April 6, 1943. G. A. VISSER 2,316,137

TRUCK MIXER

Filed Sept. 22, 1941 2 Sheets-Sheet 1

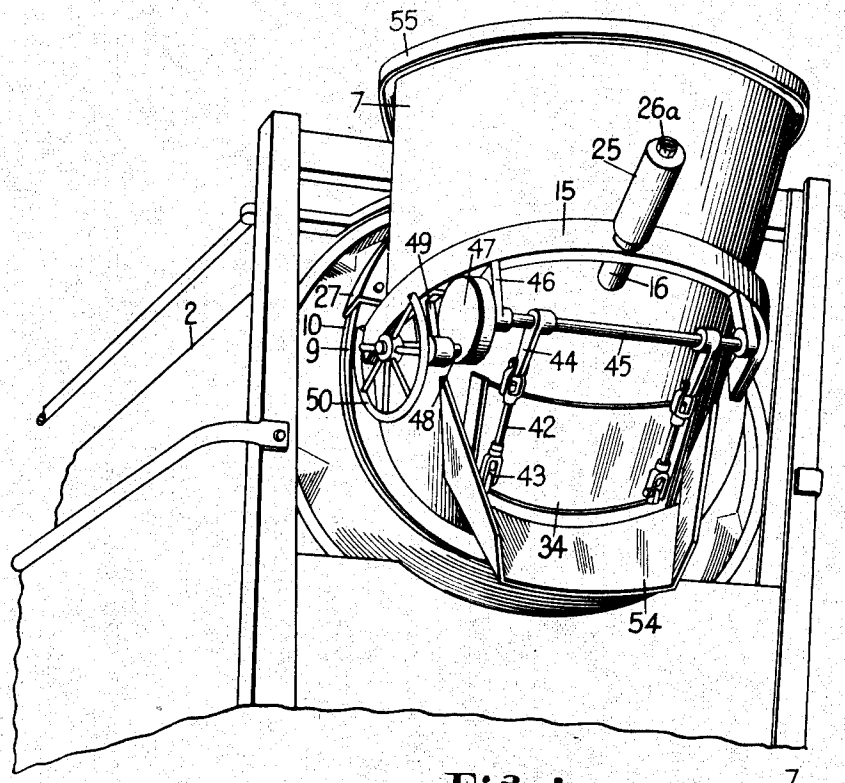


Fig. 1

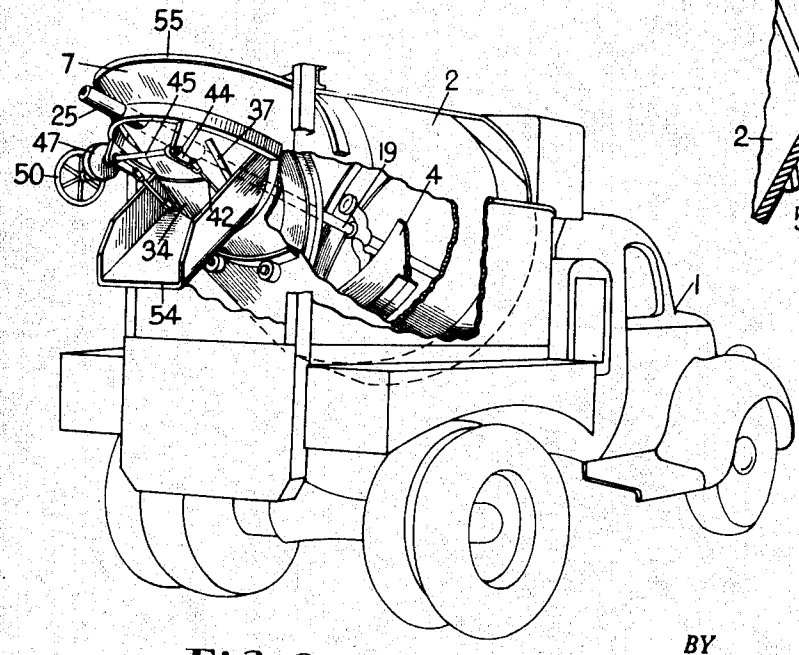


Fig. 2

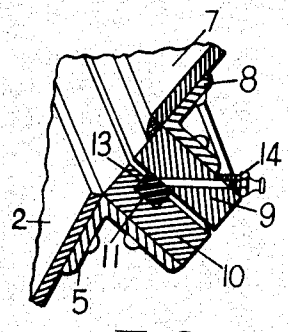


Fig. 3a

INVENTOR.
Gerrit Antoon Visser.

BY

Corbett, Mahoney & Miller

April 6, 1943. G. A. VISSER 2,316,137

TRUCK MIXER

Filed Sept. 22, 1941 2 Sheets-Sheet 2

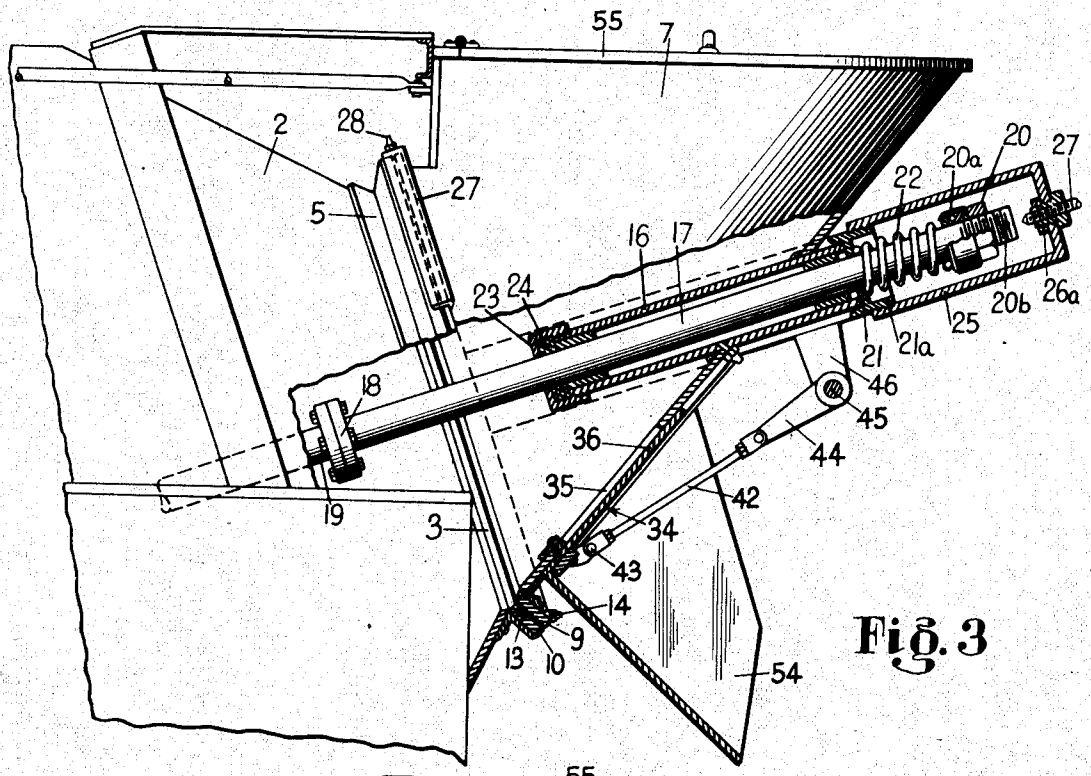


Fig. 3

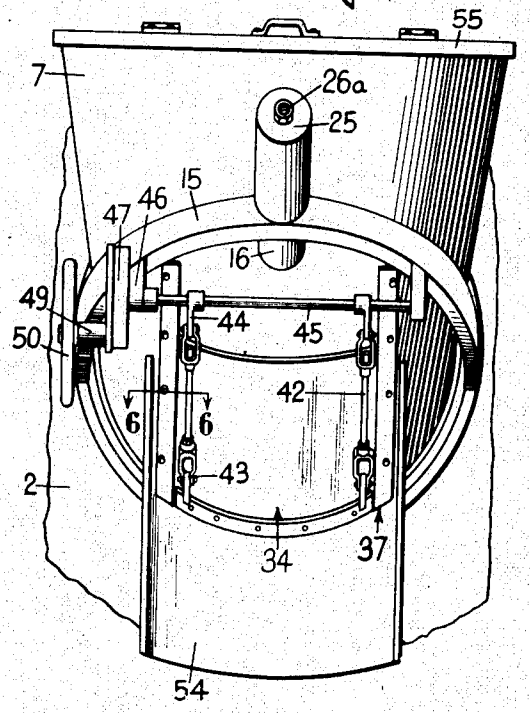


Fig. 4

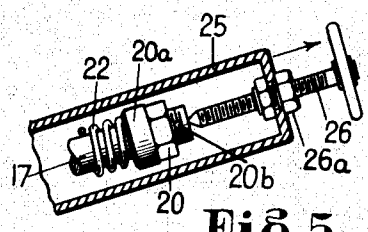


Fig. 5

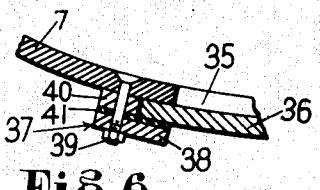


Fig. 6

INVENTOR.
Gerrit Antoon Visser.

BY

Corbett, Mahony & Miller

Patented Apr. 6, 1943

2,316,137

UNITED STATES PATENT OFFICE

2,316,137

TRUCK MIXER

Gerrit Antoon Visser, Columbus, Ohio, assignor to The Jaeger Machine Company, Columbus, Ohio, a corporation of Ohio

Application September 22, 1941, Serial No. 411,806

7 Claims. (Cl. 259—161)

My invention relates to a truck mixer. It has to do, more particularly, with a combination loading and discharge door for a truck mixer.

At the present time, a type of truck mixer is in use which embodies a rotatable mixing drum having an opening in its rear end, the opening being used both for loading the drum and for discharging the materials from the drum. In the prior art, a combination loading and discharge door unit has been associated with this opening. This unit consists of a material-receiving hopper having a disk-like member on its lower end cooperating with a seat around the opening in the drum. In loading the drum, the material is dumped into the upper end of the hopper and passes downwardly therethrough, through an opening in said disk-like member and into the drum. However, in discharging materials from the drum, it is necessary to swing the hopper and the attached disk-like member upwardly away from the opening. This unit is comparatively heavy and, therefore, it is difficult to swing it away from the discharge opening. Furthermore, when it is swung away from the opening and material is discharged from the drum, material will cling to the seat around the opening and then when the disk-like member is swung back into position on the seat, a proper seal will not be obtained. It is important to have a very tight seal at this point to prevent leakage from the drum and this is difficult to obtain with the prior art structure referred to, particularly since the drum rotates relative to said disk-like member. Another disadvantage of this prior art structure is that it is difficult to lock the disk-like member in association with its seat around the discharge opening. Furthermore, the entire unit is supported on the truck mixer frame in such a manner that the disk-like member often is out of alignment with its seat due to distortion of the frame or distortion of the unit itself which may occur when it has been swung into its upper position.

One of the objects of my invention is to provide a combination loading and discharge door for a truck mixer which is of a very simple construction and is very efficient.

Another object of my invention is to provide a combination loading and discharge door for a truck mixer which embodies a material-receiving upper unit that will always be in a fixed position in association with the discharge opening of the mixing drum.

Another object of my invention is to provide a combination loading and discharge door for a truck mixer wherein the material-receiving hopper thereof carries a sealing member which is always associated with a seat around the discharge opening of the rotatable mixing drum so that there will be no danger of material lodging on the seat and, consequently, so that an effective seal will be provided.

Another object of my invention is to provide a combination loading and discharge door unit which is so supported on the truck mixer that it will always be in proper alignment with the discharge opening of the mixing drum.

In its preferred form my invention contemplates the provision of a combination loading and discharge door unit which is associated with the discharge opening in the rear end of a rotatable mixing drum. The door unit consists of a material-receiving hopper which carries an annular seat on its lower end adapted to cooperate with an annular seat around the discharge opening to produce an effective seal. The hopper unit is supported on the mixer in such a manner that the seat carried by it is always resiliently pressed against the seat around the discharge opening. The hopper unit is always maintained in this fixed position. The rear wall of the hopper is provided with a sliding gate which is adapted to be opened when it is desired to discharge material from the mixing drum.

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 perspective view, illustrating a door unit made according to my invention.

Figure 2 is a perspective view, partly broken away, showing my unit in position on a truck mixer.

Figure 3 is a view, partly in side elevation and partly in vertical section, of my unit.

Figure 3*a* is an enlarged vertical sectional view through the sealing seat structure of my unit.

Figure 4 is a rear view of my unit.

Figure 5 is a detail in vertical section of means for pulling the hopper unit away from the drum to permit access to the seat around the discharge opening.

Figure 6 is a transverse sectional view taken substantially along line **6—6** of Figure 4 through the edge of the gate structure and cooperating guide.

With reference to the drawings, I have illustrated my invention applied to a truck mixer **1** having a rotatable mixing drum **2**. This truck mixer is of the high-dump type, the mixing drum **2** being tilted upwardly towards its rear end to

provide a high discharge point. However, my invention is not limited to a truck mixer of the high discharge type. The drum 2 is provided with a circular opening 3 in its rear end. This opening is adapted to serve both as a charging opening and as a discharging opening. The drum 2 is provided with suitably disposed mixing blades 4 of the screw type which terminate adjacent the opening 3. When the drum 2 is rotated in one direction, the blades 4 will serve to draw in material and feed it forwardly into the drum. When the drum is rotated in an opposite direction, the blades 4 will serve to force the material outwardly from the drum through the opening 3. The opening 3, as shown in Figure 3, is provided with a ring 5 which is suitably secured in position around the opening.

I provide a hopper 7 associated with the opening 3. This hopper 7 is adapted to receive material and feed it through the opening 3. The hopper extends from a point above the opening 3 to a point below the opening. The rear and side walls of the hopper are inclined downwardly and inwardly. The front wall of the hopper is at the same inclination as the rear end of the drum 2. The front wall of the hopper is provided with an opening corresponding to the opening 3 and around this opening the hopper carries an annular ring 8. This ring 8 has suitably fastened thereto a seat member 9 of annular form which has a machined surface that bears against a machined surface of a seat member 10, carried on the ring 5 carried by the drum. The member 10 is provided with an annular groove 11 which receives a sealing ring 13 of square cross-section.

The sealing ring 13 may be made of felt, synthetic rubber, cork or any other similar suitable material. It is of such thickness that the surfaces of members 9 and 10 will not contact too firmly even when the sealing ring is compressed in a manner to be described. Thus, the sealing ring serves to produce an effective seal between members 9 and 10. Furthermore, this seal will permit relative rotation of these parts. Spaced circumferentially disposed lubricating fittings 14 are carried by member 9 for forcing grease into the space between the members 9 and 10, and thereby reduce friction between these members.

For supporting the hopper 7 in proper position relative to the opening 3, I provide a yoke member 15. This yoke member straddles the lower portion of the hopper 7. It extends rearwardly and upwardly. Its forward ends may be welded or otherwise secured to the ring 8 carried by the hopper. Midway between its ends, member 15 is provided with an opening in which a bearing sleeve 16 is disposed. This sleeve 16 extends downwardly and forwardly through an opening in the rear wall of hopper 7. It may be welded in position. This bearing sleeve 16 is adapted to receive a rod 17 which extends therethrough. The members 16 and 17 are free to move relative to each other. The rod 17 extends downwardly and forwardly through the hopper 7 and has its rear end rigidly connected, as at 18, to the water pipe 19 which is disposed centrally within the drum 2. Thus, the rod 17 extends through the opening 3 into the interior of the drum and is centrally disposed within the opening. At its outer end the rod 17 has a nut 20 threaded thereon. This nut carries a thrust bearing 20a of a ball bearing type. Sleeve 16 has its outer end welded to member 15 and member 15 is provided with an opening 21 in alignment with the sleeve and through which rod 17 slides. On its outer surface member 15 is provided with a cup 21a around opening 21. Between the bearing 20a and the member 15 a compression spring 22 is disposed. The inner end of this spring 22 is disposed within cup 21a. It will be understood that when the drum 2 rotates, the rod 17 will also rotate. The spring 22 will force the sleeve 16 downwardly on rod 17. Since sleeve 16 is secured rigidly to member 15 and hopper 7, the entire hopper unit will be forced towards the end of the drum. This will cause the sealing ring 13 between members 9 and 10 to be compressed and produce the proper seal. Furthermore, relative rotation of members 9 and 10 will be permitted.

Thus, it will be apparent that the hopper unit is supported by the centrally disposed water pipe 19 in such a manner that a firm but resilient seal will be produced between members 9 and 10. The rod 17 will be free to rotate relative to sleeve 16 and twisting of the spring 22 will be precluded by the thrust bearing 20a. The member 9 carried by the hopper unit will always be in proper alignment with the member 10 carried by the mixing drum.

The lower end of the sleeve 16 has a flanged collar 23 threaded thereon which carries a packing ring 24. The upper end of the rod 17 is enclosed by a suitable housing formed by means of a cylindrical member 25 having an open inner end threaded on cup 21a. The closed outer end of housing 25 is so positioned that it will not contact with the end of rod 17.

It will be apparent that spring 22 will keep members 9 and 10 in proper association and will take up for wear of ring 13. Also, it will be apparent that by adjusting the nut 20 on the threaded end of rod 17, the force exerted by spring 22 may be varied. This will adjust the resilient pressure tending to force members 9 and 10 toward each other. A cotterpin 20b may be provided in the end of rod 17 to prevent nut 20 from being threaded off the rod. In order to separate members 9 and 10 to permit replacement of sealing ring 13, I provide a jack screw 26 threaded through a nut unit 26a secured to the closed outer end of housing 25. By threading this screw inwardly until its inner end contacts with the outer end of rod 17, my entire unit may be pulled outwardly on rod 17 so that members 9 and 10 will be spaced apart. Then ring 13 may be renewed. The outward pull exerted by screw 26 will merely further compress spring 22. When the screw 26 is threaded outwardly spring 22 will return the unit to its original position.

The upper portion of ring 8, carried by hopper 7, carries a segment of a ring 27. This member 27 is in the form of an angle iron having one of its flanges extending over the member 10 and ring 5 carried by the mixing drum. If rod 17 starts to sag for some reason, the flange of member 27 will contact with member 10 and ring 5 and prevent movement of members 9 and 10 out of cooperative relationship. A lubricating fitting 28 may be provided for forcing grease beneath the flange of member 27.

For permitting discharge from the hopper 7, I provide a gate 34. This gate is disposed on the rear wall of the hopper 7 and adjacent the lower end thereof in association with a discharge opening 35 formed therein. The gate 34 comprises a plate 36 which is of metal like the hopper 7 and which is curved transversely the same as the hopper 7. This plate 36 has its edges disposed in vertical guides 37. The structure of the guides 37 is illustrated best in Figure 6. Each of the

guides 37 comprises an outer strip 38 of metal which overlaps the plate 36. This strip 38 is secured by means of bolts 39 to the wall of the hopper 7. A spacer 40, preferably of metal, is provided between the member 38 and the hopper wall. Furthermore, a thin portion 41 of rubber is provided on the inside of member 38 to prevent direct contact of members 36 and 38. It will be apparent that a rubber surface is provided adjacent the edge and at the outer surface of plate 36. Since concrete or other mixed material will not adhere to this surface as easily as to the metal surfaces, vertical sliding movement of the plate 36 will be facilitated.

For moving the plate 36 vertically, I provide a pair of links 42, each of which has its lower end pivotally connected, as at 43, to the plate 36. The upper end of each link 42 is pivotally connected to the inner end of a crank arm 44, which has its outer end keyed on a transversely extending shaft 45. The shaft 45 is rotatably carried by a pair of bearing brackets 46 disposed adjacent the crank arms 44 and formed as a part of yoke 15. The shaft 45 has one end extending into a gear housing 47 carried by member 15. This gear housing has a stub shaft 48 extending therefrom which is supported by bracket 49 carried by member 15. A hand wheel 50 is keyed on the outer end of shaft 48 by means of which it may be rotated. When the hand wheel 50 is rotated, it will be apparent that the plate 36 will be moved vertically relative to opening 35.

Secured to the rear wall of the hopper 7 in association with opening 35 and gate 34, I provide a discharge spout 54. This spout 54 extends downwardly and rearwardly. Material discharged through opening 35 will pass into this spout.

The top of the hopper 7 is enclosed by means of a lid 55. This lid may have its rear edge hinged to the truck mixer 1. This lid will prevent rain from entering the hopper 7.

In the use of my combination loading and discharge door unit, the unit is mounted on the mixer in the manner indicated in the drawings and will always be held thereon in a fixed position relative to the opening 3 in the end of the mixer. To charge material into the drum 2, it is merely necessary to allow the material to flow into the hopper 7 which will direct it inwardly into the drum 2. The drum 2 will be rotating in the proper direction so that the blades 4 will tend to pull the material into the drum. It will be understood that at this time the gate 34 will be closed. When it is desired to discharge material from the drum, the direction of rotation of the drum is reversed and the blades 4 will force the material out through opening 3 into the hopper 7. The gate 34 will be opened, allowing the material to pass downwardly through the opening 35 into the spout 54.

It will be apparent from the above description that I have provided a combination loading and discharge door structure which is of very simple construction and is very efficient. The material-receiving unit is always in a fixed position relative to the discharge opening of the mixing drum. Thus, the cooperating sealing surfaces carried by the rotating drum and said unit will always be in proper association and there will be no danger of material lodging on such surfaces. Consequently, an effective seal will always be provided. Furthermore, the loading and discharge door unit is so supported on the truck mixer that the sealing surfaces referred to above will always be in proper alignment.

Various other advantages will be apparent from the preceding description, the drawings and the following claims.

Having thus described my invention, what I claim is:

1. In combination with a rotatable mixing drum having an opening at the end thereof and being provided with screw blades for selectively drawing material into the drum through said opening or for forcing material from the drum through said opening, a centrally disposed support provided in said mixing drum, a material receiving hoppper supported in cooperative relationship with said opening, means for connecting the hopper to the drum so that the hopper will always be in position to feed material into the drum through said opening, said means permitting rotation of the drum relative to the hopper, said means including a rod having its forward end connected to said support and also including sealing rings carried by the hopper and the drum adjacent said opening, said hopper being carried on said rod by a sleeve free to slide on said rod, a compression spring surrounding said rod and having one end bearing against the sleeve to force it forwardly on the rod to maintain said sealing rings in resilient contact, and an adjustable stop on said rod with which the other end of the spring contacts, said hopper being provided with a discharge opening in one wall thereof, and a gate for controlling said opening.

2. In combination with a rotatable mixing drum having an opening at the end thereof and being provided with screw blades for selectively drawing material into the drum through said opening or for forcing material from the drum through said opening, a centrally disposed support provided in said mixing drum, a material receiving hopper supported in cooperative relationship with said opening, means for connecting the hopper to the drum so that the hopper will always be in position to feed material into the drum through said opening, said means permitting rotation of the drum relative to the hopper, said means including a rod having its forward end connected to said support and also including sealing rings carried by the hopper and the drum adjacent said opening, said hopper being carried on said rod by a sleeve free to slide on said rod, a compression spring surrounding said rod and having one end bearing against the sleeve to force it forwardly on the rod to maintain said sealing rings in resilient contact, an adjustable stop on said rod with which the other end of the spring contacts, one of said rings having a removable compressible sealing member carried thereby, means for pulling the hopper outwardly to permit replacement of said sealing member, said means comprising a support carried by the hopper adjacent the outer end of said rod but mounted independently thereof, a screw carried by said support for engaging the outer end of said hopper, said hopper being provided with a discharge opening in one wall thereof, and a gate for controlling said opening.

3. A structure according to claim 1 wherein a compressible sealing member is associated with the cooperating sealing rings.

4. A structure according to claim 1 wherein one of said sealing rings has a groove which receives a replaceable compressible sealing member.

5. A structure according to claim 1 including a member carried by the upper portion of the

sealing ring carried by the hopper and overlapping the sealing ring carried by the drum for preventing downward displacement of the hopper-carried sealing ring relative to the drum-carried sealing ring.

6. In combination with a mixer having a frame carrying a rotatable mixing drum having an opening at the end thereof and being provided with screw blades for drawing materials into the drum through said opening during rotation of the drum in one direction and for forcing materials from the drum through said opening during rotation of the drum in the opposite direction, a centrally disposed support carried by said mixing drum and projecting outwardly through said opening, a material-receiving hopper supported by said centrally disposed support independently of said frame in cooperative relationship with said opening for feeding material thereinto, said drum and said hopper being provided with cooperating sealing surfaces, resilient means associated with said support for bodily pressing said hopper forwardly on said support to maintain said sealing surfaces in cooperative relationship during charging and discharging rotation of the drum, said hopper being provided with a discharge opening in one wall thereof, and a gate for controlling said opening.

7. A structure according to claim 6 wherein said resilient means for pressing said hopper forwardly on said support is adjustable to vary the sealing contact between said sealing surfaces.

GERRIT ANTOON VISSER.