

996,961.

Patented July 4, 1911.

2 SHEETS—SHEET 1.

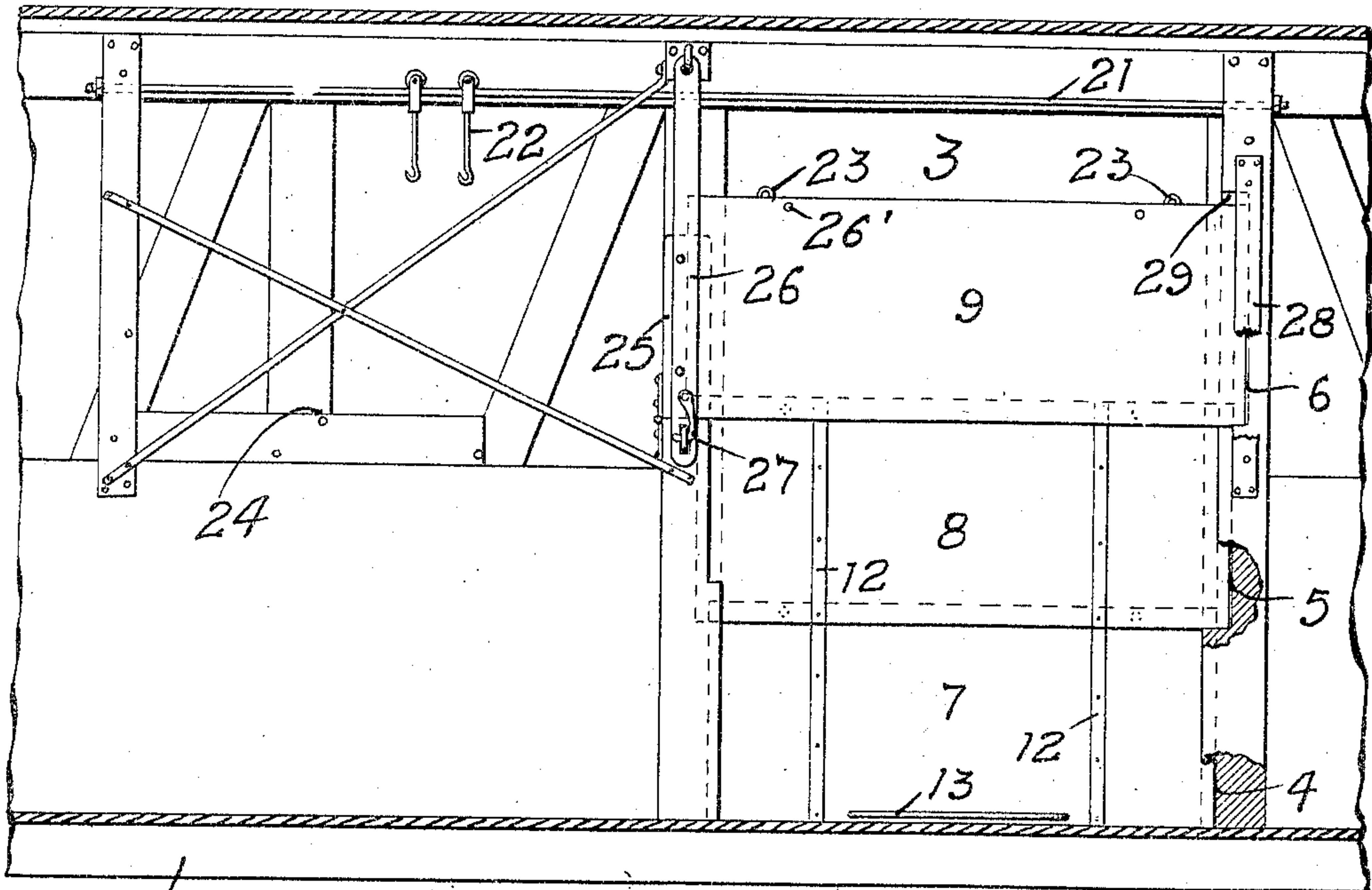


Fig 1

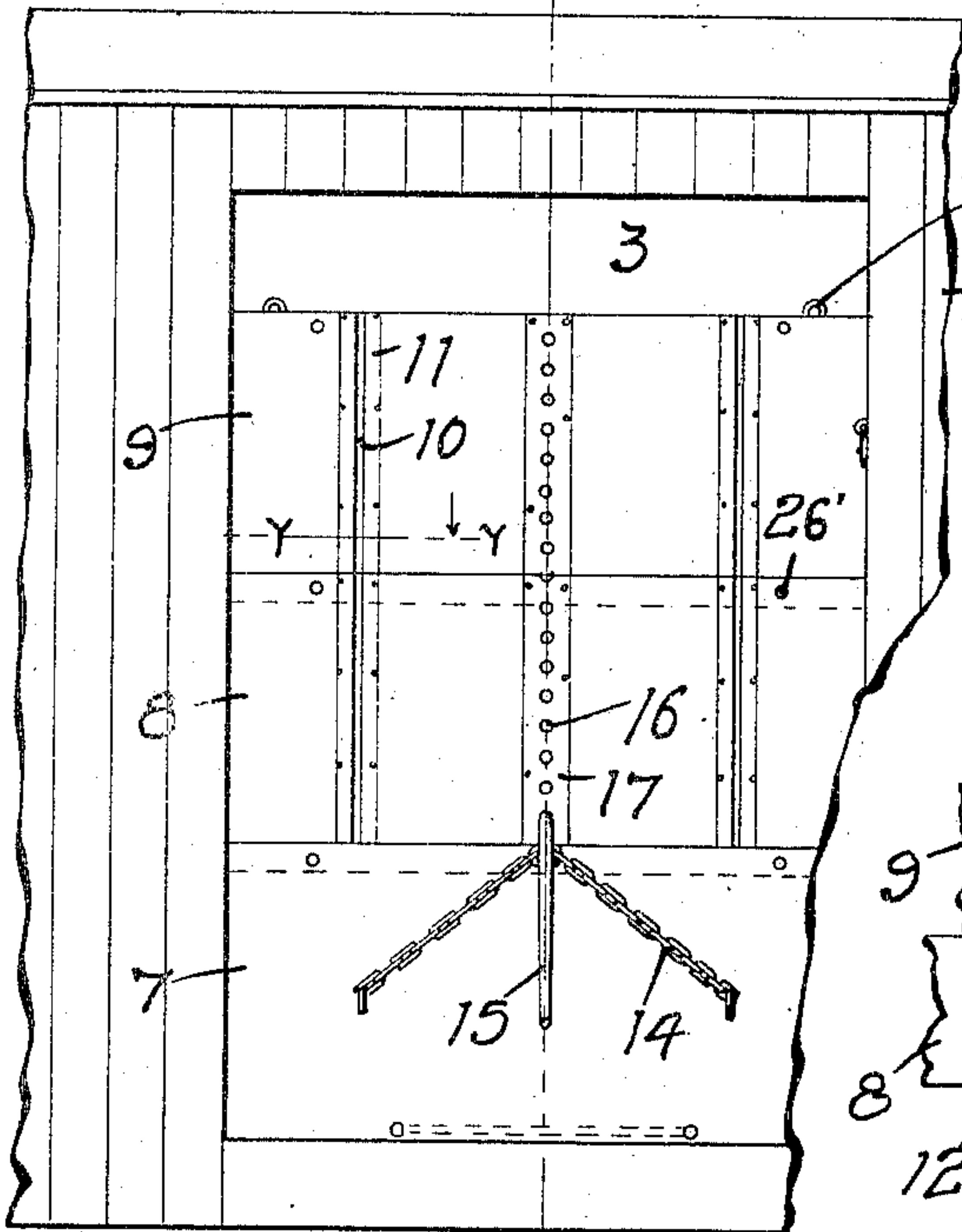


Fig 2.

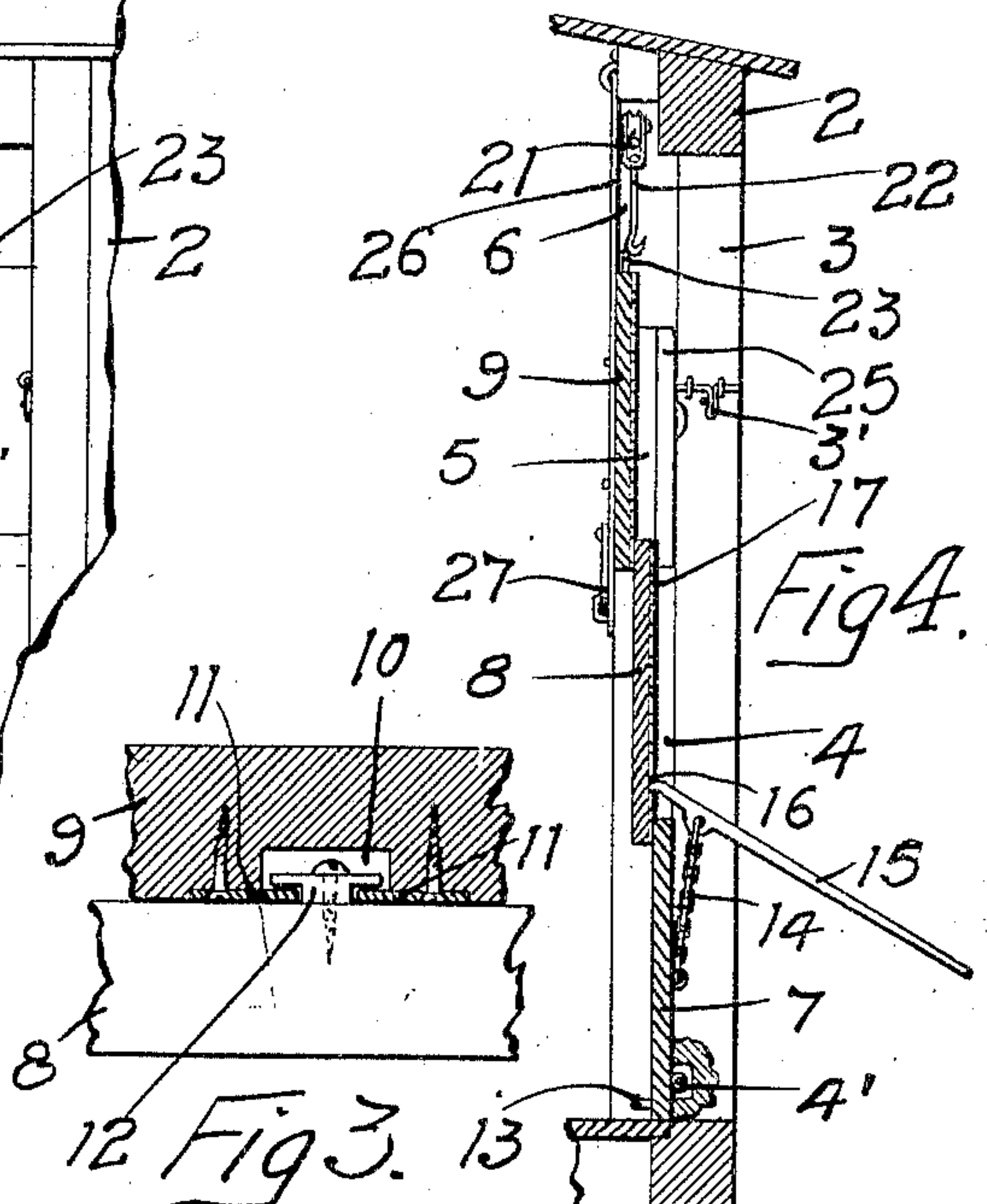


Fig 3.

Fig 4.

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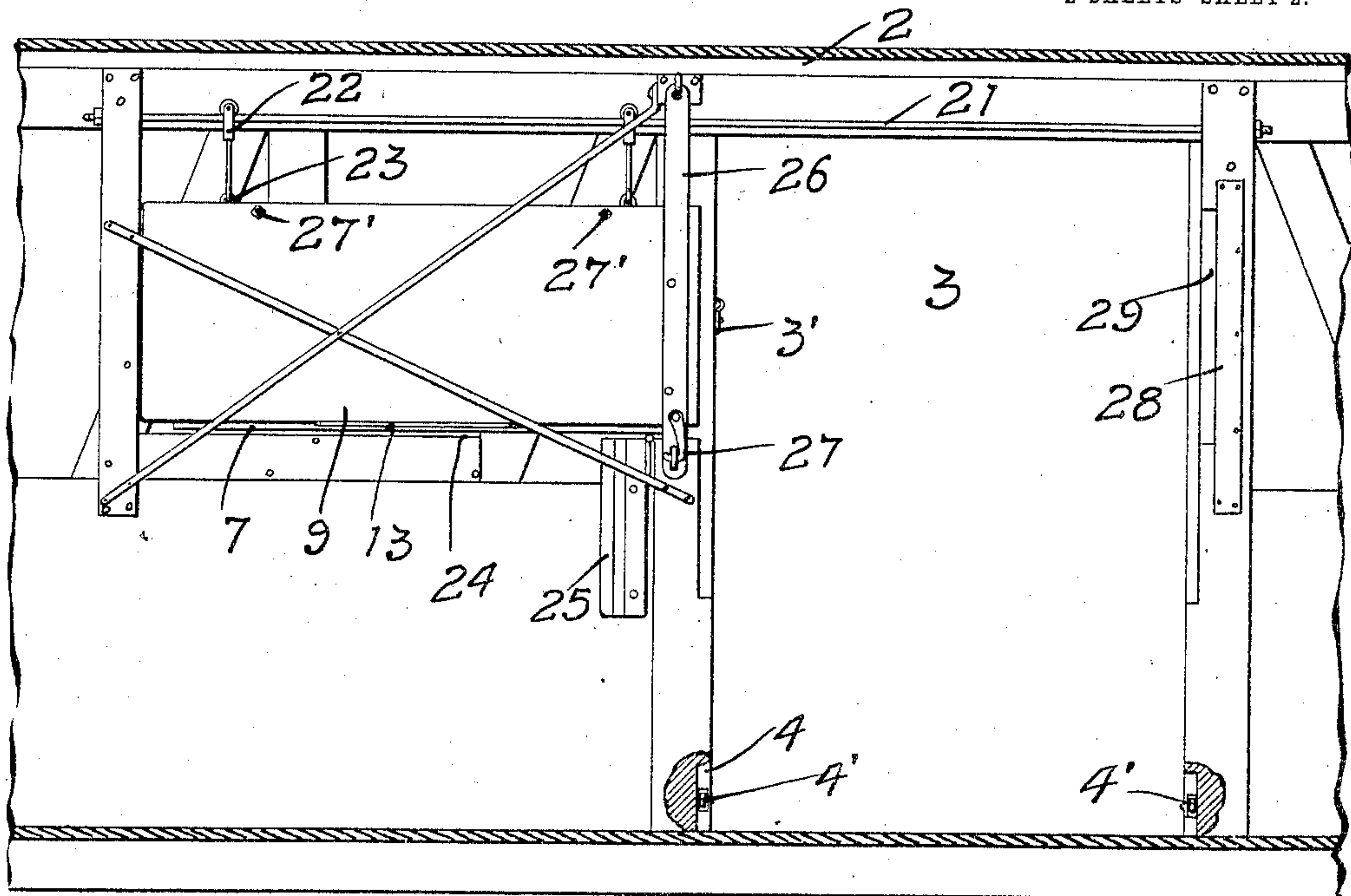
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GRAIN DOOR.  
APPLICATION FILED FEB. 27, 1908.

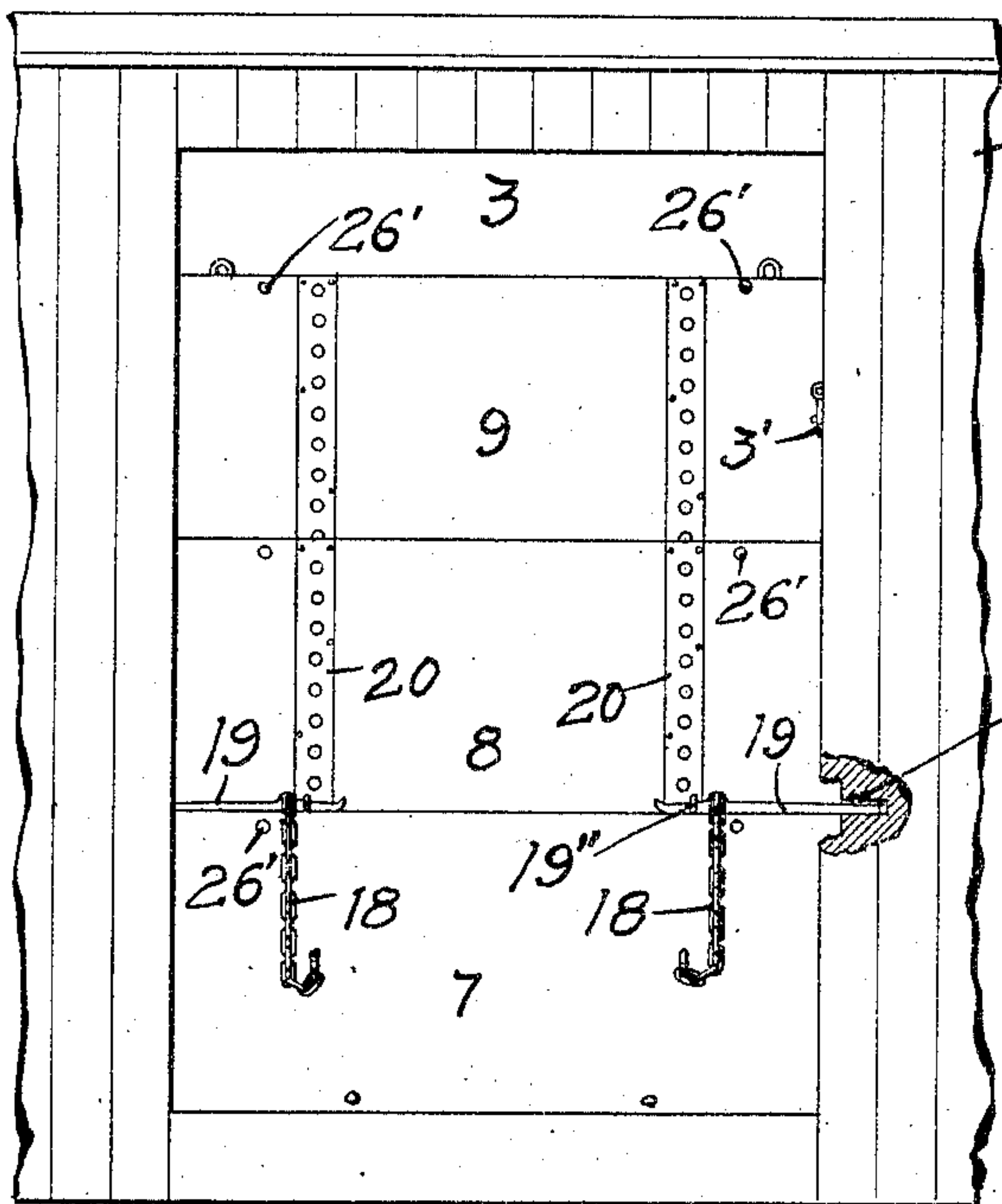
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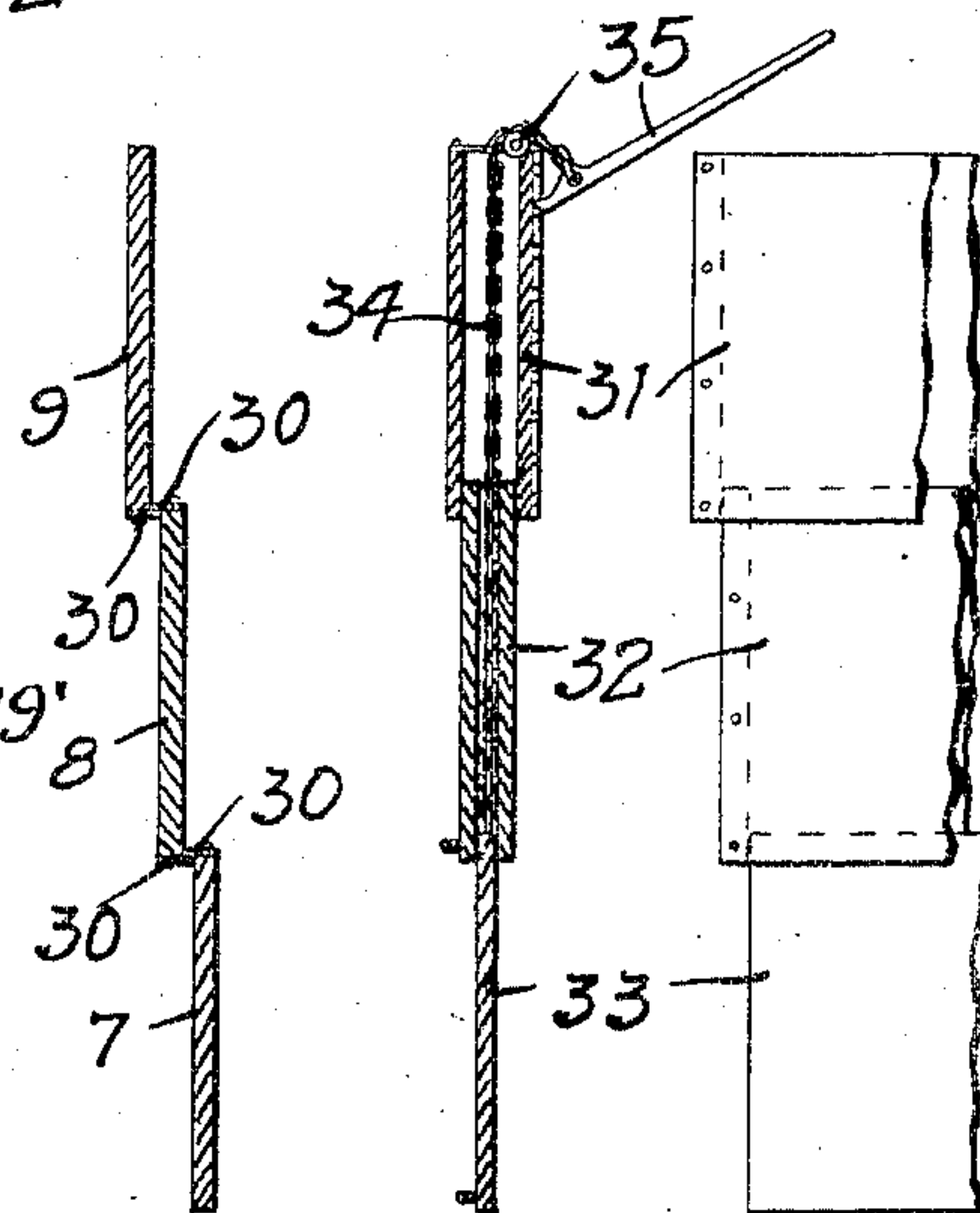
2 SHEETS—SHEET 2.



*Fig 5.*



*Fig 6.*



*Fig 7. Fig 8. Fig 9.*

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# UNITED STATES PATENT OFFICE.

PETER A. AURNESS, OF MINNEAPOLIS, MINNESOTA.

## GRAIN-DOOR.

996,961.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed February 27, 1908. Serial No. 418,051.

*To all whom it may concern:*

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

This invention relates to grain doors for freight cars and the object of the invention is to provide a door of simple compact construction and one which can be easily operated for the purpose of adapting the car for use in hauling grain or merchandise.

A further object is to provide a grain door for freight cars which affords ready means for opening the car and whereby the actual force required to lift the door will be proportional to the number of sections, two or more, employed, less than the force required to lift the door if it should be made in one continuous section.

A further object is to provide a door having grain tight joints, and one which when not in use can be compactly collapsed or folded to occupy a recess in the wall of the car.

The invention consists generally 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 longitudinal vertical sectional view of a portion of the freight car with my invention applied thereto. Fig. 2 is an outside view of the grain door illustrating it in its closed position. Fig. 3 is a detail sectional view on the line *y-y* of Fig. 2. Fig. 4 is a vertical sectional view on the line *x-x* of Fig. 2. Fig. 5 is a sectional view illustrating the door in its folded and inoperative position. Fig. 6 is a view of the outside of the door illustrating a modified means for raising it. Fig. 7 is a sectional view illustrating a modified construction of the door. Fig. 8 is another modification showing a telescoping form of door. Fig. 9 is a detail view looking at one side of the form of door shown in Fig. 8.

In the drawing, 2 represents a freight car having the usual door opening 3. On each side of the door opening vertical guideways are provided consisting of grooves 4, 5 and 6, that are arranged parallel with one another and adapted to receive and guide the door sections 7, 8 and 9 that have their ends fitted within said grooves and their contig-

uous edges lapping by one another and adapted to slide one upon another to expand or collapse the door. The sections are preferably held in their proper relative position by interlocking devices consisting of vertical recesses 10 formed in the surface of one section and plates 11 arranged to lap over said recesses with spaces formed between the contiguous edges of the plates in which the shank of a T-shaped plate 12 secured on the contiguous door section, is adapted to slide. The door sections are thus held together but are allowed to slide up and down in their guideways but their edges will be held against separation and the escape of the grain.

At the bottom of the doorway on each side I provide anti-friction rollers 4' against which the lower section 7 contacts when the door is closed. On one of the guideways I provide a bolt 3' that is adapted to slide in beyond the door sections when they are raised and moved to one side of the door opening to prevent the door sections from sliding out into the doorway when the car is in motion. The lower section 7 is prevented from sliding by the next one above by a suitable stop 13 provided near the lower edge of said section.

For the purpose of raising the door sections when the car is loaded and the grain is pressing against the inside of the door, I provide a chain or other flexible means 14 attached to the lower section and carrying a lever 15 having one end that is adapted to enter holes 16 in plates 17 that are secured transversely to the middle portion of each door section, as shown in Fig. 2. In Fig. 6 a similar lifting apparatus is provided except that two chains 18 are used for the levers 19 and two sets of plates 20 are secured to the surfaces of the door sections. The levers 19 are inserted into sockets 19' in the guideways and through staples 19'' on the edge of the sections 7. When it is desired to raise the lower section these levers can be easily and quickly removed and adjusted for use.

At the top of the door is a track 21 whereon hangers 22 are adapted to slide, said hangers having hooked lower ends to engage staples 23 in the upper edge of the door. At one side of the door opening is a way 24 of sufficient width to receive the door sections placed side by side, and one of the guideways at the side of the door has a hinged upper section 25 that is adapted to swing



down away from the door casing and allow the collapsed door to be pushed from the door opening.

A bar 26 is hinged at the top of the car and has a hook and staple fastening device 27 at its lower end for holding the door in place upon the guideway. The door sections have holes 26' therein which are adapted to register when the sections are moved to a collapsed or folded position and bolts 27' are inserted into the holes to hold the sections together. The hangers 22 are inserted into the staples 23 when the door is folded and the sections suspended within the recess in the wall of the car. The bar 26 also holds the upper section of the door in place across the car opening and on the other side of the casing a bar 28 is to extend down beside a recess 29 into which one end of the upper door section is inserted.

I may prefer to provide plates 30 on the edges of the door sections, said plates contacting with one another when the door is closed and forming grain tight joints between the sections. This construction is illustrated in Fig. 7.

In Fig. 8 I have shown a series of telescoping sections 31, 32 and 33 arranged to slide one within another, the lower section having a cable 34 attached thereto with means 35 above the upper section for winding up the cable and drawing the sections together until both the sections 32 and 33 are included within the section 31. When this has been done the door is ready to be pushed into the recess at one side of the opening. When the operator wishes to move the section 32 up into the section 31, (shown in Fig. 8) he can wind the chain around the lever 35 until the slack is taken up, or the lever may be made detachable from the chain 34 so it can be hooked into another link.

It will be noted that the door sections increase in length from the bottom toward the top of the door to adapt them for the vertical guideways, the grooves therein being step like in a cross section of the guideway.

I claim as my invention:

1. The combination, with a freight car having a door opening therein and vertical guideways on each side of said opening, of a door composed of sections arranged to slide vertically in said guideways, the contiguous longitudinal edges of said sections lapping by one another, the wall of said car having a recess on one side of said opening adapted to receive the door sections when

raised, and the guideway on that side of the car having a hinged upper portion arranged to swing down out of the path of the door sections and permit them to be moved into said recess, substantially as described.

2. The combination, with a freight car having a door opening therein and vertical guide ways on each side of said opening, said guide ways consisting of a series of vertical grooves arranged parallel with and lapping by one another, and a door composed of a series of sections having their ends fitting respectively in said grooves, the adjacent longitudinal edges of said sections lapping by each other vertically to form grain tight joints, means disposed in said joints between the sections for holding said lapping edges together and permitting them to slide vertically upon one another, means for lifting said sections, said sections being capable, when raised, of sliding by one another until the upper and lower edges of the lower sections are flush substantially with the corresponding edges of the upper section, and the side wall of said car having a recess therein to receive the said door sections when so collapsed, and means for temporarily closing said side wall recess substantially as described.

3. The combination, with a freight car having a door opening therein and vertical guide ways on each side of said opening, said guide ways including comparatively shallow grooves arranged parallel with one another and lapping by each other and gradually increasing in depth from the bottom to the top of said guide ways, whereby seats will be formed at the lower end of each groove, a door composed of sections of different length arranged to slide vertically in said grooves, the longitudinal edges of the adjacent sections lapping by one another in their respective grooves, interlocking means mounted on said sections and adapted to hold said lapping edges closely together and permit the free vertical movement of said sections, means for raising said sections until the edges of the lower sections are flush substantially with the corresponding edges of the upper section, and said car wall having a recess at one side of the door opening therein to receive said sections when so collapsed, substantially as described.

In witness whereof, I have hereunto set my hand this 19th day of February 1908.

PETER A. AURNESS.

Witnesses:

J. A. BYINGTON,  
C. G. HANSON.