

No. 897,463.

PATENTED SEPT. 1, 1908.

H. T. HERR.  
DUMP CAR.

APPLICATION FILED MAY 4, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

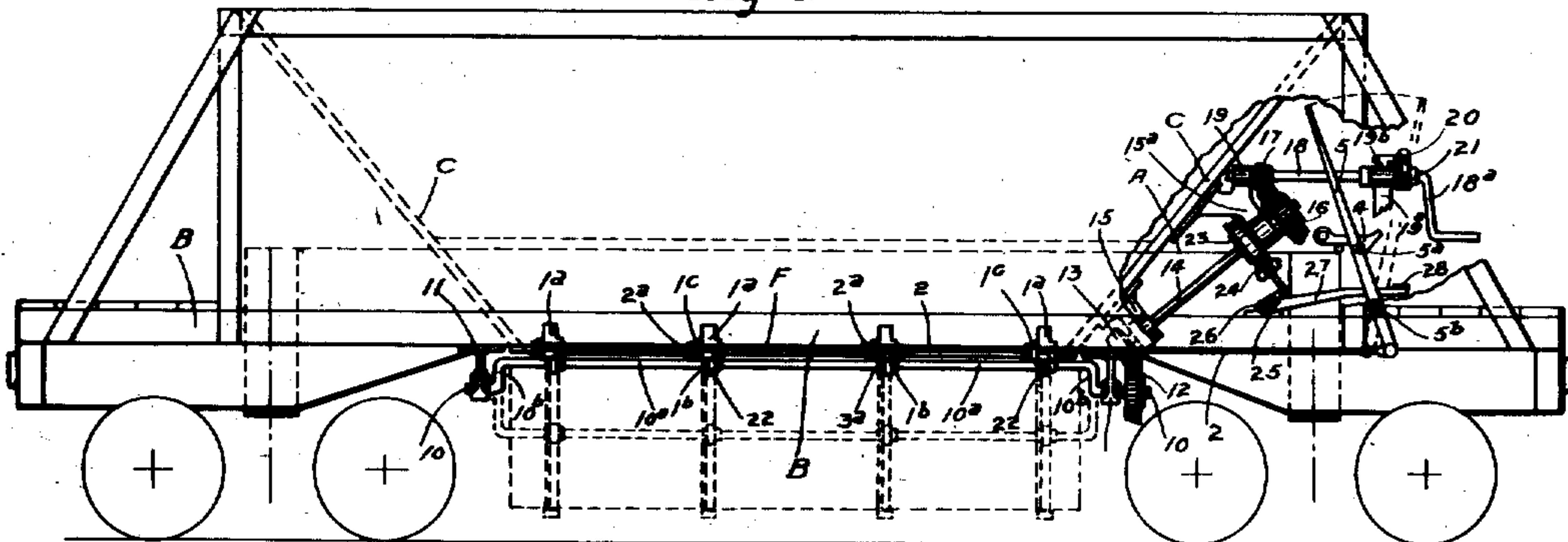


Fig. 2.

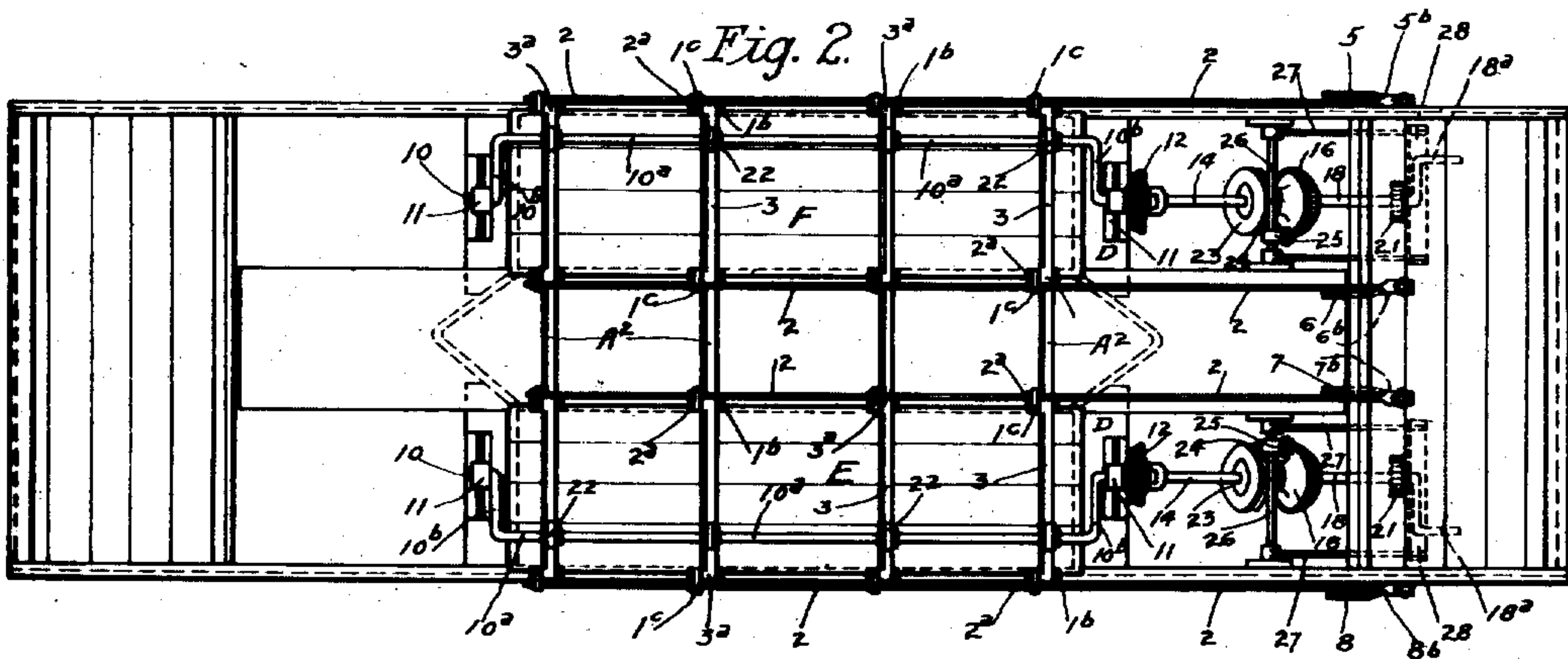


Fig. 3.

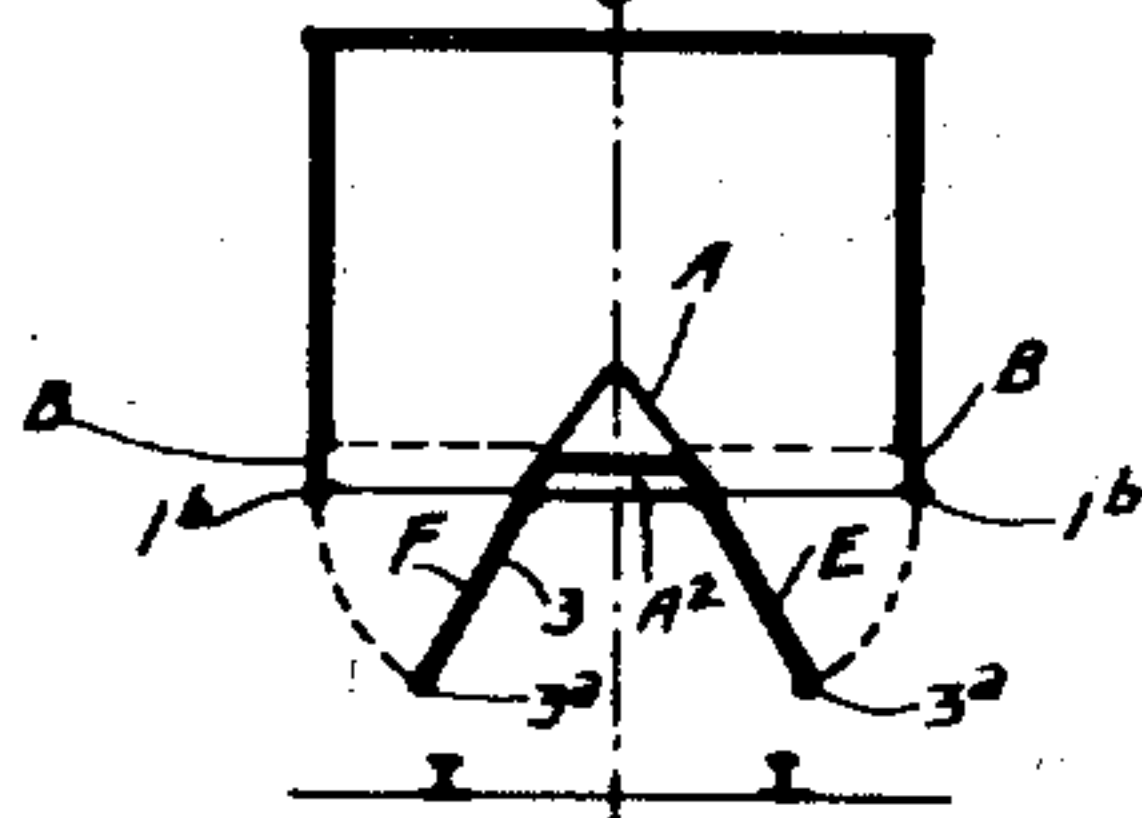


Fig. 4.

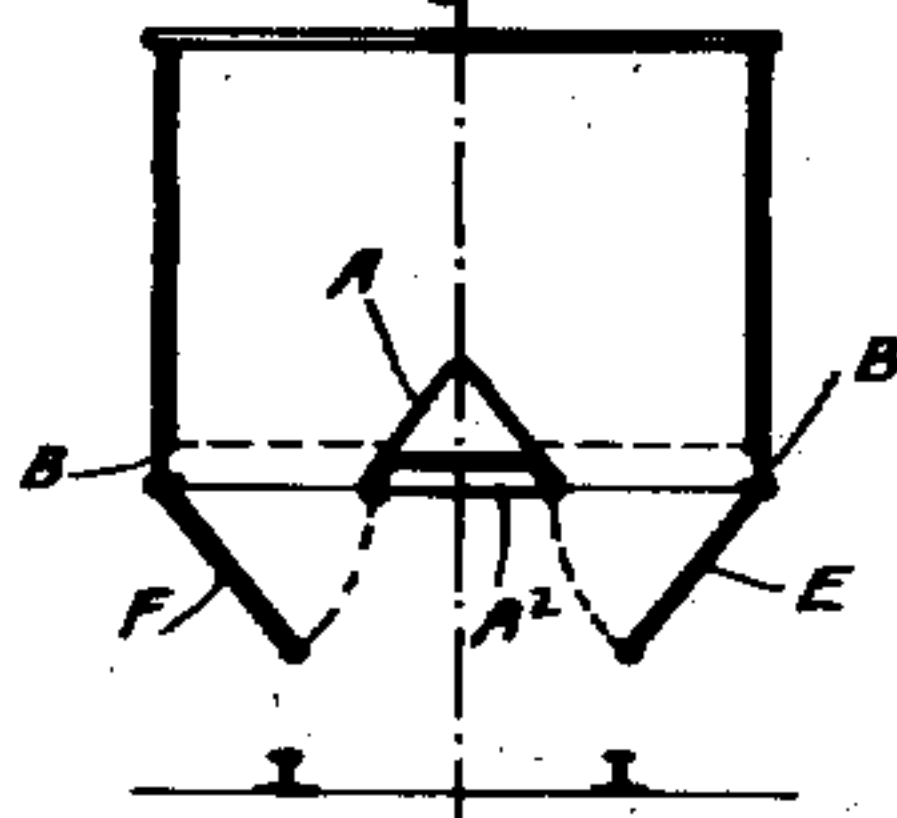


Fig. 5.

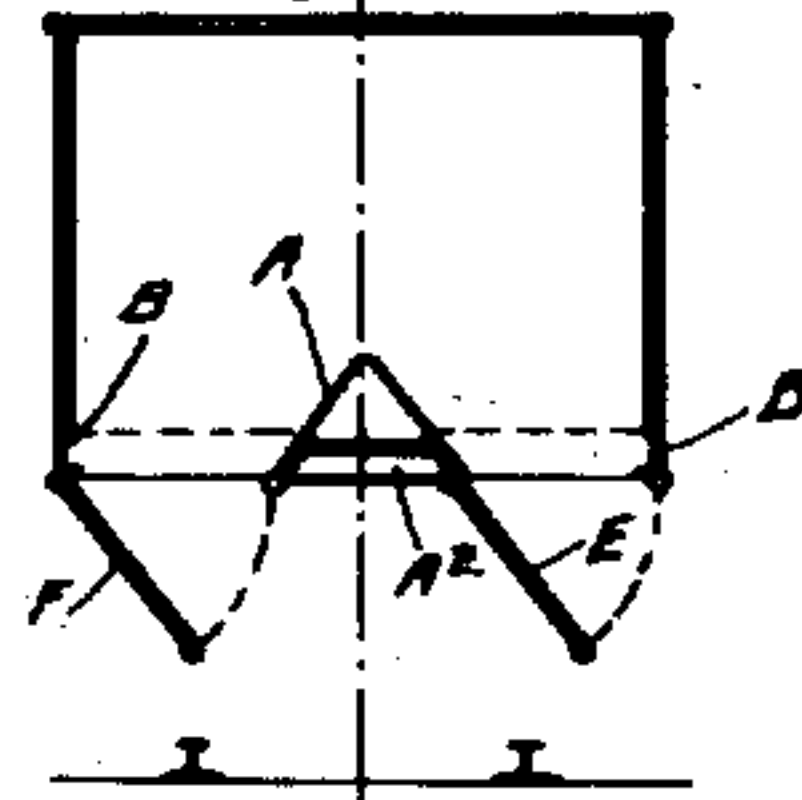


Fig. 6.

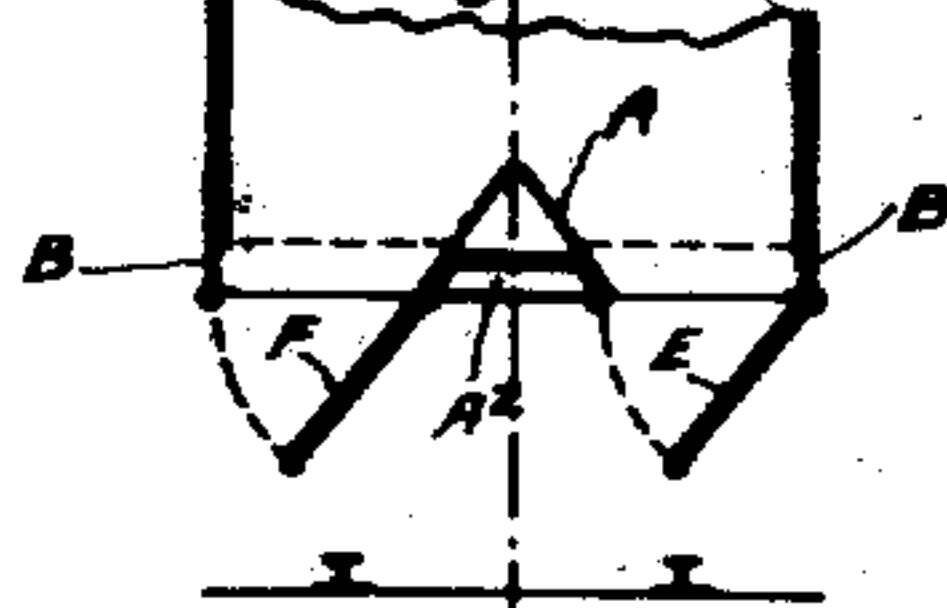


Fig. 6-A.

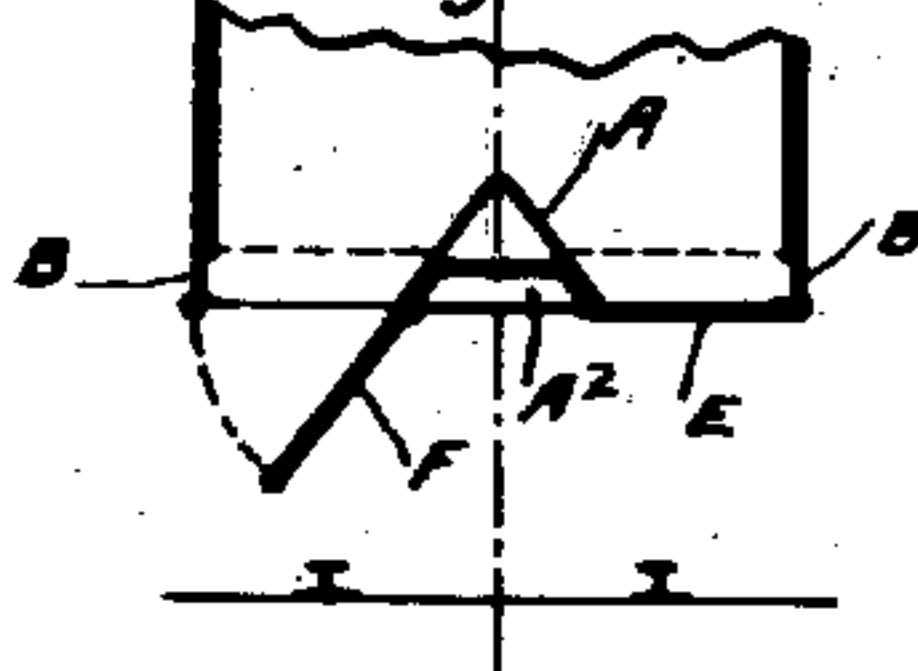
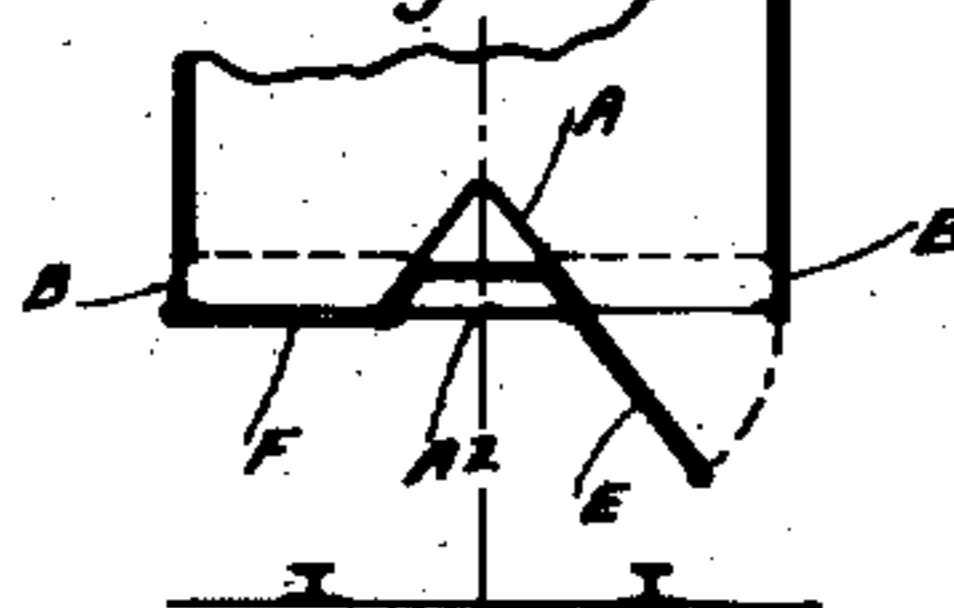


Fig. 6-B.



Witnesses  
*Arthur T. Herr*  
*A. H. Gorman*

Inventor  
Herbert T. Herr.  
*By A. H. Gorman*  
Attorney

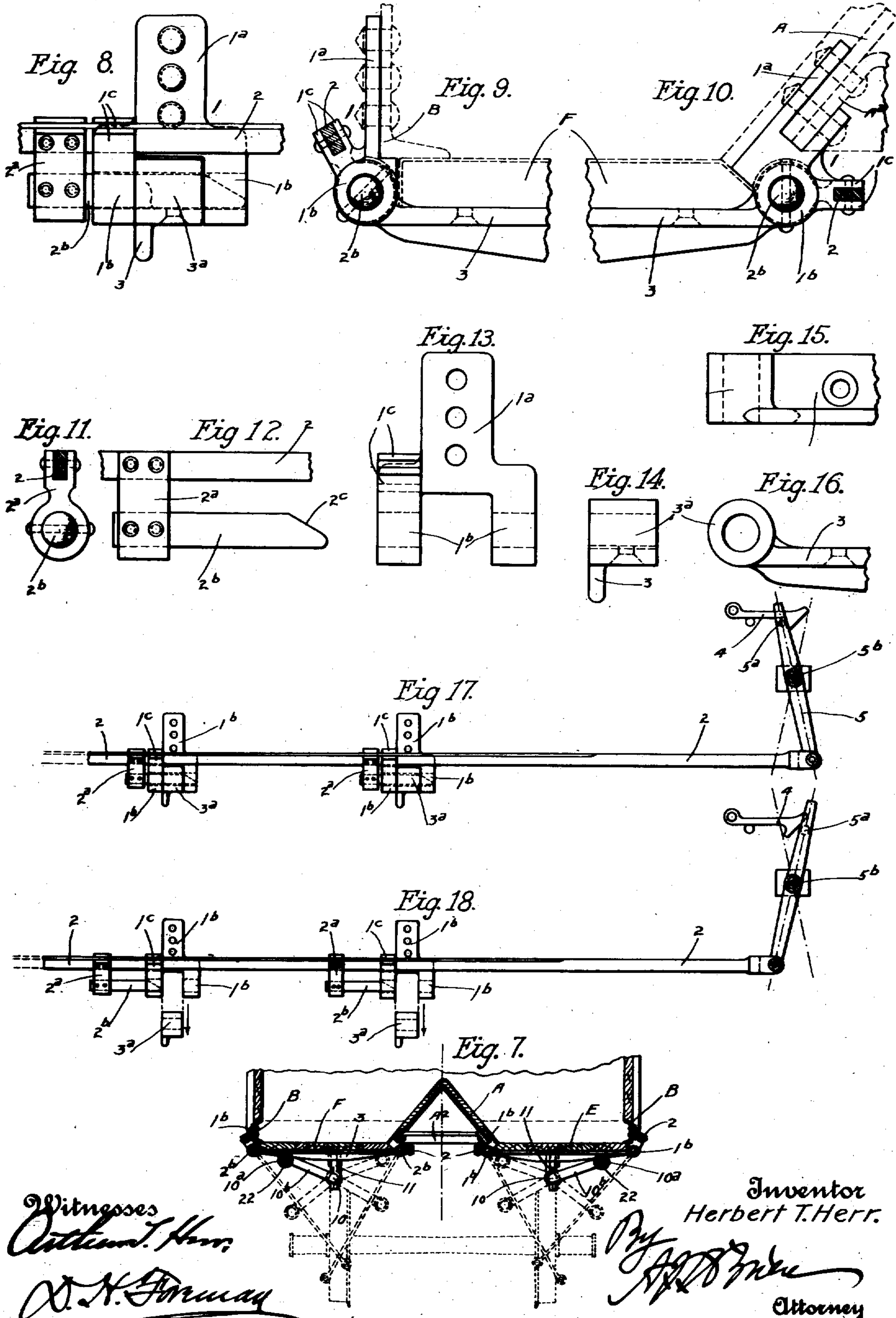
No. 897,463.

PATENTED SEPT. 1, 1908.

H. T. HERR.  
DUMP CAR.

APPLICATION FILED MAY 4, 1906.

2 SHEETS—SHEET 2.



Witnesses  
*Arthur T. Herr*  
*A. N. Forney*

Inventor  
Herbert T. Herr.  
*Herbert T. Herr*  
Attorney



# UNITED STATES PATENT OFFICE.

HERBERT T. HERR, OF DENVER, COLORADO, ASSIGNOR TO THE HERR DUMP CAR COMPANY,  
OF DENVER, COLORADO.

## DUMP-CAR.

No. 897,463.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed May 4, 1906. Serial No. 315,265.

*To all whom it may concern:*

Be it known that I, HERBERT T. HERR, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Dump-Cars; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in dumping cars, and is more particularly adapted to the constructive type of dump car body having a centrally disposed longitudinal truss beam or A frame, with end floors inclined downwardly, at a suitable angle from the ends, to the central portion of the car body; on to the bottom of which are secured two or more longitudinally hinged dumping or discharge doors.

A novel and important feature embodied in my invention, which I believe to be generically new, and a radical departure from existing details in this class of construction, is the means whereby I secure the discharge doors to the bottom of the car with a separable hinge-lock by the use of which I am enabled to release the discharge doors from either their inner or outer edges, while the engaged members upon the opposite side of the doors act as a hinge, around which the released doors swing, either inwardly or outwardly as the case may be. This arrangement enables me to discharge the entire load upon either side of the track, or between the rails of the track, or in part upon either side of the track, or in part between the rails of the track and upon either side of the track as conditions may require. The separable hinge-locking construction embodies a further novel and important feature, inasmuch as it will take up a limited amount of sag in the doors, liable to arise in practice, due to warping, etc., or to failure of the winding mechanism to carry the doors completely home, the locking pins being formed with a suitable sloped point to effect this movement. My construction further affords in either of these several dumping positions a maximum area of open dumping space enabling me thereby to discharge the entire

load very quickly, if so desired, entirely automatically, by gravity, requiring no hand shoveling of any portion of the load.

My invention comprises a winding mechanism whereby the released doors may be lifted and replaced in position, and properly secured by the hinge-locks for reloading the car. Considering the several positions into which the doors may be dropped, from any of which they can be replaced by this winding attachment, the construction is comparatively quite simple, efficient and durable.

My invention further comprises a foot-brake mechanism, mounted upon the winding mechanism whereby the operator is enabled to fully control the speed with which the loaded doors are permitted to drop, thereby avoiding the danger of damaging the construction from the impact of the heavily loaded doors, were they permitted to drop freely upon the parts. This foot-brake attachment also enables the operator to govern the distance to which the doors are permitted to open, and with an interlocking pawl and ratchet suitably mounted upon the winding mechanism, secure them in any partly opened position, when desired to particularly control the discharge of the material being dumped.

Additional details as to the construction and operative functions of my invention will be more fully hereinafter set forth.

Reference is to be had to the accompanying drawings forming a part of this specification in which:

Figure 1 is a reduced scale, outline, side elevation of the preferred type of a two-door dump car, showing in general outline my attached construction, the centrally disposed discharge doors being shown in the raised or closed position; the released or open position of the same being shown in broken lines. A portion of the side of the car at the operative end is broken away in this figure to more clearly show the arrangement of the separable hinge operating levers and winding or door raising mechanism of my invention. Fig. 2 is an inverted plan view corresponding with Fig. 1. Figs. 3, 4, 5, 6, 6<sup>a</sup> and 6<sup>b</sup> are reduced scale outline diagrams of a car body in cross-section through the discharge doors, illustrating the several positions into which the doors may be placed upon a car equipped with my improvement. Fig. 7 is an enlarged scale, cross-section of the car body, taken on



section line 7—7 of Fig. 1, viewed in the direction of the arrow, showing the central longitudinal truss beam and the side channel beams, the attached discharge doors, secured by the hinge-locks, upon their inner edges to the sides of the central truss beam, and upon their outer edges to the side channel beams and showing also a portion of the door raising crank shaft. Fig. 8 is a detail view in side elevation of one form of the hinge-lock, designed to be secured to the side channel of the car body, being shown in engagement with the end of a door-beam hinge. Fig. 9 corresponds with Fig. 8, showing the hinge-lock in end elevation and a part of the door-beam hinge in side elevation. Fig. 10 is a corresponding view of the door-beam hinge and hinge-lock designed to be secured to one side of the central truss beam. Fig. 11 is a detail end elevation, and Fig. 12 is a corresponding side elevation of one of the joint pins of the hinge-lock, with the connecting yoke piece, whereby the pin is secured to a section of the connecting bar as shown in Fig. 8. Fig. 13 is a detached detail view in front elevation of the hanger portion of the hinge-lock shown in Fig. 8. Figs. 14 and 16 are respectively, end and side elevations, and Fig. 15 a corresponding plan view, of an end of a door-beam hinge. Fig. 17 is a detail side elevation of a portion of the hinge lock operating lever and the connecting bar, carrying the joint pins, showing the hinge-locks in engagement with the door beam hinge. Fig. 18 is a corresponding view with the parts in position showing the door-beam hinge released.

Similar reference characters throughout the description indicate corresponding parts in the several figures.

In this present application I describe and illustrate, merely in a general way, a construction of dump car adapted to embody my invention referring specifically to only so much of the car body construction as is necessary to enable one skilled in the art, to fully and clearly comprehend the construction, application and coöperation of my invention.

Referring to the drawings, briefly stated, I provide in the car body construction a central longitudinal truss-beam, being in cross section an A-shaped plate member A, Fig. 7, the lower edges of which are transversely supported by a number of struts A<sup>2</sup> formed of angle bars which are secured to the sides thereof, on a transverse line with the door beam hanger locks as shown in Figs. 2 and 7, and side channel beams or car sills, B. B., sloping end floors C. C., Fig. 1, inclined downwardly at a suitable angle from the ends of the car body toward the central portion thereof, at the termination whereof are suitably disposed transverse beams D. D. Figs. 1 and 2, thus forming in the central bottom portion of a two-door car body between the

sides of the central truss-beam member and the adjacent respective side sills and cross-beam members two rectangular openings of suitable area. These openings are fitted with suitable discharge doors, E and F. Figs. 1, 2 and 7. It will be understood that I do not limit myself to this number of openings and doors, since under certain conditions a greater number of doors, with probably diminished areas of openings would be desirable. Referring to Fig. 7, I indicate in broken lines the several positions into which the doors may be dropped, also in broken lines the several corresponding positions from either of which the doors can be carried up to their respective closed positions by two longitudinally disposed crank shafts 10, 10.

In diagram Figs. 3 to 6<sup>b</sup>, Fig. 3 shows the doors set to discharge the load to the outer sides of the track; Fig. 4 to the inside of the track; Fig. 5 partly to the right hand side and partly between the track rails. Fig. 6 partly to the left hand side and partly between the track rails. Fig. 6<sup>a</sup> with the door F released, and the door E closed, Fig. 6<sup>b</sup> with the door E released and the door F closed; Figs. 1, 2 and 7, all doors in closed position.

I secure the doors to the car body by a suitable number of hinge-locks, 1, 1 shown in enlarged detail Figs. 8 to 16 inclusive, comprising the main hanger, secured by a flange portion 1<sup>a</sup> to the side channels B, B and the central truss beam A. Cast integrally with this flanged base and extending downwardly from the side thereof, are two longitudinally bored joint-pin lugs 1<sup>b</sup>, upon the top of one of which is formed a longitudinally slotted boss 1<sup>c</sup> which serves as a guide or carrier for a connecting bar 2, mounted upon which, adjacent the hinge-lock hanger is a yoke-piece 2<sup>a</sup> carrying a joint-pin 2<sup>b</sup>, designed to register with, and be engaged by the bored hanger lugs 1<sup>b</sup>.

The hinge lock shown in Fig. 10 is substantially a duplicate of that shown in Figs. 8 and 9 described above, excepting that on this the flanged base 1<sup>a</sup> and the bored joint-pin lugs 1<sup>b</sup> are disposed relatively at a slightly different angle, and the flanged part 1<sup>a</sup> is formed double or as a jaw-flange, designed to be secured to, and conform with the sloping sides of the central truss beam A. On to the under sides of the discharge doors E and F are secured a corresponding number of transversely disposed door beam hinges 3, 3, the ends of which, projecting slightly beyond the sides of the doors, are formed into joint-pin eyes, or hinge ends, 3<sup>a</sup>, 3<sup>a</sup> designed to register with the slotted spaces formed between the bored hanger-lugs 1<sup>b</sup>, 1<sup>b</sup> of the hinge-locks, in which position they are engaged by the coöperating joint-pins 2<sup>b</sup>, as shown in Figs. 8, 9, 10 and 17.

Referring to Fig. 12 it will be seen that the



end of the joint-pin  $2^b$  is tapered at a suitable angle  $2^\circ$  to permit of its taking-up to some extent, a sagging door hinge  $3^a$ , when the pins are thrust home, and engage the hinge end between the hanger lugs  $1^b$ , by moving the connecting bars, 2, 2, 2, 2. These bars are suitably disposed, one each adjoining the side sills B, B of the car, and two beneath the central truss beam A, each mounted in their respective hanger slots  $1^c$ , and carrying the several joint-pins  $2^b$  as shown in Figs. 2 and 7. The extreme end of each bar 2, 2, 2, 2 adjoining the operative end of the car is jointed, respectively, to vertically disposed operating levers 5, 6, 7 and 8 as shown in Figs. 1 and 2, each mounted on a suitable bearing  $5^b$ ,  $6^b$ ,  $7^b$ , or  $8^b$ . Upon the side of each lever, above the bearing is formed, respectively, a stud  $5^a$ ,  $6^a$ ,  $7^a$  or  $8^a$ , each of which is engaged by a self-acting retaining hook, 4, 4, 4, 4, as shown in Figs. 1, 17 and 18 positively securing the levers in the position corresponding with the normally engaged position of the joint pins  $2^b$ , thereby preventing the accidental disengagement of the joint pins, and release of the discharge doors.

The mechanism hereinbefore described comprises the entire construction required to retain two discharge doors in their closed positions, or to manipulate the attachments in a way to effect any of the several dumping positions shown.

It is important that the operator be enabled to release the doors without having to leave his position on the operative end of the car. I provide means whereby this can be done. To release the doors and discharge as shown in Fig. 3, which is outside dump, the operator disengages the locking pawls 20, 20 from the ratchets 21, 21 mounted on the winding crank shafts 18, 18, Figs. 1 and 2, hereinafter described, and the respective retaining hooks 4, 4, and moves the outer operating levers 5 and 8 from the position shown in Fig. 1, in full lines, to the position shown in broken lines, thereby withdrawing the respective joint-pins  $2^b$ , as shown in Fig. 18, releasing the corresponding door beam hinges  $3^a$  upon the outer sides of the doors. The pins and hinges upon the inner sides of the doors, remaining in engagement, as shown in Fig. 10, form the hinge joint around which the discharge doors swing, as shown in Fig. 3. From the above it will be readily comprehended how the several discharge positions may be effected, by moving the corresponding operating levers 5, 6, 7 or 8. It will also be seen that all doors can be entirely disengaged and conveniently moved aside, making all parts of the detail construction readily accessible to mechanics or car repairers, if necessary.

The mechanism for raising the released discharge doors, from any of the several

combined positions shown in Figs. 3 to  $6^b$ , into the closed, reloading position, as shown in Fig. 7, is provided in duplicate, each construction coöperating with its corresponding door, located upon either side of the central truss beam and inasmuch as the constructions are identical a description of either, will apply to both.

In a two-door car, as shown in Figs. 1 and 2, a longitudinal crank shaft 10, has formed thereon a crank  $10^a$ , slightly longer than the door. This crank shaft is mounted in hanger bearings 11, 11 which are secured beneath the car body adjacent the ends of the discharge door, substantially in a plane beneath the longitudinal center of the door, as shown in Fig. 7. Mounted upon the cranks are a number of antifriction rollers 22, 22 corresponding with the number of hinge beams secured upon each of the discharge doors, which in Figs. 1 and 2 is shown to be four, this is optional, however, as a greater number may be found necessary to meet the requirements of practice. The rollers are placed in position to register with the hinge beam irons against which they roll when the door is being raised by the crank, a separate rolling plate may be used if desired.

Referring to Figs. 1 and 2 it will be seen that the door swings freely between the crank arms  $10^b$  permitting the crank  $10^a$  to assume a position beneath the same when the door is dropped regardless of the position occupied by the crank prior to the releasing of the door, or whether the door be released from the inner or outer side. And it will also be seen that the door can be carried back to the closed position by rotating the crank in the corresponding required direction. It will also be observed that the crank forms a hanger or stop for the released door, assuming a position at right angles thereto with the weight and force exerted longitudinally through the crank arms  $10^b$ , thereby eliminating torsional forces upon the crank shaft, by the weighted door, which otherwise might tend to give the same a permanent "set."

In Figs. 1 and 2 are shown secured upon the end of the shaft 10 a bevel gear 12, which meshes with a bevel pinion 13 mounted upon the lower end of an upwardly inclined countershaft 14, which is suitably supported in bearings 15 and  $15^a$ , adjacent the operative end of the car, disposed, beneath and at an angle nearly parallel to the slope of the inclined end floor C. Upon the upper end of this counter-shaft 14 is secured a bevel gear wheel 16 which meshes with a bevel pinion 17, which is keyed upon the end of a short horizontal winding crank shaft 18, which forms a part of the crank winding or door-raising mechanism. This winding crankshaft is mounted and rotates freely in



bearings 19 and 19<sup>a</sup>, both suitably secured upon the operative end of the car body. Formed upon the upper side of the bearing 19<sup>a</sup> is a boss 19<sup>b</sup>, upon which is mounted a right and left locking pawl 20, designed to engage a ratchet 21, which is securely keyed upon the winding crank shaft 18, adjacent the hand-crank 18<sup>a</sup>.

The above described construction comprises the attachments adapted to secure, release and raise the discharge doors, providing for the opening of the doors to their maximum limit, permitting of the rapid discharge of the load, ordinarily desirable when dumping coal or ore into bins or chutes. In practice, however, it is frequently necessary that the opening of the discharge doors be controlled, particularly in the case of handling gravel or ballast along the line in road work, where it is desired to distribute the same from a moving car with the doors partly open. I accomplish this result by the use of a foot-brake construction.

Referring to Figs. 1 and 2, a band brake wheel 23, of the usual construction is secured upon the counter-shaft 14, from which the friction strap 24 is secured to a short crank arm 25 formed upon a transversely disposed rock-shaft 26, suitably mounted upon the car frame, upon the ends of which shaft are formed two foot-tread arms 27 which carry a transverse tread board 28, located adjacent the hand-crank, and accessible to the operator when operating either the inner or outer release levers. By applying the brake the dropping of the door can be controlled and brought to a stop in any part of the swing, by the engagement of the brake-retarded crank shaft 10<sup>a</sup>, beneath the door and when so stopped can be securely retained by interlocking the pawl 20 and ratchet 21, upon the winding crank shaft.

Referring to Figs. 3 and 7, it will be seen that to raise the released doors from the position shown in Fig. 3, which is outward discharge, the operator grasps the cooperating hand crank 18<sup>a</sup>, hanging downward as in Fig. 1, and rotates it outwardly, as indicated in broken lines in Fig. 2. In Fig. 4 which is inward dump, rotate the respective hand crank inwardly. In Fig. 5, the left side door F being inward dump, rotates the cooperating crank inwardly, the right side door E being outer dump, rotates the right side crank outwardly. Thus it will be seen that the direction of discharge is a guide to the required movement of the hand crank to return the door, consequently even though my construction embodies this plurality of dumping positions, confusion on the part of the operator in manipulating the parts is not likely to arise.

In view of the foregoing description a brief connected reference as to the operation of the mechanism, will be readily understood.

Let it be supposed that the operators wish to dump a load from the two door car, inwardly, as shown by diagram Fig. 4. Disengaging the pawls from the winding shaft ratchets, and the respective retaining hooks 4, 4 from the inner operating levers 6 and 7, these levers are drawn outwardly from the car to the extreme outward position as shown in broken lines in Fig. 1, disengaging the door hinges upon the inner sides, and permitting the doors to drop as shown in Fig. 4, discharging the load inwardly. The load having been discharged inwardly with the operating levers still in the outward position, corresponding with the released position of the hinge members, to return the open doors to the closed position, the operator proceeds to turn the hand crank 16<sup>a</sup>, inwardly, adjusting the pawl 20 accordingly in engagement with the ratchet 21 upon the winding crank shaft. When the empty doors have been carried up to the closed position, and retained by the pawl and ratchet, the operating levers are thrown inwardly, carrying the hinge-locking mechanism into positive engagement with the door beam hinges as has been shown, while the retaining hooks 4—4 automatically engage the respective lever studs 6<sup>a</sup> and 7<sup>a</sup>, securing the levers and cooperating door hinge construction in the closed door position.

Having thus described my invention, what I claim is:

1. In a dumping car, the combination with the car body, and a hinged dumping door, of means for locking the door in the closed position, said means including stationary hangers and movable members cooperating with the hangers, an operating rod supported and guided by the hangers and connected in operative relation with the movable locking members, and actuating means connected with the rod to release the movable locking members from or throw them into locking engagement with the door at will.

2. The combination with the car body provided with a dumping door, forming a part of its bottom, means for locking the door in the closed position including stationary hangers and movable locking members, the movable members being provided with means for imparting a limited degree of lifting movement when actuated to perform the locking function, to overcome any sagging tendency of the door, the latter being provided with members which are engaged by the locking means, an operating rod, a suitable connection between the rod and the movable locking members, the hangers being provided with supporting guides which the rod engages, and means for actuating the rod to perform the door-locking and door-releasing functions.

3. In a dumping car, the combination with the car body, of a bottom door extend-



ing lengthwise of the car and hinged at its opposite longitudinal edges, stationary hangers mounted on the car adjacent the hinged edges of the door, rods extending lengthwise of the car and supported and guided by the hangers, movable locking devices connected with the rods and cooperating with the hangers to lock the doors in the closed position, and means for operating the rods whereby the door may be released and locked at either of its hinged edges.

4. In a car, the combination of two doors arranged to close openings in the car bottom on opposite sides of its longitudinal center, the said doors being both hinged at their opposite longitudinal edges, hangers mounted on the car adjacent both hinged edges of both doors, movable locking devices cooperating with the hangers to lock the doors in the closed position, rods supported and guided by the hangers and connected in operative relation with the movable locking devices, and means for actuating the rods whereby the doors may be released or locked at either edge.

5. In a dumping car, a hinged door forming a part of the car bottom, a crank shaft for closing the door, an operating shaft, an inclined counter-shaft, a gearing connection between the counter-shaft and the two other shafts, a brake wheel on the counter-shaft, a rock shaft having a crank, a brake strap engaging the brake wheel and connected with the crank of the rock shaft, and means for operating the rock shaft for applying the brake.

6. In a dumping car, a hinged door form-

ing a part of the car bottom, a crank shaft for closing the door, an operating shaft, an inclined counter-shaft, a gearing connection between the counter-shaft and the two other shafts, a brake wheel on the counter shaft, a rock shaft having a crank, a brake strap engaging the brake wheel and connected with the crank of the rock shaft, and two foot tread arms attached to the rock shaft and provided with a connecting tread board.

7. In a dumping car, a hinged door forming a part of the car bottom, a crank shaft for closing the door, an operating shaft, a counter-shaft, a gearing connection between the counter-shaft and the two other shafts, a brake wheel on the counter-shaft, a rock shaft having a crank, a brake strap engaging the brake wheel and connected with the crank of the rock shaft, and means for operating the rock shaft for applying the brake.

8. In a dumping car, a hinged door forming a part of the car bottom, a crank shaft for closing the door, an operating shaft, a counter-shaft, a gearing connection between the counter-shaft and the two other shafts, a brake wheel on the counter-shaft, a rock shaft having a crank, a brake strap engaging the brake wheel and connected with the crank of the rock shaft, and two foot tread arms attached to the rock shaft and provided with a connecting tread board.

In testimony whereof I affix my signature in presence of two witnesses.

HERBERT T. HERR.

Witnesses:

A. J. O'BRIEN,  
DENA NELSON