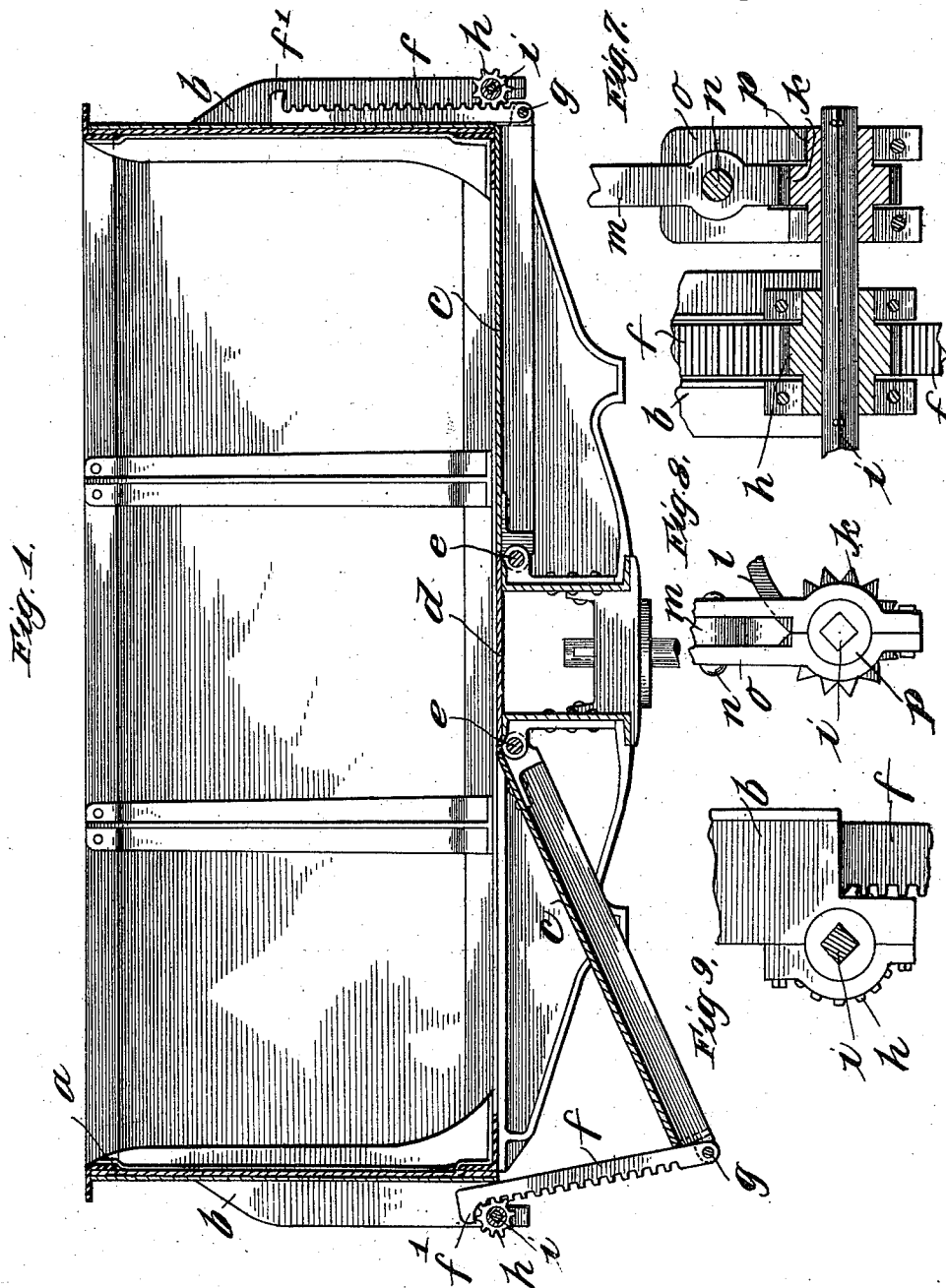


989,652.

Patented Apr. 18, 1911.

2 SHEETS—SHEET 1.



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APPLICATION FILED FEB. 24, 1908.

989,652.

Patented Apr. 18, 1911.

2 SHEETS-SHEET 2.

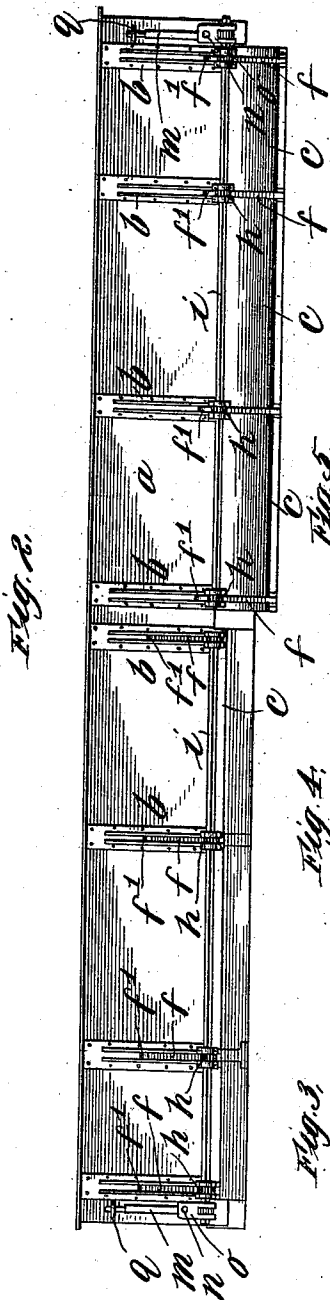


Fig. 2.

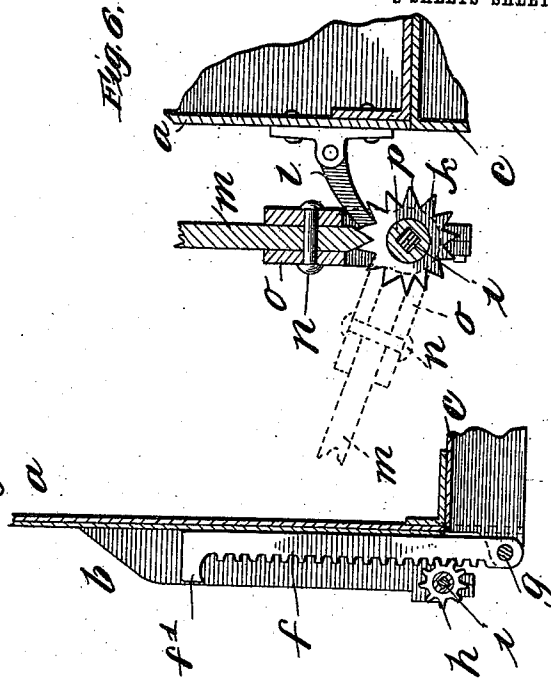


Fig. 3.

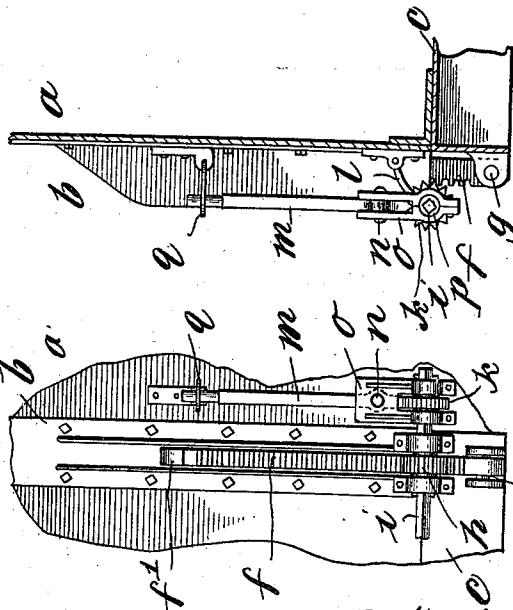
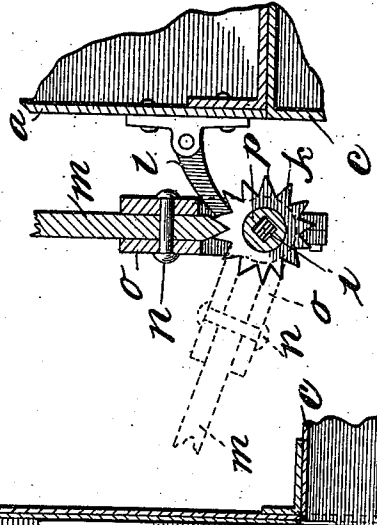


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

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VEHICLE.

989,652.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Application filed February 24, 1908. Serial No. 417,283.

To all whom it may concern:

Be it known that I, AUGUST E. SCHULTZ, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Vehicles, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to that class of vehicles having movable means whereby their loads may readily be discharged.

The invention finds a most important embodiment in railway dump cars, though I do not wish to be limited to the class of vehicles to which the invention is adapted, but inasmuch as the invention finds wide application to railway dump cars, the preferred form of the invention will be described as embodied in a railway car.

The body of the vehicle, or the car body, may be of any desired material suited to the load that the vehicle is to carry, and inasmuch as this forms no part of my invention I will not describe in detail any particular vehicle body. A bottom or floor portion of the vehicle or car body is mounted to tilt or swing, there being preferably provided for this swinging floor portion a stationary shaft about which the floor portion may swing. The floor of the car body may be divided into as many swinging sections as may be desired, the number of sections varying according to the size of the vehicle, the nature of the vehicle and the character of the load that the vehicle is to carry. I provide operating mechanism adapted to act upon a swinging floor portion to restore the floor portion to its load-holding position after a load has been discharged. I desirably so construct the operating mechanism that it may be sufficiently dissociated from the associate swinging floor portion to permit the load upon the floor portion to effect a downward swinging movement of the floor portion when the load is to be discharged, thereby eliminating the manual labor that would otherwise be entailed in lowering the floor portion.

In the preferred embodiment of the invention, the swinging floor portion has an

element of the actuating mechanism attached thereto at a place removed from the pivotal mounting shaft of the floor portion, while another element of the actuating mechanism is mounted upon the vehicle body, there being associated with the latter element of the actuating mechanism suitable lever mechanism for enabling the latter element to act upon the former to effect upward movement of the swinging floor portion. In the preferred embodiment of the invention, the element of the actuating mechanism that is thus provided upon the swinging floor section is in the form of a rack bar, while the second mentioned actuating element is in the form of a pinion adapted for engagement with the rack bar. This pinion is rotated by some suitable mechanism which may be brought into coöperative relation with the pinion when the floor portion is to be raised, and which may be brought out of association with the pinion when the load is to be permitted to effect a depression of the floor portion.

In present freight car construction, stakes or posts are usually employed for supporting the sides of the cars, certain of which stakes or posts I preferably make stationary and hollow, so that not only may they perform the function for which they were originally intended, but so that they may also act to house portions of the floor actuating mechanism, the pinions, in the embodiment of my invention that has been specifically mentioned, being disposed within the interiors of these stakes, while the rack bars are adapted to pass up and down the interiors of the stakes.

I will explain my invention more fully by reference to the accompanying drawings, showing one embodiment thereof as applied to railway dump cars, in which drawings—

Figure 1 is a sectional end view of a dump car. Fig. 2 is a side elevation of a dump car. Fig. 3 is a detail view in elevation, showing a portion of the operating mechanism as it appears upon the side of the car. Fig. 4 is a side view of the mechanism shown in Fig. 3. Fig. 5 is a view showing the interior of a stake and some of the actuating mechanism within the same. Fig. 6 is a view in elevation looking toward the end of

the car, parts being shown in section of the mechanism that may be dissociated from the operating pinion. Fig. 7 is a longitudinal sectional elevation of a portion of the pinion and rack construction and the lever mechanism having separate association with the pinion. Fig. 8 is a side view of the right-hand portion of the mechanism shown in Fig. 7. Fig. 9 is a side view of the rack and pinion mechanism shown in Fig. 7.

Like parts are indicated by similar characters of reference throughout the different figures.

I have selected for the purpose of illustrating my invention, a dump car made of sheet metal and in which the stakes are provided upon the exterior of the car body, but I do not wish to be limited to the employment of sheet metal for the construction of the car body, nor to the location of the stakes on the exterior of the car body, for other types of car bodies are well known to those skilled in the art.

Referring more particularly to Fig. 1, the car body *a* shown is one which is adapted for carrying such material as coal, stone, sand, gravel, cinders, or other material that can be properly loaded in an open car and which is adapted to be dumped from the car, but, as hitherto stated, I do not limit myself to the design of car body shown. I have illustrated stakes *b* upon the exterior of the car body, a number of each of which is preferably made of malleable iron, so as to afford hollow spaces therein for the reception of certain of the mechanism to be hereinafter described, though I do not wish to be limited to the location of parts of the operating mechanism within the hollow interiors of the stakes, but I prefer to locate parts of the operating mechanism within the hollow interiors of the supports for the purpose of protecting said parts from the weather and to enable the stakes to perform the double function of supporting the sides of the car body and that of housing the said parts of the operating mechanism. In the form of the invention shown, I provide a plurality of swinging floor portions *c c*, though I do not wish to be limited to the employment of the plurality of swinging floor portions. I desirably so construct the car that it may be unloaded from both sides, to which end I provide a swinging floor portion *c* upon each side of a center sill *d*, the adjacent ends of the floor portions *c* being desirably hinged to the center sill, the floor portions *c* forming, with the top portion of the center sill or flooring supported upon the center sill, the floor for the car body. Each swinging floor section employed in the car (one or more, as the case may be) is desirably provided with a pintle rod *e* mounted upon the sill *d* and affording a hinge mounting for

the associate swinging floor portion. I unite an actuating element *f* at a point sufficiently removed from the swinging mounting of the swinging floor portion to secure proper application of power to the swinging floor portion to effect its ready elevation to a horizontal position by manual effort. This element *f* is in the form of a bar which projects upwardly from its associate floor portion, which bar may enter the interior of an adjacent hollow stake *b* when the associate floor portion occupies its horizontal and load-holding position, said swinging floor portion being swingingly mounted at one edge and having its free edge extending longitudinally of the vehicle and adjacent to a side of the vehicle when said floor portion is shut, the aforesaid bar being attached to the swinging floor section in the neighborhood of said free edge.

In order to simplify the design of the car body and to permit of the proper movement of the bar *f*, said bar is preferably flexibly united with the floor portion *c*, as by means of a pivot *g*. The bar *f*, in the preferred embodiment of the invention, is a rack bar, the teeth thereof being adapted to be engaged by an operating pinion *h*. When the operating pinion *h* is rotated by manual effort, it will effect the elevation of the bar *f* and thereby the elevation of the contiguous floor portion. When the said pinion is released, the load upon the swinging floor portion will force the depression of the swinging floor portion, so that material may readily be discharged from the car. Any suitable means may be employed for limiting the extent to which the floor portion may be depressed by the load to be discharged therefrom. A suitable expedient for this purpose may reside in an enlargement of the upper end of the bar *f* into a nose *f'*, which by hanging over the associate pinion *h*, will engage with the pinion to limit the downward movement of the bar *f*, the side of the car *a* preventing the movement of the bar *f* away from said pinion.

I have now described the mounting of a swinging floor portion and two of the actuating elements, namely, the rack bar *f* and the pinion *h*, for effecting the elevation of the floor portion and permitting its depression. I will now describe the mechanism which I employ for effecting the manual operation of the pinion *h* for the purpose of elevating the associate floor portion.

The pinion *h* is fixedly secured upon an operating shaft *i*, an actuating ratchet wheel *k* being fixedly mounted upon the same shaft. A dog or holding pawl *l* is mounted upon the side of the car, and by engagement with teeth of the ratchet wheel *k*, serves to hold said ratchet wheel from rotation and thereby to hold the shaft *i* and the pinion *h*

from rotation, whereby the bar *f* is locked in place.

Assuming that the bar *f* is in its lower position and is to be raised, in order to raise the associate floor portion, the ratchet wheel *k* is rotated by means of the actuating lever *m* which has its inner end shaped to engage between the teeth of said ratchet wheel. A downward movement of the handle *n* will cause a rotation of the ratchet wheel *k*, the holding pawl *l* escaping the teeth of said ratchet wheel when it is thus rotated. The handle *m*, in order to be permitted to have another stroke, must be disengaged from the teeth of the ratchet wheel, to which end it is desirably pivoted at *n* to a split housing *o* that is adapted to rotate upon the hubs *p* of the ratchet wheel *k*, whereby the inner end of the handle *m* may be swung out of the plane of the teeth of the ratchet wheel, whereupon the handle *m* may be elevated and again swung into the plane of the ratchet wheel to have fresh engagement therewith, whereafter the ratchet wheel may be again rotated by the downward movement of the handle to effect further rotation of the shaft *i* and the pinion *h* fixed thereon.

It goes without saying that each step in the rotation of the pinion *h* effects an elevation of the bar *f*, the handle *m* being operated a sufficient number of times to effect a complete elevation of the bar *f* and the associate floor portion. Some suitable means is provided for holding the handle mechanism in its upright position, such as the loop *q* (Fig. 4).

When the load is to be discharged from the car, the handle *m* is swung out of the plane of the teeth of the ratchet wheel *k*, the holding pawl *l* having been released and pushed backward, whereupon the weight upon the associate floor portion *c* may effect the depression of said floor portion, the ratchet wheel *k*, the shaft *i* and the pinion *h* being unchecked in their rotary movement, because of the disengagement of the holding pawl and the handle *m* from the ratchet wheel *k*.

The housing *o* (Fig. 6) when held in an upright position by the handle *m* and the link *q*, serves to prevent the holding pawl *l* from leaving its engagement with the ratchet wheel *k*, so that the floor portion is absolutely retained in its horizontal position.

I have thus far described but one set of actuating elements *f*, *h*, *k*, *m*, etc., through the agency whereof a floor portion may be raised and which will permit the floor portion to be lowered. One rack bar *f*, one pinion *h* and parts immediately associated therewith would be sufficient to effect the elevation of a floor portion, but inasmuch as the rack bar should be so disposed as not

to interfere with the load of the car, I preferably provide two rack bars for each swinging portion, one upon each outside corner of the floor portion, and where this construction is adopted, the shaft *i* is made common to the two pinions *h* that would then be associated with each floor portion, whereby but one operating mechanism *k*, *m*, etc. may be required. Where there are a plurality of swinging floor portions upon the same side of a car, the shaft *i* may be made common to all of the pinions *h* associated with these floor portions. Very frequently the cars are so long as to make it undesirable to raise all of the floor portions upon one side of a car by the same lever mechanism, in which event I divide the swinging floor portions upon each side of the car into groups; for example, as indicated in Fig. 2, each group having an actuating mechanism common to the floor portions in each group.

Throughout the drawings the gears *h*, the rack bars *f* and the mechanism for operating the gears *h* are given similar characters of reference.

It will be seen that I have provided a vehicle having a swinging floor portion, actuating mechanism including a rack bar projecting upwardly from the floor portion, an operating pinion coöperating with said bar and mounted upon the vehicle body and adapted to move the bar to effect the elevation of the floor portion, a ratchet wheel rotating with the pinion, a holding pawl for maintaining the ratchet wheel and pinion in a position to which they have been rotated, and a hand-operated lever provided with a ratchet wheel-engaging pawl and mounted to rotate in a plane transverse to the plane of movement of the ratchet wheel, thereby having separable engagement with the ratchet wheel, whereby the ratchet wheel may be rotated by the lever, when engaged with the lever, and whereby the load in the vehicle may effect the depression of the floor portion when the holding pawl is released from engagement with the ratchet wheel and the lever is swung out of the plane of the teeth of the ratchet wheel.

While I have herein shown and particularly described the preferred embodiment of my invention, I do not wish to be limited thereto, as changes may readily be made without departing from the spirit, but,

Having thus described my invention, I claim as new and desire to secure by Letters Patent the following:—

1. A vehicle having a swinging floor portion, actuating mechanism including a bar projecting upwardly from the floor portion and having connection with the same at a substantially unchanging part of the floor portion, and an operating element coöperat-

ing with said bar and mounted upon the vehicle body and adapted to move the bar to effect the elevation of the floor portion, and manually operated mechanism for governing the operation of the actuating mechanism and separably associated therewith, whereby material carried in the vehicle may of its own weight effect a depression of the said floor portion, said swinging floor portion being swingingly mounted at one edge and having its free edge extending longitudinally of the vehicle and adjacent to a side of the vehicle when said floor portion is shut, the aforesaid bar being attached to the swinging floor section in the neighborhood of said free edge.

2. A vehicle having a swinging floor portion, actuating mechanism including a rack bar projecting upwardly from the floor portion and having connection with the same at a substantially unchanging part of the floor portion, and an operating pinion cooperating with said bar and mounted upon the vehicle body and adapted to move the bar to effect the elevation of the floor portion, and manually operated pawl mechanism for governing the operation of the actuating mechanism and separably associated therewith, whereby material carried in the vehicle may of its own weight effect a depression of the said floor portion, said swinging floor portion being swingingly mounted at one edge and having its free edge extending longitudinally of the vehicle and adjacent to a side of the vehicle when said floor portion is shut, the aforesaid bar being attached to the swinging floor section in the neighborhood of said free edge.

3. A vehicle having a swinging floor portion, actuating mechanism including a bar flexibly united with said floor portion and projecting upwardly from the floor portion and having connection with the same at a substantially unchanging part of the floor portion, and an operating element cooperating with said bar and mounted upon the vehicle body and adapted to move the bar to effect the elevation of the floor portion, and manually operated pawl mechanism for governing the operation of the actuating mechanism and separably associated therewith, whereby material carried in the vehicle may of its own weight effect a depression of the said floor portion.

4. A vehicle having a swinging floor portion, actuating mechanism including a rack bar flexibly united with said floor portion and projecting upwardly from the floor portion, and having connection with the same at a substantially unchanging part of the floor portion, and an operating pinion cooperating with said bar and mounted upon the vehicle body and adapted to move the bar to effect the elevation of the floor portion, and

manually operated pawl mechanism for governing the operation of the actuating mechanism and separably associated therewith, whereby material carried in the vehicle may of its own weight effect a depression of the said floor portion.

5. A vehicle having a swinging floor portion, actuating mechanism including a rack bar projecting upwardly from the floor portion and having connection with the same at a substantially unchanging part of the floor portion, and an operating pinion cooperating with said bar and mounted upon the vehicle body and adapted to move the bar to effect the elevation of the floor portion, a ratchet wheel rotating with the pinion, a holding pawl for maintaining the ratchet wheel and pinion in a position to which they have been rotated, and a hand lever carrying a pawl and thereby having separable engagement with the ratchet wheel, whereby the ratchet wheel may be rotated by the lever, when engaged with the lever, and whereby the load in the vehicle may effect the depression of the floor portion when the holding pawl is released from engagement with the ratchet wheel and the lever is swung out of the plane of the teeth of the ratchet wheel.

6. A vehicle having a swinging floor portion, actuating mechanism including a rack bar flexibly united with said floor portion and projecting upwardly from the floor portion and having connection with the same at a substantially unchanging part of the floor portion, and an operating pinion cooperating with said bar and mounted upon the vehicle body and adapted to move the bar to effect the elevation of the floor portion, a ratchet wheel rotating with the pinion, a holding pawl for maintaining the ratchet wheel and pinion in a position to which they have been rotated, and a hand lever carrying a pawl and thereby having separable engagement with the ratchet wheel, whereby the ratchet wheel may be rotated by the lever, when engaged with the lever, and whereby the load in the vehicle may effect the depression of the floor portion when the holding pawl is released from engagement with the ratchet wheel and the lever is swung out of the plane of the teeth of the ratchet wheel.

7. A vehicle having a swinging floor portion, actuating mechanism including a rack bar projecting upwardly from the floor portion, an operating pinion cooperating with said bar and mounted upon the vehicle body and adapted to move the bar to effect the elevation of the floor portion, a ratchet wheel rotating with the pinion, a holding pawl for maintaining the ratchet wheel and pinion in a position to which they have been rotated, and a hand-operated lever provided

with a ratchet wheel-engaging pawl and mounted to rotate in a plane transverse to the plane of movement of the ratchet wheel, thereby having separable engagement with the ratchet wheel, whereby the ratchet wheel may be rotated by the lever, when engaged with the lever, and whereby the load in the vehicle may effect the depression of the floor portion when the holding pawl is released from engagement with the ratchet wheel and the lever is swung out of the plane of the teeth of the ratchet wheel.

8. A vehicle having a swinging floor portion, actuating mechanism including a rack bar projecting upwardly from the floor portion, an operating pinion cooperating with said bar and mounted upon the vehicle body and adapted to move the bar to effect the elevation of the floor portion, a ratchet wheel rotating with the pinion, and a hand-operated lever provided with a ratchet wheel-engaging pawl and mounted to rotate in a plane transverse to the plane of movement of the ratchet wheel, thereby having separable engagement with the ratchet wheel, whereby the ratchet wheel may be rotated by the lever, when engaged with the lever, and whereby the load in the vehicle may effect the depression of the floor portion when the holding pawl is released from engagement with the ratchet wheel and the lever is swung out of the plane of the teeth of the ratchet wheel.

9. A vehicle having a swinging floor portion, a rack bar having pivotal connection therewith, which connection, in operation, is substantially fixed in location with respect to the rack bar and floor section, an operating pinion arranged adjacent to the side of the vehicle and adapted to engage the rack bar to actuate the same to lift the swinging floor portion, and retaining means for maintaining engagement between the rack bar and pinion, while at the same time permitting the lower end of the rack bar to swing inwardly while the floor portion is being lowered, said swinging floor portion being swingingly mounted at one edge and having its free edge extending longitudinally of the vehicle and adjacent to a side of the vehicle when said floor portion is shut, the aforesaid bar being attached to the swinging floor section in the neighborhood of said free edge.

10. A vehicle having a swinging floor portion, a bar having pivotal connection therewith, which connection, in operation, is substantially fixed in location with respect to the bar and floor section, an operating element arranged adjacent to the side of the vehicle and adapted to engage the bar to actuate the same to lift the swinging floor portion, said bar being in traveling engagement with said element and retaining means

for maintaining engagement between the bar and said operating element, while at the same time permitting the lower end of the bar to swing inwardly while the floor portion is being lowered, said swinging floor portion being swingingly mounted at one edge and having its free edge extending longitudinally of the vehicle and adjacent to a side of the vehicle when said floor portion is shut, the aforesaid bar being attached to the swinging floor section in the neighborhood of said free edge.

11. A vehicle having a swinging floor portion, a rack bar having flexible connection therewith, at a substantially unchanging part of the floor portion and an operating pinion arranged adjacent to the side of the vehicle and adapted to engage the rack bar to actuate the same to lift the swinging floor portion, said swinging floor portion being swingingly mounted at one edge and having its free edge extending longitudinally of the vehicle and adjacent to a side of the vehicle when said floor portion is shut, the aforesaid bar being attached to the swinging floor section in the neighborhood of said free edge.

12. A vehicle having a swinging floor portion, a bar having flexible connection therewith, at a substantially unchanging part of the floor portion and an operating element arranged adjacent to the side of the vehicle and adapted to engage the bar to actuate the same to lift the swinging floor portion, said bar being in traveling engagement with said element, said swinging floor portion being swingingly mounted at one edge and having its free edge extending longitudinally of the vehicle and adjacent to a side of the vehicle when said floor portion is shut, the aforesaid bar being attached to the swinging floor section in the neighborhood of said free edge.

13. A vehicle having a swinging floor portion, a rack bar having connection therewith, and an operating pinion adapted to be in mesh with the rack bar and arranged adjacent to the side of the vehicle and adapted by its rotation to cause the rack bar to travel and thereby lift the swinging floor section, said swinging floor portion being swingingly mounted at one edge and having its free edge extending longitudinally of the vehicle and adjacent to a side of the vehicle when said floor portion is shut, the aforesaid bar being attached to the swinging floor section in the neighborhood of said free edge.

14. A vehicle having a swinging floor portion, a bar having connection therewith, and an operating element in shifting engagement with the bar and arranged adjacent to the side of the vehicle and adapted by its operation to cause the bar to travel and thereby lift the swinging floor section, said swinging floor portion being swingingly mounted at

one edge and having its free edge extending longitudinally of the vehicle and adjacent to a side of the vehicle when said floor portion is shut, the aforesaid bar being attached to
5 the swinging floor section in the neighborhood of said free edge.

In witness whereof, I hereunto subscribe

my name this 21st day of February A. D., 1908.

AUGUST E. SCHULTZ.

Witnesses:

L. G. STROH,
G. L. CRAGG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
