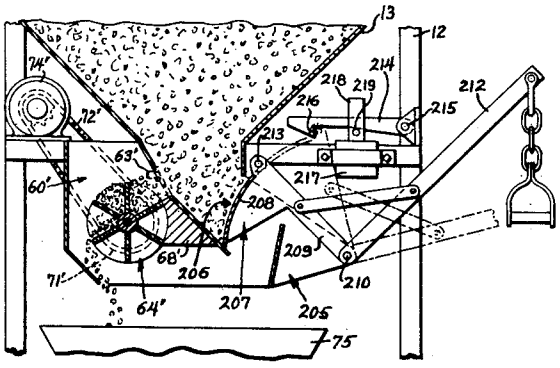
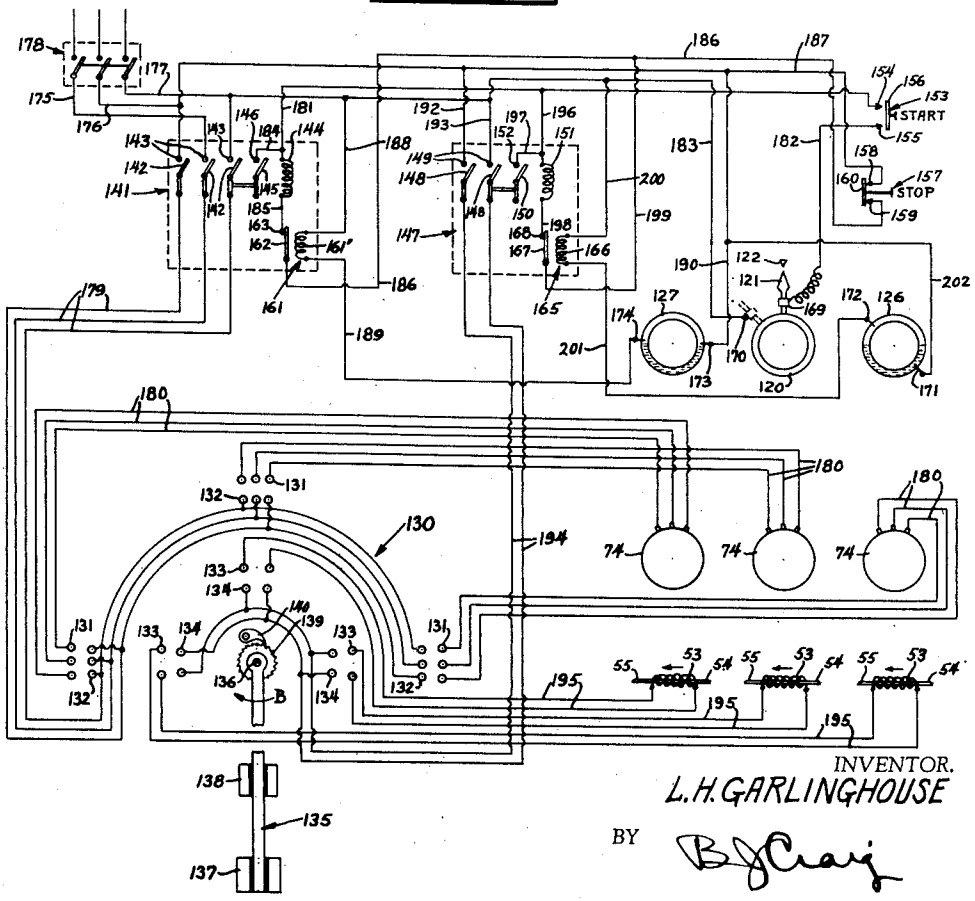


Fig. 10



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Patented Nov. 2, 1937

2,097,551

UNITED STATES PATENT OFFICE

2,097,551

BATCHING APPARATUS

Leslie H. Garlinghouse, Los Angeles, Calif.

Application June 29, 1934, Serial No. 733,037

2 Claims. (Cl. 249—43)

This invention relates to improvements in batching devices.

The general object of the invention is to provide an improved batch weighing device.

Another object of the invention is to provide an improved discharge device for storage bins.

A further object of the invention is to provide a novel discharge device for storage bins which is automatically controlled by the weight of material discharged from the bin.

An additional object of my invention is to provide a hopper construction for handling bulk materials wherein a novel by-pass is provided.

Other objects and the advantages of this invention will be apparent from the following description taken in connection with the accompanying drawings wherein:

Fig. 1 is a fragmentary side elevation of a batching device including the features of my invention;

Fig. 2 is a fragmentary end view of the device shown in Fig. 1 with portions thereof broken away;

Fig. 3 is a fragmentary section taken on line 3—3 of Fig. 2;

Fig. 4 is a fragmentary section taken on line 4—4 of Fig. 2;

Fig. 5 is a fragmentary enlarged section taken on line 5—5 of Fig. 1;

Fig. 6 is an enlarged fragmentary longitudinal section through one of the air cylinders;

Fig. 7 is a fragmentary section taken on line 7—7 of Fig. 6;

Fig. 8 is a fragmentary section taken on line 8—8 of Fig. 1;

Fig. 9 is a view similar to Fig. 8 showing the discharge door of the storage bin in an open position;

Fig. 10 is an electrical wiring diagram of the device; and,

Fig. 11 is a view similar to Fig. 8 showing a modified form of discharge door for the storage bins.

Referring to the drawings by reference characters I have indicated my improved batching device generally at 10. As shown the device 10 includes a supporting frame indicated by 12 on which a plurality of storage bins 13, shown as three in number, are mounted. Each of the storage bins 13 includes a discharge device indicated generally at 14. As shown each of the discharge devices 14 includes spaced side walls 15 and downwardly convergent end walls 16 and 17 which form a chamber 18 which communicates with the interior of its associated bin 13. The lower ends of the walls 16 and 17 are spaced apart to form a discharge opening indicated at 19.

For closing the discharge opening 19 I provide a gate member 20 which includes a pair of spaced side members 21 having an arcuate bottom member 22 secured thereto. The bottom member 22 is positioned across the discharge opening 19 and the side members are positioned adjacent the outer faces of the side walls 15 of the discharge device and are pivotally mounted as at 23 to a portion of the frame.

For opening and closing each of the gates 20 I provide a gate operating device indicated generally at 25 and shown in detail in Figs. 6 and 7. As shown the gate operating device 25 includes a closed cylinder 26 one end of which is pivotally mounted as at 27 on a bracket 28 which is secured to a portion of the frame 12. A suitable double faced piston 29 is provided in the cylinder 26 and includes a piston rod 30 which extends out of the cylinder at the end thereof opposite the pivot 27 through a suitable packing gland 31. The end of the piston rod 30 opposite the piston is pivotally secured as at 32 to a bracket 33 provided on the bottom plate 22 of the associated gate 20.

For directing air under pressure into the cylinder at one end thereof I provide a pipe 34 one end of which communicates with the interior of the cylinder and for directing compressed air into the cylinder at the opposite end thereof I provide a pipe 35 one end of which communicates with the interior of the cylinder.

For controlling the flow of air to and from the cylinder I provide a valve member 36. The valve 36 may be of any desired type suitable for the purpose. In the drawings I have shown the valve 36 as including a body portion 37 having a tapered chamber 38 therein in which a tapered rotor member 39 is mounted for rotation. As shown the body 37 includes a pair of opposed radial apertures 40 and 41, a radial exhaust aperture 42 and an axial inlet aperture 43. The end of the pipe 34 opposite the cylinder end thereof communicates with the valve aperture 40 and the end of the pipe 35 opposite the cylinder end thereof communicates with the valve aperture 41. A pipe 44 communicates with the valve inlet aperture 43 and is adapted to convey air under pressure from a suitable source of supply (not shown) to the valve (see Fig. 7).

The valve rotor 39 includes an axial recess 45 which opens towards the valve inlet aperture 43 and extending from the end of the rotor opposite the recess 45 the rotor includes a reduced operat-

ing stem 46 which extends out of the valve body through an aperture 47 provided therein. Extending radially from the recess 45 the rotor includes an aperture 48 and an aperture 49 which is positioned at an angle to the aperture 48. The rotor further includes an exhaust recess or groove 50 provided in the outer face thereof between the apertures 48 and 49 and with the ends thereof spaced from the apertures.

When the valve rotor 39 is in the position shown in Fig. 6 the aperture 48 therein communicates with the body aperture 40 thereby directing compressed air into the pipe 34 and when the rotor is in its other position the aperture 49 thereof communicates with the body aperture 41 thereby directing compressed air into the pipe 35. The exhaust recess 50 of the rotor at all times communicates with the exhaust aperture 42 in the body and when compressed air is directed in the pipe 34, as previously described, the exhaust recess 50 communicates with the body aperture 41 thus placing the pipe 35 in communication with the exhaust aperture 42 and when compressed air is directed into the pipe 35 as previously described the exhaust recess 50 communicates with the body aperture 40 thus placing the pipe 34 in communication with the exhaust aperture 42.

When compressed air is directed into the pipe 34 it enters the cylinder 26 and forces the piston 29 towards the packing gland 31 thereby moving the piston rod 30 which in turn swings the gate 20 to a closed position as shown in Fig. 2.

When compressed air is directed into the pipe 35 it enters the cylinder 26 and forces the piston 29 towards pivot end of the cylinder thereby moving the piston rod 30 which in turn swings the gate 20 to an open position as shown in Fig. 9. For rotating the valve rotor 39 I provide an operating arm 51 one end of which is secured to the rotor stem 46 and extends upward therefrom.

Supported on brackets 52 above the cylinder 26 I provide a solenoid coil 53 and an associated core member 54 to which one end of a rod 55 is secured. The end of the rod 55 opposite the core 54 is slidably supported by a bracket 56. On the rod 55 I provide a pair of spaced pins 57 which project therefrom and are positioned one adjacent each side of the valve operating arm 51. Secured to the rod 55 intermediate the pins 57 and the free end thereof I provide a collar 58 and surrounding the rod 55 between the collar 58 and the bracket 56 I provide a coiled spring 59.

The spring 59 normally urges the rod 55 towards the solenoid 53 which in turn retains the valve operating arm 51 in a position wherein the rotor directs compressed air into the pipe 34 thereby retaining the gate 20 in a closed position. When the solenoid coil 53 is energized as will be described hereinafter, it attracts the core 54 thereinto which moves the rod 55 against the action of the spring 59 thereby swinging the valve operating arm 51 to a position wherein the valve rotor directs compressed air into the pipe 35 which as previously described moves the piston and piston rod to a position to swing the gate 20 to an open position.

At the side of the chamber 18 opposite the gate operating device 25 the discharge device 14 includes a chamber 60. The side walls of the chamber 60 are continuations of the walls 15 and the wall 17 forms one end wall while a wall 61 spaced from the wall 17 forms the other end wall. The bottom of the chamber 60 is open to form a discharge opening indicated at 62.

Intermediate its height the wall 17 includes an aperture 63 which forms a communicating passageway between the chambers 18 and 60.

Positioned in the chamber 60 I provide a rotor member 64 which includes spaced annular end plates 65 connected by a hub portion 66 and between the end plates 65 the rotor includes a plurality of spaced radially extending plates or blade members 67. Adjacent the lower edge of the aperture 63 in the wall 17 the rotor 64 is positioned tangent with the wall 17 and between the rotor and the wall 17 below the aperture 63 I preferably provide a filler block 68. The hub of the rotor is secured to a shaft 69 which extends out through the side walls 21 and is journaled in suitable bearing members 70 secured to the side walls 21.

At one side of the discharge device a sprocket 71 is secured to the rotor shaft 69 and is adapted to be driven in the direction indicated by the arrow A, (Fig. 2) by a sprocket chain 72 from a sprocket 73 mounted on the armature shaft of a motor 74 which is suitably mounted on a portion of the frame 12. When material such as gravel is positioned in the storage bin 13 it fills the chamber 18 of the discharge device 14 and some of the material passes through the aperture 63 in the wall 17 into the chamber 60. A continuous flow of material from the chamber 18 into the chamber 60 is restricted by the material piling up against the blades 67 of the rotor 64. When the motor 74 is operated to rotate the rotor 64 material is carried in the spaced portion between the rotor blades 67 and falls therefrom through the discharge aperture 62.

The means and method of operating the motors 74 will be fully described hereinafter.

Positioned below the discharge devices 14 I provide a weighing hopper 75 which is adapted to receive the material discharged from the devices 14. The method of supporting the hopper 75 will be described hereinafter. As shown the hopper 75 includes spaced downwardly convergent side walls 76 and spaced downwardly convergent end walls 77 with the top and bottom of the hopper open.

For closing the bottom of the hopper I provide a pair of opposed gate members 78 each of which includes a bottom plate 79 secured to upwardly extending spaced end members 80 which are pivotally mounted on a trunnion 81 which is supported by a bracket 82 suitably secured to the hopper. Each of the end members 80 has gear toothed portions 83 which are coaxial with the axis of their associated trunnions 81. The gear teeth of each associated pair of members 80 intermesh so that when one gate member is swung on its pivots the other will be likewise moved.

Any suitable means may be used to operate the gates 78 but I have shown an operating lever 84 which is pivotally mounted as at 85 on a bracket 86. The bracket 86 is shown as mounted on a platform 87 which is suitably supported by the frame 12.

Intermediate the length of the lever 84 one end of a bar 88 is pivotally secured thereto as at 89. The opposite end of the bar 89 is pivotally connected as at 90 adjacent one end of a bar 91, the opposite end of which is pivotally secured as at 92 to a bracket 93 mounted on the hopper. Intermediate the length of the bar 91 one end of a pair of bars 94 are pivotally secured thereto as

at 95 to a bracket 97 which extends downward from one of the gate plates 79. Thus it will be seen that when the lever 84 is swung about its pivot away from the hopper 75 the gate 78 which includes the bracket 97 will be swung outward about its pivot 81 and when it is thus moved it will swing the other gate in the opposite direction through the medium of the intermeshing gear teeth 83. Thus the two gates 78 are swung to an open position. When the lever 84 is swung about its pivot 85 towards the hopper 75 the gates 78 are simultaneously moved towards each other to a closed position as shown in Fig. 2.

Secured to each of the side walls 76 of the hopper 75 I provide an angle member 98 and each end of the angle members 98 are connected by angle members 99.

For weighing the material in the hopper 75 I provide a standard beam scale the adjustable portion of which is indicated at 100 and is shown as including a housing 101 in which the usual tare beam 102, weight beams 103, 104 and 105 and lock members 106 therefore are mounted.

The housing 101 is shown as mounted on a frame 107 which is supported by a plurality of rods 108 which in turn are suspended from brackets 109 secured to the bins 13. The bar beam 102 is operatively connected in the usual manner by a rod 110 to one of the balance beams 112 of the scale which in turn is shown as suspended by a link device 113 from the frame 107. Other balance beams 114 are also suspended from the frame 107 by link devices 115 and the angle members 98 which are mounted on the hopper 75 are supported by a plurality of rods 116 which are pivotally suspended as at 117 from the beams 114. Thus it will be seen that the hopper 75 is supported by the balance beams of the scale device. The scale is provided with a standard automatic indicator 118 which includes a housing 119 mounted on the scale housing 101. The indicator device 118 includes the usual pivoted wheel 120 having an indicator finger 121 thereon which is adapted to indicate a predetermined weight by swinging to a position in line with an indicator mark 122 provided in the housing 119. The indicator wheel 120 is actuated in the usual manner by a rod 123 which includes a yoke portion 124 which is pivotally connected to the tare beam 102. The tare beam 102 is shown as operatively connected to the beams 103, 104 and 105 by the usual yoke member 125 which includes cross bars 125' on which the beams 103, 104 and 105 rest when the locking members 106 are released. In the accompanying drawings the beam 103 is used to weigh the material delivered from the number 1 bin 13 into the hopper 75, the beam 104 to weigh the additional material delivered from the number 2 bin 13 into the hopper 75 and the beam 104 to weigh the additional material delivered from the number 3 bin 13 into the hopper 75.

In addition to the indicator wheel 120 the indicator device 118 includes two hollow cylindrical tube members 126 and 127 which are mounted to turn with the indicator wheel 120. The tubes 126 and 127 are made of an electrical insulation material and are half filled with mercury. The tube 126 controls the operation of the solenoid cores 52 and the tube 127 controls the operation of the motors 74 as will be fully described hereinafter.

In Fig. 10 I have diagrammatically shown the manner of wiring the control devices of my batching apparatus. As shown in Fig. 10 I provide a control switch indicated generally at 130 which includes three sets of motor contacts one set for each motor 74 each of which includes three motor contacts 131 and three line contacts 132. The switch 130 further includes three sets of solenoid contacts one set for each solenoid 53 each of which includes two solenoid contacts 133 and two line contacts 134. The switch 130 is shown as including an electrically insulated switch arm 135 which is pivoted at 136 and includes contact bars 137 and 138 thereon. The switch arm 135 is further shown as having a ratchet 139 mounted thereon which is engaged by a pawl 140 to prevent the switch arm from being turned in the direction opposite to that indicated by the arrow B.

For controlling the flow of current to the motors 74 I provide a standard magnetic motor switch 141 which includes three line switch arms 142 with associated contacts 143, an electro-magnetic coil 144, a coil switch arm 145 with an associated contact 146.

For controlling the flow of current to the solenoid coils 53 I provide a similar standard magnetic switch 147 which includes two line switch arms 148 with associated contacts 149, an electromagnetic coil 151 and a coil switch arm 150 with an associated contact 152.

For momentarily directing a flow of current to the coils 144 and 151 I provide a standard open circuit push button switch 153 which includes a pair of contacts 154 and 155 which are adapted to be bridged by a contact bar 156 and for breaking the flow of current to the coils 144 and 151 I provide a standard closed circuit push button switch 157 which includes a pair of contacts 158 and 159 which are normally bridged by a contact bar 160.

In addition to the standard equipment of the motor switch 141 I provide a magnetic switch 161 which includes an electro-magnetic coil 161' having an associated armature switch arm 162 which normally engages an associated contact 163.

Similarly the switch 147 in addition to the standard equipment includes a magnetic switch 165 which includes an electro-magnetic coil 166 having an associated armature switch arm 167 which normally engages an associated contact 168.

On the indicator arm 121 I provide a contact 169 which when the scale device is inoperative engages a contact 170. On the mercury switch tube 126 I provide a pair of spaced contacts 171 and 172 which are adapted to be bridged by the mercury in the tube 126 and on the mercury switch tube 127 I provide a pair of spaced contacts 173 and 174 which are adapted to be bridged by the mercury in the tube 127. As shown electric current is directed from a suitable source of electrical energy (not shown) through wires 175, 176 and 177 to the contacts 143 of the switch 141 and a master switch device 178 is preferably interposed in the lines 175, 176 and 177.

The motor switch arms 143 are each connected by a wire 179 to associated contacts 132 of all three sets of the motor contacts of the control switch 130 and each contact 131 of each set is connected by a wire 180 to its associated motor 74. Thus when electric current is directed to the switch 141 and the switch arms 142 of the switch 141 engage their associated contacts 143 and the contact bar 137 of the control switch 130 bridges a set of contacts 131 and 132 an electric circuit is completed from the source of sup-

ply to the motor 74 associated with the bridged set of contacts 131 and 132 whereupon the motor will operate.

One end of the coil 144 of the switch 141 is connected by a wire 181 to the contact 154 of the push button switch 153 and the other contact 155 of the switch 153 is connected by a wire 182 to the contact 169 on the indicator arm 121. The associated contact 170 is connected by a wire 183 to the line wire 177. The coil contact 146 of the switch 141 is connected by a wire 184 to the wire 181 and the opposite end of the coil 144 is connected by a wire 185 to the contact 163 and its associated switch arm 162 is connected by a wire 186 to the contact 159 of the push button switch 157. The associated contact 158 is connected by a wire 187 to the line wire 176. One end of the coil 161' of the switch 162 is connected by a wire 188 to the wire 183 and the opposite end of the coil 162 is connected by a wire 189 to the contact 174 of the mercury switch 127. The associated contact 173 is connected by a wire 190 to the wire 187.

From the foregoing it will be apparent that when the indicator arm 121 is in its normal position as indicated by the dotted lines with the contact 169 engaging the contact 170 and the contacts 154 and 155 of the push button switch 153 are bridged by the contact bar 156 current flows through the wires 177 and 183 to the contact 170 through the contact 169 and the wire 182 to the contact 155 of the switch 153 thence through the contact bar 156 to the contact 154 and then through the wire 181 to one end of the coil 144 of the switch 141.

From the opposite end of the coil 144 the current flows thrcugh the wire 185 to the contact 163 and thence through the switch arm 162 and the wire 186 to the contact 159 of the push button switch 157. From the contact 159 the current flows through the contact bar 160 to the contact 158 and thence through the wire 187 to the wire 176 thereby energizing the coil 144 which actuates the switch arms 142 and 145 into engagement with their associated contacts. Thereafter the coil 144 is retained energized by engagement of the switch arm 145 and its contact 146.

To manually break the circuit to the motors the push button switch 157 is actuated to move the contact bar 160 thereof out of engagement with the contacts 158 and 159 thereby breaking the circuit to the coil 144 of the switch 141 whereupon the switch arms 142 and 145 move out of engagement with their associated contacts.

One of the contacts 149 of the switch 147 is connected by a wire 192 to the wire 187 and the other contact 149 is connected by a wire 193 to the wire 183. The switch arms 148 are each connected by a wire 194 to associated contacts 134 of all three sets of the solenoid contacts of the control switch 130 and each contact 133 of each set is connected by a wire 195 to opposite ends of its associated coil 53.

Thus when electric current is directed to the switch 147 and the switch arms 148 engage their associated contacts 149 and the contact bar 138 of the control switch bridges a set of contacts 133 and 134 an electric circuit is completed through the coil 53 thereby energizing the coil which in turn attracts its associated core 54 thereto and moves the rod 55 in the direction indicated by the arrow.

One end of the coil 151 of the switch 147 is connected by a wire 196 to the wire 181 and the wire 196 is connected by a wire 197 to the contact 152. The opposite end of the coil 151 is connected by a wire 198 to the contact 168 of the switch 165 and the switch arm 167 is connected by a wire 199 to the wire 186. One end of the coil 166 of the switch 165 is connected by a wire 200 to the wire 183 and the opposite end of the coil 166 is connected by a wire 201 to the contact 172 of the mercury switch 126 and the associated contact 171 is connected by a wire 202 to the wire 190.

From the foregoing it will be apparent that when the indicator arm is in its normal position and the push button switch 153 is actuated to bridge the contacts 154 and 155 as previously described current flows from the wire 183 to the coil 151 and then through the wire 198 to the contact 168 and then through the switch arm 167 and the wire 199 to the wire 186 thereby energizing the coil 151 which actuates the switch arms 148 and 150 into engagement with their associated contacts thereby directing current to the solenoid contacts 134 of the control switch 130. Thereafter the coil 151 is retained energized by engagement of the switch arm 150 and the contact 152.

To manually break the circuit to the solenoid coils 53 the push button switch 157 is actuated to break the circuit between the contacts 158 and 159 as previously described thereby breaking the circuit to the coil 151 whereupon the switch arms 148 and 150 move out of engagement with their associated contacts.

In operation the bins 13 are filled with the desired material to be mixed and the scale beams 103, 104 and 105 are set to weigh the desired amount of material to be delivered from their associated bins. The master switch 178 is closed and then the switch arm 135 of the control switch 130 is moved to the position wherein the contact bars 137 bridge the first set of motor contacts 131 and 132 and the contact bars 138 bridge the first set of solenoid contacts 133 and 134. The push button 153 is then actuated as previously described to close the magnetic switches 141 and 147. When the switch 141 is closed the motor 74 associated with the bridged set of contacts 131 and 132 operates and rotates its associated rotor 64 which in turn conveys a portion of the material in the chamber 18 into the chamber 60 from whence it is discharged into the hopper 75 as previously described.

When the switch 147 is closed the solenoid 53 associated with the bridged set of contacts 133 and 134 is energized and actuates the valve 36 to direct compressed air into the cylinder 26 to move the piston and piston rod 30 to swing the gate 20 to an open position as previously described and shown in Fig. 9. Whereupon the material in the chamber 18 of the associated discharge device 14 is discharged into the hopper 75.

As the material collects in the hopper 75 the indicator arm 121 of the automatic indicating device 118 moves upward towards the indication mark 122. At a predetermined distance before the indicator arm 121 registers with the indication mark 122 the contact 171 of the mercury switch moves the mercury thereby actuating the solenoid 166 to break circuit to the solenoid 53 as previously described whereupon the spring 59 moves the rod 55 as previously described which in turn actuates the valve 36 to direct compressed air into the cylinder 26 to move the piston and piston rod in the direction to swing the gate 20 to a closed position. The motor continues to

actuate the rotor 64 until the indicator arm 121 registers with the indication mark 122 in which position the contact 174 of the mercury switch moves into the mercury thereby actuating the solenoid 161' to break the circuit to the motor 74, as previously described. After the correct amount of material has been delivered from the number one bin 13 into the hopper 75 the operator releases latch 106 of scale beam 104 and sets the control switch 130 to actuate the motor 74 and solenoid 53 associated with the second bin and after the correct amount of material has been delivered from the number two bin 13 into the hopper 75 the operator releases latch 106 of scale beam 105 and sets the control switch 130 to actuate the motor 74 and the solenoid 53 associated with the third bin.

After the correct amount of material has been delivered from each of the three bins 13 into the hopper 75 the operator actuates the lever 84 to open the gates 78 to discharge the contents of the hopper.

In Fig. 11 I have indicated a modified form of discharge device generally at 205. As shown the discharge device 205 is similar in most respects to the discharge device 14 and similar portions thereof are indicated by similarly primed reference numerals. The chamber 18' of the discharge device 205 includes an angular discharge opening 206 which is adapted to be closed by a gate 207 which includes a closure plate 208 mounted on side members 209 which are pivotally supported as at 210. One of the side members 209 has an operating arm 212 secured thereto by means of which it is adapted to be swung to an open position. Adjacent the end of one of the side members opposite the pivot 210 I provide a pin 213. Above the gate 207 I provide a horizontal arm 214 pivotally mounted adjacent one end as at 215 and adjacent the opposite end the arm 214 includes a hooked portion 216. Intermediate the length of the arm 214 I provide a solenoid coil 217 having an associated core member 218. The core 218 includes a pin 219 on which the arm 214 normally rests.

When the discharge device 205 is used the contacts 171 and 172 of the mercury switch 126 are positioned so that they are normally unbridged by the mercury and when the indicator arm 121 moves upward a predetermined distance and the switch 126 is rotated a predetermined distance the contacts 171 and 172 are bridged by the mercury thereby energizing the coil 217. When the coil 217 is energized it forces the core 218 upward which through the medium of the pin 219 swings the arm 214 upward.

To discharge the contents of the chamber 18' of the discharge device 215 an operator swings the lever 212 downward whereupon the gate 207 swings upward and when it is fully open the gate pin 213 passes beyond the hooked portion 216 of the arm 214 which then retains the gate in an open position as indicated by the broken lines until the correct amount of material has been discharged into the hopper 76. Whereupon the coil 217 is energized as previously described and moves the core 218 upward which is turn swings the arm 214 upward thereby moving the hooked portion 216 of the arm out of the path of travel of the gate pin 213 whereupon the gate 207 swings downward to a closed position.

From the foregoing description it will be apparent that I have invented an improved batching apparatus which can be economically manufactured and which is highly efficient in use.

Having thus described my invention, I claim:

1. In a batching apparatus, a hopper, a bin, said bin having a discharge aperture leading to said hopper, a closure for said aperture, a scale device, said hopper being the scale-pan of said scale device, pneumatic means for moving said closure, electro-magnetic means for actuating the moving means of said closure, a scale beam adapted to weigh a desired amount of material delivered from the bin, said bin having an auxiliary discharge aperture spaced from the first discharge aperture, said auxiliary aperture discharging into said hopper, a conveyor disposed in said auxiliary aperture, means operable upon movement of said closure to open position to simultaneously cause movement of the conveyor in the auxiliary aperture associated with the bin to convey material from the bin through said auxiliary discharge aperture into the hopper, means controlled by the movement of the scale beam associated with said bin, caused by the weight of material in said hopper, to actuate said electro-magnetic means to move the closure of said bin to closed position, and other means operated by the scale beam associated with said bin and effective after the closure of said bin is closed and said hopper has received an additional weight of material to stop said conveyor.

2. In a batching apparatus, a hopper, a bin, said bin having a discharge aperture leading to said hopper, a closure for said aperture, a scale device, said hopper being the scale-pan of said scale device, fluid means for moving said closure, a scale beam adapted to weigh a desired amount of material delivered from said bin, said bin having an auxiliary discharge aperture spaced from the first discharge aperture and discharging into said hopper, a conveyor disposed in said auxiliary aperture, means to cause actuation of said fluid means to thereby move the closure to open position and to simultaneously cause movement of the conveyor in the auxiliary aperture to convey material from the bin through both apertures into the hopper, means controlled by the movement of the scale beam associated with said bin caused by the weight of material in said hopper to actuate said moving means to move the closure of said bin to closed position, and other means operated by the scale beam associated with said bin and effective after the closure of said bin is closed and said hopper has received an additional weight of material to stop said conveyor.

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