

No. 624,316.

Patented May 2, 1899.

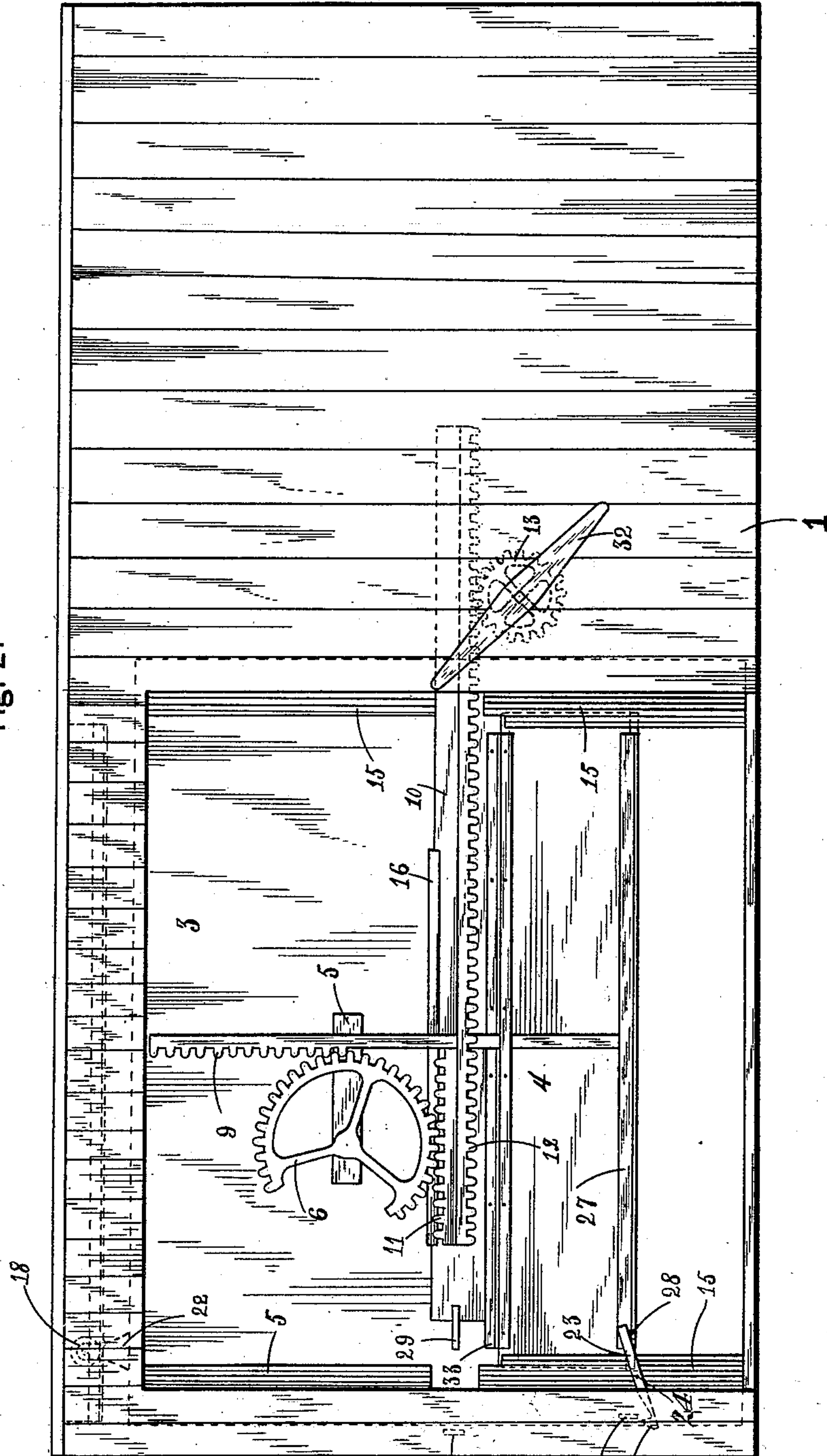
A. FINK & F. PAPLOW.
DOOR FOR GRAIN CARS.

(Application filed Nov. 25, 1898.)

(No Model.)

4 Sheets—Sheet 2.

Fig. 2.



Witnesses,
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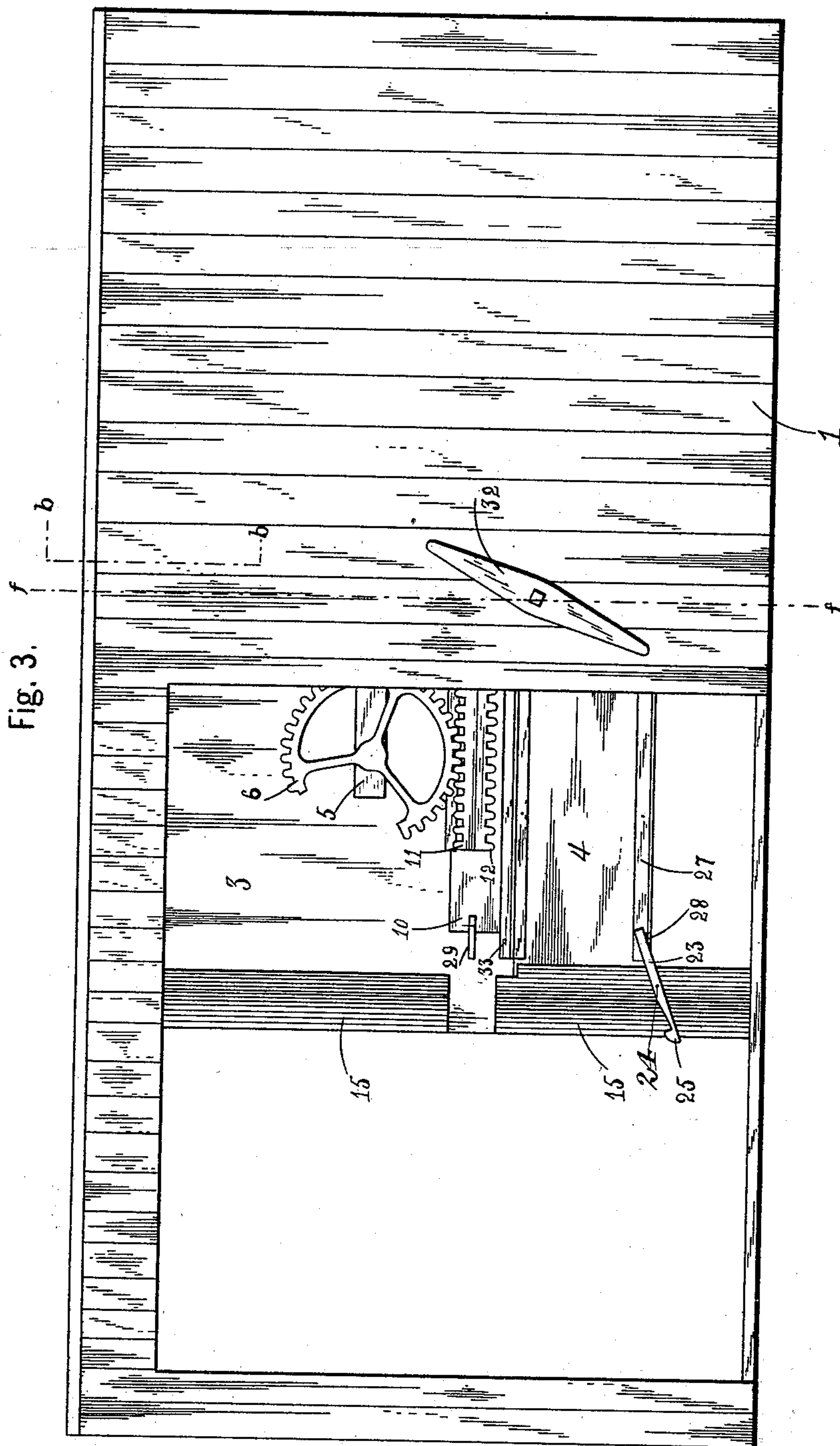
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4 Sheets—Sheet 3.



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4 Sheets—Sheet 4.

Fig. 4.

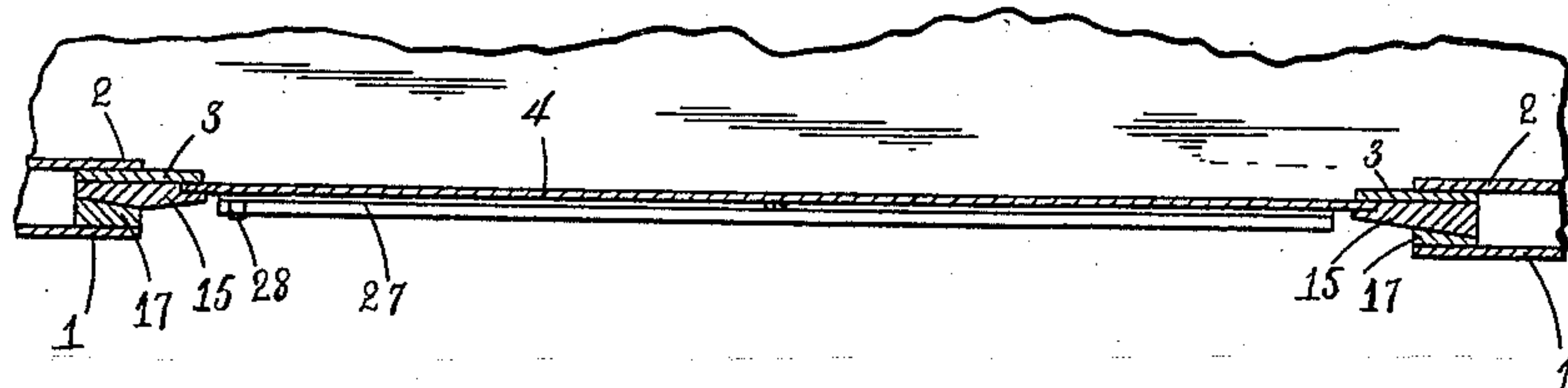


Fig. 5.

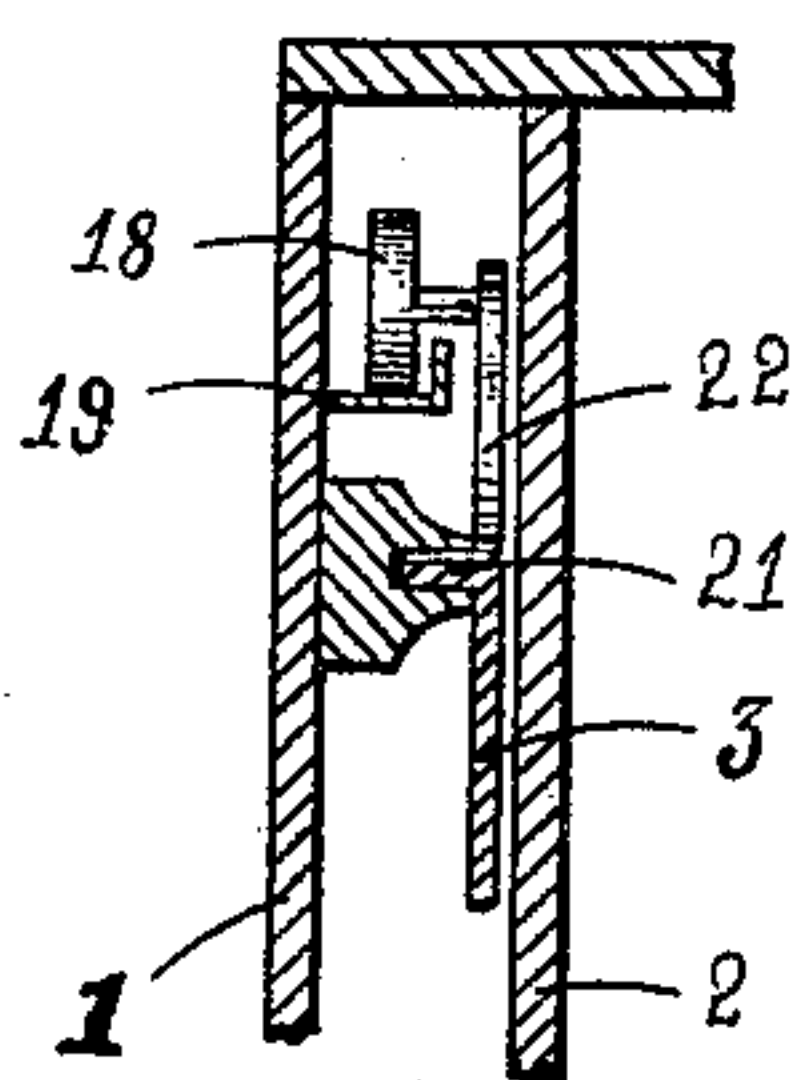


Fig. 6.

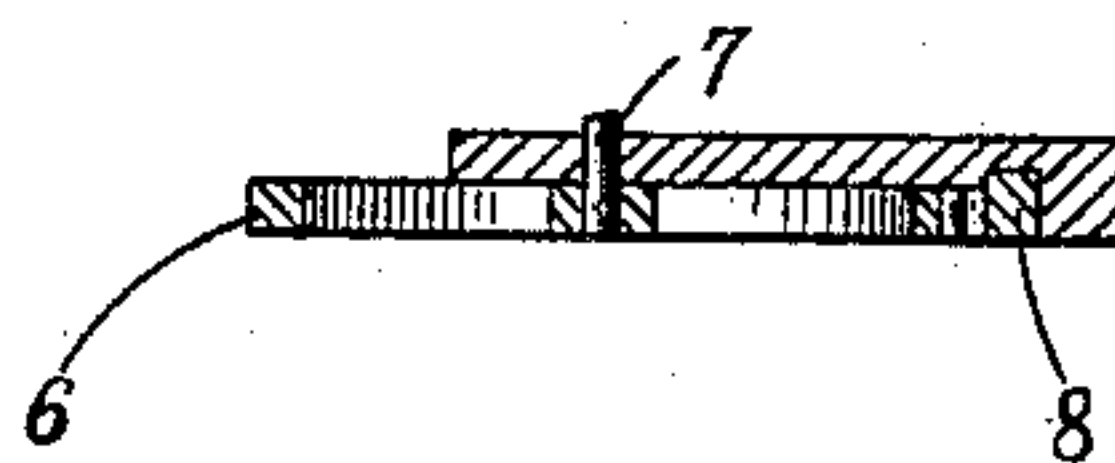


Fig. 7.

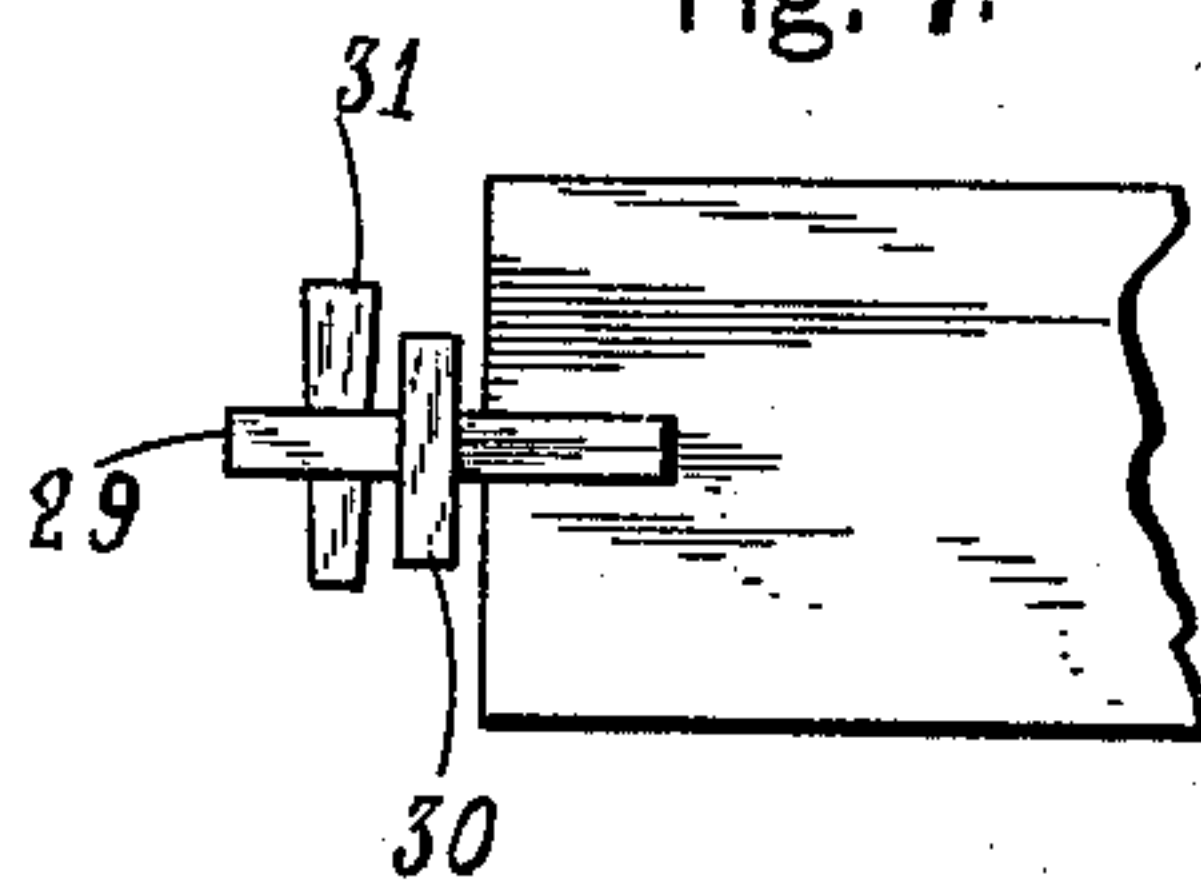
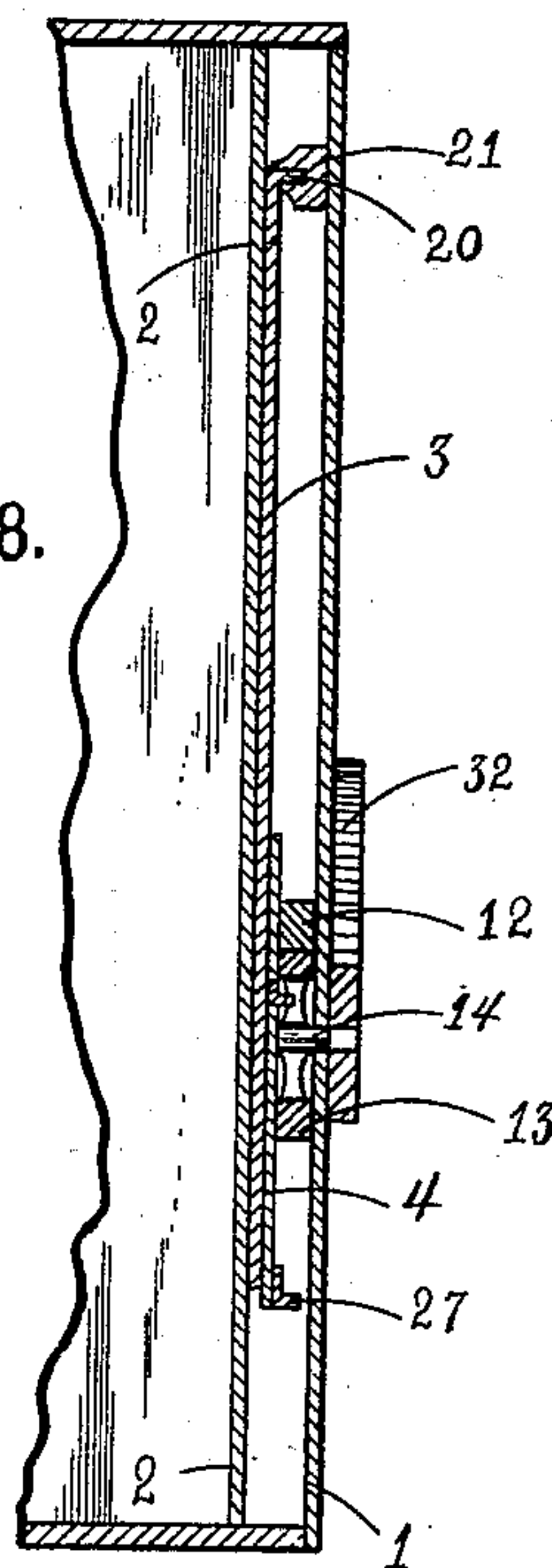


Fig. 8.



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UNITED STATES PATENT OFFICE.

ALBERT FINK, OF BUFFALO, AND FREDRICK PAPLOW, OF SLOAN,
NEW YORK.

DOOR FOR GRAIN-CARS.

SPECIFICATION forming part of Letters Patent No. 624,316, dated May 2, 1899.

Application filed November 25, 1898. Serial No. 697,337. (No model.)

To all whom it may concern:

Be it known that we, ALBERT FINK, residing at Buffalo, and FREDRICK PAPLOW, of Sloan, in the county of Erie and State of New York, citizens of the United States, have invented certain new and useful Improvements in Doors for Grain-Cars, of which the following is a specification.

Our invention relates to an improved door for grain or freight cars in which the main door is provided with a smaller supplementary door which is opened by the operating mechanism to permit a portion of the grain to flow from the car to relieve the pressure against the main door before it is opened the operating mechanism having a certain range of movement before moving the main door and the supplemental door having means connected to said operating mechanism for moving the supplemental door during the range of movement of said operating mechanism.

It also relates to a locking device for the main door, which is operated automatically by the supplementary door at or near the termination of its operating movement to release the main door and permit it being opened.

Our invention relates also to certain details of construction, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which our preferred construction is illustrated.

Figure 1 represents a side elevation of the side of the car-frame, the outer door being removed to expose the grain-door and its operating mechanism. Fig. 2 represents a similar side elevation of the car-frame, the supplementary door being shown in its open position and the locking device for the main door tilted to disengage it from the holding portion on the frame. Fig. 3 also represents a side elevation of a car-frame with the main grain-door partly open. Fig. 4 is a section on or about line *a a*, Fig. 1. Fig. 5 is a section on or about line *b b*, Fig. 3. Fig. 6 is a section on or about line *c c*, Fig. 1. Fig. 7 is an enlarged view of the fastening device. Fig. 8 is a section on or about line *f f*, Fig. 3.

In reference to the annexed drawings like numerals designate like or similar parts.

The sides of the car are constructed of two

substantially vertical walls 1 and 2, which extend parallel with and are slightly separated from each other, and the main grain-door 3 when open slides into and is supported in the space between said sides. A portion of these sides is removed to leave an opening, which is adapted to be closed by the door 3, and they are secured to the car-frame by any suitable fastening, preferably bolts or nails. The walls are also secured to the interior of the car-top by similar fastening means, such as bolts. The door 3 has an opening in its lower portion, and a supplementary door is supported in slideway mechanism mounted upon said door 3, so as to close said opening when in its normally-closed position.

A toothed segment 6 is journaled upon a short shaft 7, that projects from a horizontal bar portion 5, mounted upon the main door, and a vertical bar 8 extends upward from the supplementary door, being supported in a vertical depression in the main door, which forms a slideway, and is provided with a toothed rack 9, engaging with the segment 6.

The main door is provided with a horizontal bar 10, which is mounted in a slideway formed in said door and has a limited horizontal movement in said slideway. This bar 10 is provided with an upper rack of teeth 11, engaging with the teeth in the segment 6, and a lower rack of teeth 12, which engage with an operating gear-wheel 13, mounted on the inner end of a short shaft 14, which is journaled in the outer walls of the car side. (See Figs. 1 and 2, where this wheel is shown in dotted lines.)

The main door and the supplementary door are each preferably formed of sheet-iron of suitable thickness, and the slideways in which the supplementary door is supported are formed by attaching two metallic devices 15 to the main door, having portions cut away to provide slideways between the side of the main door and the end portions of the devices, in which the edges of the supplementary door are sustained. (See Fig. 4.) The outer edges of these devices are beveled, and correspondingly-beveled portions 17 are secured rigidly to the car-frame. (See Fig. 4.)

The devices 15 are arranged relatively to

the portions 17, so that when the door is closed they will wedge their beveled edges snugly against the beveled edges of the portions 17, and thus hold the door firmly and rigidly in place.

The main door is supported at one end by a roller 18, which travels upon a horizontal rail portion 19, which projects from the inner surface of the car side near the top thereof, (see Fig. 5,) and the opposite end is sustained by the operating gear-wheel sufficiently to allow a comparatively easy movement to the door when being opened or closed.

The upper edge of the door 3 is bent at right angles to itself to form a flange 20, which seats in a horizontal groove in the extension 21, (see Fig. 5,) which projects inwardly from the inner side of the outer portion 1, near the top of the car, and extends from the permanently-closed end of the car to a slight distance past the opening in the car-frame, which is adapted to be closed by the main door.

The main door when closed is locked against horizontal movement by a locking device or latch 23, which is pivoted to the door by means of the pivotal pin 24. This latch is provided with a hooked portion 25, which catches over the edge of the transverse bar 26, attached to the car-frame. (Shown in dotted lines in Fig. 2.)

To the lower edge of the supplementary door is secured an angle-iron 27, and a lug 28 projects outwardly therefrom, the office of which is to raise the inner end of the latch, and thereby disengage its hooked portion from the bar 26 to release the main door. This operation is automatically performed by the movement of the supplementary door at or near the limit of its upward movement, the extension 28 pressing against the inner end of the latch 21 and tilting it upward, substantially as shown in Fig. 2. The main door is also additionally fastened in place by means of the slotted piece 29, secured to the end of the bar 10, which is adapted to pass through the slot in the transverse portion 30 and be secured against removal by inserting the pin 31 in the slot or opening through it. (See Fig. 7.)

The shaft 14 is provided with a square head, upon which an operating-handle 32 is adapted to be placed.

When it is desired to open the door of a car filled with grain and having our improved attachments, the pin 31 is removed from the slot in the extension 29 and the handle 32 is turned in the direction of the arrow V, thereby rotating the gear-wheel 14, moving the bar 10 in its slideway and the piece 29 from engagement in the slot in the transverse portion 30. This bar in turn partially rotates the segment 6, and the movement of the segment lifts the vertical bar 8 and raises the supplementary door, thereby allowing a portion of the grain in the car to flow therefrom and relieving the pressure against the main door. When the

supplementary door is at or near the limit of its upward movement, the lug 28 strikes against and lifts the latch 24 from engagement with the bar 26, thereby freeing the main door. The upward movement of the supplemental door is limited by its upper edge striking against the lower edge of the horizontal strip 33, which forms the lower boundary of the slideway in which the bar 10 is supported. The rotation of the segment immediately ceases when the supplementary door reaches the limit of its upward movement, thereby locking the bar 10 against further movement in its slideway independently of the main door. Now upon continuing the rotation of the handle 32 the main door itself is moved horizontally within the double partition or sides of the door-frame to free the opening. The main door and the supplementary door are closed by turning the operating-handle in the reverse direction.

We claim as our invention—

1. In a door for grain-cars, the combination with the car-frame of a main door having an opening, a supplemental door mounted in slideways in said main door, a vertical bar extending from said supplemental door, a toothed segment journaled on a shaft extending from the main door, and in engagement with the teeth on the vertical bar, a horizontal bar mounted in slideways on the main door and having an upper series of teeth in engagement with the segment and a lower series of teeth, and an operating gear-wheel engaging with the lower series of teeth, as set forth.

2. In a door for grain-cars, the combination with the car-frame, of a main door supported in said frame and normally locked to said frame against movement, a supplemental door supported by the main door, mechanism for operating said supplemental door and means automatically operated by the supplemental door at or near the limit of its opening movement for releasing the main door from the frame to allow it to be opened.

3. In a door for grain-cars, the combination with the car-frame, of a main door mounted therein and having a horizontal movement, a supplemental door supported by and having a vertical movement in slideways in the main door, mechanism connected to the main door for operating the same and having a certain inoperative range of movement before moving said main door, and means connecting the supplemental door to said mechanism for operating said supplemental door during said inoperative range of movement, as set forth.

4. In a door for grain or similar cars, the combination with the car-frame having beveled portions, of a main door, a supplemental door and slideway devices secured to the main door in which the supplemental door is supported, said slideway devices having beveled portions which wedge snugly against the beveled portions on the car-frame when the door is closed, as set forth.

5. In a door for grain-cars, the combination
with the car-frame, of a main door supported
in said frame and normally locked to said
frame against movement, mechanism for op-
erating said main door having a certain range
of movement before moving said door, a sup-
plemental door supported by the main door,
mechanism for operating said supplemental
door during said range of movement and
means automatically operated by the supple-
mental door at or near the limit of the said
range of movement for releasing the main
door from the frame to allow it to be opened.

6. In a door for grain-cars, the combination

with the car-frame, of a main door, a supple-
mental door, a bar mounted in slideways on
the main door and having a certain range of
movement before opening said door and de-
vices in connection with the supplemental
door and the bar, for operating the supple-
mental door during said range of movement,
as set forth.

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