Dec. 11, 1951 C. I. BOHMER 2,578,170

SHUT OFF GATE FOR THE OPEN END OF TRANSIT MIXERS

Filed March 9, 1951 3 Sheets-Sheet 1

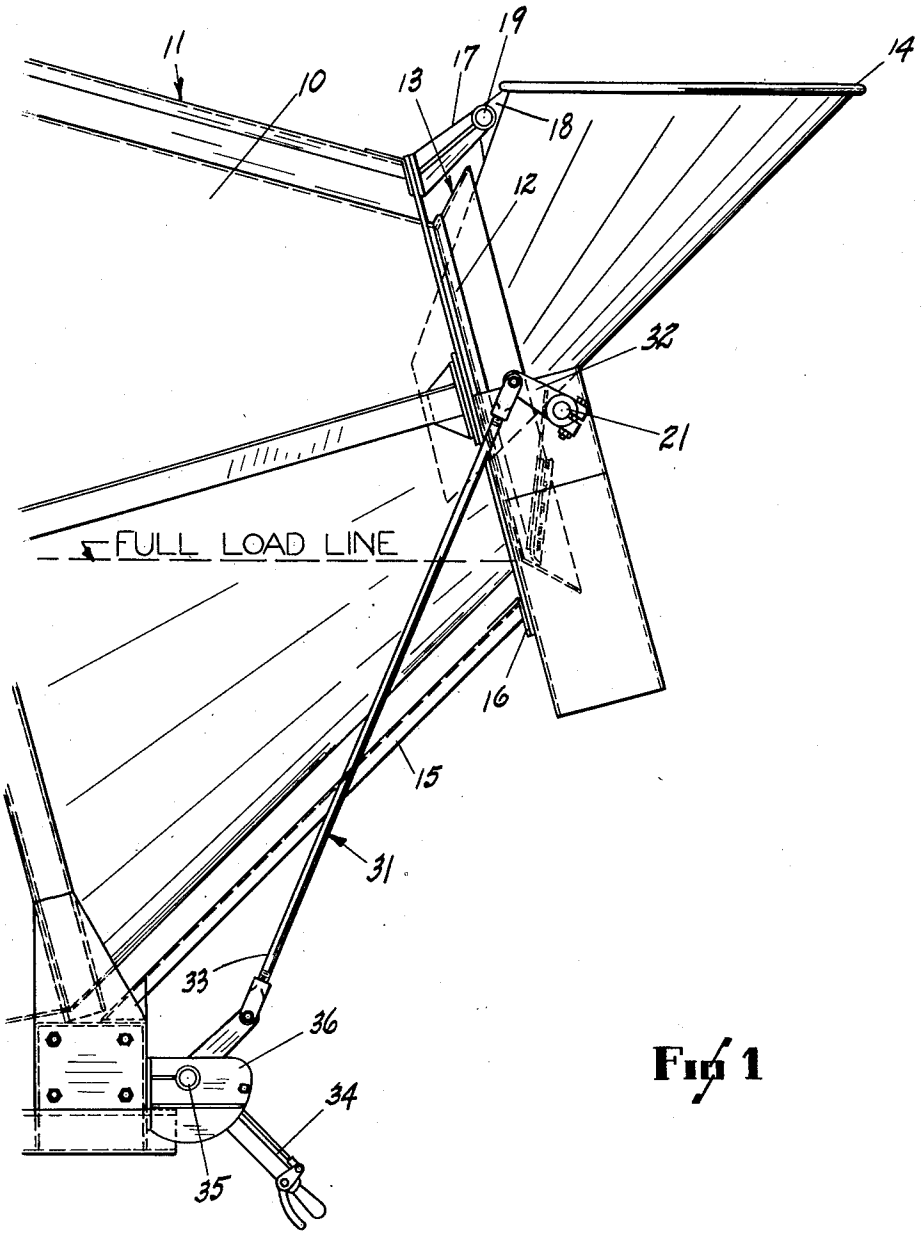


Fig 1

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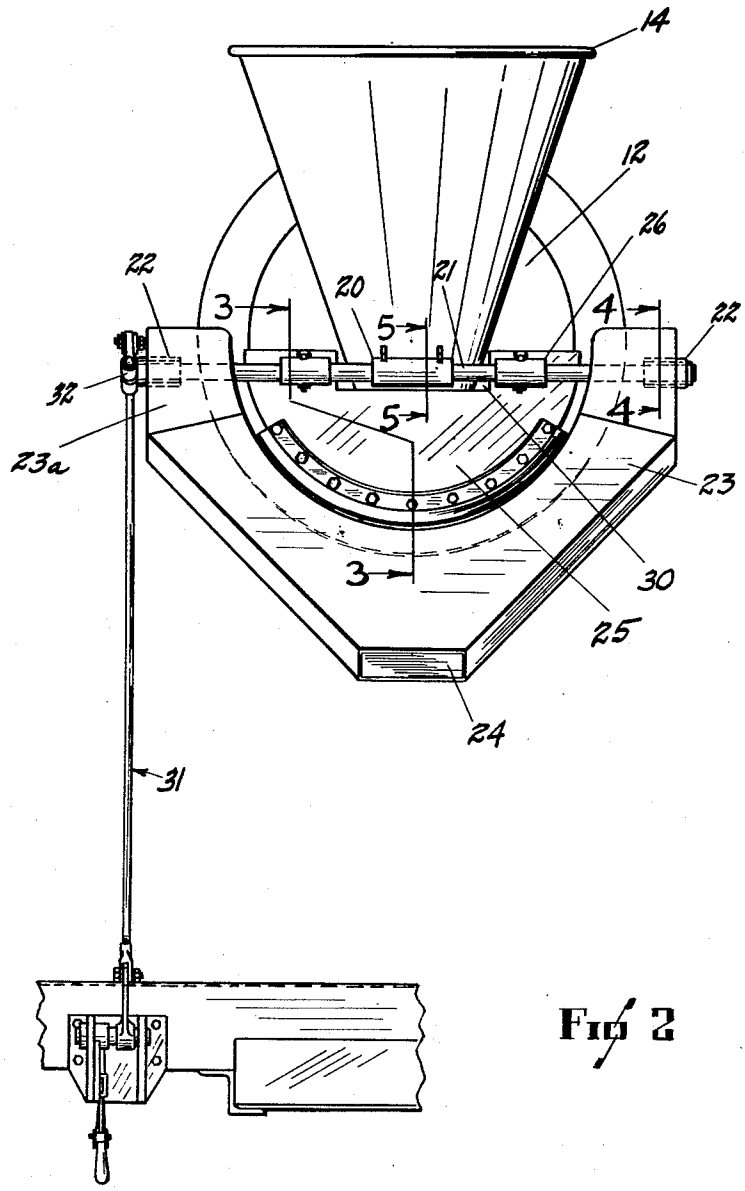


Fig 2

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Filed March 9, 1951 3 Sheets-Sheet 3

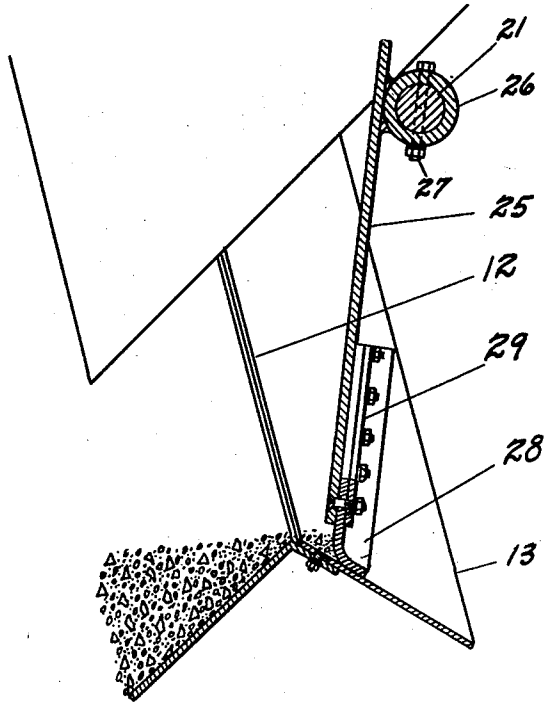


Fig 3

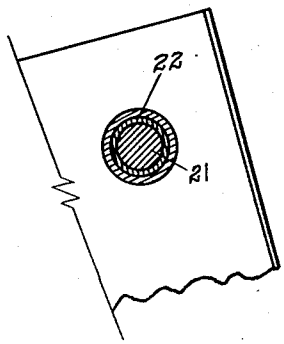


Fig 4

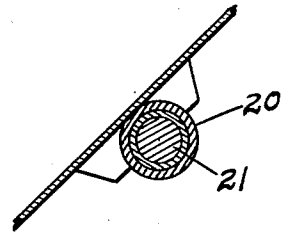


Fig 5

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UNITED STATES PATENT OFFICE

2,578,170

SHUTOFF GATE FOR THE OPEN END OF TRANSIT MIXERS

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Application March 9, 1951, Serial No. 214,665

7 Claims. (Cl. 259—161)

1

My invention relates to a shut-off gate for the open end of a transit mixer. It has to do, more particularly, with a gate which is associated with a charging hopper at the upper open end of an inclined mixing drum of a transit mixer of the high-dump type, the gate serving to prevent spilling out or splashing out of material while the mixer is in transit and while it is being charged.

With truck mixers or agitators using drums with rear open ends, there is a tendency for concrete to leak out the opening when going up grades or when applying brakes quickly. For example, this difficulty is experienced when maneuvering on the job where pulling up steep ramps is frequently necessary. This is especially true where the mixer or agitator is used for hauling large loads, without mixing in transit, with the material practically at the level of the lower edge of the drum opening. With this type of mixer or agitator, there is a tendency for cement and water to spill out of the open end of the drum when charging.

It is the main object of my invention to provide a shut-off gate for the open end of the drum of a mixer or agitator of the transit type which will prevent spilling out or splashing out of material while the mixer or agitator is in transit or while it is being charged.

Another object of my invention is to provide a shut-off gate of the type indicated which will result in increased capacity for the drum.

According to my invention, the shut-off gate is associated with the open end of a drum of a transit mixer or agitator. A hopper is associated with the opening in the drum in fixed position for charging material therethrough in loading the drum. My gate is provided at the lower portion of the opening for preventing surging or spilling of material therethrough. The gate takes the form of a hinged apron which is adapted to block the lower portion of the drum opening while the mixer is in transit and while the drum is being charged by means of the hopper. This apron can be swung out of blocking position to permit discharge of material through the drum opening. It also can be opened to different degrees to control discharge of grout or other material through the drum opening.

The preferred embodiment of my invention is illustrated in the accompanying drawings wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a side elevational view of a structure embodying the features of my invention.

Figure 2 is a rear elevational view of such structure with certain supporting parts omitted for clarity.

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Figure 3 is a section taken substantially along line 3—3 of Figure 2.

Figure 4 is a section taken substantially along line 4—4 of Figure 2.

Figure 5 is a section taken substantially along line 5—5 of Figure 2.

With reference to the drawings, I have illustrated my invention in association with the rear end of a transit mixer or agitator of the high-dump type. This mixer or agitator includes the rotatable drum 10 which is disposed in rearwardly and upwardly inclined position. The device of my invention is carried at the rear or upper end of the drum 10 by means of a frame 11. The drum rotates and the frame 11 remains stationary. The drum is provided with the opening 12 at its rear or upper end through which material may pass. A ring 13 is disposed in surrounding relationship to this opening 12 and is inclined rearwardly away from the axis of the drum.

My device includes the charging hopper 14 (Figure 1) which is supported in a stationary position by means of the frame 11. The frame 11 includes the rearwardly extending struts or supports 15 which carry a supporting ring 16 at their rear ends, this ring surrounding the rear end of the drum directly ahead of the ring 13. The hopper 14 is carried by the ring 16 by means of brackets 17 which are rigidly secured to the ring and which are connected to brackets 18 carried by the hopper by means of a transverse pin 19 which is passed through aligning openings in the brackets 17 and 18. The hopper is so shaped that it extends forwardly and downwardly through the upper portion of the opening 12 in the mixing drum. It is always in position to feed material downwardly and forwardly through the drum opening 12. The rear wall of the hopper is provided adjacent its lower end with a supporting sleeve 20 which may be welded thereto. This sleeve 20 rotatably receives a transverse supporting shaft 21. This shaft 21 has its outer ends rotatably disposed in bearings 22 which are carried on the upper vertical portions 23a of a spout member 23. This member 23 is substantially U-shape in main outline and extends upwardly along the sides of the drum opening 12. It is rigidly secured to the supporting ring 16 of the frame 11. The member 23 is open at its upper edge so that it will receive material discharged through the drum opening 12 and will direct it downwardly and rearwardly through its outlet 24.

As indicated, the hopper 14 occupies, at all times, the upper portion of the drum opening 12. For blocking the lower portion of the opening, I provide a shut-off gate in the form of a metal apron 25 which is shown in detail in Figure 3. As shown in Figures 1 and 2, the apron 25 is supported by the transverse shaft 21 for rocking or vertical swinging movement. As indicated best in Figure 2, this apron 25 is of substantially semi-circular form. It is supported by the shaft 21 by means of sleeve members 26 welded to the rear surface of the apron 25 adjacent its upper edge. These sleeves 26 are fixed to the shaft 21 by means of bolts 27, as shown in Figure 3. At the lower edge of the apron 25, a flexible flange 28 of arcuate form is attached thereto. This flexible flange is attached by means of a semi-circular metal flange member 29 which is bolted to the apron 25, the member 28 being clamped therebetween. This member 28 will extend downwardly sufficiently that when the apron 25 is swung into its forwardmost or opening-blocking position, the member 28 will contact with the drum ring 13 around the opening 12. When the apron 25 is swung into closed position, the flexible sealing member 28 contacts the surface of ring 13 and bends against such surface, as shown in Figure 3. The flange 28 will be in flexible contact with drum ring 13 so as to permit rotation of the drum, if desired. The member 28 may be made of rubber or other suitable wear resistant material. It can be replaced easily when it becomes worn. It will be noted that the upper edge of apron 25 is notched at 30 to permit clearance between it and the forward end of hopper 14.

In order to swing the apron 25 between closed and open positions, I provide a suitable leverage arrangement 31 (Figures 1 and 2) which extends downwardly to a convenient location. This arrangement 31 includes a rocker arm 32 which is clamped on one end of shaft 21. Pivoted to the outer end of this arm 32 is the upper end of an operating rod 33, the lower end of this rod being pivoted to a bell crank lever 34. This lever 34 is pivoted at 35 to a bracket 36 rigidly attached to a portion of the frame. The usual ratchet means may be provided for holding the lever 34 in adjusted position.

It will be apparent that when the apron 25 is swung to its lower and forwardmost position, the lower portion of the opening 12 in the drum is effectively blocked. Thus, spilling or surging out of material from the drum will be substantially prevented because the load line is usually, as indicated in Figure 1, on a level approximating that of the lower edge of the opening 12. The material in the drum will be permitted to surge and splash and will still not spill out through the opening 12 since it will be blocked by the gate. The hopper 14 will always be in the position indicated and the gate apron 25 will be in forward position while the mixer or agitator is in transit so as to prevent loss of material in transit. Also during charging by means of hopper 14, the gate apron 25 is in blocking position, and will prevent spillage of cement or water which might tend to back

up through opening 12. For discharge, the apron 25 can be swung quickly to open position to permit material to be discharged through the drum opening 12. Obviously, the drum 10 can be provided with the usual mixing or agitating and discharging blades. Material discharged through the opening 12 will be received by spout 23 and will be collected thereby and be directed downwardly.

It will be apparent that my shut-off gate is so arranged relative to the open end of the drum as to prevent loss of material from the drum during transit and during charging. Because the gate prevents surging or splashing out of material through the opening, the drum can be filled to a higher level. Thus, the capacity of the drum is increased by my gate arrangement.

Having thus described my invention, what I claim is:

1. In combination with a rotatable mixing drum or the like having an end opening, a charging hopper supported at the end thereof in fixed position with respect to the drum and extending into a portion of the drum opening, and a shut-off gate movably supported adjacent said hopper for substantially closing the remaining portion of said opening.

2. The combination of claim 1 including means for supporting the hopper in fixed position with a portion thereof extending into the upper portion of the opening, and means for supporting the gate directly below the hopper portion for blocking the lower portion of the opening.

3. Structure according to claim 2 wherein the gate is in the form of an apron which is mounted for rocking movement at the opening.

4. Structure according to claim 3 wherein the lower end of the hopper at its outer side carries a transverse supporting shaft, said apron being supported for rocking movement on said shaft.

5. Structure according to claim 4 wherein the apron is of substantially semi-circular form for cooperation with a circular opening in the drum surrounded by a flange, said apron being provided with a flexible flange on its lower edge which will contact with said opening flange.

6. Structure according to claim 5 including a material receiving spout supported at the lower edge of the drum opening.

7. A structure according to claim 6 including means for rocking said apron from a remote point.

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