No. 872,479. PATENTED DEC. 3, 1907.

R. R. TICHENOR.

GRAIN DOOR.

APPLICATION FILED MAY 11, 1907.

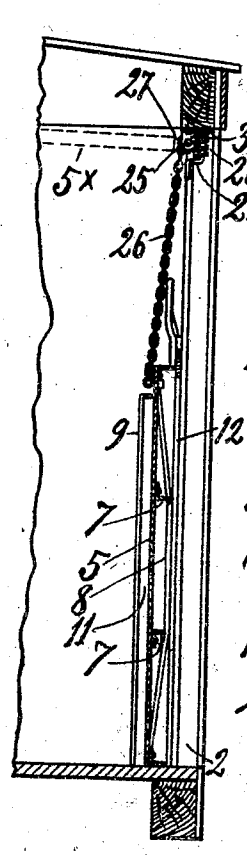

FIG. 2.

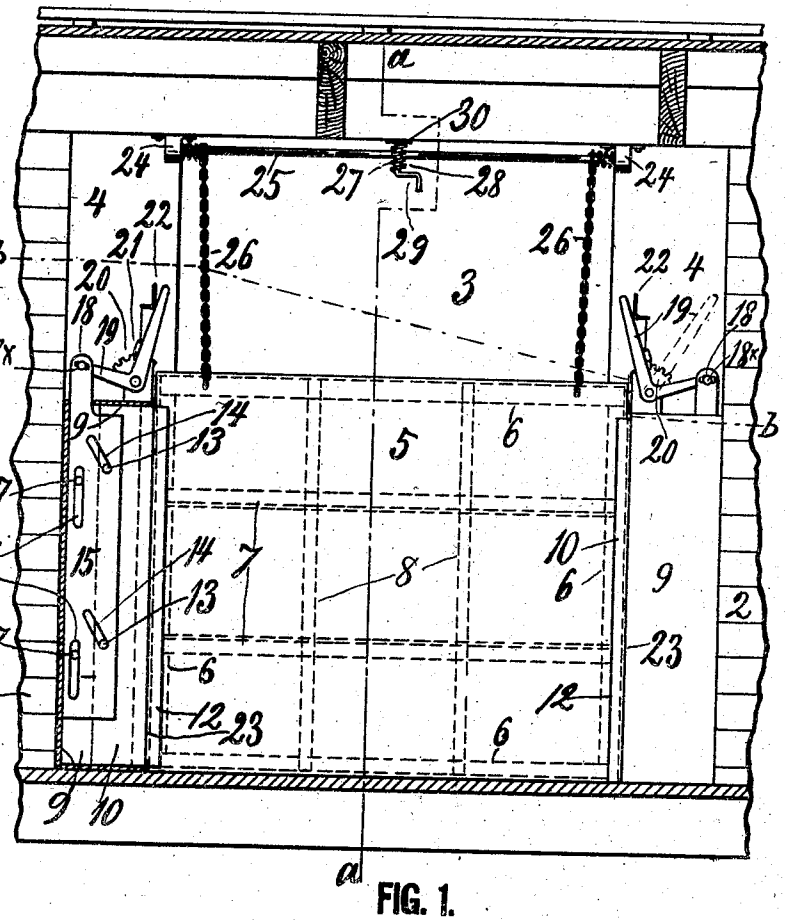

FIG. 1.

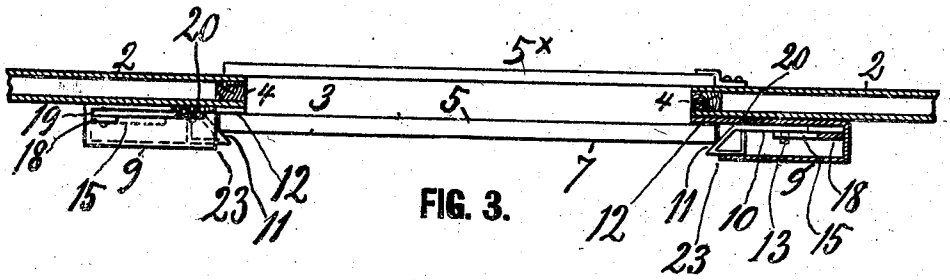

FIG. 3.

WITNESSES:

D. E. Carlson.

M. H. Carlson.

INVENTOR:

Robert R. Tichenor.

BY HIS ATTORNEY:

A. M. Carlson.

UNITED STATES PATENT OFFICE.

ROBERT R. TICHENOR, OF FEELEY, MINNESOTA.

GRAIN-DOOR.

No. 872,479. Specification of Letters Patent. Patented Dec. 3, 1907.

Application filed May 11, 1907. Serial No. 373,193.

To all whom it may concern:

Be it known that I, ROBERT R. TICHENOR, a citizen of the United States, residing at Feeley, in the county of Itasca and State of Minnesota, have invented a new and useful Grain-Door, of which the following is a specification.

My invention relates to grain-doors for freight cars; and the object is to provide a simple, cheap but efficient metallic car door and improved means for holding it both when it is in use and when it is carried idle. This object I attain by the novel construction and arrangement of parts illustrated in the accompanying drawing, in which:—

Figure 1 is a sectional view of a portion of a freight car showing my invention applied thereto. Fig. 2 is a vertical section on the line *a a* in Fig. 1. Fig. 3 is a sectional top view on the line *b b* in Fig. 1.

Referring to the drawing by reference numerals, 2 designates the side wall of a freight-car of ordinary construction having the usual side-door opening 3 and frame 4.

5 is a door made economically by using thin sheet iron and stiffening it by angle iron or steel ribs 6 all along its edges, and also angle-iron ribs 7 intermediate the edges of the door, and even truss-braces 8 across the ribs 7 to prevent bulging outward of the door when the car is filled with grain.

To the frames at both sides of the door opening I secure hollow metal casings 9, of which the one to the left in Fig. 1 is in section so as to expose the mechanism inside, and which is the same in both casings, as follows: In and by the casing is guided to slide horizontally a slide 10, having at its front edge a beveled face 11, which coacts with a forwardly projected face 12 of the casing to form a V-shaped groove for the reception of the edge of the door, no matter of what form the edge may be; in the present instance it is shown as being square. In said slide or plate 10 are fixed two studs 13, which are engaged by slanting slots 14 formed in a plate 15, having slots 16 engaging pins 17 fixed in the casing, so that the plate is guided to move vertically while its slots 14 move the plate 10 back and forth horizontally. The plate 15 is moved by having an upward projection 18 pivoted at $18^{\times}$ to an L-shaped lever 19, fulcrumed on a toothed sector 20 on which it may be held in various positions by a catch 21 engaging the sector, and a finger-latch 22 controlling the catch. When said levers 19 are in the position shown in Fig. 1 the plates 15 fit tightly against the side edges of the door, and when the levers are thrown into the position indicated in dotted line to the right in Fig. 1 the plates 15 recede back into the casings and the door is free to escape between the edges 23 of the casings into the car, where it is suspended and stored away by the following means:

In the upper corners of the door frame, between the inner door 5 and the regular outer door $5^{\times}$, are fixed bearings 24 in which are journaled the ends of a revoluble shaft 25, to which are fixed the upper ends of two chains 26, having their lower ends fixed to the upper edge of the door. Near the middle of the shaft is fixed a worm gear 27, engaged by a worm-screw 28, turned by a crank 29 and being journaled in a bracket 30 fixed to the upper door frame.

From this description it will be understood that by turning the worm-screw the door may be more or less raised, and in any such position it may be held by applying the levers 19 to the slides 15 and 10. And when the door is not in use for hauling grain or similar small goods, then the chains are wound onto the shaft until the door is close up to the shaft, its lower edge is then sprung upward and inward and secured to the roof of the car by the usual means (not shown) for that purpose.

I am aware that in my U. S. Patent No. 810,893 I have shown some kind of slides taking against the edges of a grain door. I am also aware that prior to my present invent on chains and worm-screw have been applied in some form and manner to a car door, I therefore do not claim those features broadly; but

What I claim is;—

1. The combination with a freight-car, of hollow casings provided upon each side of the door-opening and having the forwardly projected faces or flanges 12, horizontally movable plates guided to move one in each casing and having each a beveled front edge forming together with the face 12 of the casing a V-shaped groove for the edge of the car door, and means for moving and holding the plates in various positions.

2. The combination with a freight car, of hollow casings provided upon each side of the door-opening and having the forwardly projected faces or flanges 12, horizontally mov-

able plates guided to move one in each casing and having each a beveled front edge forming together with the face 12 of the casing a V-shaped groove for the edge of the car-door, and means for moving and holding the plates in various positions, said means consisting of studs in the plates, upright slides guided to slide vertically in the casings and having diagonal slots engaging the studs, and an extension projected above the casing, an L-shaped lever pivotally mounted upon the casing and having one arm pivotally connected to the extension of the slide, and means for holding the lever in various positions.

3. The combination with a freight car, of hollow casings provided upon each side of the door-opening and having the forwardly projected faces or flanges 12, horizontally movable plates guided to move one in each casing and having each a beveled front edge forming together with the face 12 of the casing a V-shaped groove for the edge of the car door, and means for moving and holding the plates in various positions, said means consisting of studs in the plates upright slides guided to slide vertically in the casings and having diagonal slots engaging the studs, and an extension projected above the casing, an L-shaped lever pivotally mounted upon the casing and having one arm pivotally connected to the extension of the slide, and means for holding the lever in various positions, the latter means consisting of a toothed sector upon the casing, a catch carried by the lever and adapted to engage the toothed sector, and a finger-operated latch on the lever controlling the catch.

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

ROBERT R. TICHENOR.

Witnesses:

FRED JOHNSON,

KARL W. HEYMAN