

May 15, 1956

G. E. DATH

2,745,563

OUTLET FRAME FOR RAILWAY HOPPER CARS

Filed June 23, 1953

5 Sheets-Sheet 1

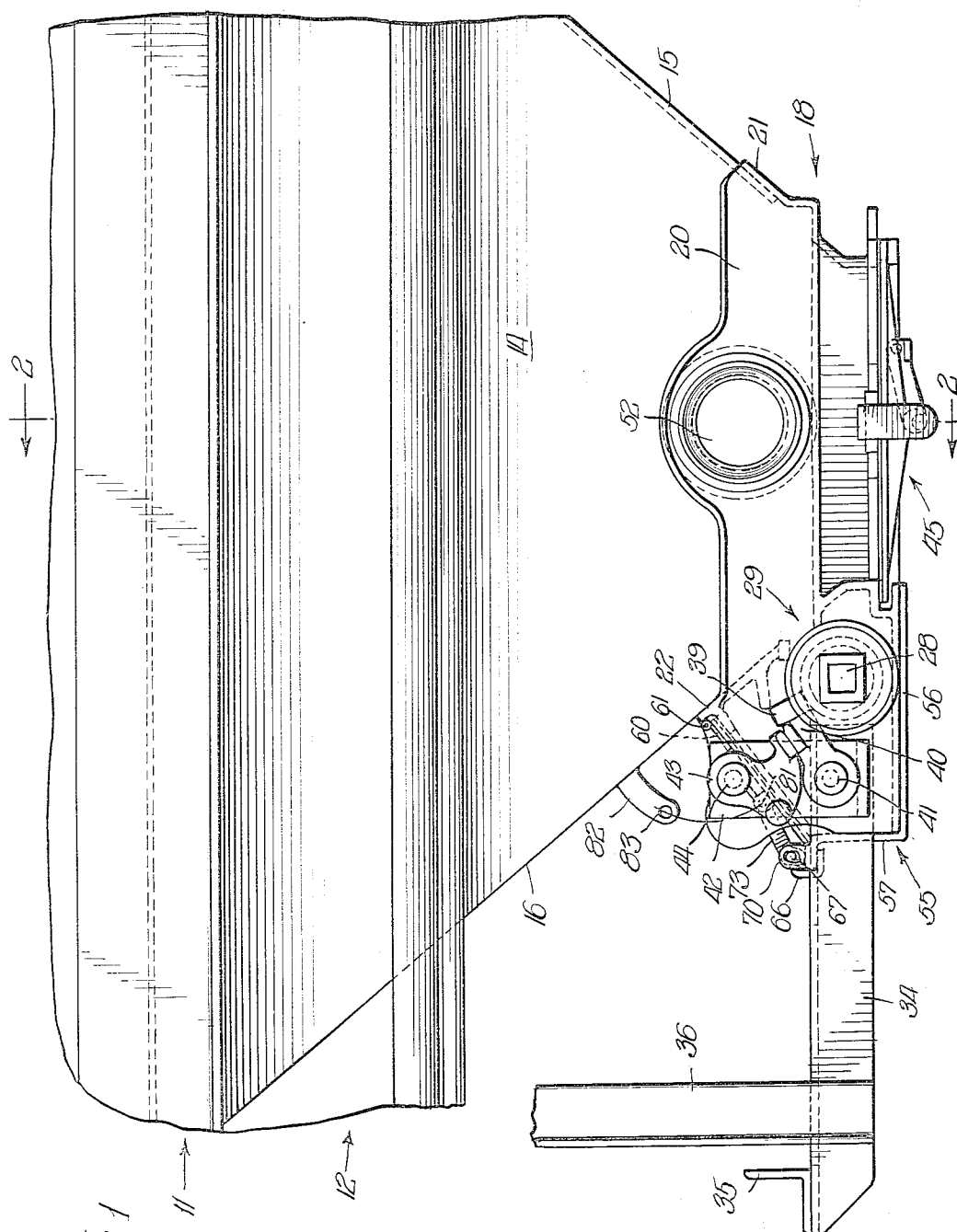


Fig. 1

INVENTOR.

George E. Dath,

BY

Robert H. Lockwood
attg

May 15, 1956

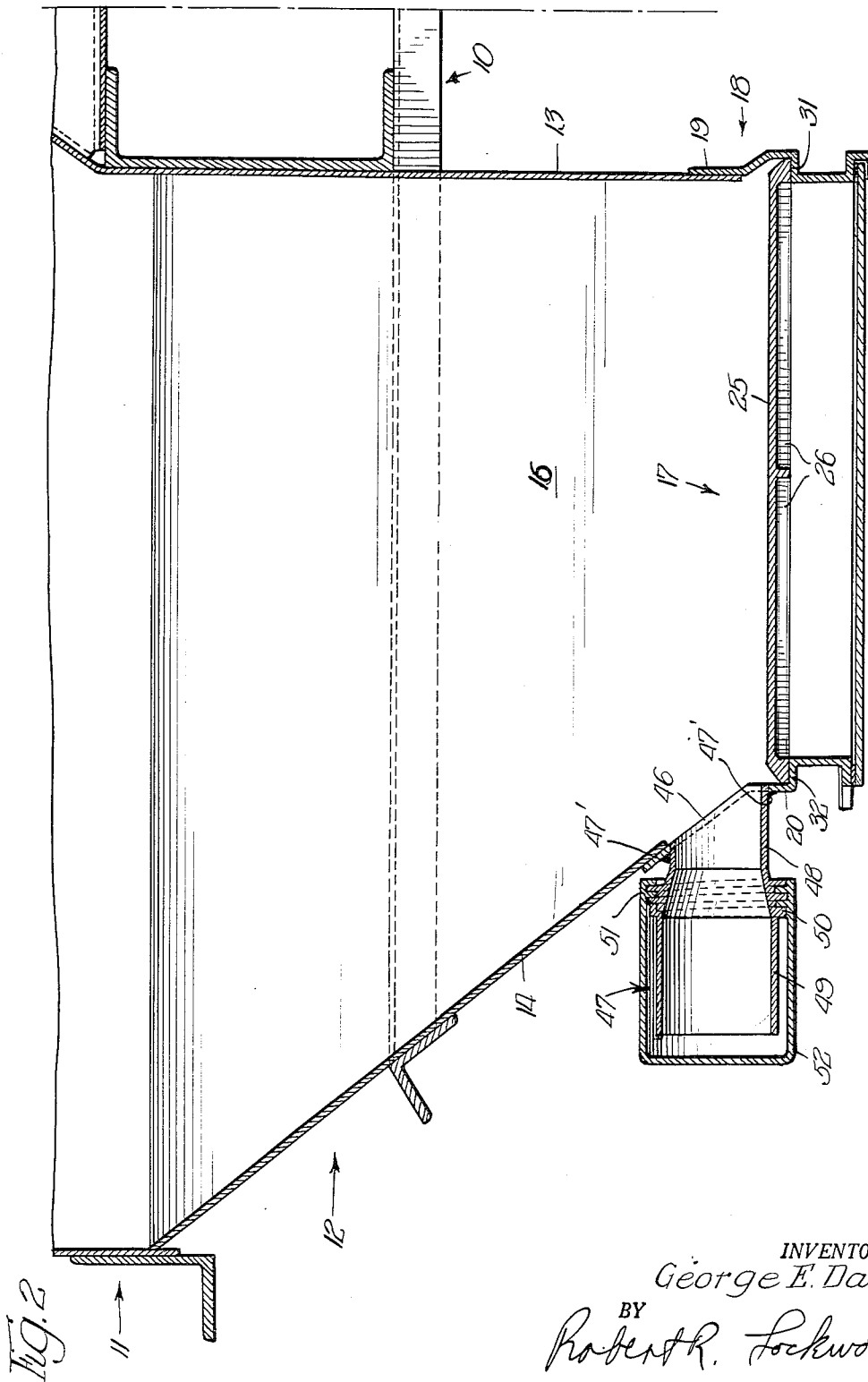
G. E. DATH

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G. E. DATH

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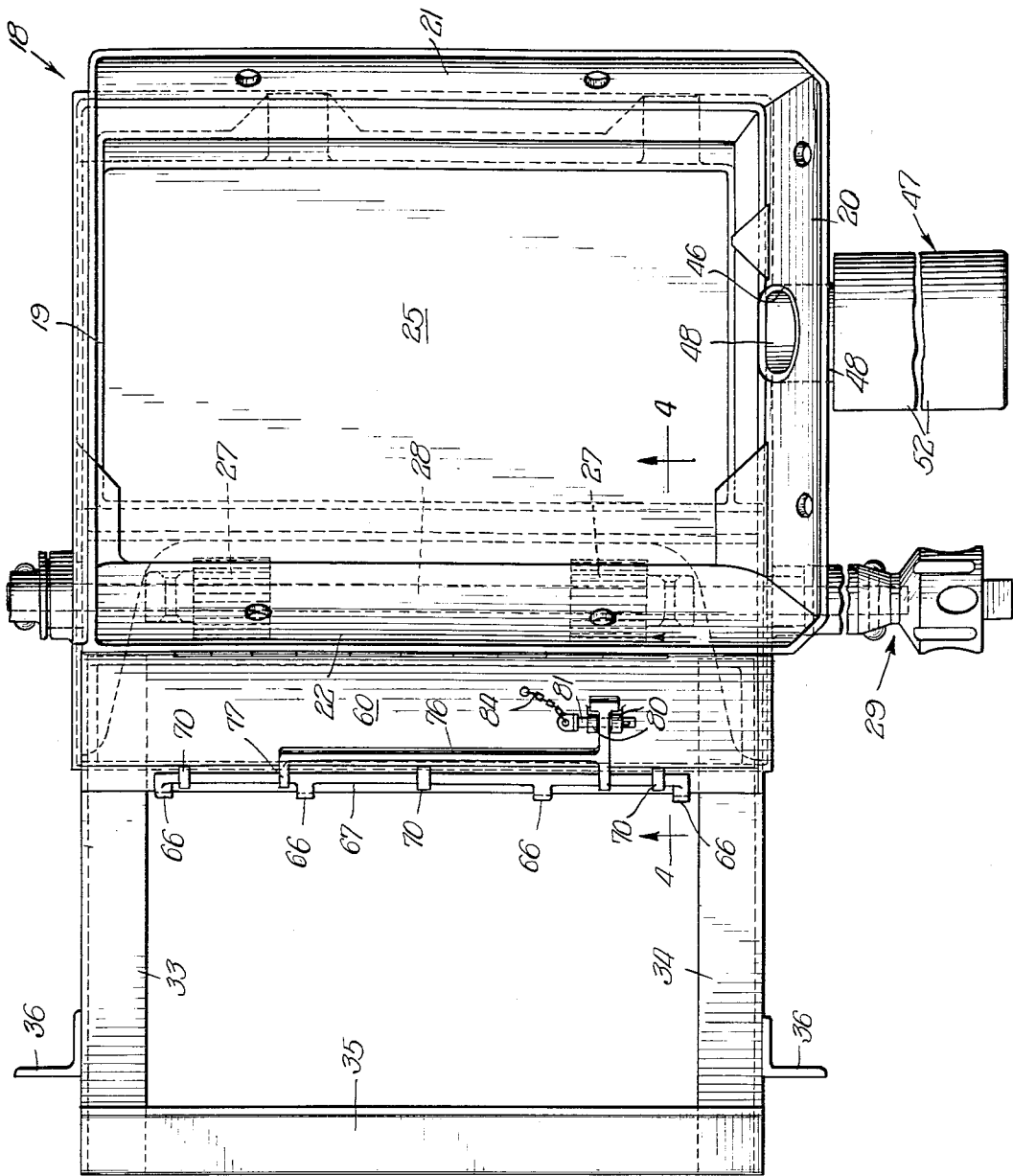


Fig. 3

INVENTOR.
George E. Dath,
BY
Robert H. Lockwood
att'y

May 15, 1956

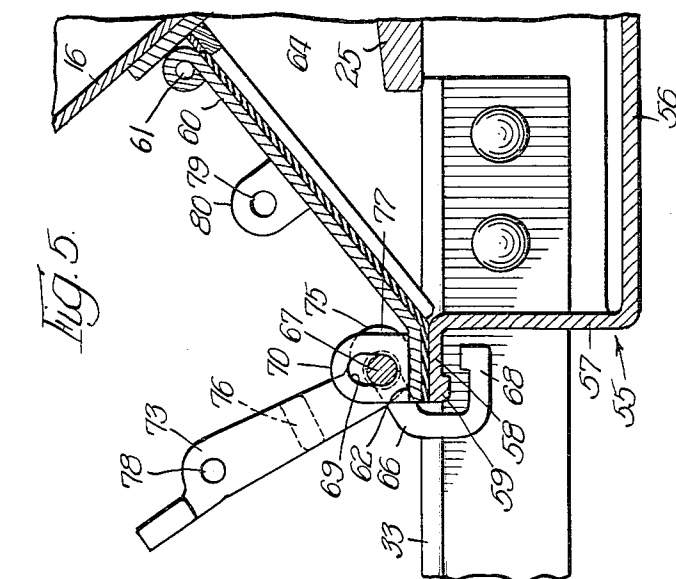
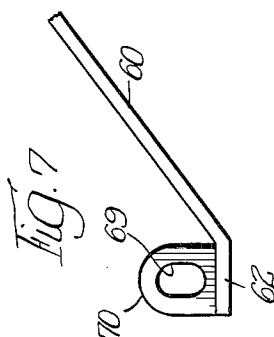
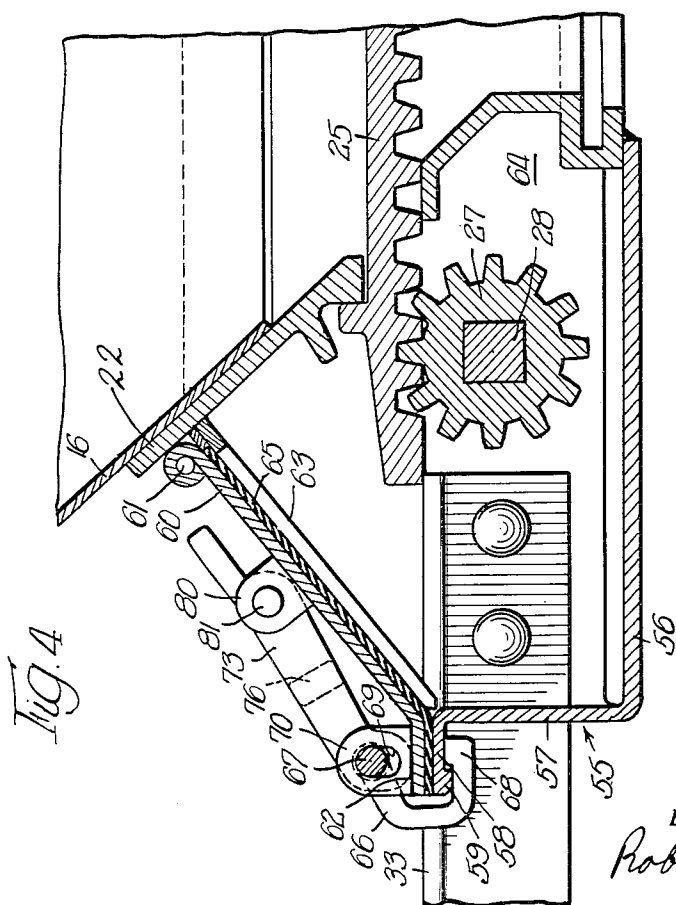
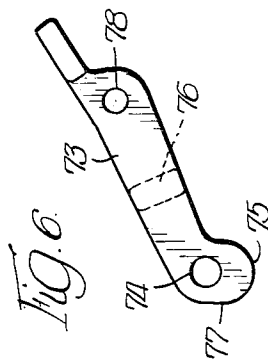
G. E. DATH

2,745,563

OUTLET FRAME FOR RAILWAY HOPPER CARS

Filed June 23, 1953

5 Sheets-Sheet 4



INVENTOR.
George E. Dath,
BY
Robert R. Lockwood
attg.

May 15, 1956

G. E. DATH

2,745,563

OUTLET FRAME FOR RAILWAY HOPPER CARS

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5 Sheets-Sheet 5

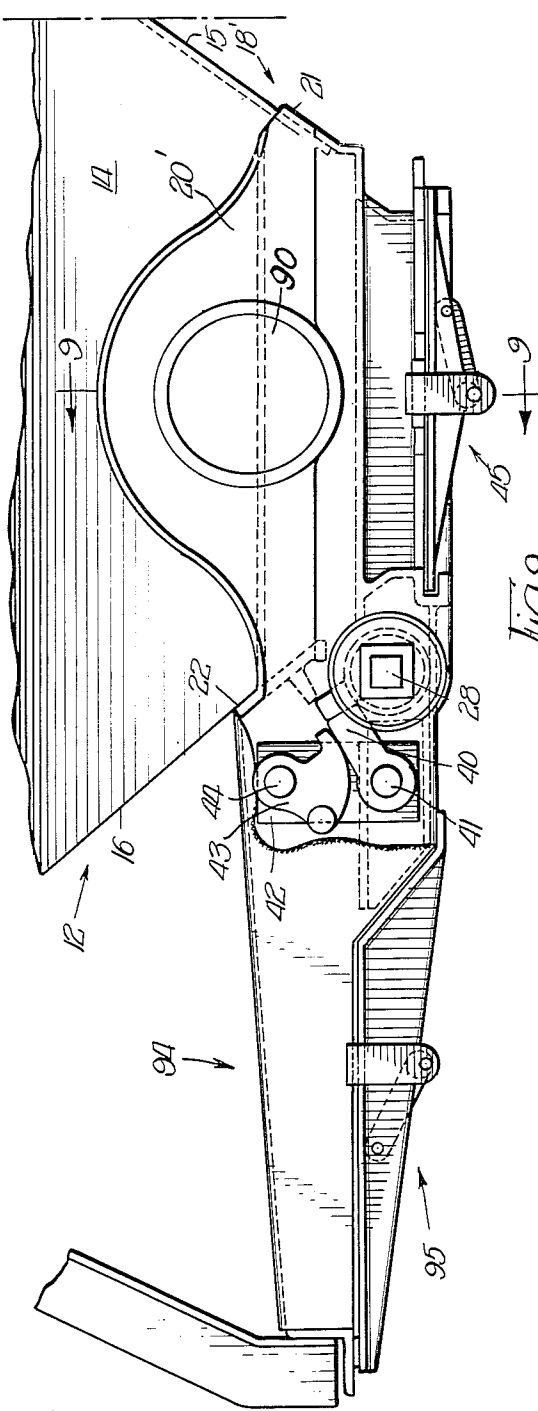


Fig. 8

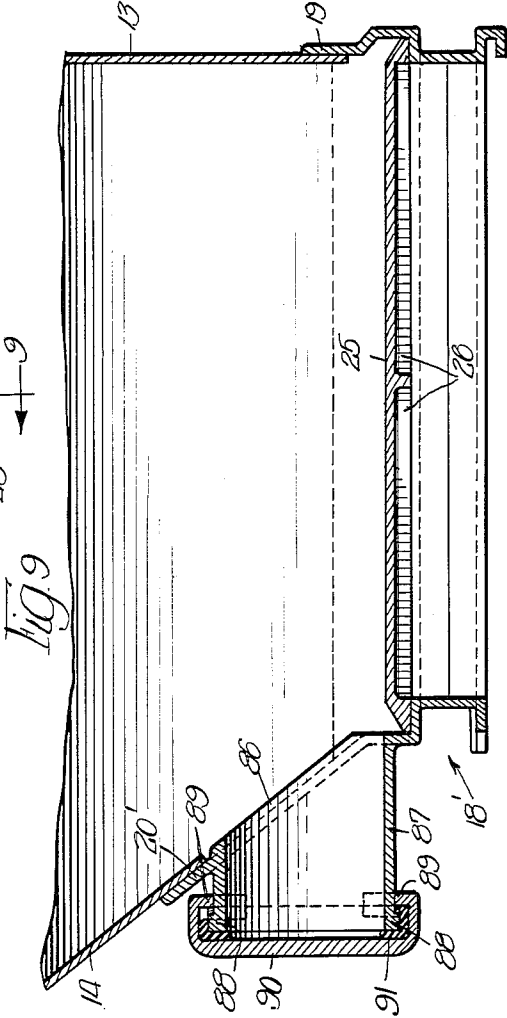


Fig. 9

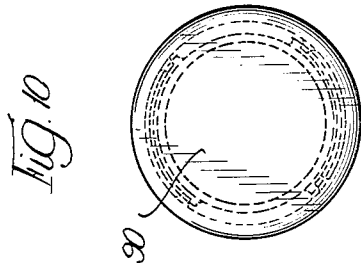


Fig. 10

INVENTOR.
George E. Dath,
BY
Robert R. Lockwood
att'y.

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2,745,563

OUTLET FRAME FOR RAILWAY HOPPER CARS

George E. Dath, Mokena, Ill., assignor to Enterprise Railway Equipment Company, Chicago, Ill., a corporation of Illinois

Application June 23, 1953, Serial No. 363,463

3 Claims. (Cl. 214—83.18)

This invention relates, generally, to the construction of railway hopper cars used for transporting fine lading, such as grain, flour, etc., and it has particular relation to outlet frames therefor.

Among the objects of this invention are: To provide a single frame construction in which the lading can be discharged either through the bottom or through one of the sides; to provide a conduit connection to an opening in a side wall of an outlet frame with the conduit being arranged to be connected to a pneumatic unloading system; to attach the conduit to the frame, as by welding; to form the conduit integrally with a side wall of the frame; to enclose the operating mechanism for a gate slidable on the frame for controlling the discharge of lading through the bottom; to open part of the enclosure for the operating mechanism and to close the same by cam operated means; and to seal the part of the enclosure that can be opened in the closed position.

Other objects of this invention will, in part, be obvious and in part appear hereinafter.

This invention is disclosed in the embodiments thereof shown in the accompanying drawings, and it comprises the features of construction, combination of elements, and arrangement of parts which will be exemplified in the constructions hereinafter set forth, and the scope of the application of which will be indicated in the appended claims.

For a more complete understanding of the nature and scope of this invention, reference can be had to the following detailed description taken together with the accompanying drawings in which:

Figure 1 is a view, in side elevation, of a railway car hopper with which a frame construction is embodied that incorporates the present invention;

Figure 2 is a vertical sectional view taken generally along the line 2—2 of Figure 1;

Figure 3 is a top plan view of the outlet frame and associated parts as shown in Figure 1;

Figure 4 is a detailed sectional view, at an enlarged scale, taken generally along the line 4—4 of Figure 3;

Figure 5 is a view, similar to Figure 4, but showing the cam locking mechanism in the unlocked position;

Figure 6 is a view, in side elevation, of the operating arm that forms a part of the cam mechanism;

Figure 7 is a view, in end elevation, of a portion of the door showing how the ears are mounted along the swinging edge thereof;

Figure 8 is a view, similar to Figure 1, showing an alternate form of side outlet construction;

Figure 9 is a detailed sectional view taken generally along the line 9—9 of Figure 8; and

Figure 10 is a view, in end elevation, of the cover employed in conjunction with the conduit shown in Figure 9.

Referring now particularly to Figures 1, 2, and 3 of the drawings, it will be observed that the reference character 10 designates generally a center sill of a conventional type railway hopper car and that the reference character

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11 designates the side wall thereof. Between the center sill 10 and the side wall 11 there is provided a hopper that is indicated, generally, at 12. It will be understood that more than one hopper is provided between the center sill 10 and each side wall 11. Each hopper 12 includes an inner side wall 13 and an outer side wall 14, the latter sloping inwardly together with end walls 15 and 16 which slope inwardly to define a hopper discharge opening 17 that is surrounded by a frame, shown generally at 18. Preferably the frame 18 is formed of cast iron and it has inner and outer sides 19 and 20 which overlie the hopper side walls 13 and 14 respectively. In addition the frame 18 has end walls 21 and 22 which overlie the end walls 15 and 16, respectively, of the hopper 12.

With a view to closing the hopper discharge opening 17 which is surrounded by the frame 18, the latter is provided with a horizontally slidable gate 25. On the underside of the gate 25 rack teeth 26 are provided which are arranged to be engaged by pinions 27 which are carried by and rotatable with a shaft 28 which extends transversely through the inner and outer sides 19 and 20 of the frame 18 and is rotatably mounted thereon in suitable bearings. An operating head 29 is provided at one end of the shaft 28 for receiving a removable operating bar (not shown) to rotate the shaft 28 and thus move the gate 25 from and to the closed position.

It will be observed that the gate 25 is slidably mounted on horizontally extending runways 31 and 32 which are formed integrally with the sides 19 and 20 of the frame 18. Extensions 33 and 34 in the form of angles serve to prolong the surfaces of the runways 31 and 32 for supporting the gate 25 when it is moved out of the frame 18 so as to open the bottom of the hopper 12 to permit discharge of the lading therethrough. A transverse angle 35 interconnects the outer ends of the runways 33 and 34 and vertical angles 36 support the same from the car superstructure.

In order to hold the gate 25 in the closed position, provision is made for retaining the shaft 28 in the position which it occupies when the gate 25 is closed. For this purpose the shaft 28 is provided with a radially extending lug 39, Figure 1, with which an arm 40 cooperates. It will be observed that the arm 40 is pivoted at 41 on an upright 42 which is carried by the extension 34. The arm 40 is held in the position shown in Figure 1 where it prevents reverse rotation of the shaft 23 by means of a dog 43 which is pivoted at 44 near the upper end of the upright 42.

Underneath the frame 18 there is provided a removable sanitary closure as indicated, generally, at 45. The sanitary closure 45 is employed for preventing contamination of the underside of the gate 25 which is of particular importance when the railway car is employed for transporting food, such as grain or flour. For illustrative purposes it is pointed out that the sanitary closure shown in copending application Serial No. 340,367 filed March 4, 1953, in the name of George E. Dath and assigned to the assignee of this application can be employed for this purpose. However, it will be understood that other equivalent types of sanitary closures can be employed in lieu of the one specified.

In certain instances it is desirable to provide for unloading the hopper 12 and the car with which it is associated rather than to open the gate 25 and permit the lading to discharge through the opening 17 downwardly. Accordingly, as provided by this invention, the outer side 20 of the frame 18 has an opening 46 therein and a conduit, shown generally at 47, is connected thereto. Preferably the conduit 47 is secured, as by welding indicated at 47', to the outer surface of the outer side 20. The conduit 47 has an inner tubular end 48 that is somewhat reduced in diameter to conform to the size of the opening

46. The conduit 47 also has an outer tubular end 49 of somewhat larger diameter to which the pneumatic conveyor system is connected in accordance with conventional practice. The forward end of the outer end 49 has a threaded portion 50 to cooperate with an internally threaded portion 51 of a cover or cap 52. It will be observed that the cover or cap 52 is telescoped over the principal portion of the conduit 47.

For obvious reasons, where the railway car is employed for transporting food stuff, it is desirable to avoid contamination of the operating mechanism for the gate 25, particularly the pinions 27 and the shaft 28 together with the leading edge of the gate 25. The underside of the space containing these parts is closed off by a closure that is indicated, generally, at 55. It includes a horizontal portion 56 and a vertical portion 57 having a transverse ledge 58 that extends between the runways 33 and 34 and is located so that the gate 25 can pass thereover. The underside of the transverse ledge 58 is provided with a downwardly extending shoulder 59 for a purpose which will be apparent presently.

With a view to permitting the opening of the gate 25 and for completely enclosing the leading edge thereof when it is in the closed position and also enclosing the pinion 27 and shaft 28, there is provided a door 60 which is hinged at 61 along its upper edge to the end wall 22 of the frame 18. The door 60 extends above and between the extensions 33 and 34 and has a flat lower edge 62 which overlies the ledge 58. The ends of the door 60 overlie inwardly extending edge portions 63 of end walls 64 which extend upwardly from the ends of the horizontal portion 56 of the closure 55. A resilient compressible gasket 65 extends underneath the four edges of the door 60 for the purpose of providing a sealed connection therearound to the adjacent surfaces of the closure 55.

With a view to clamping the door 60 in the closed position and camming it into closed position, clamp fingers 66 are employed which are fast on a transverse shaft 67. As shown more clearly in Figure 4 of the drawings, each of the clamp fingers 66 has a tip portion 68 which underlies the shoulder 59 on the transverse ledge 58. The shaft 67 is rotatably and vertically slidably mounted in vertical slots 69, Figure 7, in ears 70 which are secured to and extend upwardly from the upper surface of the flat lower edge 62 of the door 60.

Provision is made for camming the clamp fingers 66 into and out of the clamping position shown in Figure 4. For this purpose an operating arm 73 is employed which has a circular opening 74 for loosely rockably mounting on the shaft 67. Below the circular opening 74, as shown in Figure 6, there is a cam surface 75 which is arranged to engage the upper surface of the flat lower edge 62 of the door 60 to provide the desired camming action. Extending transversely from the operating arm 73 is an extension 76 which parallels the shaft 67 and has at the remote end a cam member 77 which is shaped like the lower end of the operating arm 73. Thus, when the operating arm 73 is rocked about the shaft 67 the cam member 77 also is rocked about the same horizontal axis to lower or raise the shaft 67 depending upon the direction in which the operating arm 73 is rocked.

Any suitable means can be provided for holding the operating arm 73 in the locked position shown in Figure 4. For example, the operating arm 73 can be provided with an opening 78 that is arranged to register with openings 79 in ears 80 that are mounted on and extend upwardly from the door 60 as shown more clearly in Figure 5. A transverse pin 81, Figure 3, extends through the openings 78 and 79 in the ears 80 and operating arm 73 to hold the latter in the position shown in Figure 4.

In operation, when it is desired to discharge the lading through the opening 17, the pin 81 is withdrawn and the operating arm 73 is rocked from the position shown in Figure 4 to the position shown in Figure 5. This lowers the shaft 67 in the slots 69 and moves the tip portions 68

of the clamp fingers 66 to the alternate position shown in Figure 5 where they clear the shoulder 59. Then the clamp fingers 66 can be rocked in a clockwise direction and the door 60 can be swung upwardly so as to permit the gate 25 to be moved to the open position along the extensions 33 and 34 after the dog 43 has been swung out of locking engagement with the arm 40 and the latter has been swung out of the path of the lug 39.

With a view to holding the door 60 in the open position a lug 82 is secured to the underside of the end wall 16 and is arranged to interfit between the ears 80. The lug 82 has an opening 83 which registers with the openings 79 in the ears 80 and the pin 81 can be inserted therethrough to hold the door 60 in the raised position. A chain 84 fastened at one end to the door 60 and at the other end to the pin 81 prevents loss of the latter.

Referring now particularly to the embodiment of the invention shown in Figures 8, 9 and 10 of the drawings, it will be observed that a frame 18' is shown which is generally similar to the frame 18 previously described. However, the side wall 20' of the frame 18', corresponding to the side wall 20, is provided with a somewhat larger opening 86 with which a conduit 87 is associated. In accordance with this embodiment the conduit 87, which is circular in cross section and tubular in form, is cast integrally with the outer side 20' of the frame 18' so that it is unnecessary to secure the same as by welding which is the method employed in constructing the frame 18 as shown in Figure 2. The outer end of the conduit 87 is provided with diametrically opposed flanges 88 each of which extends over about one-quarter of the circumference and these flanges are arranged to cooperate with radially inwardly extending cooperating flanges 89 formed integrally with a cover 90. A resilient gasket 91 is interposed between the outer end of the conduit 87 and the inner surface of the cover 90 to provide a sealed connection therebetween. If desired, the flanges 88 and 89 can be inclined slightly to provide a camming action. It will be observed that the cover or cap 90 is telescoped over only a minor portion of the conduit 87.

As shown in Figure 8 a fixed closure 94 is provided above the gate 25 when it is in the open position. A removable closure, shown generally at 95, may be provided underneath the fixed closure 94 to permit removal of the gate 25 if desired. The construction of the fixed closure 94 and removable closure 95 may be as disclosed in the copending application of George E. Dath, Serial No. 331,352 filed January 15, 1953, and assigned to the assignee of this application.

Since certain further changes can be made in the foregoing constructions and different embodiments of the invention can be made without departing from the spirit and scope thereof, it is intended that all matters shown in the accompanying drawings and described hereinbefore shall be interpreted as illustrative and not in a limiting sense.

What is claimed as new is:

1. For combination with a load containing hopper for a railway car adapted to transport fine lading such as grain, flour and the like, a cast iron frame defining the opening of said hopper and having side and end walls, a gate slidable on said frame for closing said hopper opening, operating means carried by said frame for moving said gate to and from closed position, one of said walls of said frame having an opening, a conduit in the form of a tube extending from said opening in said wall and cast integrally therewith to provide an auxiliary discharge for said hopper, and a removable cover for said conduit.

2. The invention, as set forth in claim 1, wherein the cover is telescoped with the tube over the minor part of its length, the cover and tube have interfitting flanges with cooperating surfaces, and a gasket is interposed between the cover and the outer end of the tube.

3. The invention, as set forth in claim 1, wherein

the cover is telescoped with the tube over the principal part of its length and is threaded onto the same adjacent the side wall containing the opening.

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