

Aug. 8, 1933.

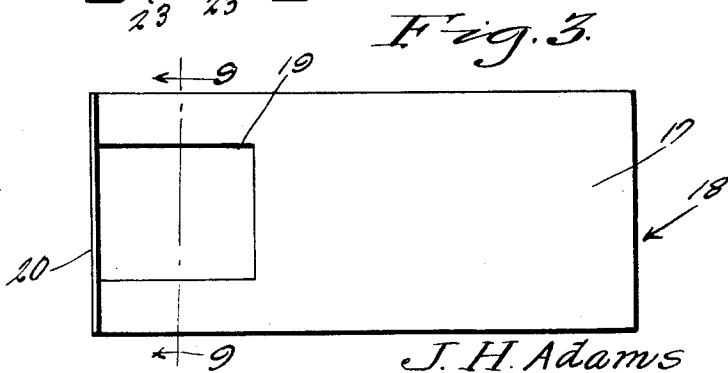
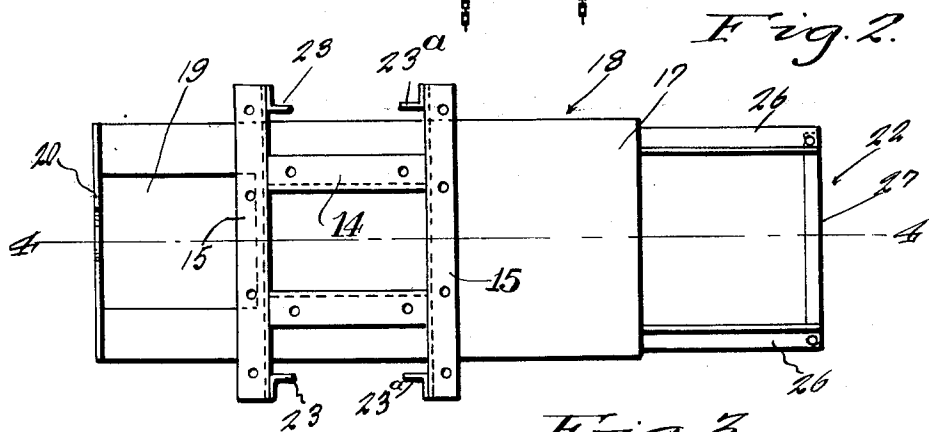
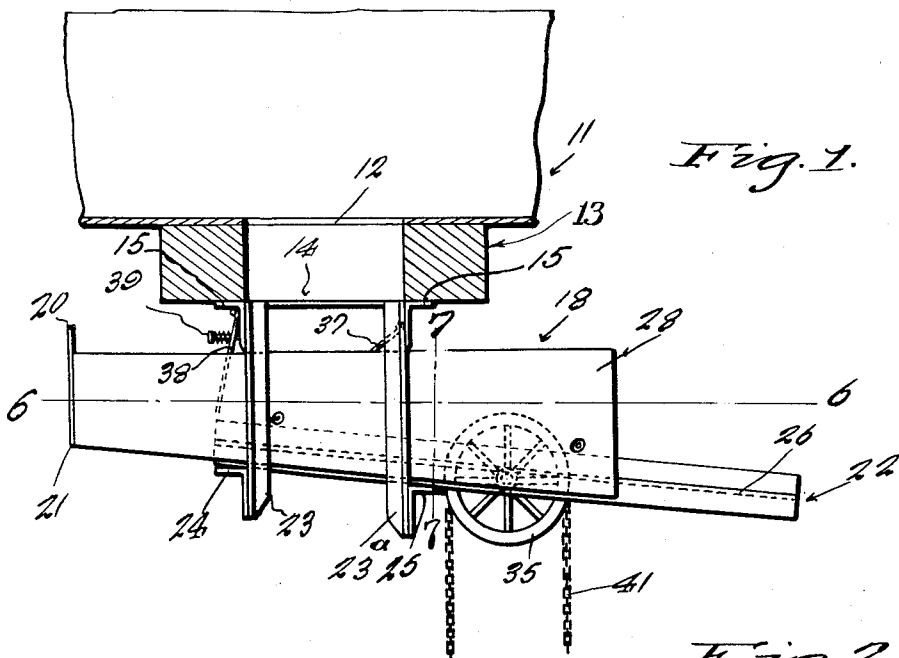
J. H. ADAMS

1,921,062

BIN CLOSURE

Filed Sept. 9, 1931

3 Sheets-Sheet 1



Inventor

J. H. Adams

By Clarence A. O'Brien  
Attorney

Aug. 8, 1933.

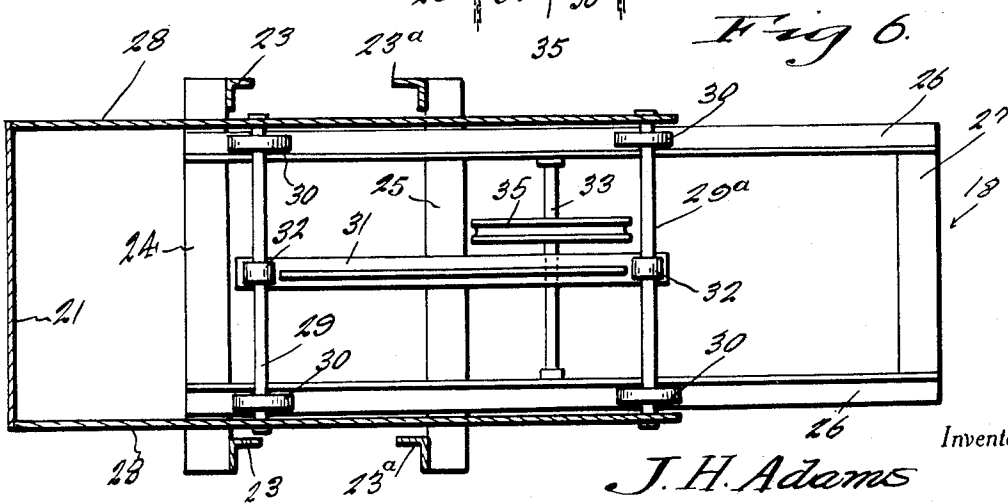
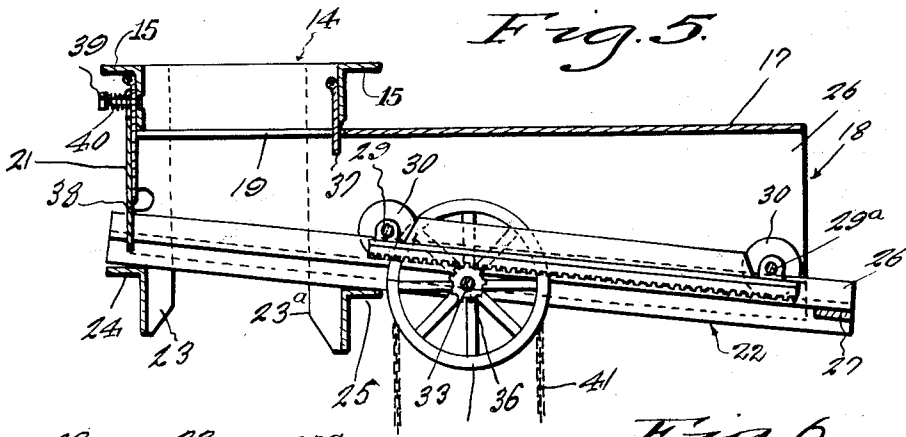
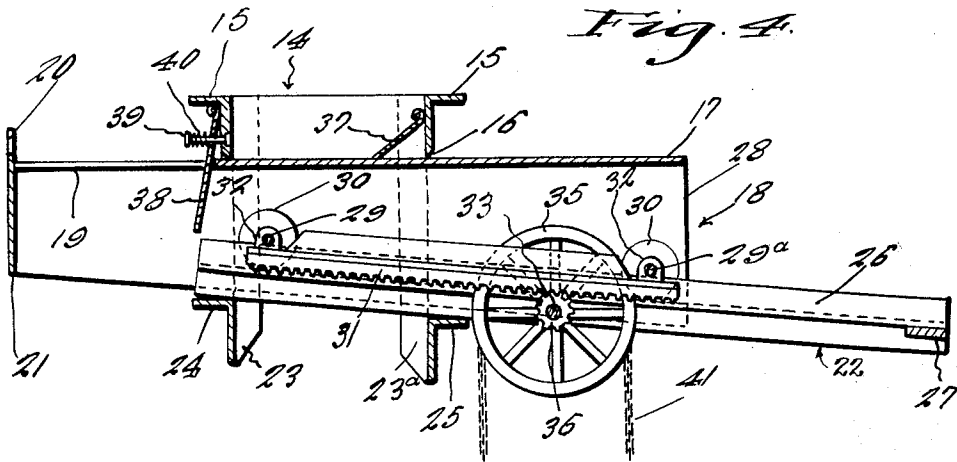
J. H. ADAMS

1,921,062

BIN CLOSURE

Filed Sept. 9, 1931

3 Sheets-Sheet 2



Inventor

J. H. Adams

By *Clarence A. O'Brien*  
Attorney

Aug. 8, 1933.

J. H. ADAMS

1,921,062

BIN CLOSURE

Filed Sept. 9, 1931

3 Sheets-Sheet 3

Fig. 7.

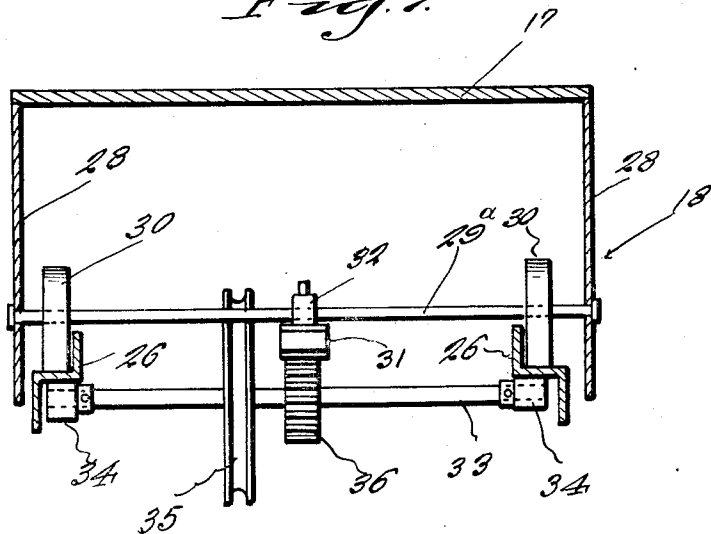


Fig. 8.

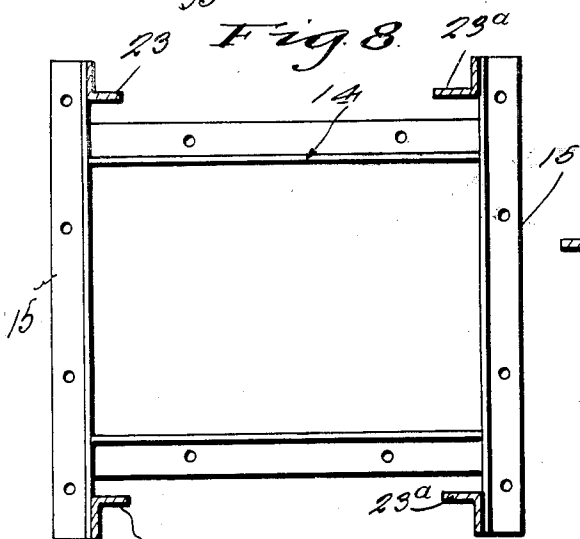


Fig. 10.

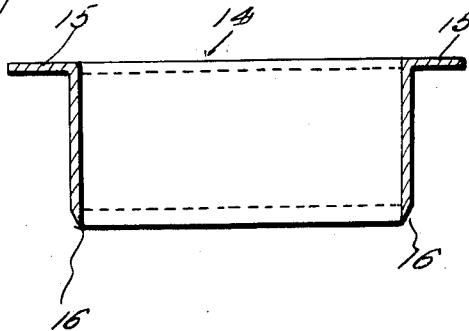
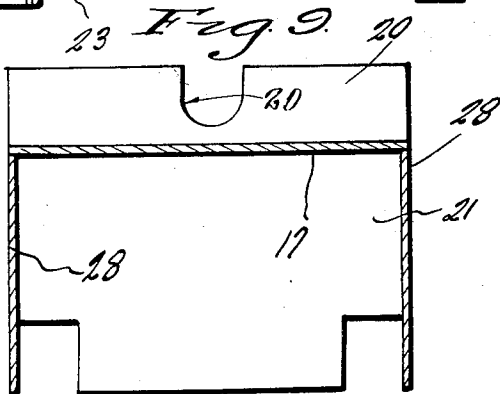


Fig. 9.



Inventor

J. H. Adams

By Clarence A. O'Brien  
Attorney

# UNITED STATES PATENT OFFICE

1,921,062

## BIN CLOSURE

James H. Adams, Circleville, Ohio

Application September 9, 1931. Serial No. 561,975

14 Claims. (Cl. 221—145)

This invention relates to an improved closure for dispensing granular materials particularly sand, from a bin into cars or trucks.

An important object of my invention is to provide a bin closure which when operated closed will positively cut off the flow of material from the bin and prevent leakage of the material from the bin, and which is provided with means to prevent depositing of material from the bin upon any part of the operating parts, whether in closed or open position or in intermediate positions.

Other objects and advantages of my invention will become more readily apparent from the following description and drawings.

In the drawings:

Figure 1 is a sectional view through a bin showing an embodiment of the invention in side elevation.

Figure 2 is a top plan view of the embodiment removed from the bin.

Figure 3 is a top plan view of the slidable member.

Figure 4 is a vertical longitudinal sectional view taken on the line 4—4 of Figure 2, showing the slidable member in closed position.

Figure 5 is a view similar to Figure 4 showing the slidable member in open position.

Figure 6 is a horizontal sectional view taken on the line 6—6 of Figure 1 looking downwardly.

Figure 7 is a transverse vertical sectional view taken on the line 7—7 of Figure 1, looking toward the right.

Figure 8 is a horizontal sectional view through the closure support means.

Figure 9 is a transverse vertical sectional view taken on the line 9—9 of Figure 3 looking in the direction of the arrows.

Figure 10 is a transverse vertical sectional view through the chute.

In the drawings a bin is designated by the numeral 11 which is formed in its bottom with a discharge opening 12 below which and secured to the bottom of the bin is a block 13 to which the chute 14 (see Figure 10) is attached. The chute is provided on its upper end with an attaching flange 15. The lower edges of the chute are inwardly beveled as indicated at 16 to provide for a shearing, non-leaking engagement of the plate 17 of the slidable member 18, with the chute 14 when in closed position. The slidable member 18 is channel-shaped in cross section comprising the plate 17 and the depending sides 28. Near one end of the plate

17 is a material passing opening 19 to be registered with the chute when the slidable member is in the open position. The same end of the slidable member is closed by a wall 21 which has an upstanding flange 20 for engaging a portion of the exterior of the chute when the slidable member is in the open position illustrated in Figure 5. An opening 20a in the upstanding flange 20 is provided for clearing the bolt and spring 39, 40 to be described.

A suitable hanger is provided for suspending the inclined track structure 22 on which the slidable member 18 is operable. The hanger embodies pairs of vertical depending angle irons 23 and 23a which are connected at their lower ends by horizontal transverse angle irons 24 and 25, respectively. The angle iron 24 is disposed at a slightly higher elevation than the angle iron 25 as shown in Figure 1. The track structure 22 rests upon the angle irons 24, 25 between the vertical angle irons 23, 23, and 23a, and embodies a pair of spaced parallel inclined rails 26 and connected together at their ends by suitable cross bars 27.

Because of the inclined position of the rails 26 with respect to the horizontal, the depending sides 28 of the slidable member 18 are formed tapered as illustrated in Figure 1 so as to adequately enclose the rails and mechanism within the slidable member so that the action of the slidable member will not be impaired by accumulations therein of material from the bin. The sides 28 of the slidable member carry therebetween longitudinally spaced transversely disposed axles 29 and 29a having rollers 30 which ride on the tracks 26. As seen in Figure 6, the numeral 31 designates a centralized rack bar whose end portions are carried by bearings 32 connected to intermediate portions of the axles 29 and 29a.

The numeral 33 designates a shaft journaled in bearings 34 secured to the underside of the tracks 26 as seen in Figure 7, and having secured thereon a grooved pulley 35, and to one side of the pulley 35 a pinion 36. The pinion is meshed with the teeth of the rack bar 31.

As shown in Figure 4, there is hingedly mounted at one side within the chute 14 a gravity operated guard adapted to be moved to the position shown in Figure 4 when the slidable member 18 is closed. The guard 37 drops into the opening 19 in the slidable member to the position shown in Figure 5 when the slidable member is in the open position and acts to prevent material discharging from the bin from falling into

the interior of the slidable member 18 and accumulating therein and impairing the efficient operation thereof. The numeral 38 designates a similar guard member which is constantly positioned in the opening 19 and acts to properly guide material discharging from the bin while the slidable member is moving towards or away from closed position. This guard member 38 is hingedly mounted on the outside of the chute and has an aperture accommodating a headed pin 39 fixed to the chute and carrying a retention coiled spring 40 which tends to push the guard member against the side of the chute and yieldingly resist displacement of the guard member by the edge of the opening 19 as the slidable member 18 moves into closed position.

A chain 41 is provided for operating the pulley 35 so as to rotate the shaft 33 and the pinion 36 for reciprating the slidable member 18 into and out of closed position.

It is thought that the description taken in connection with the drawings will enable a clear understanding of the invention to be had. Therefore, a more lengthy description is thought unnecessary. While the preferred embodiment of the invention has been shown and described, it is to be understood that minor changes coming within the field of invention claimed may be resorted to if desired.

I claim:

1. In a structure of the class described, in combination, a bin having a discharge opening, a valve seating chute in registry with said opening, supporting and guiding means suspended from the bin below the chute, a valve carried by said means in a position to have a horizontally reciprocating action into and out of closing relationship with the chute, said valve having a rising movement as it approaches closing relationship with the chute to produce a wedge-action closing relationship between the valve and chute, together with remote control operating means for the valve.

2. In a structure of the class described, a chute adapted for attachment to a material containing and discharging bin, a pair of spaced parallel angular tracks suspended beneath said chute and occupying a slightly downwardly inclined position, a closure comprising a valve plate having an aperture co-operable with said chute, and having a pair of depending side flanges partly embracing the track, axles mounted between said flanges, wheels on said axles co-operable with the track, a shaft journalled across said track, a pinion carried by said shaft, a pulley carried by said shaft, a chain for operating said pulley, a longitudinal rack bar attached to said axles and in mesh connection with the pinion.

3. In a structure of the class described, a chute adapted for attachment to a material containing and discharging bin, a pair of spaced parallel inclined tracks suspended beneath said chute, a closure for the chute comprising a valve plate having an opening co-operable with said chute, a pair of depending side flanges on the plate and disposed to partly enclose the tracks, axles mounted between said flanges, wheels on said axles co-operable with the tracks, a shaft journalled between said tracks, a pinion carried by said shaft, a pulley carried by said shaft, a chain for operating said pulley, a longitudinal rack bar attached to said axles and meshed with said pinion, together with a pair of downwardly swingable hingedly mounted

guard plates carried by said chute and adapted to depend into the opening in the valve plate for confining material passing from the chute to the opening in the valve plate and preventing depositing of material from the chute onto the tracks, shafts, pinion and rack bar.

4. A closure for a bin comprising a block surrounding the discharge opening of the bin, a chute depending from the block, a frame depending from the block about the chute and below the chute, a pair of inclined tracks carried by the frame, a longitudinally tapered valve member disposed between the chute and the tracks, friction reducing means carried by the valve member for supporting it for movement upon the tracks, a rack secured to the valve member, rack shifting means carried by the tracks, and means for operating the shifting means to reciprocate the valve horizontally and upwardly in a wedging action into chute closing relationship, and horizontally and downwardly out of chute closing relationship.

5. A closure for a bin comprising a block surrounding the discharge opening of the bin, a chute depending from the block, a frame depending from the block about the chute and below the chute, a pair of inclined tracks carried by the frame, a longitudinally tapered valve member disposed between the chute and the tracks, friction reducing means carried by the valve member for supporting it for movement upon the tracks, a rack secured to the valve member, rack shifting means carried by the tracks, and means for operating the shifting means to reciprocate the valve horizontally and upwardly in a wedging action into chute closing relationship, and horizontally and downwardly out of chute closing relationship, said valve member comprising a plate having depending tapered longitudinal sides which are adapted to protectively overhang the tracks and the shifting and operating means to prevent deposit thereon of material from the chute.

6. A closure for a bin comprising a block surrounding the discharge opening of the bin, a chute depending from the block, a frame depending from the block about the chute and below the chute, a pair of inclined tracks carried by the frame, a longitudinally tapered valve member disposed between the chute and the tracks, friction reducing means carried by the valve member for supporting it for movement upon the tracks, a rack secured to the valve member, rack shifting means carried by the tracks, and means for operating the shifting means to reciprocate the valve horizontally and upwardly in a wedging action into chute closing relationship, and horizontally and downwardly out of chute closing relationship, said valve member comprising a plate having depending tapered longitudinal sides which are adapted to protectively overhang the tracks and the shifting and operating means to prevent deposit thereon of material from the chute, said plate being provided with an opening which is registered with the chute when the valve member is in the chute opening relationship.

7. A closure for a bin comprising a block surrounding the discharge opening of the bin, a chute depending from the block, a frame depending from the block about the chute and below the chute, a pair of inclined tracks carried by the frame, a longitudinally tapered valve member disposed between the chute and the tracks, friction reducing means carried by the

valve member for supporting it for movement upon the tracks, a rack secured to the valve member, rack shifting means carried by the tracks, and means for operating the shifting means to reciprocate the valve horizontally and upwardly in a wedging action into chute closing relationship, and horizontally and downwardly out of chute closing relationship, and confining means carried by the chute for cooperation with the opening in the valve member when the valve member is in the chute opening relationship whereby to guide and confine to said opening material passing from the chute and prevent deposit thereof onto the tracks, shifting means, and operating means.

8. A closure for a bin having a discharge chute, comprising a frame supported around the chute depending below the chute, inclined tracks carried by the frame, a valve member movably supported by the tracks between the tracks and the chute, said valve member being provided with a discharge opening to be registered with the chute for discharging material from the bin in the open position of the valve member, shifting means cooperating between the tracks and the valve member for moving the valve member up the inclined tracks into closing relationship with the chute in a wedging action, and means carried by the tracks for operating the shifting means.

9. In a structure of the class described, a bin having a discharge opening, a chute registered with the opening having knife edges at its discharge end, supporting means carried by the bin outward of the discharge end of the chute, a valve carried by the supporting means in a position to have transverse reciprocating action into and out of closing relation with the chute and into engagement with the knife edges on its discharge end, said valve having a movement toward the knife edges as it approaches closing relation with the chute to produce a shearing action between the valve and the knife edges of the chute and seal the chute against leakage of material therein, and remote control means for operating the valve.

10. In a structure of the class described, a bin having a discharge opening, a chute registered with the opening and provided on its lower end with knife edges, support means on the bin, a horizontally reciprocable valve carried by the support means below the knife edges, said valve having also a rising action as it comes into closing relation with the lower end of the chute so as to engage the knife edges in a shearing, wedging relation so as to close the lower end of the chute against leakage.

11. In a structure of the class described, a bin having a discharge opening, a chute registered with the opening, support means, a horizontally reciprocable valve carried by the support means adapted to be moved into closing relation to the chute, and having a rising action toward the chute as it moves toward closing relation to the chute to cause a wedging tight

closing engagement, said support means comprising inclined track means on which the valve moves, said valve comprising a casing in protective relation to the inclined track means, so as to prevent accumulation on the track means of material from the chute.

12. In a structure of the class described, a bin having a discharge opening, a chute registered with the opening, support means, a horizontally reciprocable valve carried by the support means adapted to be moved into closing relation to the chute, and having a rising action toward the chute as it moves toward closing relation to the chute to cause a wedging tight closing engagement, said support means comprising inclined track means on which the valve moves, said valve comprising a casing in protective relation to the inclined track means, so as to prevent accumulation on the track means of material from the chute, knife edges on the lower end of the chute with which the valve directly engages in a shearing action for positively closing the chute against leakage.

13. In a structure of the class described, a bin having a discharge opening, a chute registered with the opening, a support means, a horizontally reciprocable valve carried by the support means adapted to be moved into closing relation to the chute, and having a rising action toward the chute as it moves toward closing relation to the chute to cause a wedging tight closing engagement, said support means comprising inclined track means on which the valve moves, said valve comprising a casing in protective relation to the inclined track means, so as to prevent accumulation on the track means of material from the chute, knife edges on the lower end of the chute with which the valve directly engages in a shearing action for positively closing the chute against leakage, said knife edges and the portion of the valve engageable therewith being of metal so as to produce a metal-to-metal engagement thereof for positively cutting off flow of material from the chute.

14. In a structure of the class described, a chute for attachment to bin, inclined track means under the chute, a closure for the lower end of the chute, said closure comprising a plate for closing the lower end of the chute, and having an opening therein adapted to be registered with the chute, depending sides on the plate, said plate and sides forming a cover for preventing depositing of material from the chute upon the track means, axles mounted between the sides, wheels on the axles and operable with the track means, a shaft journaled across the track means, a pinion carried by the shaft, a longitudinal rack bar carried by the said axles in mesh with the pinion, the axles, the pinion, and the rack also being protected by the cover, and means for rotating the pinion for operating the closure.

JAMES H. ADAMS.