

No. 649,696.

Patented May 15, 1900.

E. JACQUEMIN.
GRAIN DOOR.

(Application filed June 26, 1899.)

(No Model.)

2 Sheets—Sheet 1.

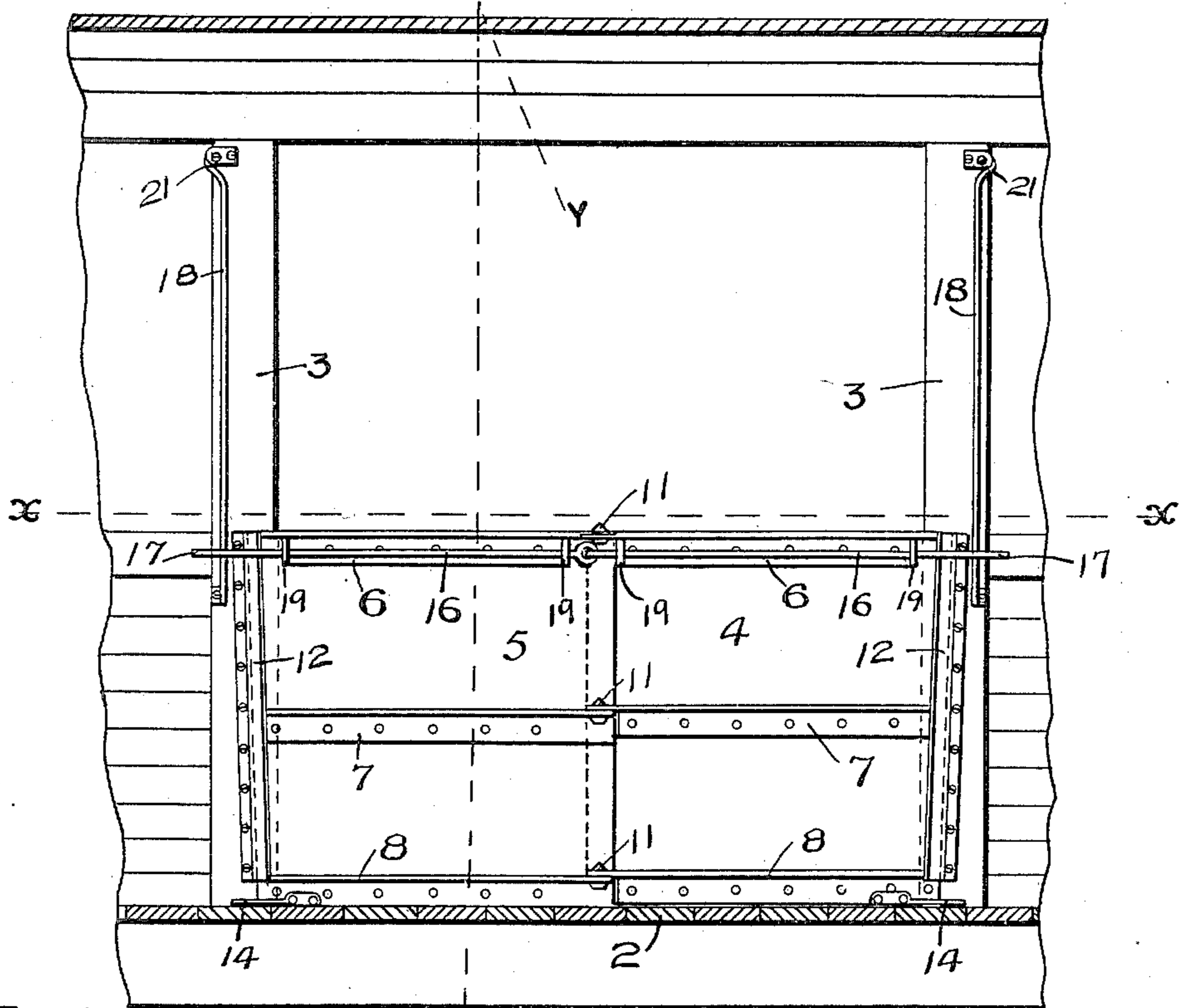


FIG. 1.

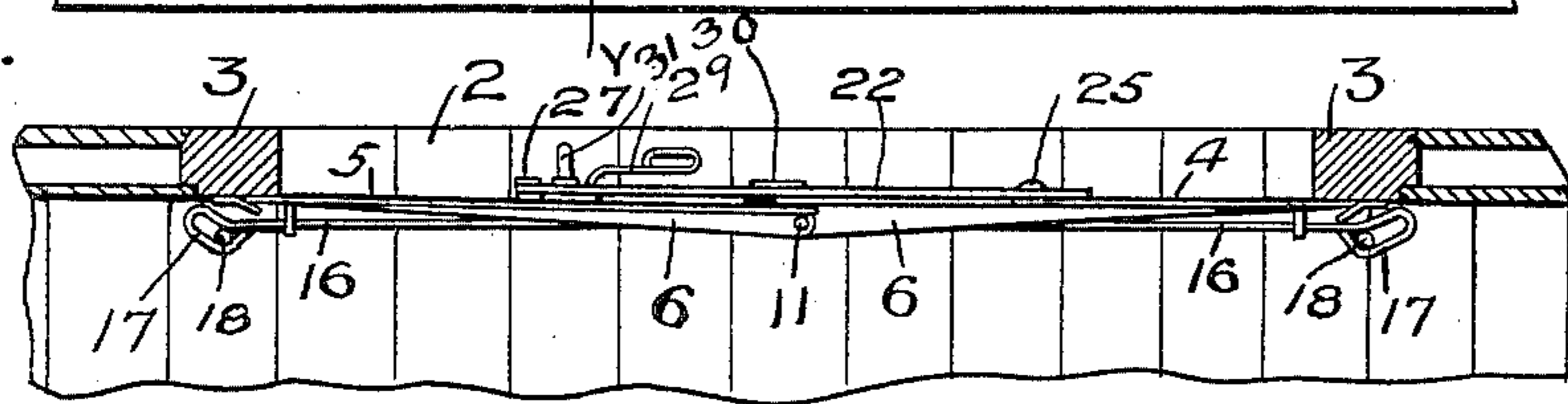


FIG. 2.

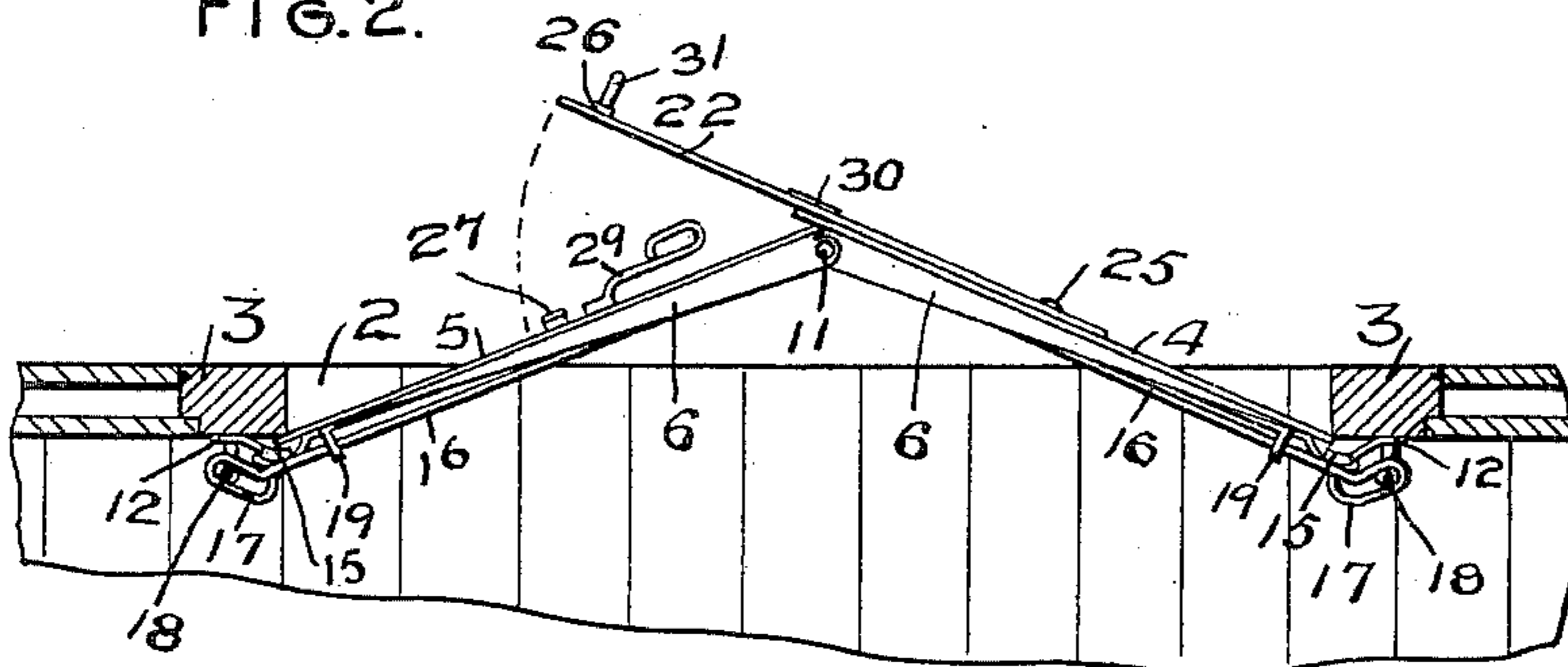


FIG. 3.

WITNESSES.

Richard Paul

INVENTOR

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2 Sheets—Sheet 2.

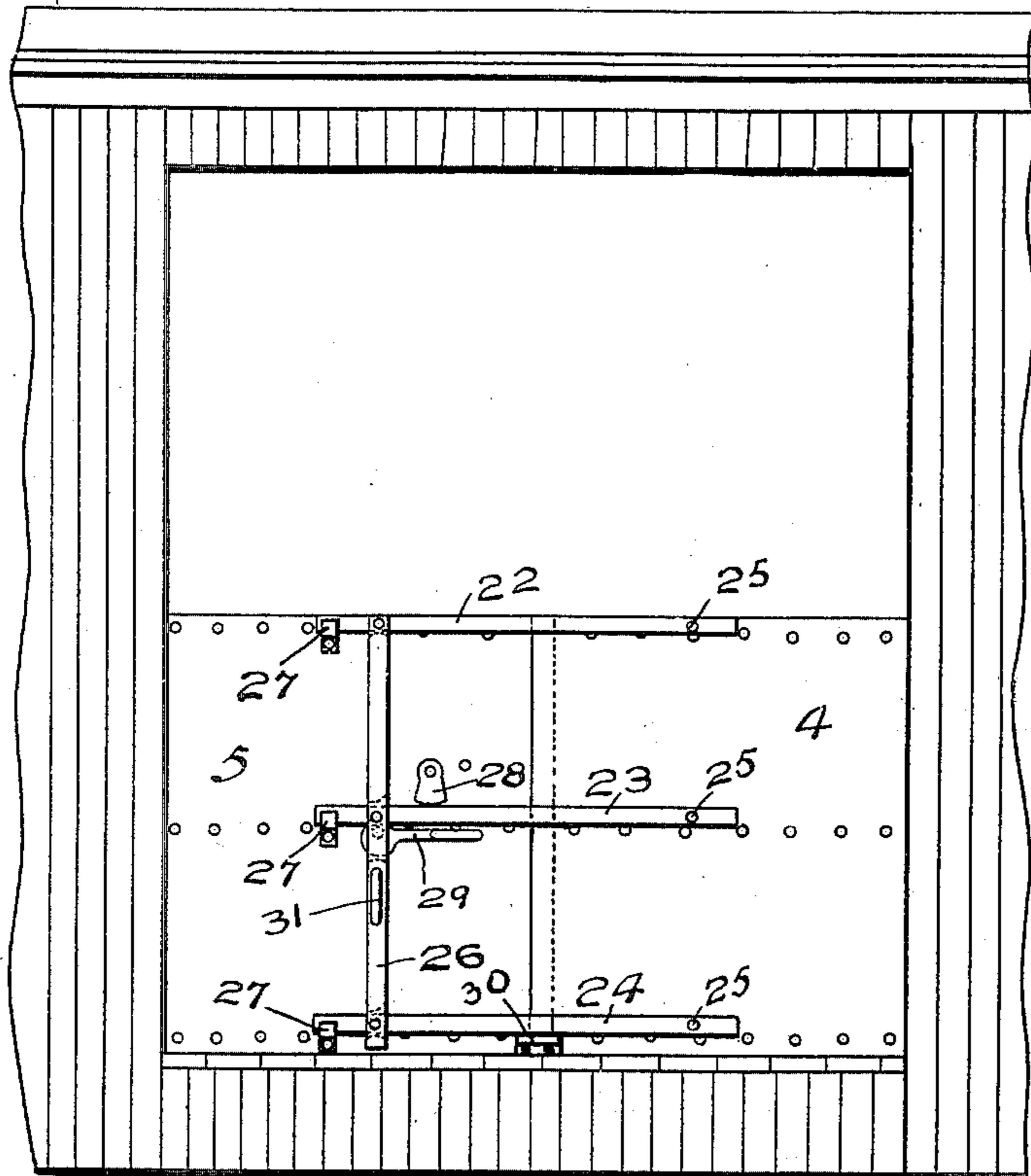


FIG. 5.

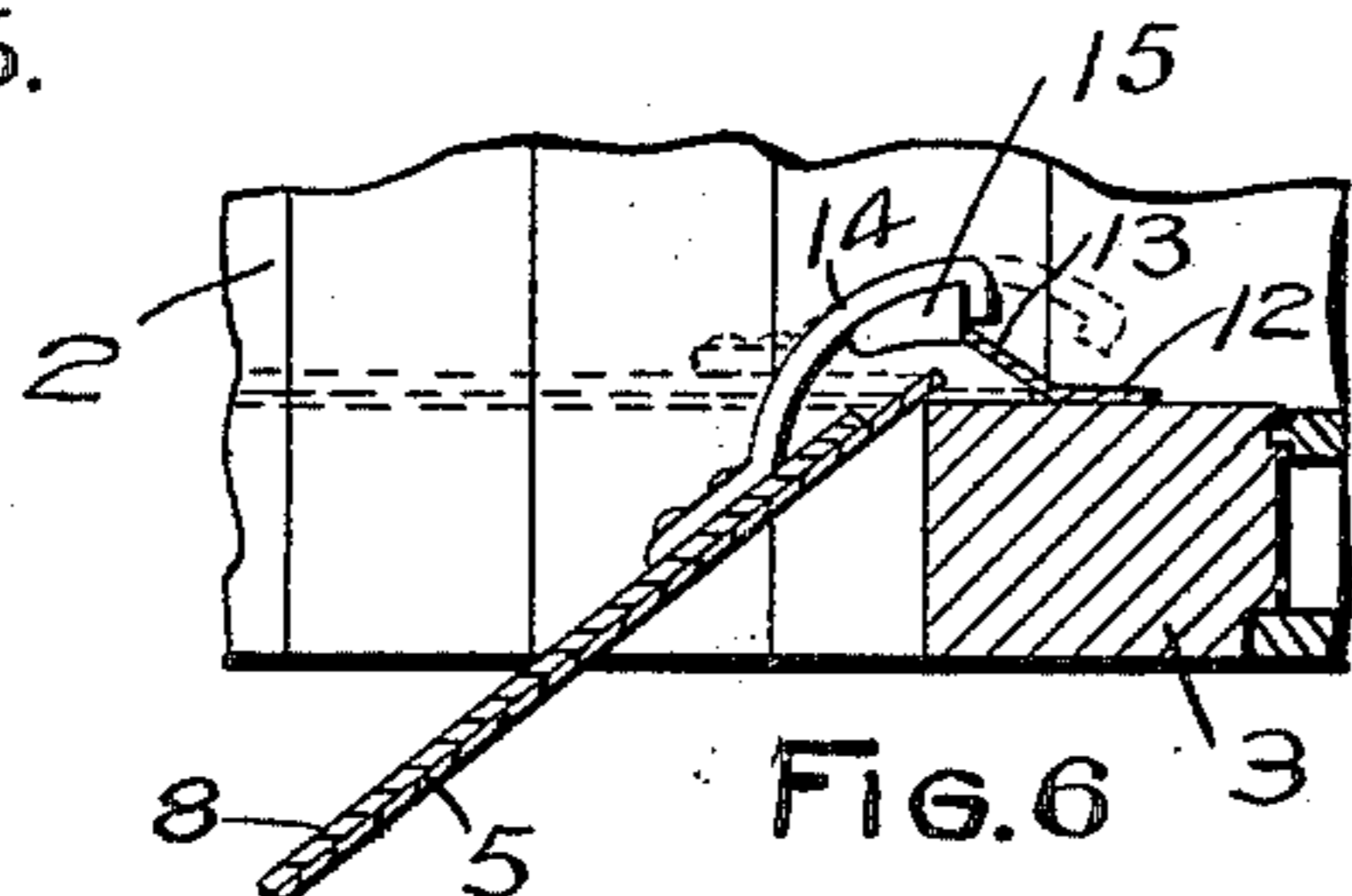


FIG. 6.

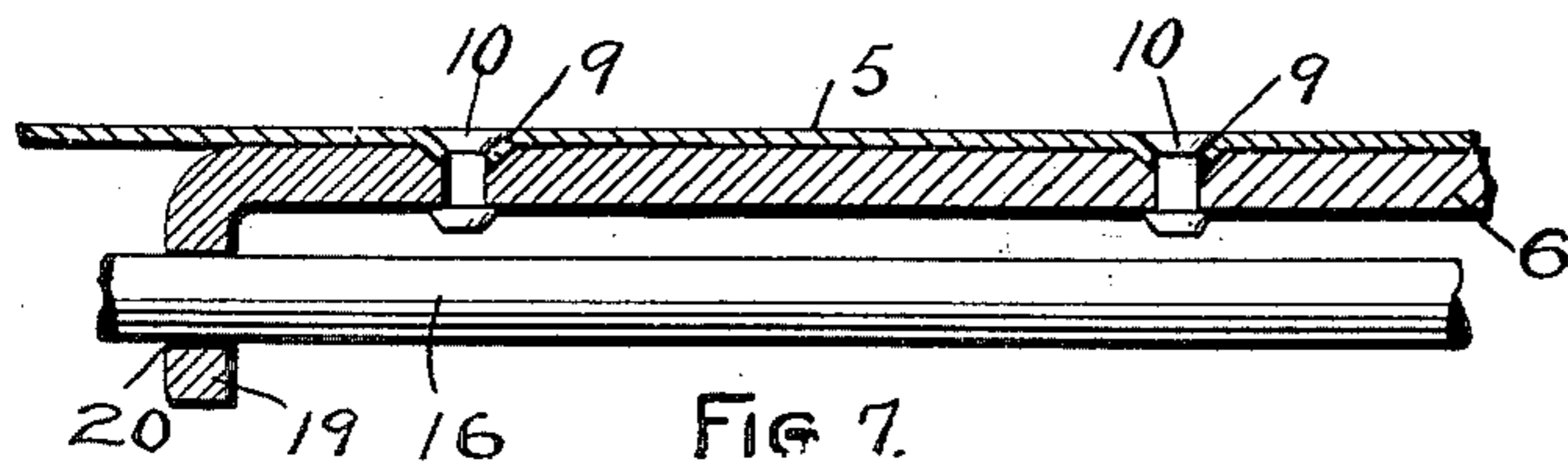
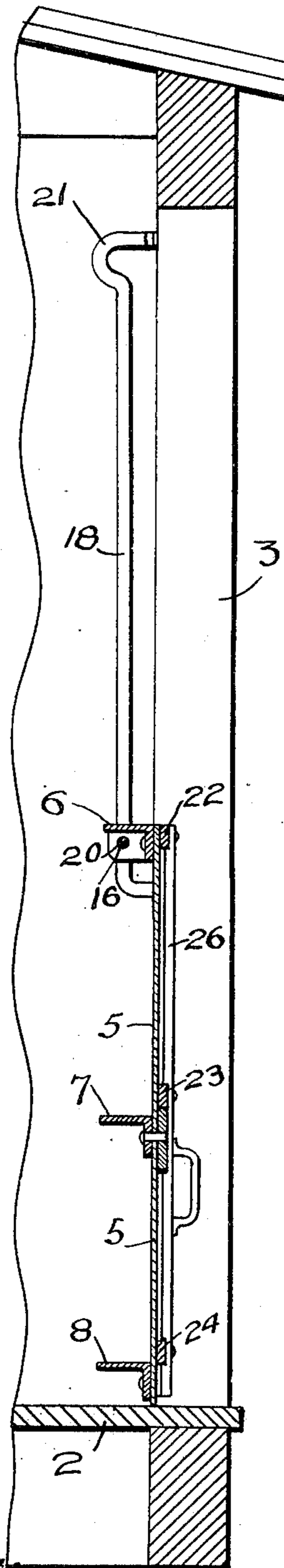


FIG. 7.

FIG. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

EUGENE JACQUEMIN, OF MINNEAPOLIS, MINNESOTA.

GRAIN-DOOR.

SPECIFICATION forming part of Letters Patent No. 649,696, dated May 15, 1900.

Application filed June 26, 1899. Serial No. 721,835. (No model.)

To all whom it may concern:

Be it known that I, EUGENE JACQUEMIN, of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Grain-Doors, of which the following is a specification.

The invention relates to grain-doors for freight-cars; and the objects of the invention are, first, to provide a grain-door, preferably of metal, that is simple in construction, though strong and durable, and, being made of comparatively-light material, can be easily handled; second, to provide a grain-door which will effectually close the lower part of the opening in the side of a car and have close-fitting joints through which the grain cannot escape while the door is in use, and, third, to provide a grain-door which can be quickly opened to permit the discharge of the grain and when not in use raised to the top of the car out of the way.

The invention consists generally in a wedge-shaped sectional grain-door of an improved construction and vertically-tapering or wedge-shaped sockets for said door, said sockets being also tapered or wedge-shaped in horizontal cross-section to permit the ends of the door to be wedged therein and grain-tight joints formed between the walls of the sockets and the door.

Further, the invention consists in particular means for supporting the jointed sections of the door within the opening in the side of the car.

Further, the invention consists in particular means for locking the jointed sections of the door together.

Further, the invention consists in improved means for preventing the grain-door from being forced outwardly beyond its proper position while the car is discharging its contents.

Further, the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a view of my improved grain-door in a closed position looking from the interior of the car. Fig.

2 is a horizontal section on the line $x x$ of Fig. 1. Fig. 3 is a similar view showing the door partially open to discharge the grain. Fig. 4 is a vertical section on the line $y y$ of Fig. 1. Fig. 5 is a view of the closed door from the outside of the car. Fig. 6 is a detail showing the construction of the grain-tight joint at the ends of the door, and Fig. 7 is a detail showing the particular means for riveting the plates of the door to the frame.

In the drawings, 2 represents the car-floor, and 3 3 the posts upon each side of the door-opening. The door for closing the lower portion of said opening consists, preferably, of two jointed sections or parts comprising the preferably sheet-metal plates 4 and 5, securely riveted near the middle and at the top and bottom to horizontal angle-irons 6 6, 7 7, and 8 8, and said plates may have their edges turned over to form beads, (not shown in the drawings,) thus materially strengthening the edges of the sections. These angle-irons are preferably placed upon the inside of the door and the rivet-holes therein are countersunk, as shown at 9 in Fig. 7, and when the rivets are headed the edges of the holes in the plates 4 and 5 over said rivet-holes will be forced therein and the heads of the rivets will be flush with the outer surface of the door and present a neat appearance thereto and not in any way interfere with the movement of the locking mechanism hereinafter described.

The vertical flanges of the angle-irons 6 6, 7 7, and 8 8 at their inner or adjacent ends are preferably cut away to permit the abutting horizontal flanges to overlap, as shown in Figs. 1, 2, and 3, and pivots 11, passing through said overlapping flanges, hinge the sections of the door together, and as it is important that a grain-tight joint be formed at this point the abutting edge of the plate 5 overlaps the plate 4, and I also prefer to provide grain-tight joints at the ends of the door, which consist in plates 12, secured to the posts 3 3 on the inside of the car and having outwardly-turned flanges or lips 13, between which and the posts 3 3 the ends of the plates 4 and 5 are securely wedged when the door

is closed, as indicated by dotted lines in Fig. 6. These plates 12 are preferably placed at an incline on the posts 3 3, converging from the top toward the bottom and forming a wedge-shaped socket to receive the edges of the door, which is preferably tapered to fit within said socket, so that when the car is filled and the door is dropped down with its lower edge resting upon the floor of the car it will fit snugly between the plates 12 and the jarring and shaking of the car will only serve to seat it more firmly in its socket.

In order that the lower sections may not be forced out of position by the weight of the grain when the car is being emptied, I prefer to provide means for limiting the outward stroke or travel of the jointed sections, and with this end in view I provide hooks 14, bolted at one end to the angle-irons 8 8 at the bottom of the door and at their other ends engaging lugs 15, projecting from the floor of the car. When the door is in its closed position, the hooks will be in the position indicated by dotted lines in Fig. 6, and when the door is open the hooks will move forward, engaging the lugs 15, and limit the outward travel of the lower portion of the door-section, though permitting it to be moved vertically when it is desired to raise the door to the top of the car. In order that the upper portion of said sections may not be moved out too far and their ends disengaged from the sockets formed by the plates 12 and the posts 3 3, I prefer to provide rods 16, having their inner ends looped and joined together preferably near one of the pivots 11 and having at their outer ends elongated loops 17, inclosing the vertical rods 18. The rods 16 are supported in guides formed by turning in the ends of the vertical flanges of the angle-irons 6 6, forming ears or lugs 19, having holes 20, through which said rods are slidable. The horizontal flanges of these angle-irons 6 6 are preferably cut away on a taper from their inner toward their outer ends, and the horizontal flanges of the angle-irons 7 7 and 8 8 may be treated in a similar manner, and thus the door made considerably lighter, while not materially detracting from its strength or rigidity. The rods 16, as shown in Figs. 2 and 3, owing to the elongated loops 17, are free to move back and forth on the rods 18, thus permitting the upper portion of the door to be moved outwardly a distance corresponding to the travel of the lower portion, but checking its outward movement before the ends of the door become disengaged from their sockets. The looped ends 17 are also vertically slidable on the rods 18 to permit the door when the car is empty to be raised up to the top of the car and said looped ends pushed over the shoulders 21, formed by bending the upper ends of said rods, so that the distance between the shoulders will be substantially the same as the distance between the outer ends of the rods 16, to the end that when the rods 16 are

raised up over said shoulders said rods and the car-door will be suspended in an elevated position.

To prevent twisting and buckling of the door-sections at the point where their edges overlap and also to prevent the weight of the grain from bulging or pressing the door out of position, I prefer to provide means upon the outside of the door-sections for locking them securely together until such time as it is desired to empty the car of its contents. With this end in view I provide a series of locking-bars 22, 23, and 24 at the top, near the middle, and at the bottom, respectively, of the door. At one end these bars are secured to one of the door-sections, preferably the right hand, as shown in Fig. 5, by rivets or bolts 25, that pass through said bars a sufficient distance from their ends to permit said ends to bear upon the door-sections and prevent the bars from sagging or dropping out of their normally-vertical plane and away from the plane of the door should the bars become loose on their pivots. Near the opposite ends of said bars is a vertical bar 26, having recesses on its inner surface to receive the bars 22, 23, and 24 and wherein said bars are pivoted, the edge of the same bearing upon the shoulders of the recesses, which are preferably rounded, as indicated by dotted lines in Fig. 5, so that when said locking-bars are raised to permit the door to be opened by the mechanism hereinafter described the strain will not fall upon the pivots connecting said locking-bars and said bar 26, but rather upon the shoulders of the recesses, whereby the pivots will be protected from strain or breakage and the durability of the locking mechanism considerably increased. The ends of the locking-bars drop behind the lugs 27 provided on the left-hand section of the door, and the hinge-joint is thus strongly bridged to withstand the bulging pressure of the grain, and to prevent the locking-bars from becoming accidentally disengaged from the lugs 27 I provide a button 28, pivoted on the left-hand section in position to engage the middle locking-bar. For disengaging said bars from the lugs 27 when it is desired to open the door I prefer to provide a cam-lever 29, pivoted on the left-hand section, preferably beneath the vertical bar 26 and near the middle locking-bar 23, so that when said cam-lever is turned down the locking-bars will be disengaged from the lugs 27 and the door-sections permitted to swing out. To support the door in a horizontal position when raised to the top of the car, I prefer to provide a lug 30 near the bottom of the door, to be engaged by a hook provided in the roof of the car.

The operation of my improved grain-door is as follows: When it is desired to load a car with grain, the door is disengaged from the shoulders 21 at the top of the rods 18 and, sliding down said rods to the floor of the car, is wedged firmly in the sockets at the ends of the

door and all joints and holes through which grain might escape from the car are effectually closed. The car having reached its destination and it being desired to empty it of its contents, the operator grasps the cam-lever 29, disengages the locking-bars from the lugs 27, and the weight of the grain within the car aids in forcing the jointed ends of the door-sections outwardly to permit the grain to escape. When the jointed sections have moved sufficiently far to permit the ready discharge of the grain, the hooks 14 and the looped ends of the rods 16 will engage the lugs 15 and the rods 18 and lock said sections against further outward movement. As soon as the grain has been discharged the door-sections may be returned to their normal positions and elevated again to the top of the car.

I have shown and described my improved grain-door as made of sheet metal and angle-iron; but I do not wish to confine myself to this material, as the same may be made wholly or partially of wood, if preferred; nor do I wish to confine myself to the particular means which I have shown for limiting the outward travel of the door-sections, nor to the means for making grain-tight joints at the ends of the doors, nor to the locking mechanism, for while I have shown the preferred construction of these parts I am aware that the same may be modified considerably without materially affecting their efficiency, and I therefore do not wish to be confined to the particular construction herein shown and described.

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

1. A grain-door, composed of two or more jointed sections, each section comprising a sheet-metal plate and angle-iron bars secured together, the abutting horizontal flanges of said angle-irons being hinged together, and means for retaining said sections in position within a car-door opening, substantially as described.

2. A sectional grain-door, comprising plates and angle-iron bars secured thereon, the horizontal flanges of said bars at their abutting ends being pivotally connected and the outer vertical edges of said plates being inclined or beveled causing said door to be tapered or wedge-shaped in form, sockets provided on the side of the car to receive the ends of the door, and said sockets converging or tapering from top to bottom to permit the door to be wedged therein, for the purpose set forth.

3. A grain-door comprising several sections hinged together, means for locking said sections against outward movement, the rods 18 provided on the side of the car, the rods 16 provided on said sections and having looped ends engaging said rods 18, substantially as described.

4. A grain-door comprising several sections hinged together, means for locking said sections against outward movement, rods 18,

the rods 16 provided on said door and engaging said rods 18, lugs 15, and the hooks 14 provided on said sections and engaging said lugs 15.

5. A sectional grain-door comprising plates having overlapping inner edges and angle-iron bars secured to said plates, the horizontal flanges at the inner ends of said bars being overlapped and pivoted together, and sockets on the sides of the car for the ends of said door, substantially as described.

6. A sectional grain-door, comprising plates and angle-iron bars secured thereto, said bars having the horizontal flanges at their inner ends pivoted together, vertical rods provided on the sides of the car, and horizontal rods 16 supported by said angle-iron bars and having their outer ends connected to said vertical bars, substantially as described.

7. A locking device for sectional grain-doors, comprising bars 22, 23 and 24 pivoted to one of the sections, lugs 27 provided upon the opposite sections in position to be engaged by the free ends of said bars, a bar 26 connecting the free ends of said bars, and a lever 29 whereby said bars may be simultaneously disengaged from said lugs, substantially as described.

8. In a grain-door composed of two sections hinged together, the horizontally-slidable rods 16 connected at their inner ends, lugs 19 provided on said sections having openings 20 wherein said rods are slidable, and fixed supports provided at the ends of the door and whereto said rods are connected at their outer ends, substantially as described.

9. A metallic grain-door, comprising two or more sections hinged together, means for locking said sections against outward movement, the plates 12 secured to the side of the car and having flanges 13 forming horizontally wedge-shaped sockets with the sides of the car to receive the ends of said door, and said sockets extending from the bottom to the top of said door whereby grain-tight joints are formed, substantially as described.

10. A grain-door, comprising sheet-metal plates or sections hinged together, in combination, with sockets, wedge-shaped in horizontal cross-section, provided on the sides of the car to receive the outer ends of said sections and permit them to be horizontally wedged therein, substantially as described.

11. In a grain-door composed of sections hinged together, slidable rods or bars supported on said sections and having their inner ends pivotally connected, and fixed supports provided at the ends of the door and whereto the outer ends of said rods are loosely connected, substantially as described.

12. The combination, with a vertically-movable grain-door, composed of several sections hinged together, of longitudinally-movable rods or bars supported on said sections and having their inner ends pivotally connected and upright supports provided at the ends of the door and whereto the outer ends

of said rods are loosely connected and where-
on they are vertically slidable, substantially
as described.

13. A grain-door composed of two or more
5 jointed sheet-metal sections, bracing or
strengthening angle-iron bars provided on
said sections, the horizontal flanges of said
angle-irons being cut away or tapered from

their inner toward their outer ends, for the
purpose specified.

In witness whereof I have hereunto set my
hand this 15th day of June, 1899.

EUGENE JACQUEMIN.

In presence of—

A. C. PAUL,
RICHARD PAUL.