(No Model.) 3 Sheets—Sheet 1.

G. D. BENJAMIN.

Freight Car.

No. 238,555. Patented March 8, 1881.

Fig. 1

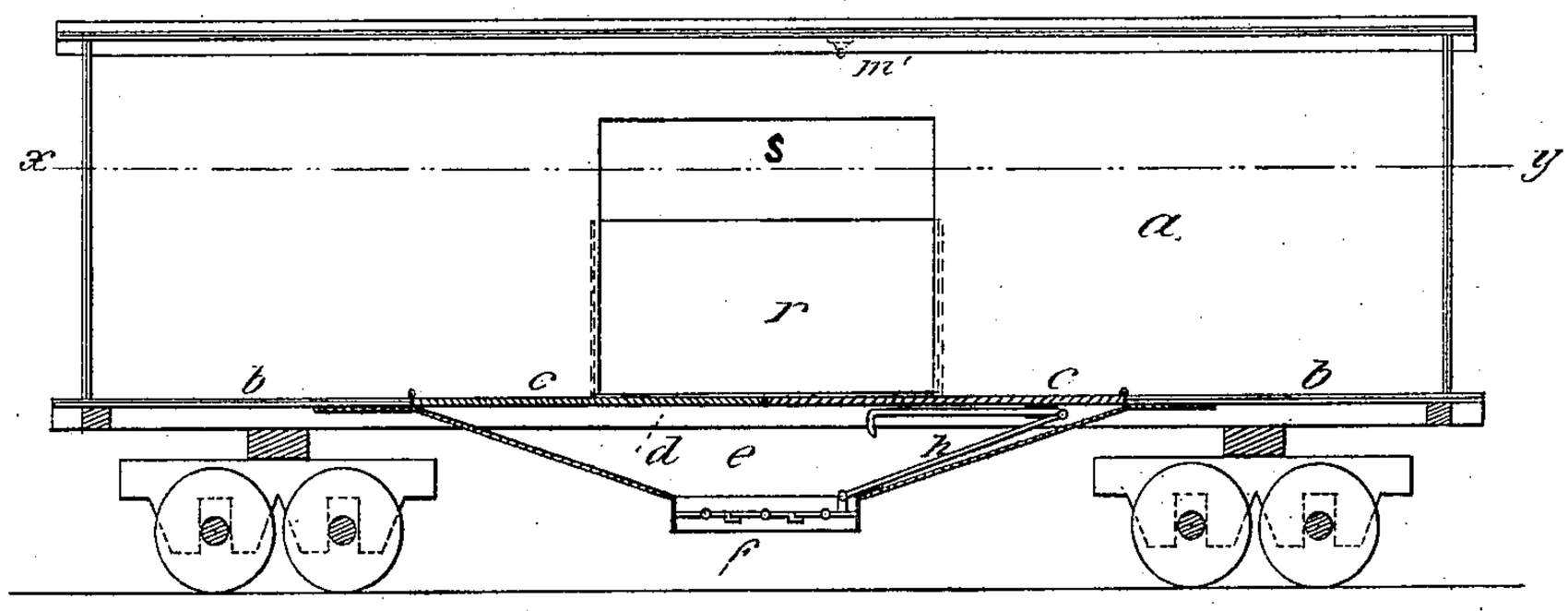
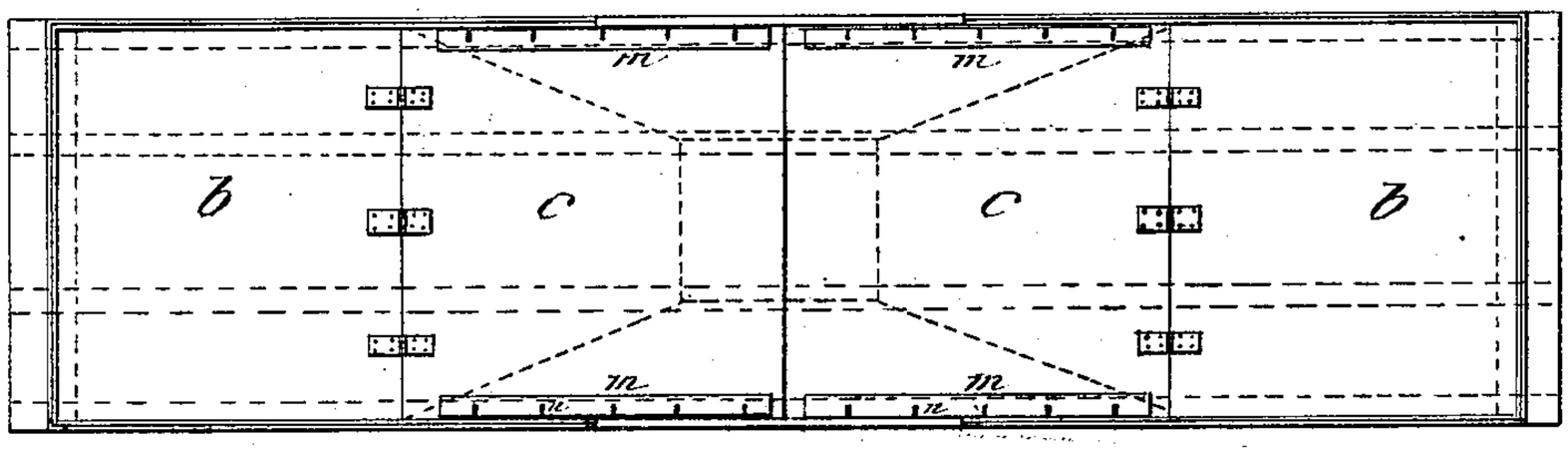


Fig. 2



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(No Model.) 3 Sheets—Sheet 2.

G. D. BENJAMIN.

Freight Car.

No. 238,555. **Patented March 8, 1881.**

Fig. 3.

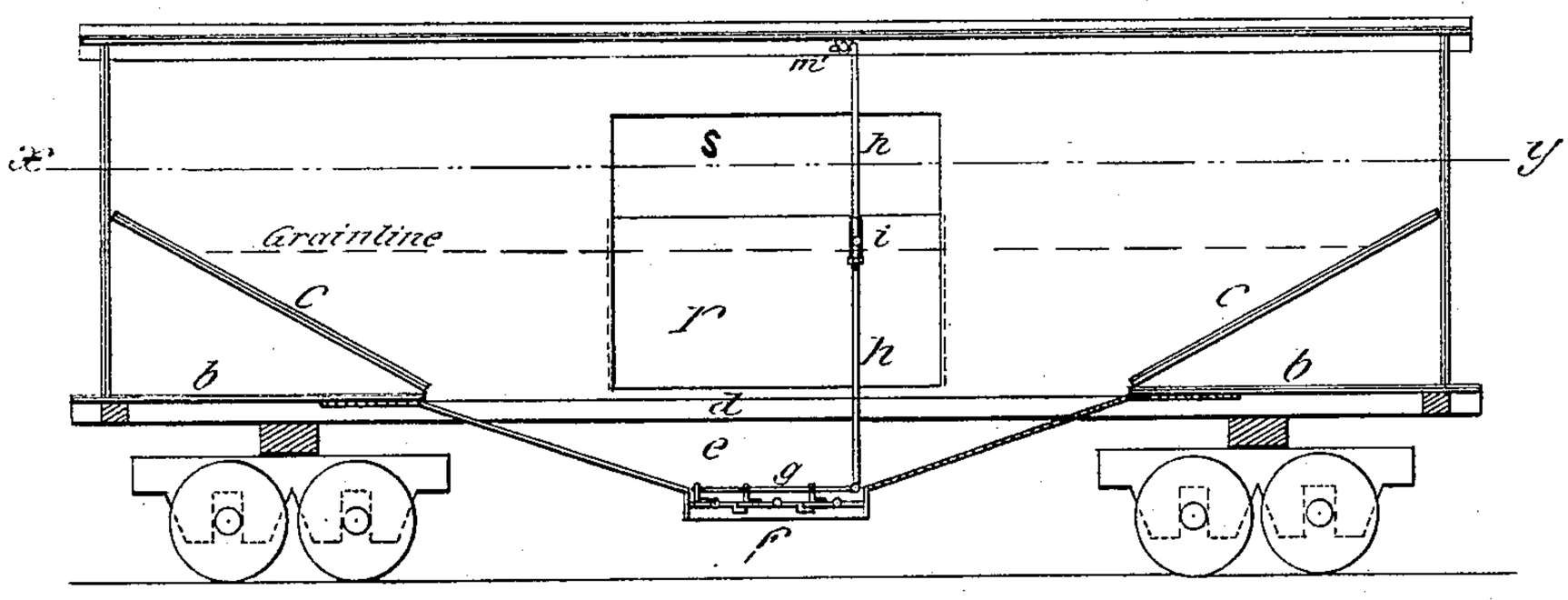
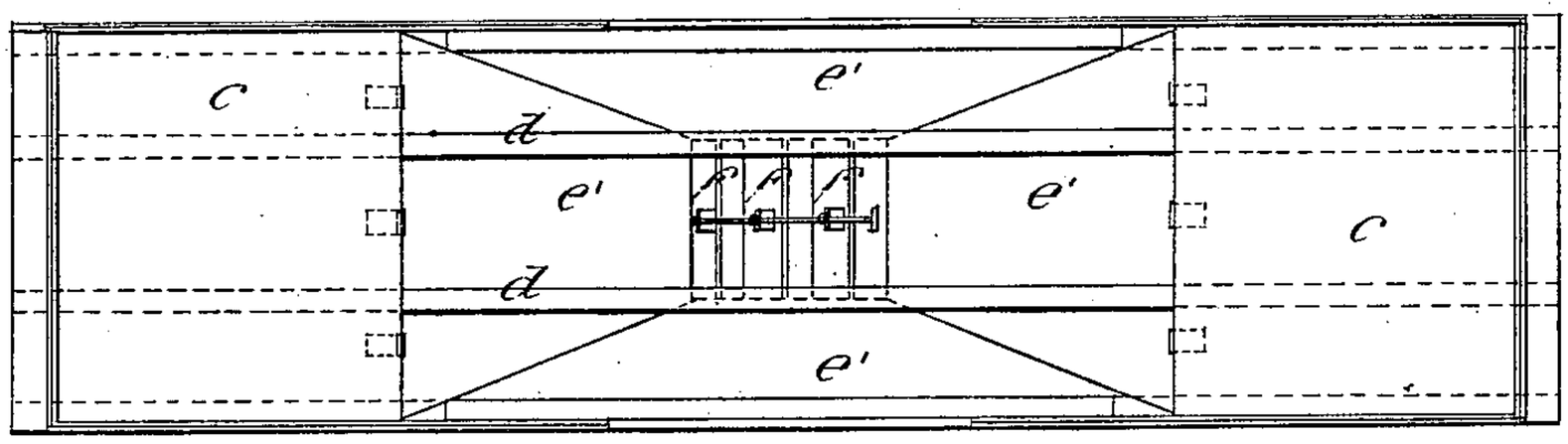


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

G. D. BENJAMIN.

Freight Car.

No. 238,555. **Patented March 8, 1881.**

Fig. 10.

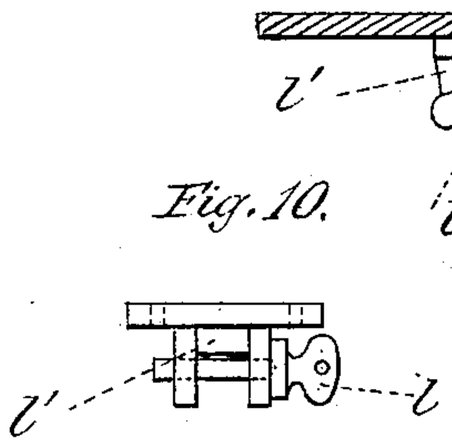
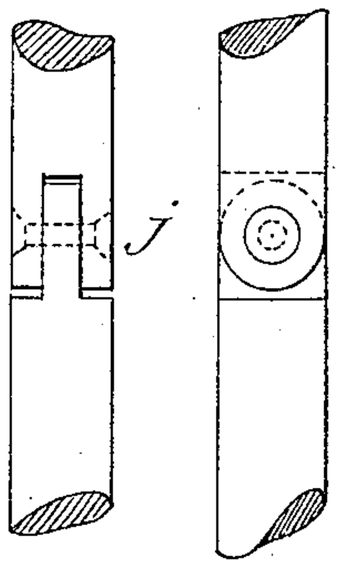


Fig. 12.

Fig. 13. *Fig. 14.*



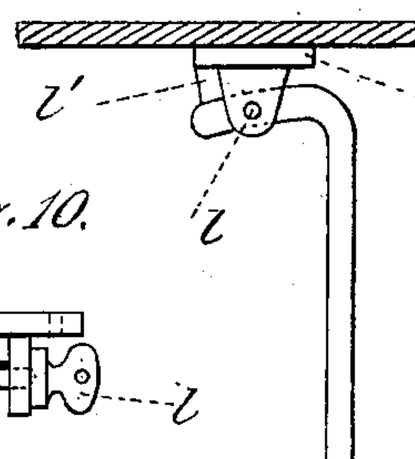


Fig. 9.

Fig. 7.

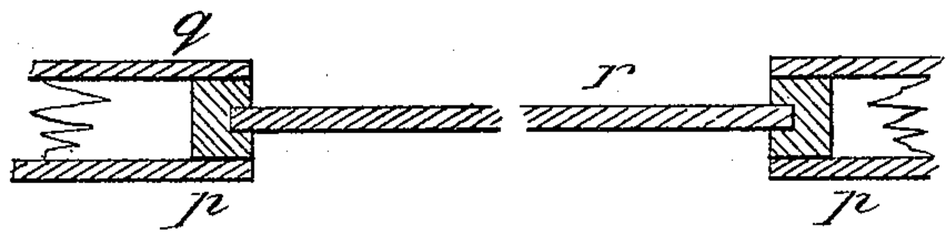


Fig. 8.

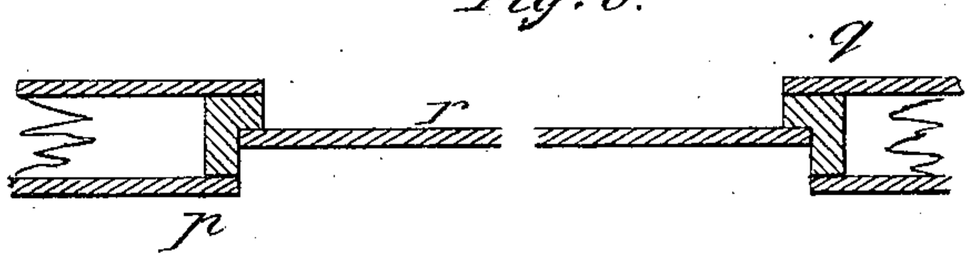


Fig. 6

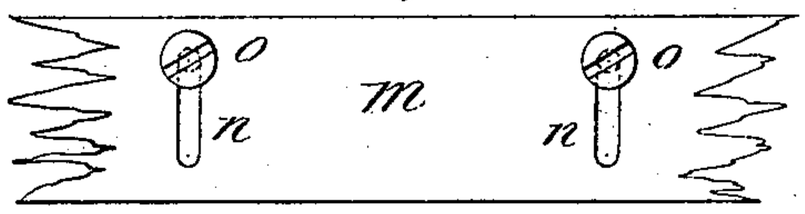
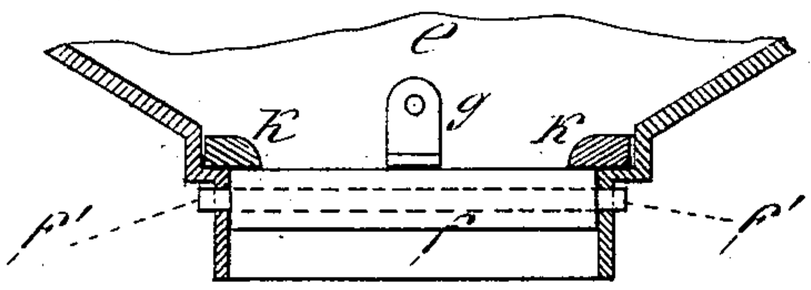


Fig. 5



Witnesses:
John Murdock
Lew P. Luckey

Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE D. BENJAMIN, OF DIXON, ILLINOIS.

FREIGHT-CAR.

SPECIFICATION forming part of Letters Patent No. 238,555, dated March 8, 1881.

Application filed January 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. BENJAMIN, a citizen of the United States, residing at Dixon, in the county of Lee and State of Illinois, have invented certain new and useful Improvements in Convertible Freight and Grain 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to freight or box cars; and it consists of an arrangement of the floor or bottom of the car by which an ordinary box-car can be at once converted into a grain-car, and when no longer needed as a grain-car may be reconverted into a box or freight car; and it further consists in the peculiar construction of the bottom of the said car, by which, when used for the transportation of grain, the contents can be discharged or unloaded in one-tenth of the time now required for the purpose; and, further, it consists in a series of gates at the bottom of the car, which, by their opening, allow the contents of the car to be discharged; and it further consists in a lever attached to the above-named gates to open and close them, and arranged to lock into the roof of the car, whereby the accidental opening of the discharge-gates in the bottom of the car is prevented.

In the accompanying sheets of drawings, in which similar letters of reference indicate like parts in the several figures, Figure 1 is a sectional view of the car arranged as an ordinary freight-car. Fig. 3 shows the same converted into a grain-car. Fig. 2 is a horizontal section of the car on the line *x y* of Fig. 1. Fig. 4 is a similar section on the line *x y* of Fig. 2, and Figs. 5 to 14 are detail views.

I construct my cars of the usual materials and in the usual manner, except the floor and the hopper at the bottom, to be hereinafter described, which may be made of iron, or of wood, or of both, or of any other suitable material.

In the drawings, *a* represents a box-car, having the floor *b*, which is made solid, and is immovably attached to the sleepers *d* for about one-fifth of its length at each extremity of the car. The remainder of the floor is composed of the two leaves *c*, which are hinged to the solid parts of the floor and rest on the sleepers *d*. These leaves are so constructed that they can be turned back against the ends of the car to convert it into a grain-car, as shown in Fig. 3. As each leaf *c* is longer than the solid ends of the floor, when turned back it forms an incline, which permits the grain to run down and to be discharged by its own weight when the gates below are opened.

To prevent the grain passing through cracks or openings where the leaves *c* impinge on the sides of the car, I place over them cross-boards *m*, (shown in detail in Fig. 6,) having slots *n*, through which pass screws *o*, connecting them with the leaves of the bottom. The object of these slots is to allow the cross-boards to be moved up to fit snugly against the sides of the car and break the joints. *d* are the sleepers on which the bottom *b* and leaves *c* rest. These are made with rounded tops, as shown in Fig. 12, to prevent the lodgment of the grain.

Below the body of the car and between the trucks is constructed a hopper, *e*, having ends and sides *e'* flaring at the top and converging downward toward a point. The ends have the same inclination as the leaves *c* when turned up against the ends of the car, and form with them a continuous incline, and at the bottom of this hopper are a series of gates, *f f*, through which the contents of the car are discharged. The ends and sides of the hopper are sloped toward the bottom to permit the grain to pass out freely. These gates *f f* (represented as three in the drawings) may be made of any number. They are connected with each other and with the safety-lever *h* by a series of hinged bars, *g g*, so that raising the lever to open one gate will open all. The gates may be made of wood or metal, usually of iron. They are flat, and they overlap each other, so that no grain can pass between them. They are hung at each end by pivots *f'*, as shown in detail in Fig. 9.

h is the safety-lever, which performs the double function of opening and closing the gates and of locking and securely fastening the same so that they cannot be opened by accident or from the outside *in transitu*. It is jointed, as shown at *j* in Figs. 9 and 13, so that it can be folded to lie in the hopper under the leaves

of the floor when the car is used as a freight-car, as in Fig. 1, and to enable the gates to be opened when the load is to be discharged.

To prevent the lever being accidently bent at the joint *j* when in use and the gates thus opened, I employ a metallic thimble, *i*, which passes over the joint and holds it in place. To prevent the lever falling the upper end is bent and passes through an iron frame, *m'*, attached to the roof of the car, and shown more clearly in Figs. 9 and 10. This frame has an open space between its sides, through which the bent end of the lever passes, and an opening is made through these sides and the end of a lever to receive a screw, *l*, which locks the lever in place. The top of the frame *m'* is made sloping at *l'*, so that as the bent end of the lever is forced into the open space between the sides of frame *m'* the incline *l'* will press the lever down against the gates and prevent their partial opening.

s is the side door of the car, through which the grain is introduced; but to prevent the escape of the grain while loading I employ a device shown in Figs. 1 and 3, and sectionally in Figs. 7 and 8, wherein *r* represents a half-door, which is placed in the lower part of the opening *s*, either by sliding in grooves between the inner and outer boarding of the car *p* and *q*, as in Fig. 7, or held against shoulders by the pressure of the grain, as in Fig. 8.

In Fig. 5 is shown a device to prevent leakage at the ends of the gates *f*, where *k k* represent iron battens along the ends of the gates to prevent the grain passing through the crevices at their extremities. These battens are attached to the gates like the hinge-bars *g g*, and rise and fall with them.

I design using these cars in connection with a device for conveying grain from cars to an elevator, which is made the subject of another application for Letters Patent now pending; but they may be used independently of such device.

When the car is used as an ordinary box or freight car the lever is folded into the space within the hopper below the floor, and the leaves are let down, as shown in Fig. 1. When not used as a grain-car the half-doors *r* are stowed away in the hopper *e*, under the leaves of the floor; but when it is designed to use as a grain-car the door *s* is opened, the lever is raised, the bent end is inserted in the frame *m'*, the screw *l* is turned, the position of the lever and gates is then that indicated in Figs. 3 and 9, the half-door *r* is placed in position, and the grain introduced through the opening over the half-door *r*. The door *s* is then closed and secured. After the car-doors are closed the lever cannot become detached by accident, nor by the act of any person outside the car.

To discharge the grain, open the door *s*, turn the screw *l*, and remove it from the lever, unhook the lever, slide up the thimble *i*, and raise the lever. This will open the gates *f*, and the contents of the car will pass rapidly through the opening in the bottom of the hopper. The lever is jointed at its connection with the first hinge-bar, *g*, and gate *f*, to enable it to be folded down in the hopper when the car is not used for the transportation of grain.

Fig. 11 shows the manner in which the lever may be bent at *j*, when the thimble *i* is raised, and Fig. 14 also shows the joint in the lever.

I am aware that coal-cars have heretofore been constructed with bottoms opening to discharge their contents. Therefore I do not broadly claim such cars; but I am not aware this principle has ever been applied to grain-cars, nor have the other peculiarities of my construction been thus applied. Therefore,

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a grain-car, the safety-lever *h*, constructed as described, for the purpose of opening and closing the discharge-gates of the car, and for locking the said gates when the car is loaded with grain.

2. The combination, in a grain-car, of the safety-lever *h*, the locking device *l l' m'*, and the discharge-gates *f*, all as described.

3. In a convertible grain and freight car, the combination of the safety-lever *h*, provided with joint *j* and thimble *i*, the locking device *l l' m'*, the discharge-gates *f*, and the battens *k*, all as described.

4. In a convertible freight and grain car, the combination of the hopper *e*, the safety-lever *h*, the pivoted gates *f*, and hinge-bars *g*, all as described, and for the purposes specified.

5. In a convertible freight and grain car, the combination of the hopper *e*, discharge-gates *f*, and jointed lever *h*, adapted to be folded down within the hopper below the floor of the car.

6. In a convertible freight and grain car, the combination of the leaves *c*, provided with the screws *o*, with the slotted side boards, *m*, all substantially as described.

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

GEO. D. BENJAMIN.

Witnesses:

J. GALES MOORE,

IRVING G. ASHLEY.