(No Model.) 2 Sheets—Sheet 1.

E. A. BURRAGE.

GRAIN DOOR FOR CARS.

No. 535,353. Patented Mar. 12, 1895.

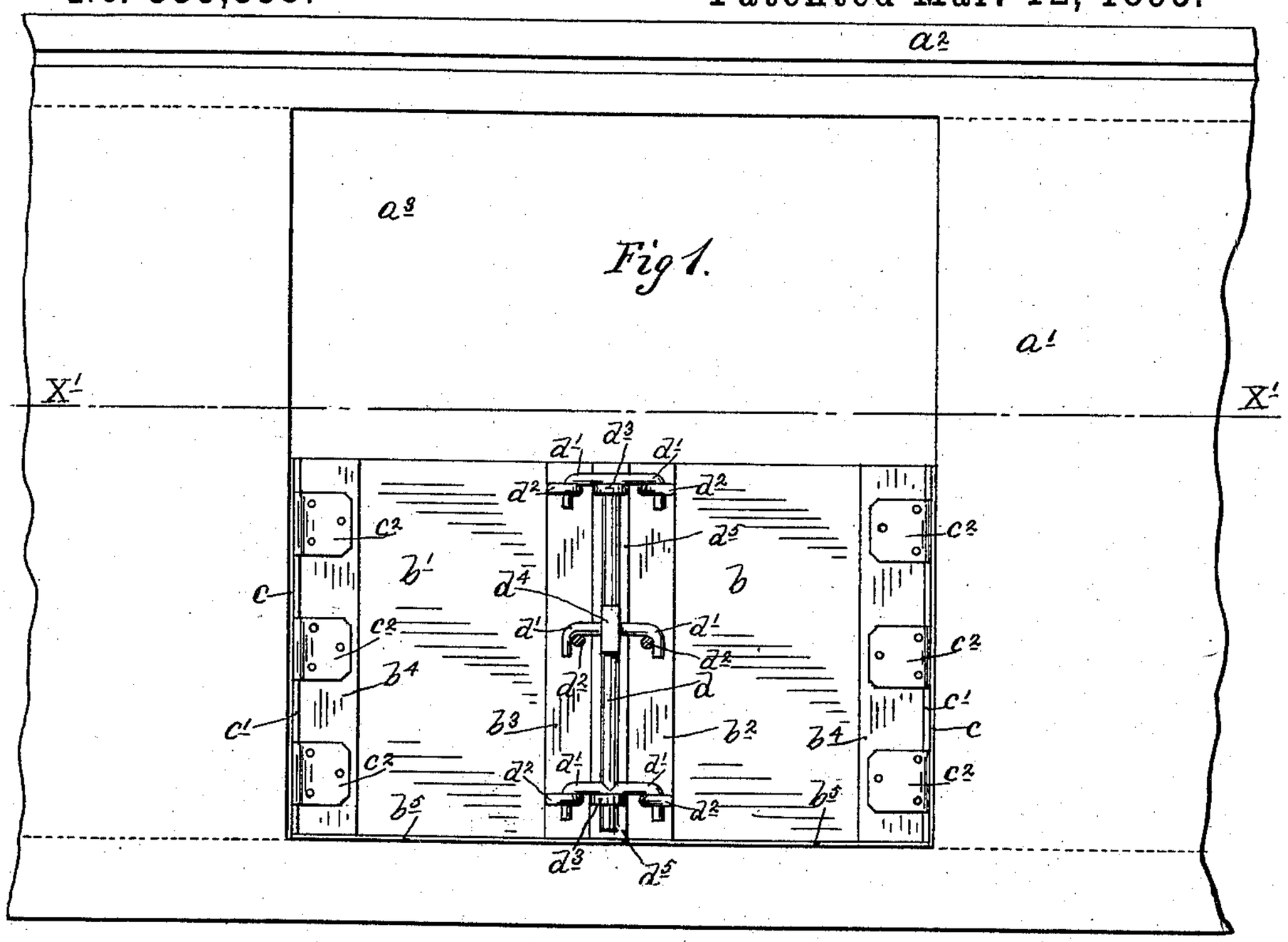

Fig. 1.

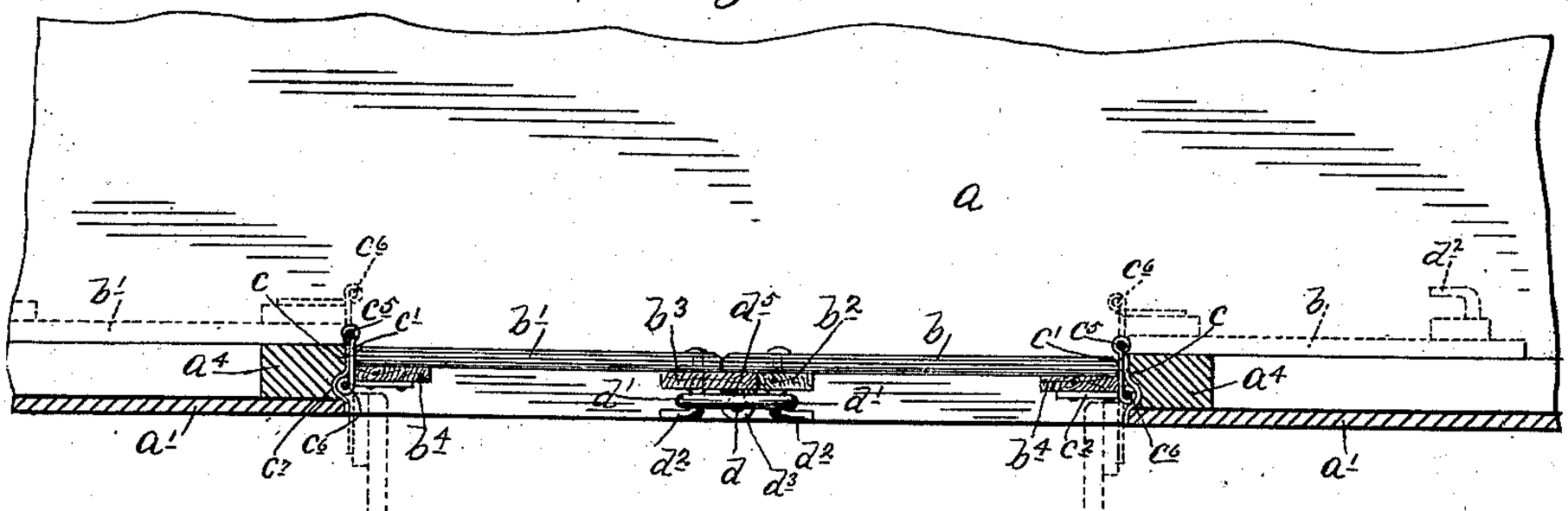

Fig. 2.

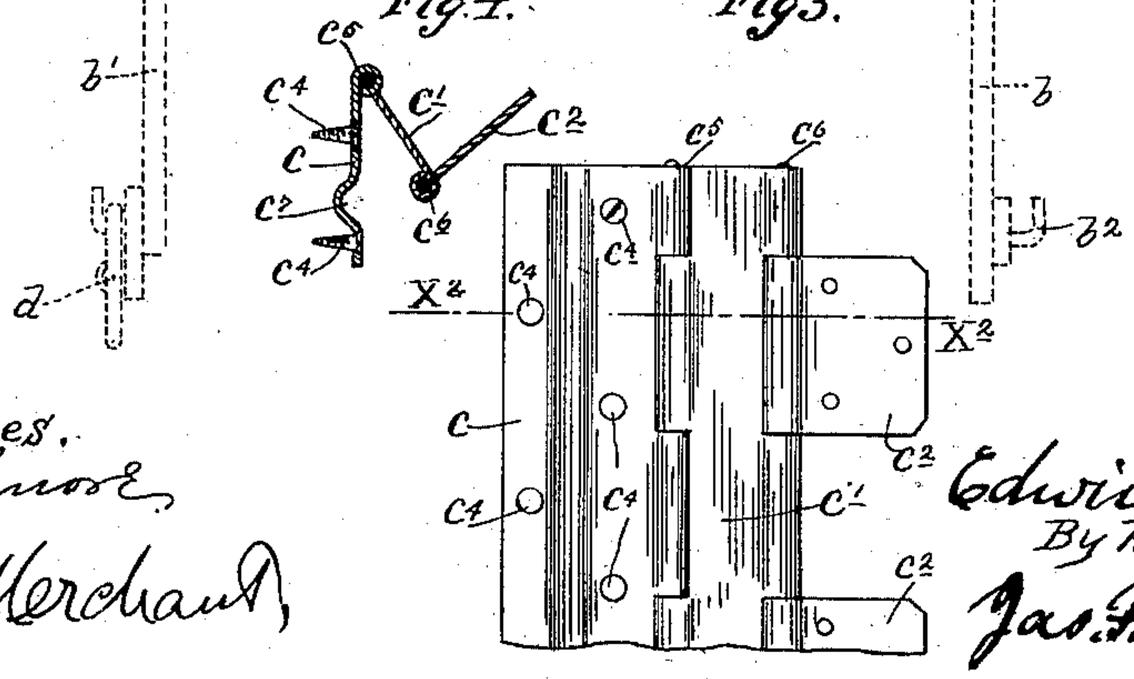

Fig. 4.

Fig. 3.

Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 6.

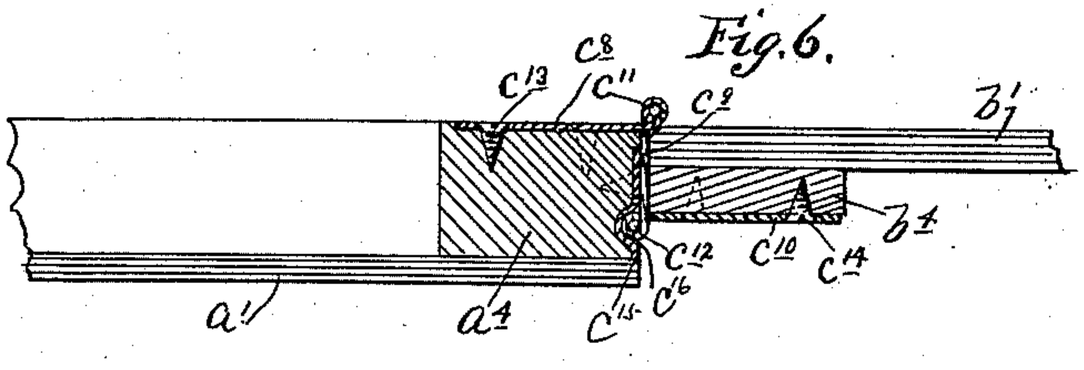
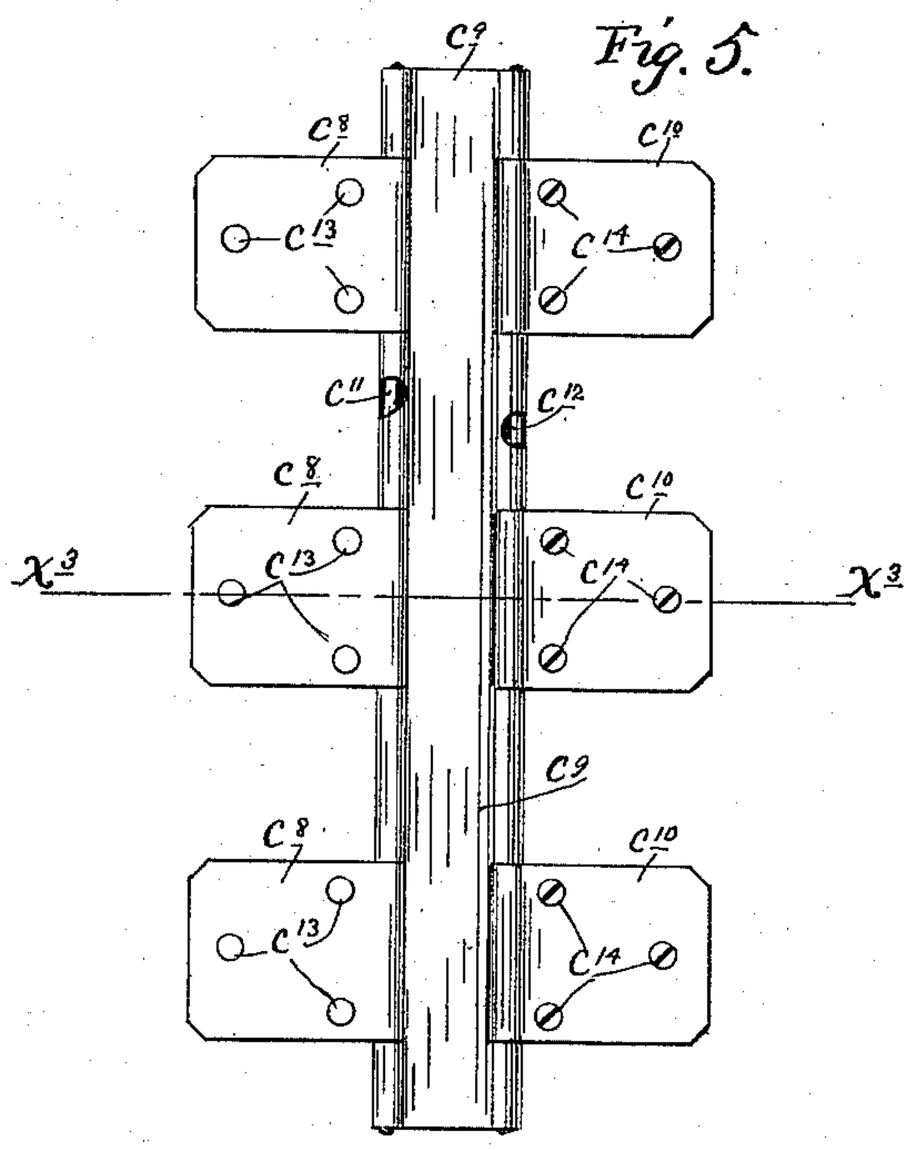


Fig. 5.



Witnesses:
E. F. Elmore.
Frank D. Merchant.

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UNITED STATES PATENT OFFICE.

EDWIN A. BURRAGE, OF MINNEAPOLIS, MINNESOTA.

GRAIN-DOOR FOR CARS.

SPECIFICATION forming part of Letters Patent No. 535,353, dated March 12, 1895.

Application filed April 3, 1894. Serial No. 506,231. (No model.)

To all whom it may concern:

Be it known that I, EDWIN A. BURRAGE, 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 Grain-Doors for 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 has for its object to provide an improved grain-door for cars.

To this end, the invention consists of certain novel devices and combinations of devices, which will be hereinafter fully described and be defined in the claims.

The accompanying drawings illustrate my invention, wherein like letters refer to like parts.

Figure 1 is a side elevation of a car-body equipped with my improved grain-door, with some parts of the car-body broken away, and other parts shown in diagram lines only. Fig. 2 is a horizontal longitudinal section, on the line X′ X′ of Fig. 1, with some parts broken away. Fig. 3 is a detail in side elevation, showing one form of the double hinges detached. Fig. 4 is a cross section, on the line X^2 X^2 of Fig. 3. Fig. 5 is a detail in side elevation, showing a modified form of one of the double hinges detached; and Fig. 6 is a cross section, on the line X^3 X^3 of Fig. 5.

Referring to the car-body, *a* represents the floor, *a′* the side walls, a^2 the top, a^3 the door openings in the side walls, and a^4 the door posts of an ordinary freight-car, adapted, among other things, for use in carrying grain.

Having regard to the grain-door, *b b′* represent the body portions of the sectional or vertically divided two-part wooden grain door.

b^2 b^3 represent a pair of vertically arranged joint battens, on the exterior of the two door sections, which are so related as to form an overlapping joint, at the meeting margin of the door sections, when closed; and b^4 represents vertically arranged battens, on the exterior of the said door sections, at the hinge margins of the same. The said door sections are connected to their respective door-posts a^4 by double hinges, which may be in the form shown in Figs. 3 and 4, or in the form shown in Figs. 5 and 6. If the form shown in Figs. 3 and 4 be employed, the inner or primary leaf *c* will be made fast to the jamb faces of the door-posts by lag-screws c^4, or in any other suitable way. The second or intermediate section *c′* will be connected to the primary section by the pintle or bolt c^5 with the bead of the joint, thus formed, projecting inward beyond the inner angle of the door-post; and the outer or third section c^2 will be connected to the central or intermediate section *c′*, by the pintle or hinge-bolt c^6, with the joint of the same projecting beyond the outer angle of the door batten b^4 and the said leaf c^2 will be made fast to the said batten in any suitable way.

The central leaf *c′* is continuous and the other two leaves *c* c^2 may be either continuous or made up of sections at will. The inner leaf *c* is depressed, as shown at c^7, to form a seat for the bead or joint c^6, uniting the sections *c′* and c^2. The section *c* is also preferably made continuous. With this construction, when the parts are in position and the doors are closed, as shown in Figs. 1 and 2, the hinge section *c′* will rest flush against the primary section *c* and form a grain-tight joint. In virtue of the double hinge action, the door sections may either swing outward and be made to form side walls or guides, for the delivery of the grain, when unloading the same, or be swung inward and backward, so as to lie parallel with the side walls of the car and flush with the interior surface of the same—both of which positions, for the said door sections, are shown in dotted lines in Fig. 2.

If the form of hinge shown in Figs. 5 and 6 be employed, which in some respects is preferable, the primary leaf c^8 may be sectional, the intermediate section c^9 will be continuous, and the outer section c^{10} may be sectional, and the said sections be connected by the inner pintle or bolt c^{11}, and the outer pintle or bolt c^{12}. The leaf c^8 would then be secured to the inner vertical face of the door-post by lag-screws c^{13}, or in any other suitable way, and the outer leaf c^{10} be connected to the exterior surface of the batten b^4 by the lag-screws c^{14}, or in any other suitable way, and the intermediate section c^9 would be of such width as to cause the inner hinge bead or

joint c^{11} to project beyond the inner angle of the door-post a^4, and the outer joint or bead c^{12} to project beyond the outer angle of the batten b^4. A chafing or joint plate c^{15} would then be secured to the jamb-face or surface of the door-post and be provided with a depression c^{16}, to form a seat for receiving the hinge-bead c^{12} when the door-section is closed, so as to permit the leaf c^9 to form a grain-tight joint with the chafing plate c^{15}. With the form of double hinge, as shown applied in Figs. 5 and 6, the door sections may swing outward or inward and backward into the dotted line positions, shown in Fig. 2, and a grain-tight joint at the door-post is absolutely insured. The joint batten b^2 on the door section b, is placed a short distance back from the front edge of the door section; and the door-batten b^3 is of a width to project beyond the front or joint margin of the door section, by which it is carried. Hence, when the door sections are in their closed position, the said batten b^3, on the section b', will overlap the joint margin of the door section b, and abut against the batten b^2. Hence, a grain-tight joint will be formed at the meeting margins of the door sections. When the door sections are thus in their closed position, they are held against the pressure of the grain, within the car, by a trussing lock; which lock, as shown is composed of a vertically sliding lock-rod or bar d, provided with hook-ended and down turned transverse arms d', formed rigid therewith, the hook-like ends of which are engageable with suitable detents d^2, fixed to the door sections. As shown, the lock-bar d is carried by keepers d^3, fixed to the batten d^3 of the door section b' and the detents d^2 are fixed to the said door sections at equidistant points on the opposite sides of the locking-bar d. These detents d^2 are shown as passing through the respective joint battens b^2 and b^3, and the door sections by which they are carried. The hook-like ends of the arms d' are shown as of rectangular form, and the detents d^2 are also shown of rectangular hook-like form. This hook-like construction of the said parts has this advantage, viz: that the engagement of the hooks with the detents may be insured, without requiring the said parts to be always brought into any one exact relative position, in respect to each other. It will, however, be understood, of course, that the said detents d^2, might be of other forms, such for example, as staples, or eye-bolts.

When the door sections are brought into their closed position and the locking bar is thrown down into its lowermost position, so that the hook ends of its arms d' will engage with the detents d^2, the doors will be held with a trussing action against the pressure of the grain from within. The lower end of the lock-bar d is extended through the lower keeper d^3 to a point near to but slightly above the threshold of the door. This permits the ready application of a crow-bar, or other form of lever, for lifting the lock and releasing the door section, by simply engaging the end of the crow-bar under the lower end of the lock-bar d, and operating the same over the car floor or threshold of the door as a fulcrum. When the lock is thus raised to its uppermost position, the door sections will, of course, automatically open outward, under the pressure of the grain from within the car. A chafing-plate d^5 is placed on the door batten b^3 behind the lock-bar d, to prevent the said lock-bar from digging into the door-batten, under the strain thereon from the pressure of the grain; and the lower end of said chafing plate d^5 serves to afford a buffing-plate, to resist the jamming action of the crow-bar, when applying the same to raise the lock-bar d. The lower edges of the door sections b b' are protected by shoe-plates b^5 secured thereto in any suitable way, for preventing the splintering or wearing away of the lower edges of the doors, when opening or closing the same.

The facility afforded for the application of a crow-bar to raise the locking-bar d and release the doors, is an important feature of improvement. With grain-doors as ordinarily made, it is the custom to raise the same in their vertical guides against the pressure of the grain, by jamming the crow-bars, under the lower edge of the doors, and operating the same over the threshold of the door as a fulcrum. This practice speedily destroys the wooden doors requiring the same to be replaced, at short intervals, under the rough usage of the service.

With my improvement, the doors will last for a comparatively long time, without requiring substitution or repair. At the same time, the construction is of such character, that the door can be made at comparatively small cost.

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

1. The combination with a two-part grain door of a lock for the same, comprising detents fixed on one of said door sections, and a vertically movable locking slide, carried by the other of said door sections, provided with lock arms for engagement with said detents to lock and truss said door sections when closed, substantially as described.

2. The combination with a two-part or vertically divided grain-door body joining, when closed, with an overlapping joint, of double hinges connecting said sections with the respective door posts, detents fixed to both of said door sections and a vertically movable locking slide carried by one of said door sections and provided with hook ended arms engageable with said detents to lock and truss the said door section when closed, substantially as described.

3. The combination with a two-part or vertically divided grain-door body, of a trussing lock for holding said sections in their closed position, comprising a vertically movable slide carried by one of said door sections, hook-like detents on said sections, on the op-

posite sides of said slide and transverse arms on said slide having hook-like ends engageable with said hook-like detents, substantially as described.

4. In a grain-door, the combination with a two-part or vertically divided door-body, the sections of which are hinged to the door-posts, of the trussing lock, for holding said door sections in their closed positions, having as one of its elements a vertically movable slide extending near to but stopping short of the door sill, for affording a point of application for a crow-bar with the sill as a fulcrum, to raise the slide and unlock the door sections, substantially as described.

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

EDWIN A. BURRAGE.

Witnesses:
F. D. WECK,
E. W. KLINGLER.