

(No Model.)

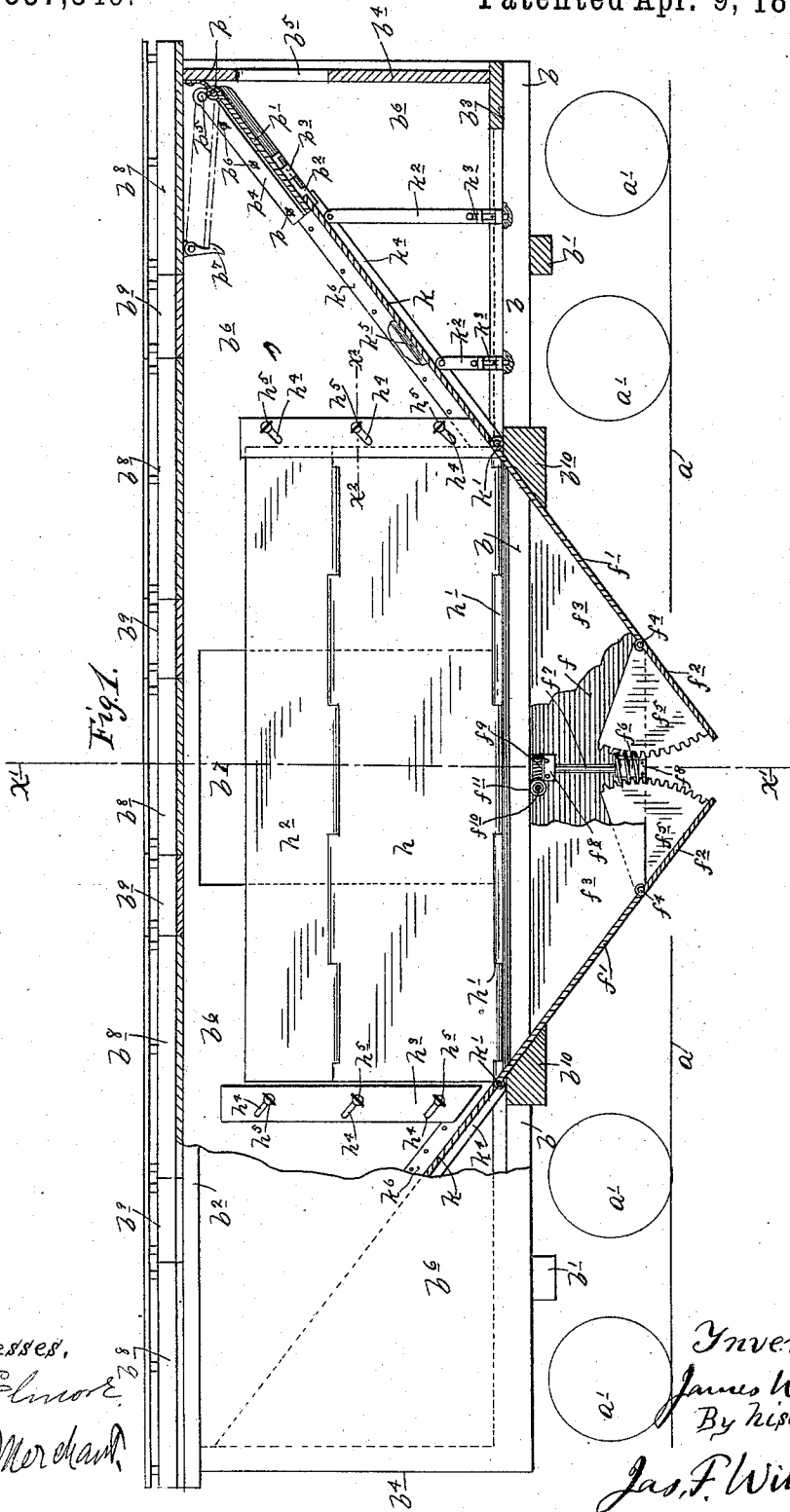
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J. W. MORSE.

SELF DISCHARGING AND CONVERTIBLE FREIGHT CAR.

No. 537,349.

Patented Apr. 9, 1895.



Witnesses,
E. F. Elmore
Frank D. Merchant

Inventor,
James W. Morse
By his attorney,
Jas. F. Williamson

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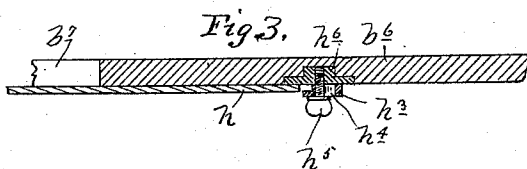
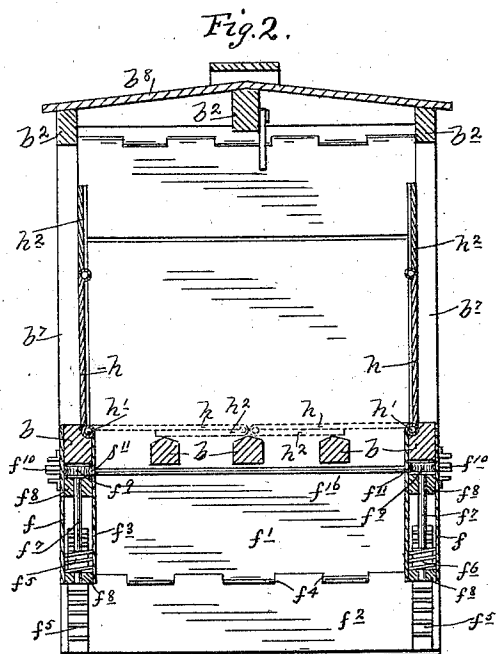
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Frank D. Moreland.

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James W. Morse
By his Attorney,
Jas. F. Williamson

UNITED STATES PATENT OFFICE.

JAMES W. MORSE, OF MINNEAPOLIS, MINNESOTA.

SELF-DISCHARGING AND CONVERTIBLE FREIGHT-CAR.

SPECIFICATION forming part of Letters Patent No. 537,349, dated April 9, 1895.

Application filed March 29, 1894. Serial No. 505,541. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. MORSE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Self-Discharging and Convertible Freight-Cars; and I do hereby 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.

My invention relates to freight cars; and has for its object to provide an improved construction for rendering the car self discharging, and for converting an ordinary box-car from the rectangular to hopper-like form, or vice-versa, whereby the same car-body may be interchangeably used in either of the two forms, according to the character of merchandise with which the car is to be loaded.

My present invention is in the same line as the construction described in a companion case (A) filed by me of even date herewith, wherein generic claims will be found, covering in a broad point of view, a number of the features herein shown. The present case is distinguished from the companion case, however, by a number of important features of construction, which will be found hereinafter fully described and defined in the claims.

A care embodying my invention is illustrated in the accompanying drawings, wherein like letters refer to like parts throughout the several views.

Figure 1 is a view, partly in side elevation and partly in section, with some parts in diagram lines and others broken away, showing my improved convertible car. Fig. 2 is a vertical cross section, on the line X' X' of Fig. 1, looking from the left toward the right with the central shifting floor sections shown in full lines turned up into position, for serving as grain-doors, and shown in their lowered or floor serving positions in dotted lines; and Fig. 3 is a detail in cross section, on the line X² X² of Fig. 1, showing the relation of the bars which co-operate with the end margins of the side pivoted floor sections, when turned up, to hold the same in their grain-door positions, with a grain-tight joint.

The track-rail lines are indicated at *a*, and the car-wheels at *a'*, in Fig. 1.

With the exceptions hereinafter noted, the car-body may be of the well-known standard construction, involving the longitudinal floor timbers *b*, car-body bolsters *b'*, top girders *b²*, fixed floor sections *b³*, end walls *b⁴* with end openings *b⁵*, side walls *b⁶* with side door openings *b⁷*, and the top deck *b⁸*.

Under the center of the car-body, I place a discharge hopper composed of metallic side-plates *f*, sectional convergent metallic end-plates *f'* *f²*, sheath forming plates *f³*, pivots *f⁴* connecting the sections *f'* and *f²*, sector-gears *f⁵*, worms *f⁶* engaging said sectors and carried by worm-shafts *f⁷*, journaled in bearings *f⁸*, worm-gears *f⁹* on the upper end of said shafts *f⁷*, and transverse shaft *f¹⁰*, provided with worms *f¹¹* engaging said worm-gears *f⁹*. The pivoted sections *f²* constitute discharge gates and the sector gears and worm-shafts a power device, for controlling said gates and holding the same in any desired position. When closed, said gates form the bottom of the discharge hopper; and, when open, form downward extensions of the convergent inclined walls of the hopper reaching to a point below the track-level, for delivering the grain or other materials into a pit below the track. The transverse shaft *f¹⁰* extends to the exterior of the car and has angular ends, for the application of a wrench or crank handle, for operating the gates from either side of the car.

The top of the car is provided with removable trap-doors *b⁹*, suitably spaced apart, which adapts the car to be loaded from the top, when using the same for self discharging materials.

All the parts so far described, are substantially like those shown and described in the above identified companion case.

Turning now to the modified construction, for converting the car-body from rectangular to hopper-like form, or vice-versa, it will be seen at a glance, on the drawings, that I provide shifting parts certain of which are adapted to form upward extensions of the side walls of the discharge hopper and others of which are adapted to form upward extensions of the inclined or convergent end walls of the hopper. Of these shifting parts, the principal pieces are adapted when in their lowermost position, to co-operate with the short

fixed floor sections b^3 , to make up the floor of the car-body.

More specifically stated, the part of the car floor spanning the discharge hopper, is longitudinally divided or made up of two sections h , which are pivoted to the main frame, at their side margins, as shown at h' , which, when in their lowermost or turned down position, are adapted to cover the discharge hopper, as shown in dotted lines in Fig. 2, and which when turned up form upward extensions of the side walls of the hopper, which serve as grain-doors, to close the openings b^7 , in the sides of the car, up to the grain level. As one half the cross section of the floor would not be sufficient to afford a grain door of the requisite height for light grains, the sections h have pivoted thereto underfolding leaves h^2 , which underlie the sections h , when in their floor forming position, and which are adapted when turned up, into their grain-door forming positions, to constitute upward extensions to the main sections h , for giving a grain-door of the desired maximum height, as clearly shown in Figs. 1 and 2. When the said sections h^2 are in their upturned or grain-door forming positions, they are held with a grain-tight joint by angular or otherwise suitable formed vertical bars h^3 , which are adjustable laterally and downwardly on the side walls of the car, by means of inclined slots h^4 in said bars, and thumb-screws h^5 working through the said slots and engaging with suitable nuts h^6 , fixed to the car-body. By loosening the said screws h^5 , the said bars h^3 are adjustable away from the vertical end margins of the sections h h^2 into the position shown at the left in Fig. 1, for releasing the said sections, or from the position shown at the left into the position shown at the right in Fig. 1, for locking said sections h h^2 , in their upturned or grain-door positions with a grain-tight joint.

The intermediate floor sections k , which fill the space between the fixed sections b^3 and the side pivoted central sections h , when all the parts are in their floor forming positions, are pivoted to the upper ends of the hopper sections f' , as shown at k' , by hinge-lugs of a form which will constitute a grain-tight joint. Hence, the said floor sections k may be turned up on the pivots k' into the position shown in Fig. 1, for forming upward extensions of the inclined end walls of the hopper, where they may be held by braces k^2 , pivoted to the undersides thereof, which are adapted to assume vertical positions with their lower ends resting upon the floor-sills b and locked thereto against lateral displacement by sliding catches k^3 , or in any other suitable way. When the said floor sections k are in their lowermost position, the pivoted braces k^2 will fold under the same between the strengthening flanges k^4 , fixed to the under side of said floor sections, and be held up in their folded position, by the sill timbers b , against which the ribs k^4 and the said braces will rest.

The floor sections k are not of sufficient

length to extend the inclined walls of the hopper to a junction with the end walls b^4 of the car body, near the union of the same with the top wall or deck. Hence, at or near the junction of the end walls with the top wall of the car, I pivotally attach, by a strong hinge p , additional hopper-wall sections p' , which are adapted to swing inward and form a junction with the sections k , for filling the intervening space and extending the inclined or convergent end walls of the hopper to a junction with the car-body at the upper end angles of the same, as shown in Fig. 1. When in this position, the sections k and p' may be locked together by the overlapping of the lower margin of the section p' , with the upper margin of the section k , and co-operating slide-bolts p^2 , carried by keepers p^3 fixed to the upper section p' , the lower ends of which bolts engage under the upper margin of the section k . With this construction, the section p' must be raised to a position above its hopper forming line, before the section k is turned up into its hopper forming position; and, on then lowering the section p' , the junction may be formed and the parts interlocked by shifting the position of the sliding bolts p^2 . The floor sections k and the pivoted hopper sections p' have upturned flanges k^5 , co-operating with flange joint strips k^6 and p^4 , of which strips, the member k^6 is fixed, and the member p^4 pivoted as shown at p^5 , which flanges and joint strip constitute grain-tight joints between the side walls of the car and said sections k and p' . The pivoted joint strip p^4 is held down in its joint forming position by thumb screws p^6 carried by the strip and engageable with fixed nuts in the side wall of the car, not herein shown, but which may be exactly like those shown in my companion case, or in any other suitable form.

When permitted to swing to its lowermost or vertical position, the section p' will close the opening b^5 in the end of the car; but the said sections p' may be held up in their uppermost position, out of the way, together with the pivoted joint strips b^4 , by hooks p^7 , depending from the top of the car and engaging under the lower edge of said section, or in any other suitable engaging part thereon.

The floor framing of the car-body is reinforced at the junction with the hopper sections f' , by transverse filling blocks or timbers b^{10} , secured between or to the longitudinal floor-sills b .

The action is obvious from the description stated. When the said shifting floor sections are down, in their lowermost position, the car-body will have a continuous floor and be of rectangular form in cross section, capable of use like an ordinary box-car. When the said shifting floor sections are turned up into their hopper forming positions, and the sections p' are swung out, into their hopper forming position, the interior of the car will be converted into hopper-like form, adapting the same for carrying grain or other self discharge-

ing material. Hence, when the car is taken to its unloading position and the gates are opened, the grain or other material will discharge itself therefrom, under the action of gravity.

It is obvious, that this form of convertible construction for the car-body has some advantages, over the form shown in my companion case, the chief of which is the provision of the side pivoted central floor sections, adapted when turned up to serve as grain-doors.

It must be obvious that the floor might be stationary from the junction with the central sections h outward to the end of the car, and that the pivoted hopper sections p' might be of a length which when lowered, would enable them to form a junction with the upper ends of the hopper sections f' and make the same constitute the whole instead of a part of the upward extension of the said inclined or convergent end walls of the hopper.

It will be understood, of course, that many of the details might be changed, without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a car-body, the combination with a hopper-like discharge section extending below the floor level, of a pair of side pivoted floor sections provided each with a folding leaf, which floor sections are adapted, when down, to cover said discharge section, and when turned up, to form grain doors of a height greater than one half the cross section of the car-floor, substantially as described.

2. In a car-body, the combination with a hopper-like discharge section extending below the floor level, of a pair of side pivoted floor sections adapted, when down, to cover said discharge sections, and, when up, to form grain doors, and combined lock bars and joint strips secured to the car-body and engageable with the vertical margins of said pivoted floor sections, to lock the same in their grain door position and form a grain tight joint, therewith, substantially as described.

3. In a car-body, the combination with the pivoted floor sections h of the flanged bars h^3 having the slot and screw connection $h^4 h^5$ with the side walls of the car, and adjustable into and out of engagement with the end margins of said floor sections, when in their upright positions, substantially as and for the purposes set forth.

4. In a car-body, the combination with a central hopper-like discharge section below the floor level, of the pivoted floor sections adapted to form upward extensions of the inclined end walls of said hopper, and pivoted or folding braces, carried by said pivoted floor sections adapted to support the same from the car sills, when in their hopper forming position, substantially as described.

5. In a car-body, the combination with a central hopper-like discharge section below the floor level, of pivoted floor sections adapted to be turned up and form upward extensions of the inclined end walls of said hopper, and hopper wall sections pivoted to the car-body adapted to form a junction with said pivoted floor sections, for extending the end walls of the hopper to a union with the end walls of the car, substantially as described.

6. In a car-body, the combination with a central hopper-like discharge section extending below the floor level, of the central side pivoted floor sections adapted, when down, to cover said discharge sections, and when up, to form grain doors, the adjacent end pivoted floor sections, adapted, when turned up, to form upward extensions of the inclined walls of said hopper, and the top pivoted hopper wall sections adapted to form a junction with said end pivoted floor sections, and extend the hopper walls to the top of the car, all substantially as described.

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

JAMES W. MORSE.

Witnesses:

JAS. F. WILLIAMSON,
EMMA F. ELMORE.