Oct. 30, 1928. 1,689,806

B. W. STRAW

BALLAST SPREADING DEVICE

Filed July 2, 1927 4 Sheets-Sheet 1

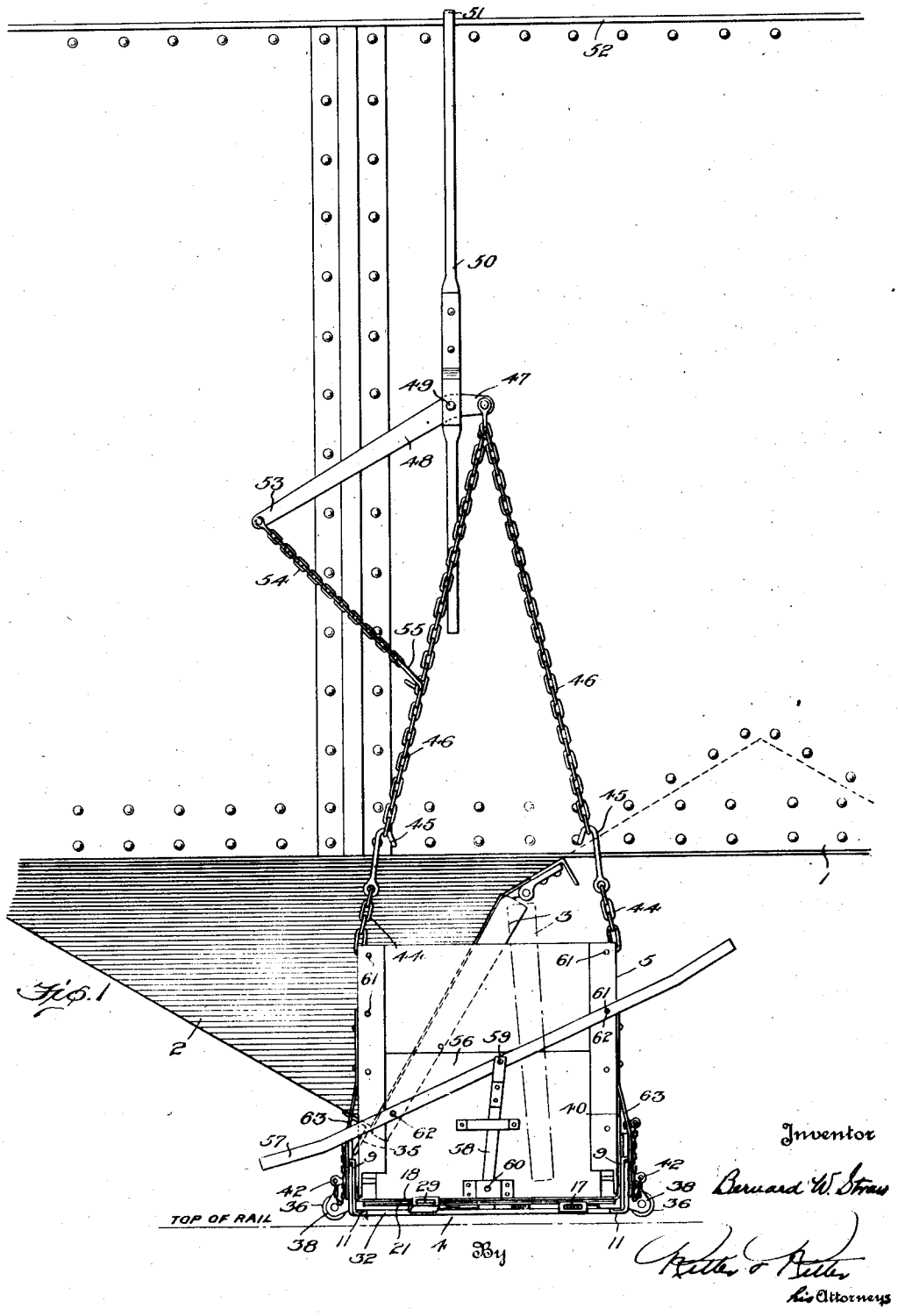


Fig. 1

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By

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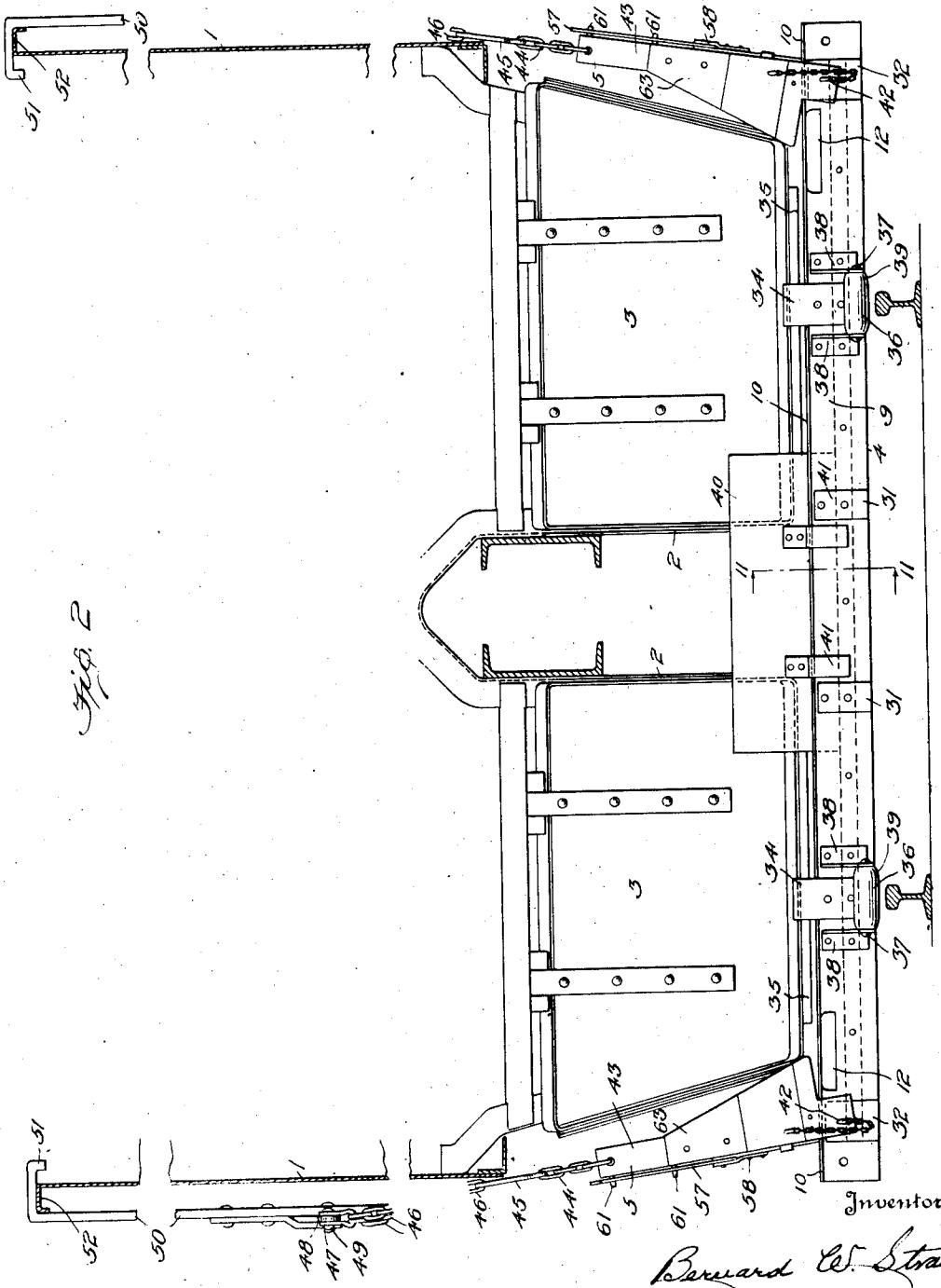


Fig. 2

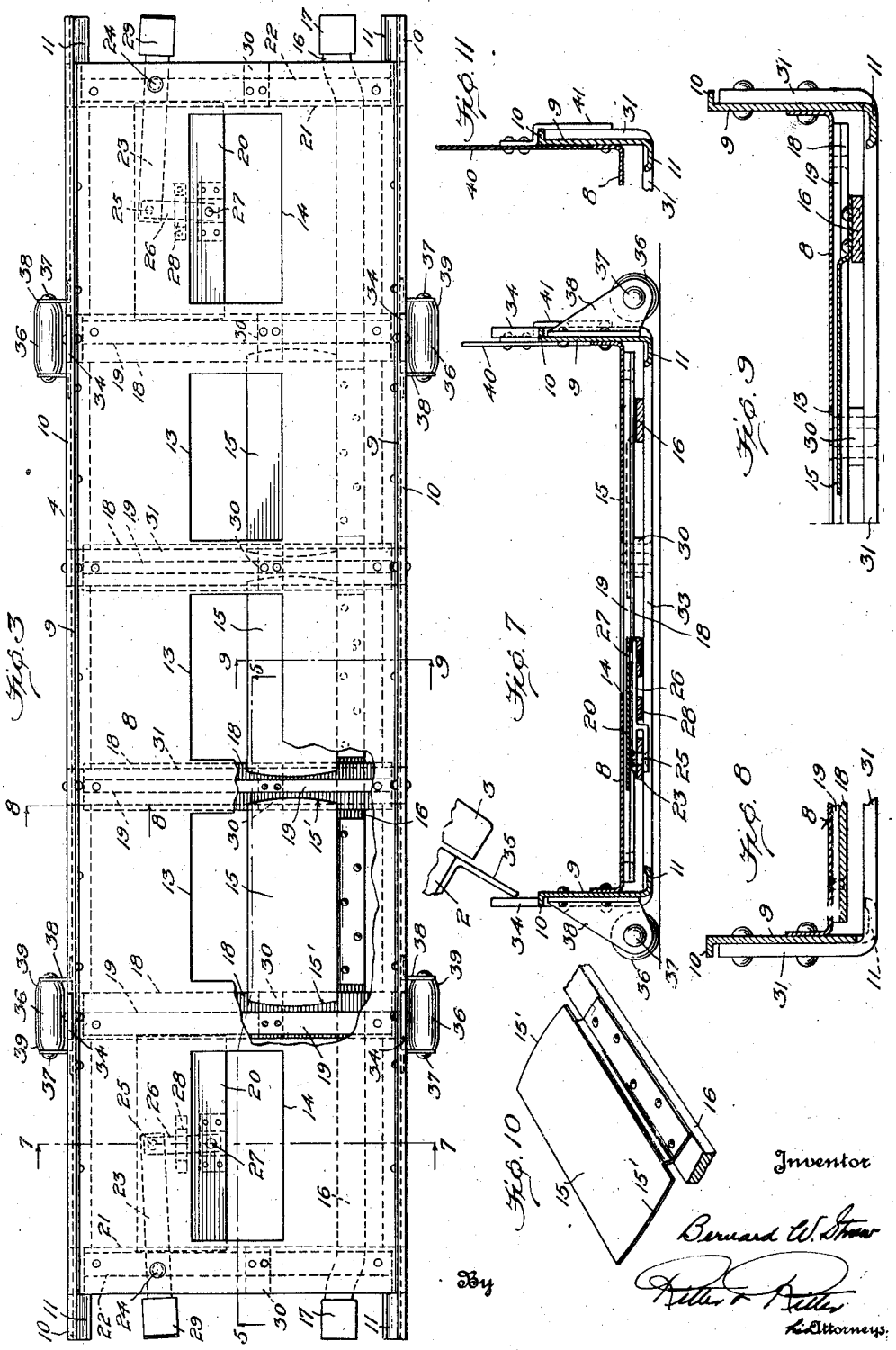
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Filed July 2, 1927 4 Sheets-Sheet 3



Oct. 30, 1928. 1,689,806

B. W. STRAW

BALLAST SPREADING DEVICE

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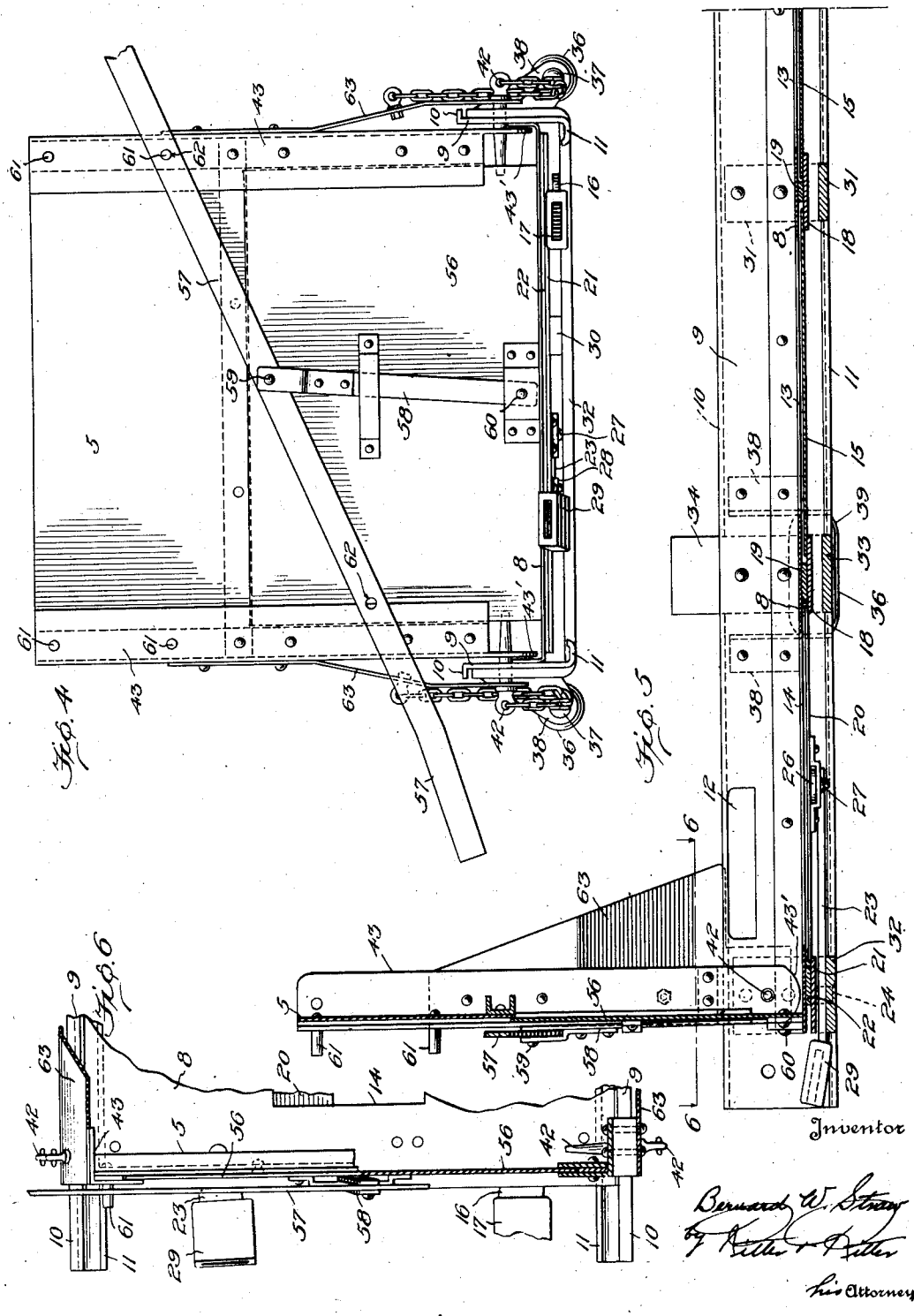


Fig. 4

Fig. 5

Fig. 6

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UNITED STATES PATENT OFFICE.

BERNARD W. STRAW, OF MOUNT AIRY, MARYLAND, ASSIGNOR TO STRAW BALLAST DISTRIBUTER CORPORATION, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE.

BALLAST-SPREADING DEVICE.

Application filed July 2, 1927. Serial No. 203,118.

My invention, generally stated, relates to a device for receiving ballast from a railway car and delivering it at will to any desired portion of the underlying track ballast cross section of the track over which the car passes, the device being movable with the car and positioned in the path of the ballast discharged from the latter.

The principal objects of the invention are to provide a ballast spreading or delivering device which is simple, rugged and easily manipulated, and to afford controlling means for ballast delivered to the roadbed.

A primary feature of the invention consists in providing the ballast spreader with rollers which are adapted to contact with the tops of the track rails over which the car passes, thereby facilitating movement of the spreader along the track and relieving its bottom from wear when, as is sometimes the case, it is necessary to position the spreader in contact with the rails in order to permit the lading discharge door of a particular car to be opened sufficiently to properly discharge the lading.

Another feature of the invention consists in providing the ballast spreading device with an auxiliary side plate or wall section which is adapted to be positioned so as to prevent the undesired discharge of ballast to the road-bed through the space between the inner ends of the door sections of a hopper car.

A further feature of the invention consists in providing the bottom of the central portion of the spreader with an angularly movable door formed as a series of sections rigidly united to a common operating lever or bar, the ends of the door sections being curved to facilitate the angular movement of the door.

A still further feature of the invention consists in the provision of lever means adapted to vertically adjust the ballast spreading device so as to position it in proper operating relation to the lading discharge opening of the railway car with which the device is associated.

Other features of the invention, relating to advantageous relations of parts and details of construction, will hereinafter appear and be pointed out in the claims.

In the drawings illustrating a preferred form of construction, Figure 1 is an elevational view of the mechanism looking toward the side of the car.

Figure 2 is a transverse vertical sectional view showing the distributor in elevation.

Figure 3 is a detail plan view of the central member or pan portion of the spreader.

Figure 4 is a detail elevational view of the end of the device.

Figure 5 is a detail vertical section of the portion of the device illustrated in Fig. 4, the view being taken on the line 5—5, Fig. 3.

Figure 6 is a detail view of the mechanism partly in plan and partly in section on the line 6—6, Fig. 5.

Figure 7 is a detail sectional view on the line 7—7, Fig. 3, a portion of the car hopper and its door being also shown.

Figure 8 is a detail sectional view on the line 8—8 Fig. 3.

Figure 9 is a detail sectional view on the line 9—9, Fig. 3.

Figure 10 is a detail perspective view of one of the door sections of the angularly movable door, together with a portion of its operating lever.

Figure 11 is a detail view on the line 11—11, Fig. 2.

In the drawings 1 indicates a railway car of the well known twin hopper type provided with a hopper 2 from which lading is adapted to be discharged by gravity. The discharge opening of the hopper is closed by a swinging door 3 which is made in sections disposed on opposite sides of the center sill construction of the car in the usual manner. It is to be understood of course that this type of car is not illustrated with intent to limit the invention to application thereto, as the invention is capable of use with other forms of cars as well.

The ballast spreader comprises a central portion or pan member 4 and end wall members 5. The pan member 4 and end wall sections 5 are provided with doors for controlling the discharge from the device of the ballast received from the car.

The central portion of pan member 4 of the device is preferably formed with a sheet metal floor plate 8 which is flanged upwardly at its sides, the side walls 9 of the pan preferably being fashioned as separate pressed metal members to which the flanged margins of the floor plate are riveted. The top edges of the side walls 9 may advantageously be

flanged outwardly for the sake of stiffness as indicated at 10 and said side walls preferably extend downwardly below the floor plate 8 and are flanged inwardly at their lower ends as indicated at 11. These lower flanges 11 of the side walls extend from end to end of the pan and constitute runners or skids which are adapted to have sliding contact with the tops of the track rails thereby preventing the pan from catching against the side of the track rail when the device is slid transversely of the car beneath a hopper discharge opening. The extension of the side walls 9 downwardly below the floor plate 8 also serves to stiffen the pan 4 against distortion. As shown in Figs. 2 and 5, the side walls 9 may advantageously be provided adjacent both ends of the pan 4 with openings 12 forming hand holes enabling workmen to readily shift the pan transversely of the car.

The floor plate 8 is apertured so as to permit the ballast to be delivered to the underlying roadbed. It is for this purpose preferably formed with a series of alined openings extending longitudinally of the pan, the intermediate openings 13 permitting the material to be discharged between the rails and the end openings 14 allowing delivery of the ballast outside of the rails. The openings 13 are adapted to be respectively closed by doors 15 which are rigidly attached along one edge to an operating bar or lever 16, thus being adapted to operate as a unit and in effect constituting a single door. To permit them to assume an angular position with respect to the axis of the pan 4, the ends of the door sections 15 are rounded at each end, as at 15', thus enabling the effective areas of the openings 13 to be varied with respect to each other and thereby permitting the amount of ballast which is delivered between the rails to be graduated or controlled so as to deliver more adjacent one rail than adjacent the other. The ends of the door operating bar or lever 16 project outwardly beyond the opposite ends of the pan and are preferably formed as sockets 17 for receiving a removable operating bar (not shown). The door sections 15 rest at their ends and are slidably supported upon plates 18 spaced from the floor plate of the pan by spacer bars 19 which intervene between the ends of adjacent door sections 15 or between one of said sections and the adjacent door 20 of the pan. As well shown in Figs. 3, 8 and 9 the door supporting plates 18 and the spacers 19 are riveted to the floor plate 8. In addition to performing the function described these members 18 and 19 serve to stiffen the pan against distortion and thus materially aid in preventing any binding of the doors.

The doors 20 which are adapted to close the respective openings 14 in the ends of the bottom of the pan preferably have a sliding movement only. Each of these doors may be conveniently supported and guided in substantially the same manner as the door sections 15 heretofore described, that is to say, the inner end of each door 20 is preferably slidably supported by its adjacent supporting plate 18, while the outer end of each of said doors is similarly supported by a plate 21 spaced from the floor plate of the pan by an intervening bar 22, these two members being riveted to the floor plate 8. Each of the doors 21 may be independently operated in any convenient manner as for example by means of a lever 23 rotatably connected to the pan by a pivot rivet 24, the inner end of said lever being pivotally connected at 25 to the bifurcated end of a link 26, (see Fig. 7) which itself is pivotally attached at 27 to the door 20. The links 26 are preferably supported intermediate their ends in suitable guide brackets 28 riveted to the underside of the doors 20. At their outer ends each of the door operating levers 23 may advantageously be fashioned with a socket member 29 adapted to receive a removable bar for operating the lever. The sockets 29 are preferably inclined upwardly with respect to the sockets 17 of the door operating bar 16 so as to provide sufficient clearance between the removable operating bars when the socket members 17 and 29 are moved to the extreme limit toward each other.

The door operating levers 16 and 23 slidably rest upon transversely extending bars which are spaced downwardly from the door supporting plates 18 and 21, the spaced relation of said parts being maintained by suitably positioned spacer blocks 30 intervening between said bars and the respective door supporting plates. All of these lever supporting bars are preferably bent upwardly so as to embrace the side walls or side flanges 9 of the pan to which they are rigidly secured, those indicated at 31 which are about midlength of the pan and those indicated at 32 which are adjacent the ends of the pan preferably terminating at their upper ends just below the reinforcing flanges 10 at the upper edges of the side walls of the pan, while the intermediate bars 33 preferably project upwardly above the side wall 9 as at 34. The upwardly extending portions 34 of these bars are adapted to extend under the hopper of the car in overlapped relation to a bottom portion 35 of the hopper construction, thus insuring that the ballast spreader shall be maintained in proper operating relation to the hopper discharge opening. Where the transverse bars 31, 32 and 33 pass beneath the side walls 9 the lower flanges 11 of the latter are cut away (see Fig. 8) so as to cause the bottom surface of the transverse bars to lie in the same plane as the lower face of the skids or runners formed by said flanges 11. The upper flanges 10 of the pan side walls are pref-

erably likewise cut away to permit the intermediate bars 33 to extend above the top edge of the pan.

On the outside of the pan adjacent the bars 33 are rollers 36 which are adapted to roll upon the rails by which the car is carried if it becomes desirable to adjust the ballast spreader to so low a position to permit proper opening of the door 3 of the hopper. These rollers are mounted upon pins or journals 37 carried by spaced brackets 38 rigidly secured to the side walls 9 of the pan. The rollers are disposed on opposite sides of the pan and, as well shown in Fig. 7, are normally adapted to come into contact with the tops of the rails so as to prevent other parts of the pan from coming in contact therewith. The opposite ends of each roller are, however, preferably somewhat coned or beveled as at 39, thus preventing said rollers from catching on the heads of the track rails when the ballast spreader is shifted transversely of the rail.

Means are provided to prevent accidental escape of ballast from the pan through the space below the car center sills between the door sections of the car hopper door 3, such means (see particularly Fig. 2) preferably being formed as a shield or plate 40 constituting an upward extension of the side wall 9 of the pan which is remote from the car hopper from which ballast is being received. The shield or auxiliary side wall section 40 which bridges the space between the hopper door sections is preferably designed to be detachably mounted upon the pan so as to enable it to be associated with either side wall 9 thereof as occasion may require, such a construction permitting the pan to be shifted to position from beneath one pocket to another without the necessity of reversing the pan end for end. A simple manner of effecting this detachable connection is to rigidly mount upon the outer face of the shield 40 a plurality of angle clips 41 whose free ends are spaced outwardly from the body of the shield a sufficient distance to receive the side wall 9 of the pan.

The end members or end walls 5 of the ballast spreading device are connected to the central member 4 preferably by means of pins 42 permitting a relative pivotal movement of these parts so as to enable the end wall members 5 to accommodate their position to cars of slightly varying width. To permit this pivotal or swinging movement the lower ends of the end wall frame members or posts 43 are preferably rounded as indicated at 43'. At their upper ends the end wall members 5 preferably have secured to them short lengths of chains 44 each terminating in a hook 45, the hooks being respectively adapted to connect with chains 46 whose upper ends are suitably attached to the short arm 47 of an operating lever 48 by means of which the workmen may raise or lower the pan until it assumes the desired relation to the car body. This lever is pivotally connected at 49 to a suspension bar 50 provided at its upper end with a hook 51 adapted to extend over the top edge 52 of the car side. The free end of the longer arm 53 of the adjusting lever 48 is provided with an attached chain 54 having a hook 55 adapted to hook into the links of the neighboring chain 46. It will be appreciated that by suitably manipulating the lever 48 the workman is enabled easily to raise or lower the ballast spreading device. When the device is in proper position of adjustment it is maintained in said position by catching the hooks 55 into suitable links of the neighboring chains 46. When the device is to be positioned beneath the car the hooks 45 are connected to the respective chains 46, the lever 48 is operated to position the ballast spreader at the desired height and the lever is then secured against rotation by means of the chains 54. When the spreader is to be shifted from one hopper to another the lever 48 is released thus permitting the ballast spreader to be lowered so as to rest upon the rails. The pins 42 are then withdrawn thus releasing the pan section 4 from the end wall members 5. The spreader and the suspension bars 50 with their attached parts are then shifted to the desired positions and thereafter reconnected. It will be noted that any slack in the chains 44 and 46 which may occur when the ballast spreader is lowered to rest on the rails does not cause disengagement of the hooks 45 from the chains 46.

Each of the end wall members 5 is provided at its lower end with a discharge opening closed by a vertically sliding door 56. These doors may be actuated by any suitable means, but each is preferably controlled by an operating lever 57 projecting beyond the opposite sides of the device as well shown in Fig. 1. Each lever 57 is operatively connected to the corresponding door by a link 58 pivotally connected at 59 to the lever and pivoted to the door at 60. To form fulcrum points for the levers 57 the end face of each of the columns or posts 43 is provided with spaced outwardly projecting pins or studs 61 and each lever 57 is provided with suitable holes 62 for receiving said studs. By this means, as will be appreciated from an inspection of Fig. 4, the lever 57 when inserted upon an appropriate fulcrum stud may be operated from either of its ends as may be most convenient; and it will also be appreciated that the doors 56 may, as desired, be sustained in open position by causing studs 61 to project through both of the openings 62 with which each lever is provided.

Each of the end wall members 5 is preferably provided at its sides with inwardly projecting flanges or baffle plates 63 which preferably are wider at the bottom than at the top. These members may advantageously be

embodied in the construction as they serve to prevent the accidental escape to the roadbed of any ballast which may be discharged into the pan at points closely adjacent the end wall members 5.

I claim:—

1. In combination, a railway car having an opening for the discharge of ballast or the like, and a ballast spreading device adapted to receive ballast discharged through said opening and deliver it to the roadbed, said device including a pan member having an opening in the bottom thereof, and a sliding door for said opening, said door being curved at its ends so as to permit it to shift its angular position in its plane of operation.

2. In combination, a railway car having an opening for the discharge of ballast or the like, and a ballast spreading device adapted to receive ballast discharged through said opening and deliver it to the roadbed, said device including a pan member formed with a floor plate having a plurality of openings therein for permitting delivery of ballast to the roadbed, and door means for controlling the discharge of ballast through the openings in the floor plate, said door means comprising an operating bar and a plurality of door sections connected to said bar, each of said door sections being provided with rounded ends to permit it to assume different angular positions.

3. In combination, a railway car having an opening for the discharge of ballast or the like, and a ballast spreading device adapted to receive ballast discharged through said opening and deliver it to the roadbed, said device including a pan member, and end wall members secured to said pan member at opposite ends of the latter, each of said end wall members being provided with a door for controlling the discharge of ballast endwise of the device and having at its opposite sides inwardly extending baffle plates.

4. In combination, a railway car having an opening for the discharge of ballast or the like, a ballast spreading device adapted to receive ballast discharged through said opening and deliver it to the roadbed, and means for adjustably suspending said device from the car, said means including a lever operatively connected to said device.

5. In combination, a railway car having an opening for the discharge of ballast or the like, a ballast spreading device adapted to receive ballast discharged through said opening and deliver it to the roadbed, and means for suspending said device from the car, said means including a bar adapted to be supported by a portion of the car, a lever pivotally connected to said bar, and means connecting said lever with the ballast spreading device.

6. In combination, a railway car having an opening for the discharge of ballast or the like, a ballast spreading device adapted to receive ballast discharged through said opening and deliver it to the roadbed, and means for suspending said device beneath the car, said means including a suspension bar adapted to be supported by the car, a lever pivotally connected to said bar, a plurality of chain devices connecting said lever with the ballast spreading device, and means for preventing rotation of said lever when the device is in operative position.

7. In combination, a railway car having an opening for the discharge of ballast or the like, a ballast spreading device adapted to receive ballast discharged through said opening and deliver it to the roadbed, and means for adjustably supporting said device from the car, said means including a suspension bar having a hook adapted to extend over the upper edge of the car side, a lever pivotally connected to said bar, a plurality of chains connected to said lever and respectively connected to hooks carried by chains attached to the device, and means for preventing rotation of the lever when the device is in adjusted position.

8. A ballast spreading device adapted to extend transversely of the track beneath a railway car, said device including a pan member having in its bottom a plurality of openings permitting the discharge of ballast, doors for the respective openings, and operating bars for the respective doors, each of said bars being adapted to be operated from the end of the device and being provided with means for cooperating with a removable operating bar.

9. A ballast spreading device adapted to extend transversely of the track beneath a railway car, said device including a pan member having openings in the bottom thereof permitting the discharge of ballast to the roadbed, doors for said openings, and rollers positioned so as to be adapted to cooperate with the rails of the railway track.

10. In combination, a railway car having an opening for the discharge of ballast or the like, and a ballast spreading device adapted to receive ballast discharged through said openings and deliver it to the roadbed, said device including a pan member having a floor plate and side walls, said floor plate having an opening permitting the discharge of ballast, a door for said last named opening, and an auxiliary side wall member adapted to be detachably connected to one of the side walls of the pan and to extend upwardly therefrom.

11. A ballast spreading device involving a pan member having a floor plate, side walls and end members, said side walls having portions extending below and spaced downwardly from the under side of the floor plate and constituting skids for the device.

12. A ballast spreading device including a pan member having a floor plate, side walls and end walls, and provided with transversely extending bars extending under the floor plate in spaced relation thereto, the lower ends of

the side walls being in substantially the same plane as the lower faces of said bars.

13. A ballast spreading device including a pan member having a floor plate formed with a plurality of openings permitting ballast to be discharged to the roadbed, doors for said openings, supporting plates for the doors spaced downwardly from said floor plate, and spacers interposed between said supporting plates and the floor plate.

14. In combination, a railway car having an opening for the discharge of ballast or the like, a ballast spreading device movable with and extending under the car transversely of the track on which the car is supported, said device being positioned in the path of ballast discharged from the car, means for controlling the discharge from said device of the ballast received from the car, and rollers carried by said device for cooperating with the rails of the track.

In testimony whereof I affix my signature.

BERNARD W. STRAW.