July 16, 1968 J. T. SMITH 3,393,017

DISCHARGE UNIT FOR RAILWAY HOPPER CARS

Filed May 22, 1967 5 Sheets-Sheet 1

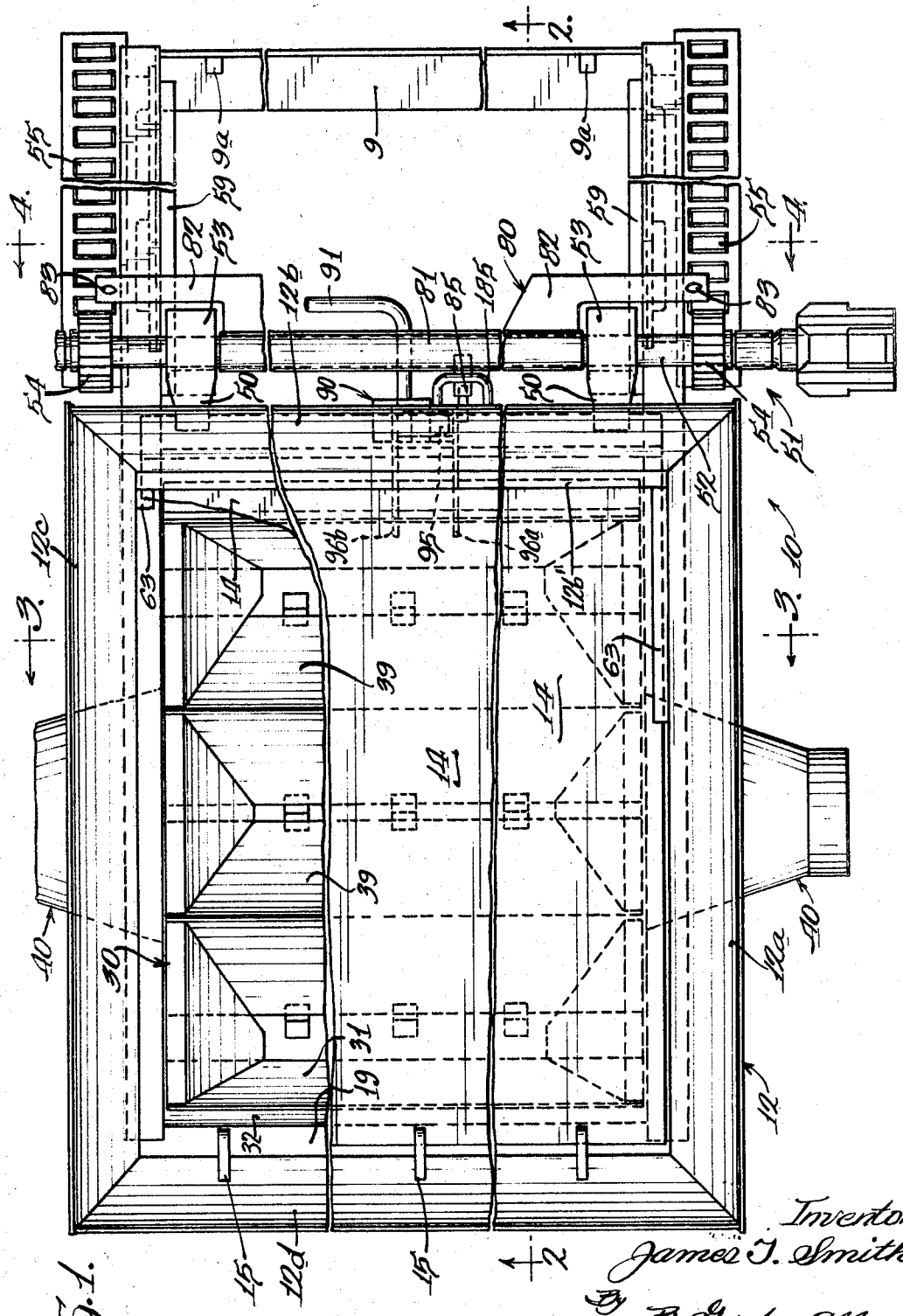

FIG. 1.

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DISCHARGE UNIT FOR RAILWAY HOPPER CARS

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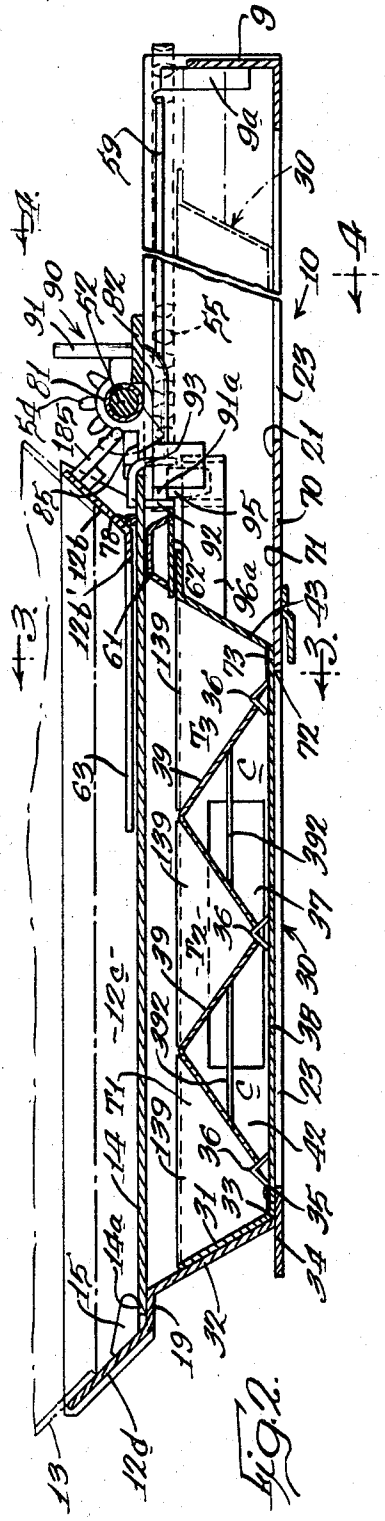

FIG. 2.

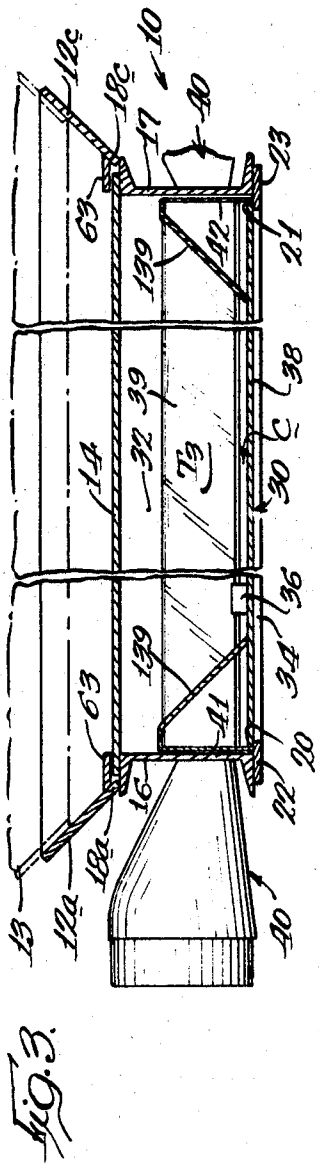

FIG. 3.

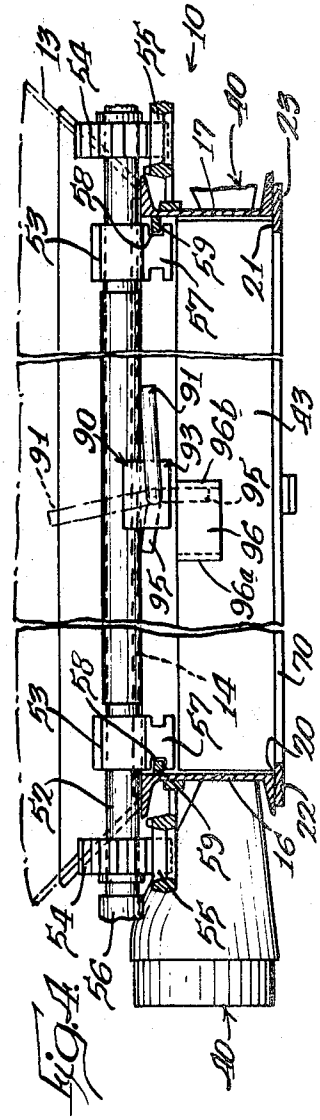

FIG. 4.

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DISCHARGE UNIT FOR RAILWAY HOPPER CARS

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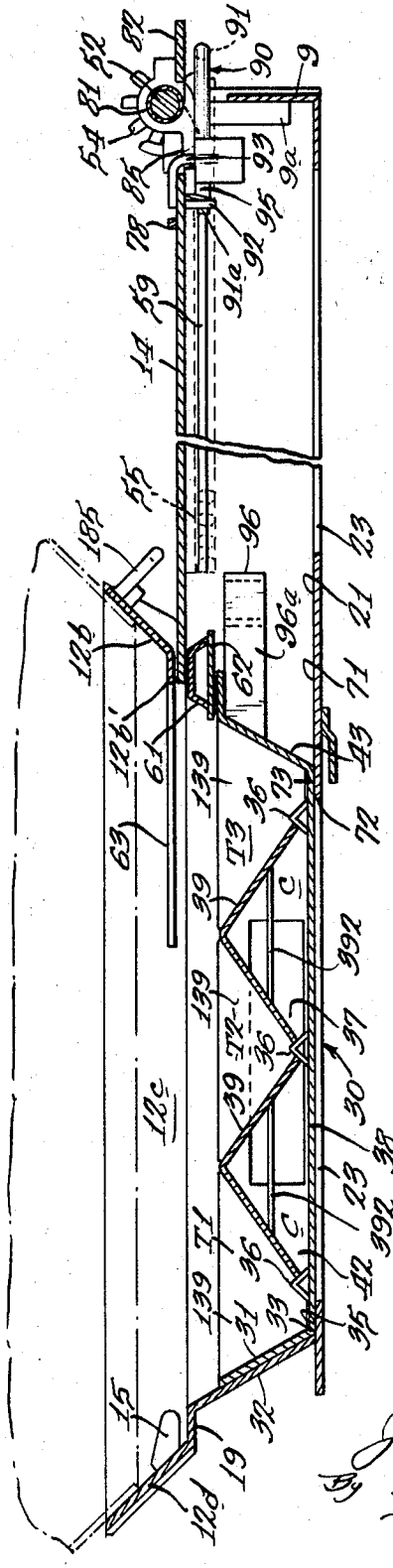

Fig. 5.

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DISCHARGE UNIT FOR RAILWAY HOPPER CARS

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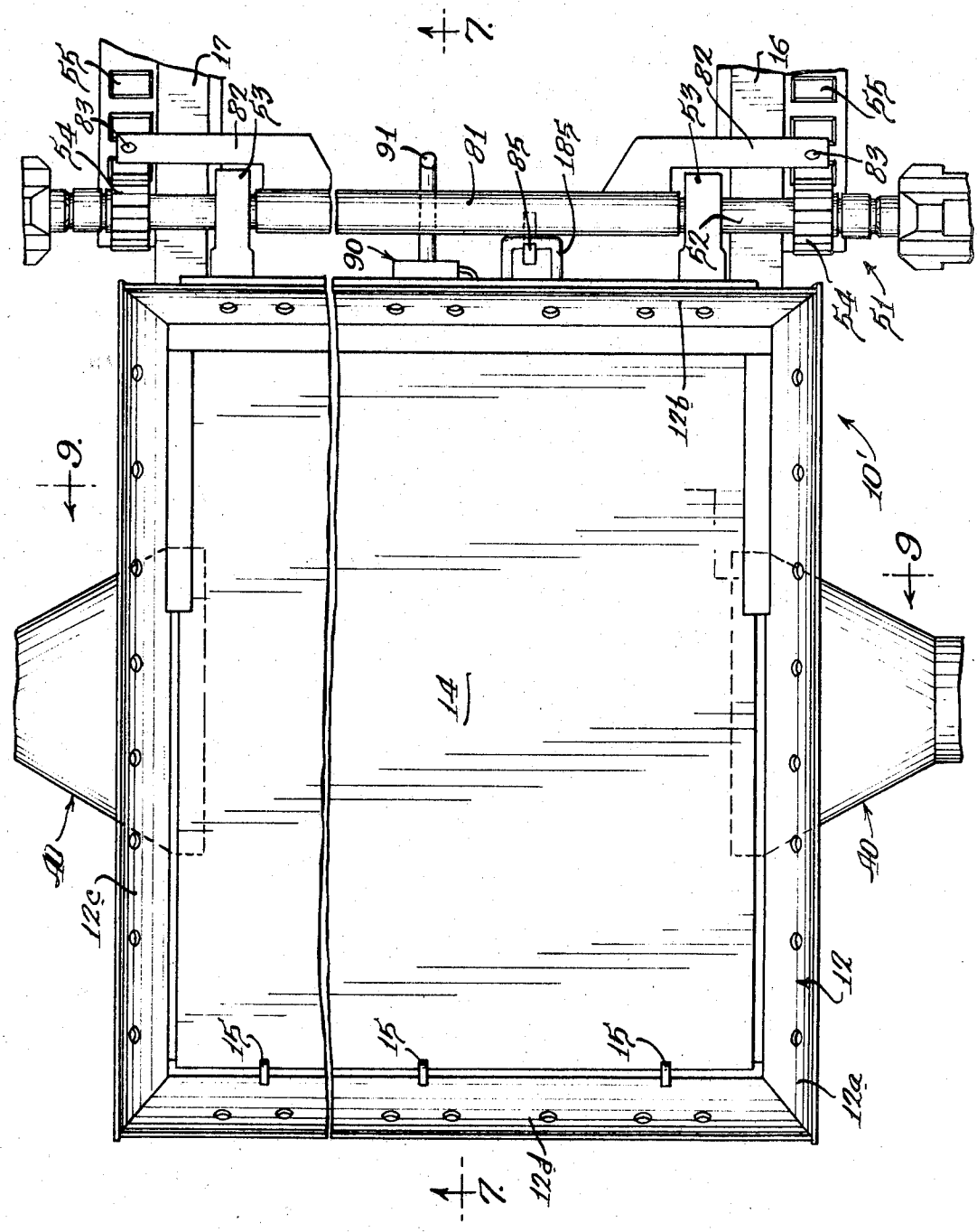

Fig. 6.

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DISCHARGE UNIT FOR RAILWAY HOPPER CARS

Filed May 22, 1967 5 Sheets-Sheet 5

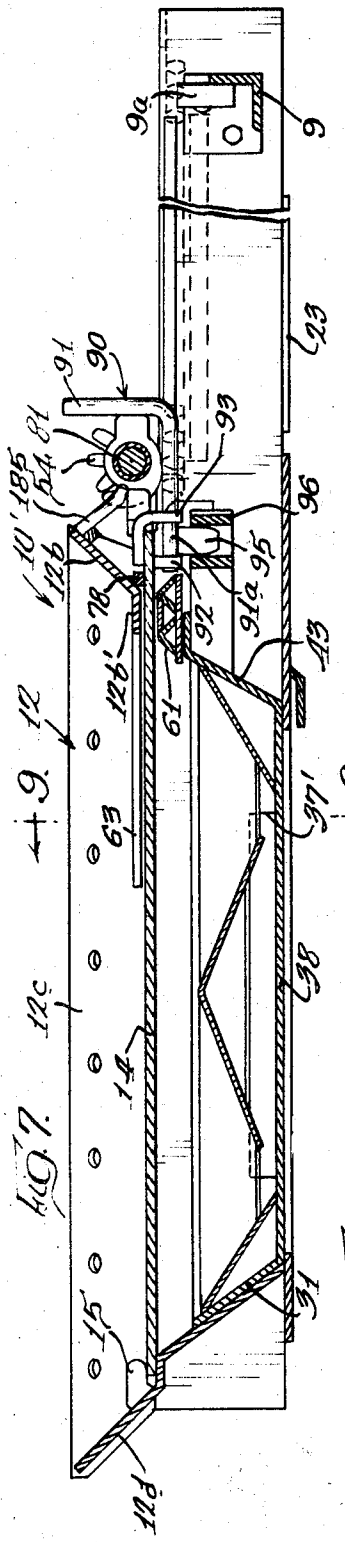

Fig. 7.

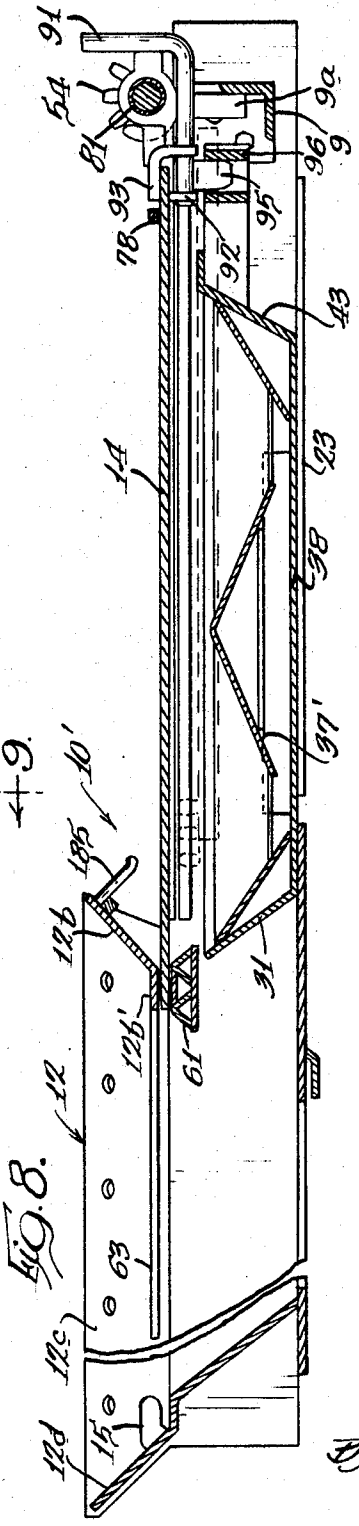

Fig. 8.

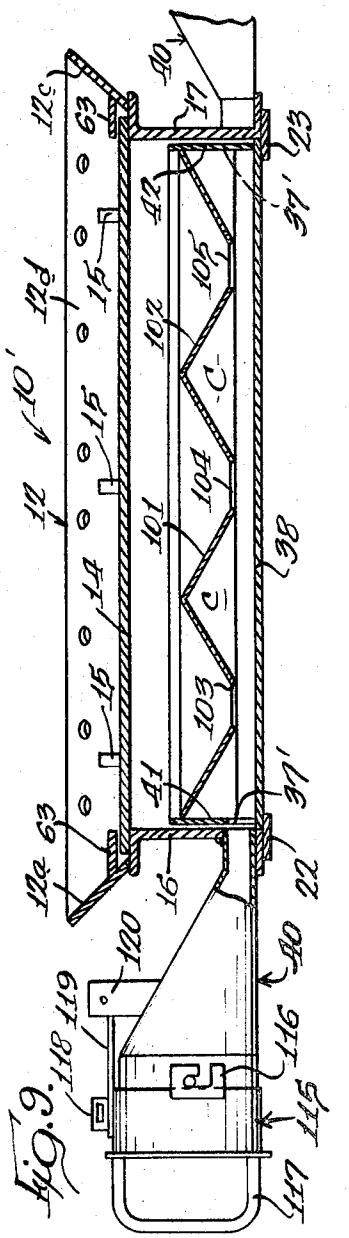

Fig. 9.

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United States Patent Office

3,393,017

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3,393,017

DISCHARGE UNIT FOR RAILWAY HOPPER CARS

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Filed May 22, 1967, Ser. No. 640,264
9 Claims. (Cl. 302—52)

ABSTRACT OF THE DISCLOSURE

A hopper discharge unit for hopper railway cars is selectively alterable for gravity discharge of materials of large aggregate size and also for vacuum discharge of finely divided materials from the hopper chute. The unit includes pinion and rack mechanism similar to that shown in James T. Smith Patent No. 3,085,517 for opening or closing a sliding door plate at the bottom of the hopper, and it also serves to selectively move a vacuum discharge assembly between a functional position below the hopper chute whereby finely divided material may be vacuum discharged through a nozzle assembly and a storage position whereby the hopper may be used for holding other materials and for discharging these materials by gravity feed alone. The vacuum discharge assembly is slidably supported for motion between the position below the chute and a storage position away therefrom. By manually maniplating a latching mechanism, the assembly may be attached to the moving portion of the door and the pinion and mechanism whereby movement of the pinion mechanism slides the vacuum assembly between its operational and storage positions.

Also disclosed is a novel locking mechanism for a pinion-and-rack type of railway hopper car door assembly including a sleeve mounted over the pinion axle for relative rotation thereabout, operating arms affixed to the sleeve on either end thereof, a hooking member centrally affixed to the sleeve and a fixed eyelet on the chute for receiving the hooking member when the pinion axle is in the closed position. By revolving the arms, the hooking member may be caused to enter the eyelet for locking the rack and pinion mechanism in the closed position.

Cross reference to related patents

James T. Smith, Patent No. 3,085,517, dated Apr. 16, 1963, entitled, "Sliding Hopper Closure Discharge Assembly."

Background of the invention

The invention relates to railway hopper cars and particularly to hopper car discharge unit that is selectively and easily adaptable to either full gravtiy discharge or to vacuum discharge. The discharge unit of the present invention is positioned at the base of a railroad hopper and is secured thereto either permanently or semi-permanently during use. The railroad discharge unit of the present invention employs a rack and pinion mechanism which is generally similar to that shown in the present inventor's issued patent, entitled, "Sliding Hopper Closure Discharge Assembly," U.S. Patent No. 3,085,517, which issued on Apr. 16, 1963.

Hopper cars have been in general use in the United States for well over 60 years. During this period the use of these cars has been expanded from carrying a few staple items, such as coal and crushed rock, to the carrying of a great number of different types of bulk products. The use of hopper cars for moving bulk materials of varying natures has resulted in specialized hopper cars for various materials. The nature of some of the bulk materials to be moved requires either special adaptation of existing hopper cars or specially constructed hopper cars. Some of these materials, as for example wheat and cement, are produced or used seasonally. As such, the need for transporting these products is also seasonal. Hopper cars which are specially adapted to be used for such seasonal products would remain unused and idle during the off seaon. Futhermore, the need for transporting some of these is essentially uni-directional. For example, wheat is shipped from the farming area of the Midwest to the ports of Chicago. Cars specially equipped to handle wheat are used in the shipment of wheat from the farmland areas to Chicago and as they often cannot be used for other bulk goods, must be "dead-headed" back to the farm areas. That is, shipped back empty to the loading area. This wasted shipping space increases the costs of operation of such specialized cars as well as increasing the cost of operating the railroads using such cars.

It is an object of the present invention to provide a hopper discharge unit that prevents this waste by readily adapting the railway hopper car to handle either finely divided materials such as wheat and coarser materials such as rock or coal.

A further object of the invention is to provide a hopper discharge unit which very quickly discharges the entire contents of the hopper unit.

Brief description of the drawings

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The invention, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings, in the several figures of which like reference numerals identify like elements, and in which:

FIG. 1 is a fragmentary plan view, with parts broken away to show the interior construction and hidden parts shown in dashed lines, of a hopper discharge unit for a hopper car constructed in accordance with the present invention;

FIG. 2 is a fragmentary longitudinal sectional view of the unit of FIG. 1 as seen from line **2—2** in that figure with a portion of the hopper of a railway car shown in phantom to illustrate the manner of attachment thereto and a moved position of part of the unit illustrated in dashed lines;

FIG. 3 is a transverse fragmentary sectional view of the unit of FIGS. 1 and 2 as seen from the lines **3—3** of those figures;

FIG. 4 is a transverse fragmentary sectional view of the unit of FIGS. 1 to 3 as seen from the line **4—4** of FIG. 1;

FIG. 5 is a sectional view similar to FIG. 2 showing the door plate in open position and the hopper in condition for vacuum discharge;

FIG. 6 is a fragmentary plan view of a second hopper unit constructed in accordance with the present invention;

FIG. 7 is a transverse fragmentary sectional view of the second embodiment depicted in FIG. 6 as seen from the line **7—7** in that figure;

FIG. 8 is a similar view as FIG. 7 with parts shown in a moved position; and

FIG. 9 is a transverse elevational view, partially in section, as generally seen from the line **9—9** in FIG. 6.

Detailed description

Referring to FIG. 1, there is depicted a discharge unit designated by the numeral **10**. The unit **10** includes a discharge chute **12** comprising four slanting wall members **12***a*, **12***b*, **12***c* and **12***d* each of which may be formed from stock ¼" steel sheet. The members are joined to-

gether about a square with oppositely disposed transverse members **12***b* and **12***d* abutting against and joined to opposite ends of the longitudinally disposed members **12***a* and **12***c*. The members **12***a* to **12***d* all are slanted at approximately 45° to the horizontal to form an upward opening shadow-box-like structure that may funnel material from the hopper **13** to which it may be attached and of which it may form an extension as shown in FIG. 2. The chute **12** bottoms at a horizontal plane at which a slidable rectangular door plate **14** is disposed. The door plate **14** when in its closed position is maintained there, in part, by three outstanding hold-down lugs **15** spaced along member **12***d* and preferably affixed thereto by welding. These lugs **15** deform slightly when the plate **14** assumes its closed position and they bear against the plate's upper surface to prevent it from moving upward and possibly causing a leakage of material from the hopper. The forward edges **14***a* of the plate when in the closed position overlies a horizontal ledge **19** which extends along the bottom of the wall **12***d* between the channel members **16** and **17**. The plate **14** is wedged between this ledge **19** and the lugs **15** when in the closed position. The longitudinal edge portions of plate **14**, as best shown in FIG. 3, rest on the upper edges of and span transversely between two vertically disposed channel members **16** and **17**. The bottommost edges of member **12***a* may be affixed as by welding at **18***a* to the top of the channel member **16** while the number **12***c* may be similarly affixed at **18***c*. Together the welded members **12***a* and **12***c* form a longitudinal track for guiding the door plate **14**.

At the bottom of each structural channel member **16**, **17** there is a longitudinally extending lip **20** and **21**, respectively, preferably formed by welding longitudinally extending rigid strips **22** and **23** to the bottom surface of the members **16** and **17** so that they protrude inward. The strips extend for approximately the full length of the members **16** and **17** and provide support for a vacuum pan assembly **30**.

The vacuum pan assembly **30** extends between the channel members **16** and **17** and has its lower longitudinal edges resting on the lips **20** and **21**. As best seen from FIG. 1 the pan assembly **30** is generally rectangular in shape opening upward and is sized to approximately extend under the opening formed when the door **14** is opened. When the unit **10** is to be used for discharging a finely divided material by vacuum the assembly **30** is positioned, as shown in solid lines in FIGS. 1 to 5, under the closed position of the door plate **14**. As shown in FIG. 2, the forward wall **31** of the assembly **20** is canted to the vertical and rests against a similarly canted wall **32** which spans between the members **16** and **17** and is affixed thereto by welding. The wall **32** extends upward to the member **19** and may be formed integrally therewith. The lower forward edge **33** of the unit rests on a supporting member **34** which forms a lip or flange **35** extending between the members **16** and **17**. The member **34** is preferably welded to the lower surface of the members **16** and **17** and forms a forward extension of the lips or flanges **20** and **21** formed by the strips **22** and **23**.

The vacuum pan assembly **30** defines an upwardly opening pan with material flow dividers and deflectors therein. Beneath the flow divider and deflector arrangement there is a sheltered-area C having an outlet **37** opening thereinto from each side of the assembly **30**. In register with the outlet **37**, when the assembly **30** is in its operating position, is a similarly sized opening in the channel members which opens into vacuum nozzle assemblies **40** which are permanently affixed to the members **16** and **17** and extend outwardly therefrom. The assemblies **40** are adapted to having vacuum discharge hoses attached thereto for extracting material from the unit **10**.

More specifically, the assembly **30** comprises a generally rectangular floor plate **38** about whose edges are affixed four walls to define a pan-like structure. In addition to the slanted forward wall **31**, the assembly includes two longitudinally extending vertical side walls **41** and **42**, having the openings **37** defined therein, and a slanted rear wall **43**.

The pan assembly **30** includes flow dividers and deflectors affixed therein. These include two transverse extending flow dividers **39** of an inverted V-shape in cross section. The dividers are preferably formed from rectangular steel sheets bent along the longitudinal center line. Horizontal brace members **39***a* (FIG. 3) may be welded between the opposite walls of the dividers **39** to hold their configuration. The lower transverse edge of the dividers **39** are spaced from the floor **38** by means of V-shaped separators **36**. Deflectors **139** which extend longitudinally are affixed at either end of the three transverse troughs T_1, T_2 and T_3 formed by the dividers **39** and the end walls **31** and **43**. These deflectors **139** are generally triangular shaped sheets extending from the top of either the wall, **41** and **42** at an angle to the horizontal until they reach the floor **38**. The side edges of the deflectors **139** are affixed, as by welding, to the upward facing walls of the dividers or walls between which they extend.

Permanently affixed to the rearward edge of the door plate **14** by means of a pair of transversely spaced brackets **50** is a rack and pinion mechanism **51**. In many respects the mechanism **51** is similar to that shown in the aforementioned Patent No. 3,085,517. This mechanism includes an axle **52** carried in bearings **53** which are affixed to the brackets **50**. Also affixed to the axle **52** are pinions **54** which mesh in racks **55**. At one or both ends of the axle **52** are affixed handle sockets **56** by which the axle **52** and pinions **54** may be rotated and consequently moved along the racks **55**. Because of the brackets **50** and bearings **53** the door **14** is moved longitudinally between the closed position as shown and an open position in which it overlies the racks **55**.

Affixed to the upper surface of the plate **14** is a transverse stopper bar **78** which makes contact with the outer and lower surface of the wall **12***b* to stop the forward travel of the door plate **14** when it assumes its closed position.

As best shown in FIG. 4 the bearings **53** each include a guide member **57** having a cutout portion **58** for receiving a guide rail **59**. One of the rails **59** is affixed to the inside of the back of the members **16** and **17**, forward of the closed position of the door **14** to guide the moving portion of the rack and pinion assembly **51**.

In moving longitudinally the door plate **14** passes through a horizontal slot formed between a horizontal flange extension **12***b'* of the wall **12***b* and a support member **61** (FIG. 2). The member **61** is preferably welded to a horizontal transversely extending planer member **62**. Further guidance for the door plate as it is moved longitudinally by the rack and pinion assembly **51** is provided by horizontal guidance flanges **63** extending longitudinally at the base of the walls **12***a* and **12***c* from the flange **12***b'* for a portion of the extent of the walls **12***a* and **12***c*.

Below the member **62** and spaced therefrom is another transverse planer member **70**. The member **70** has an upper surface **71** which lies in the same plane as that of surface **21** and has a forward edge **72** that underlies and supports the rearward transverse bottom edge **73** of the pan assembly **30**.

In accordance with one aspect of the invention a locking mechanism **80** is provided including a hollow cylindrical sleeve **81** having an inside diameter slightly greater than the outside diameter of the axle **52**. The sleeve **81** is mounted about the axle **52** between the bearings **53**. The sleeve **81** and the axle **52** may rotate relative to one another. Affixed to either end of the sleeve **81** are arms **82** preferably formed from steel plate and designed to project outward traversely from the sleeve lock to terminate above the racks **55**. The outer terminal ends of the arm **82** have holes **83** made therein. The holes function to receive a shipment seal bond which may be passed through the hole **83** and through the rack **55**. The arms **82** are made such

that they clear the pinions **54** and may be rotated over to lay on the top surface of the members **50**.

Also affixed to the sleeve **81** and outstanding therefrom is a hooking member **85**. Rotation of the arms **82** revolves the sleeve **81** and thus the hooking member **85**. Affixed to the rearward portion of wall member **12***b* so that the hook member **85** may selectively enter therein is an eyelet **185**. The eyelet **185** is formed by a U-shaped bar whose ends are welded or otherwise suitably affixed to the wall member **12***b*. Rotation of the arms **82** may move the member **85** into the eyelet **185** whenever the door **14** is in its closed position. Counter-rotation of arms **82** unlocks the door and allows it to be opened.

In accordance with the primary aspect of the present invention, means are provided for removing and restoring the pan assembly **30** from its position below the chute **13**. These means include manually operated coupling means generally designated **90**, for coupling the pan assembly **30** to the moving portion of the door plate **14** and pinion and rack assembly **51**. The means **90** includes an L-shaped handle bar **91** which is pivotally mounted by having one of its members **91***a* seated in bearing members **92** and **93**. The bearing member **92** is affixed to the bottom of the rearward edge of door plate **14** to depend therefrom and has a hole formed in it to receive the member **91***a*. The bearing member **93** is generally L-shaped in side view and is affixed to the upper surface of the plate **14** and has a portion that depends over the rearward edge of the wall **14** to be spaced from, but aligned with the member **92** and to have a hole therein to receive the member **91***a* of the handle **91**. Affixed to the member **91***a* between the members **92** and **93** is a stud **95**. The stud **95** lies roughly in the same plane as that of the handle **91** so that when the handle **91** is moved upward to a vertical position the stud **95** depends downward, as shown in phantom in FIG. 4. If the handle **91** which is normally horizontal is operated and moved upwardly when the door **14** is in its closed position and the vacuum pan assembly **30** is positioned below chute **13**, the stud **95** will enter a stud socket **96**. The socket **96** is affixed to the pan assembly **30** and includes two vertically disposed longitudinally extending parallel, but spaced, walls **96***a* and **96***b* and at two spaced transverse vertical walls **96***c* spanning between the walls **96***a* and **96***b*, to form the socket for receiving the stud **95**. By manually moving the handle **91** the stud **95** is caused to enter the socket **96**.

The vacuum pan assembly **30** may be simply removed from or restored to beneath the chute **13** by locking the pan assembly to the plate **14** in the manner above described. It is removed, as the plate **14** is moved to open position, a large opening is formed for gravity discharge through the hopper. This opening is bounded by the members **22**, **23**, **34** and **70**, and is directly below the chute **13**. Therefore, large material may be gravitationally discharged therethrough from the hopper. The pan assembly **30** is stored in the rearward portion of the unit **10** between the channel members **16** and **17** and below the plate **14** as shown in phantom line in FIG. 2.

If it is desired to remove the lading by vacuum discharge through the hopper, the door plate **14** is not locked to the pan assembly **30** and the latch stud **95** remains in the FIG. 4 position. The door plate is moved to the right as shown in FIG. 5 and the lading is withdrawn from the nozzles **40** through the previously described chambers C and the opening in the pan assembly.

To provide improved structural rigidity for the unit **10**, an L-shaped, in cross section, member **9** is affixed between the channel members **16** and **17** at the rearward end of these members. The pair of stops **9***a* are affixed to the cross member **9** to stop the moving pinion door **14** assembly in its open position and to prevent override therefrom by contacting the rearward portions of the guides **57**.

Suitable detenting means are preferably provided for detenting the assembly **30** in either its operational position or its storage position to prevent shifting of the assembly **30** during movement of the hopper car.

Referring now to FIGS. 6 to 9, a second preferred embodiment of the invention is depicted. The discharge unit **10′** is generally of a similar overall construction and operation as the unit **10** of FIGS. 1 to 5 differs therefrom primarily in the construction of the vacuum pan assembly **30**. The assembly **30** includes the upward opening pan shaped structure including a floor **38**, transverse end walls **31** and **43** and longitudinal walls **41** and **42**. However, an opening **37′** is formed therein of a greater transverse and lesser vertical extent than the opening **37** of the prior embodiment. As best seen in FIG. 9, the vacuum pan assembly **30** includes a number of longitudinally disposed flow dividers such as flow dividers **101** and **102**. The flow dividers such as **101** and **102** guide the flow towards openings such as the openings **103**, **104**, and **105**, and into the chamber C formed below the flow dividers.

The mechanism for locking the pan assembly **30** of this embodiment to the door **14** is the same as that shown in FIG. 1 and the description will not be repeated.

In both embodiments, the vacuum nozzle assembly **40** is preferably equipped to receive a cap **115** which may include a bayonet-type latch **116** positioned on either side thereof, and a handle **117**, as well as a locking mechanism including an upstanding lock or seal receiving member **118** and a latching member **119**. The member **119** is affixed to a standard **120** mounted on the nozzle assembly **40**. The latching member **119** may pivot in a horizontal plane to latch over, in close fit, the member **118** or to swing freely therefrom.

In removing the cap **115** the latching member **119** is pivoted upward to be free of the member **118** and the cap is rotated so as to advance the bayonet pins of the mechanism **116** out of the bayonet. The cap **115** may be replaced by repeating the process. In operation, the embodiment of FIGS. 6 to 9 is similar to that of the embodiment of FIGS. 1 to 5 and reference may be made to the above description.

As is now obvious, a new and improved hopper discharge unit for railroad cars has been disclosed. The discharge unit **10** or **10′** may be readily adapted to handle material by vacuum discharge or by gravity discharge. One advantage of the described unit lies in the dual uses, not only the rack and pinion mechanism, but also in the dual uses for the door plate, which can be used to control discharge flow in both the gravity discharge and in the vacuum discharge process by being opened to varying degrees during either of these discharge processes.

While I have shown and described preferred embodiments of my invention, it will be apparent that numerous variations and modifications thereof may be made without departing from the underlying principles of the invention. I therefore desire, by the following claims, to include within the scope of the invention all such variations and modifications by which substantially the results of my invention may be obtained through the use of substantially the same or equivalent means.

I claim:

1. A discharge unit for a hopper of a railway hopper car comprising:

a chute defining an opening;

a vacuum pan assembly;

a door plate slidably interposed between said chute opening and said vacuum pan assembly;

means for mounting said vacuum pan assembly on the car for movement between a first position in which said vacuum pan assembly is juxtaposed to the opening of said chute and a second position removed from the opening;

a vacuum nozzle assembly mounted for cooperation with said vacuum pan assembly when said assembly is in said first position, to facilitate the vacuum discharge of material from the hopper when said assembly is in its first position;

means for selectively latching said door plate to said vacuum pan assembly; and

means for selectively moving either said door plate alone

when said door plate and vacuum pan assembly are unlatched or said door plate and said vacuum pan assembly together when said door plate and vacuum pan assembly are latched so as to selectively adapt the unit respectively for either vacuum discharge or gravity discharge of material carried therein.

2. The discharge unit as defined in claim 1 in which:

said means for selectively moving said door plate and vacuum pan assembly is of the rack and pinion type and is disposed horizontally for moving either said door plate alone or both longitudinally; and

said means for mounting said vacuum pan assembly includes a pair of spaced longitudinally extending members between which said vacuum pan assembly is supported for sliding between its first and second positions, said longitudinal members also serving to define an opening therebetween for allowing material to be gravitatingly discharged from the unit therethrough when said pan assembly is in its second position.

3. A discharge unit as defined in claim 2 in which:

said pan assembly is of a generally rectangular shape, has a floor and a plurality of flow dividers, said flow dividers being of inverted V-shape in cross section and are raised above the floor of said assembly to define a chamber between said floor dividers and said floor, said vacuum nozzle assembly opens into said chamber through at least one of said pair of longitudinal extending members for the vacuum removal of finely divided material therefrom.

4. The discharge unit as defined in claim 2 in which:

said rack and pinion type means for selectively moving said door plate and said vacuum pan assembly includes two spaced horizontal longitudinally extending racks and a pair of spaced pinions mounted on an axle with one of said pinions meshing with each of said racks; and

a locking mechanism locking said pinion mechanism in one position relating to said rack, comprising a hook member mounted for rotation about said axle and eyelet defining member affixed to said unit in a stationary position thereon so as to selectively receive said hook member when said axle and pinion are in said one position.

5. The discharge unit as defined in claim 4 in which:

said hook member is mounted on a hollow cylindrical sleeve which is mounted for relative rotation about said axle between said pair of pinions;

said eyelet defining member being of generally U-shape and being affixed to said chute;

and said sleeve having a pair of arms affixed thereto at spaced transverse positions thereon, one of said arms extending forward to one side and the other of said arms extending outward to the other side, whereby said hooking member may be manually rotated into and out of said eyelet defining member by the manual movement of one of the arms to lock said axle and said pinions in said one position.

6. The discharge unit as defined in claim 1 in which:

said latching means includes a socket defining means on said vacuum pan assembly and said door plate has a pivotally mounted stud that may be selectively caused to enter and leave the socket defined by said socket defining means, whereby when said stud is in said socket movement of said door plate is transferred to said vacuum pan assembly.

7. The discharge unit as defined in claim 6 in which:

said stud is mounted outstanding from one straight portion of an L-shaped bar which bar portion is pivotally mounted to said door plate by means of a pair supports one of which supports said bar on one side of said stud and the other of which supports said bar on the other side of said stud, said supports being attached to the rear edge of said door plate, whereby said other straight portion of said bar serves as a handle for manually moving said stud into and out of the socket defined by said socket defining means.

8. The discharge unit as defined in claim 2 in which:

two vacuum nozzle assemblies are provided, one on either side of said unit, and at least one of said assemblies is provided with a cap of a hollow cylindrical shape, open at one end and closed at the other, and said nozzle assembly has a bayonet type locking mechanism for reliably securing said cap to said nozzle assembly;

and further an upstanding lock and seal receiving member is affixed to the outer surface of said cap and a pivotally mounted latching member having an opening found therein for closely fitting over said upstanding lock and seal receiving member, is mounted on said nozzle assembly for selecting latching over said lock and seal receiving members when said cap is secured.

9. The discharge unit as defined in claim 1 in which:

said chute includes four slanting wall members disposed adjacent to one another in a square arrangement with the forward and rearward of said wall members being transversely disposed and the other two of said wall members being longitudinally disposed and with side edges of said members joined together to form an upwardly opening shadow-box-like frame about the opening from said chute, which opening is square in configuration;

said door plate is of a generally rectangular shape and is sized to at least close the opening defined by said chute, said door being horizontally mounted for sliding movement between a closed position in which it closed the opening and an open position in which it is substantially clear of said opening;

a pair of spaced longitudinally disposed vertically oriented channel members for supporting on their upper surface the longitudinal edges of the said door plate which bridges therebetween one of said channel members being mounted below one of said longitudinally disposed wall members and the other of said channel members being mounted below the other of said longitudinally disposed wall members;

said channel members extending longitudinally beyond said chute to form a surface upon which said door plate is supported when said door plate is in its open position, with the forward and rearward of said wall members being transversely disposed and the other two of said wall members being longitudinally disposed;

a longitudinally extending lip formed at the bottom of each of said pair of longitudinally extending channel members, said lip protruding inward for supporting said vacuum pan assembly;

said vacuum pan assembly is generally rectangular in shape and opening upward so sized as to extend under the opening formed by said chute and to extend between the channel members and to be supported on and bridge said lips;

said vacuum pan assembly further includes rectangular floor, sidewalls and a plurality of flow dividers of a generally inverted V-shape supported above said floor to form a chamber therebetween with openings between the floor dividers and sidewalls for allowing flow into the chamber;

a lip forming cross-member extends between the upper surfaces of said channel members below the front wall member;

a plurality of hold down legs affixed to the inner surface of the forward wall member projecting above said cross-member to hold said door plate therebetween when said door plate assumes its closed position;

said nozzle assembly is mounted projecting outward from one of said channel members and a second nozzle assembly is provided mounted on the other of

said channel members and projecting outward therefrom;

said nozzle assembly being in connection with said vacuum pan assembly elongated horizontal rectangular openings formed in said channel members and each of said nozzle assembly terminating in a circular outlet;

said selective moving means is a rack and pinion mechanism including two spaced and horizontal, longitudinally extending racks each mounted across from each other and above one of said channel members rearward of said chute and a pair of spaced pinions affixed to an axle transversely mounted for rotation by means of spaced bearings outstanding from the rear of said door plate, said pinion meshing with said racks, and said axle having lever-receiving sockets at either end for receiving a lever by which the pinions may be rotated to move the door relative to the rack;

a locking mechanism locking said pinion mechanism in one position relative to said rack, comprising a hook

member mounted for rotation about said axle and eyelet defining member affixed to said unit in a stationary position thereon, so as to selectively receive said hook member when said axle and pinion are in said one position; and

said latching means includes a socket defining means on said vacuum pan assembly and said door plate has a pivotally mounted stud that may be selectively caused to enter and leave the socket defined by the socket defining means, whereby when said stud is in said socket movement of said door plate is transferred to said vacuum pan assembly.

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