

D. F. NOLL.
 FLUSH CAR DOOR SUPPORTING AND OPERATING MEANS.
 APPLICATION FILED NOV. 30, 1908.

955,537.

Patented Apr. 19, 1910.

4 SHEETS—SHEET 1.

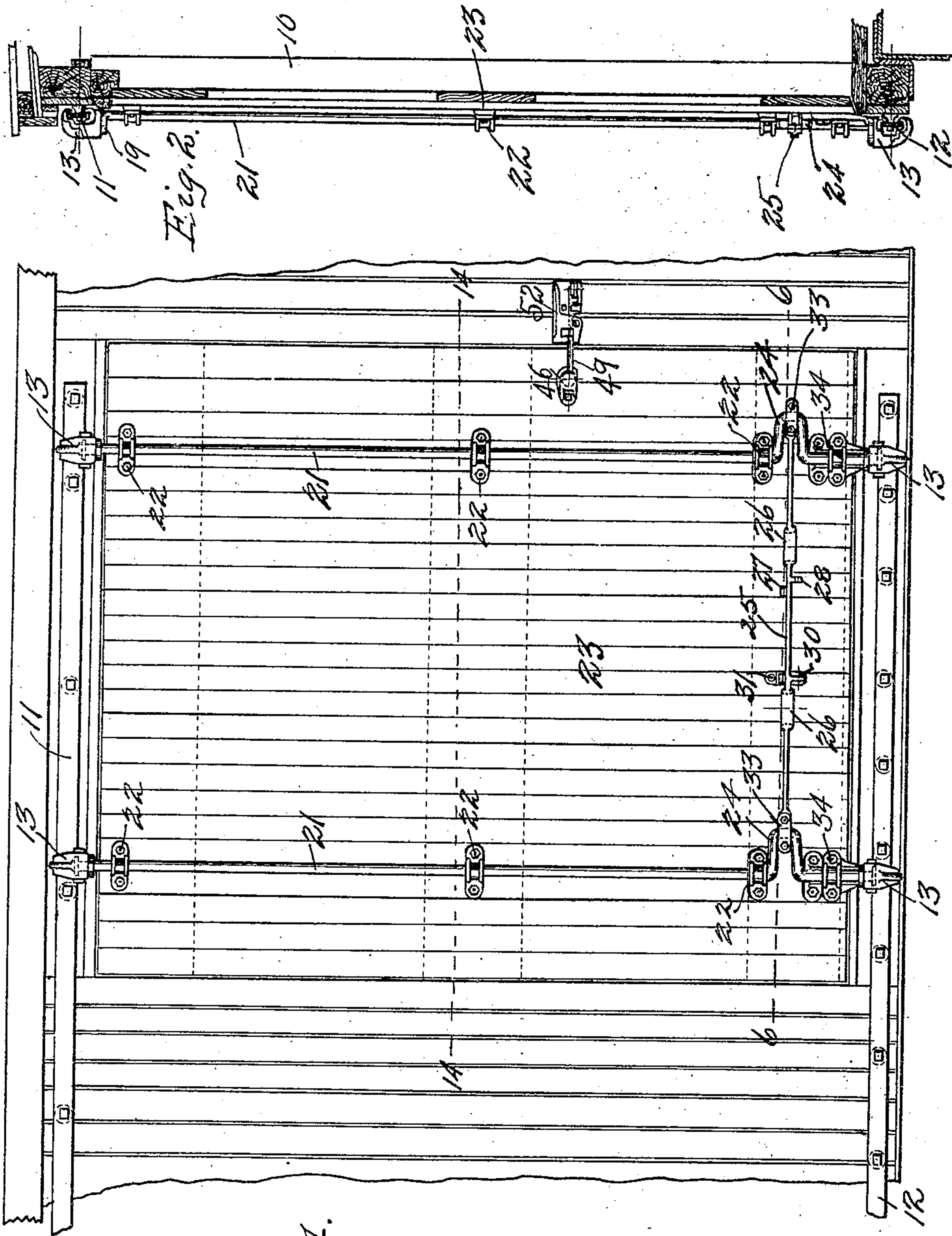


Fig. 1.

Fig. 2.

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Witnesses

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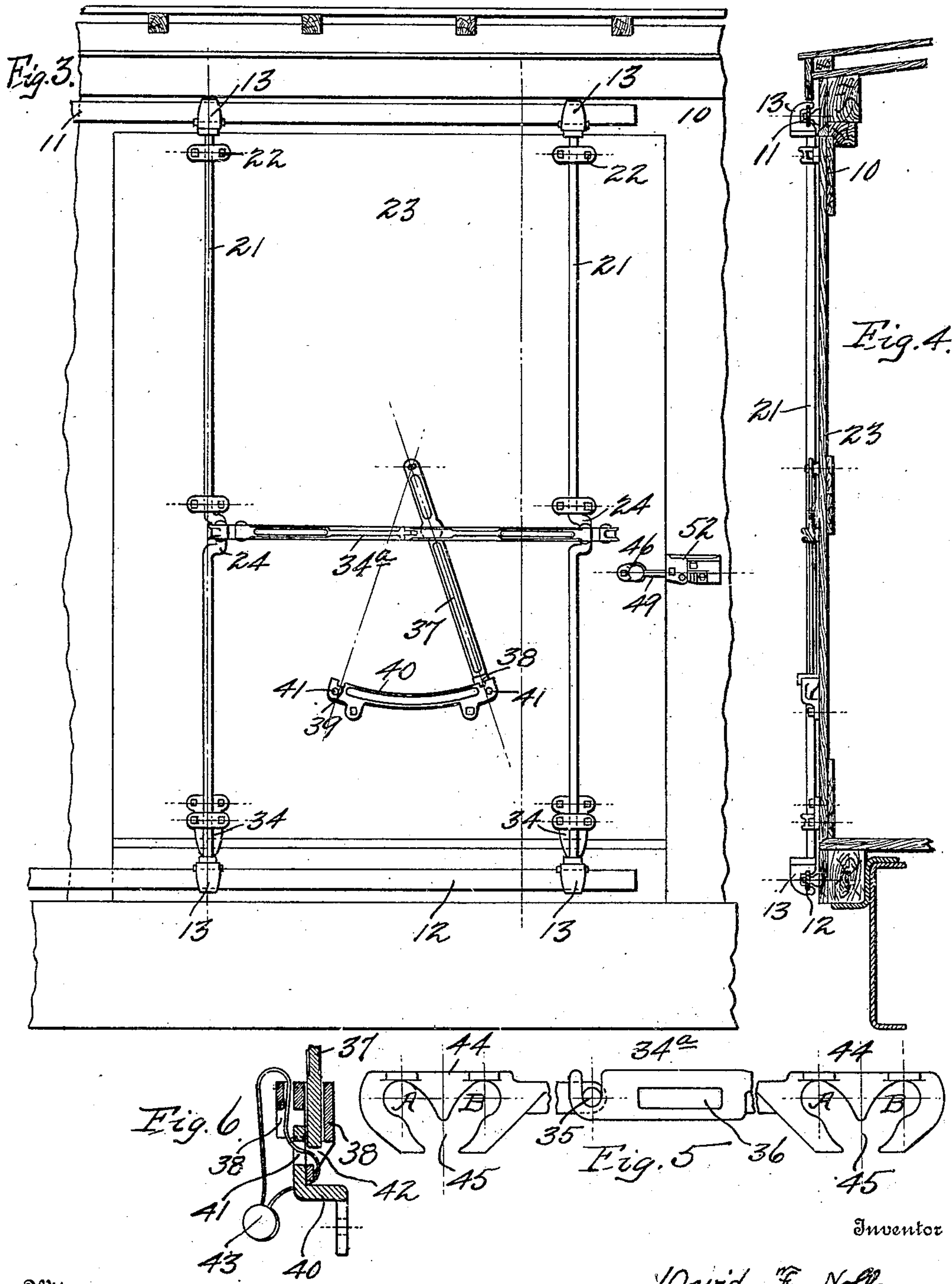
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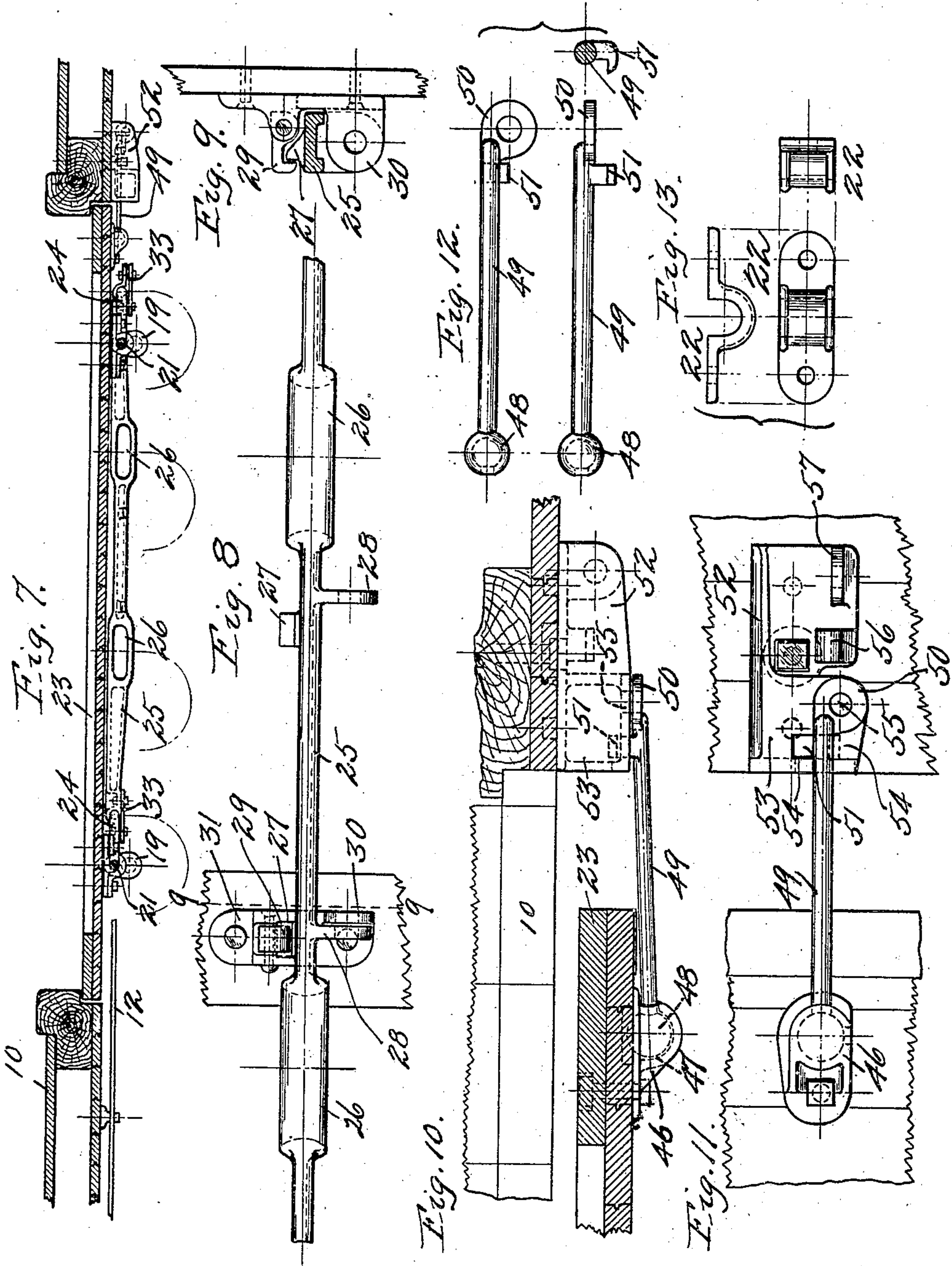
By Norman E. Gee, Attorney

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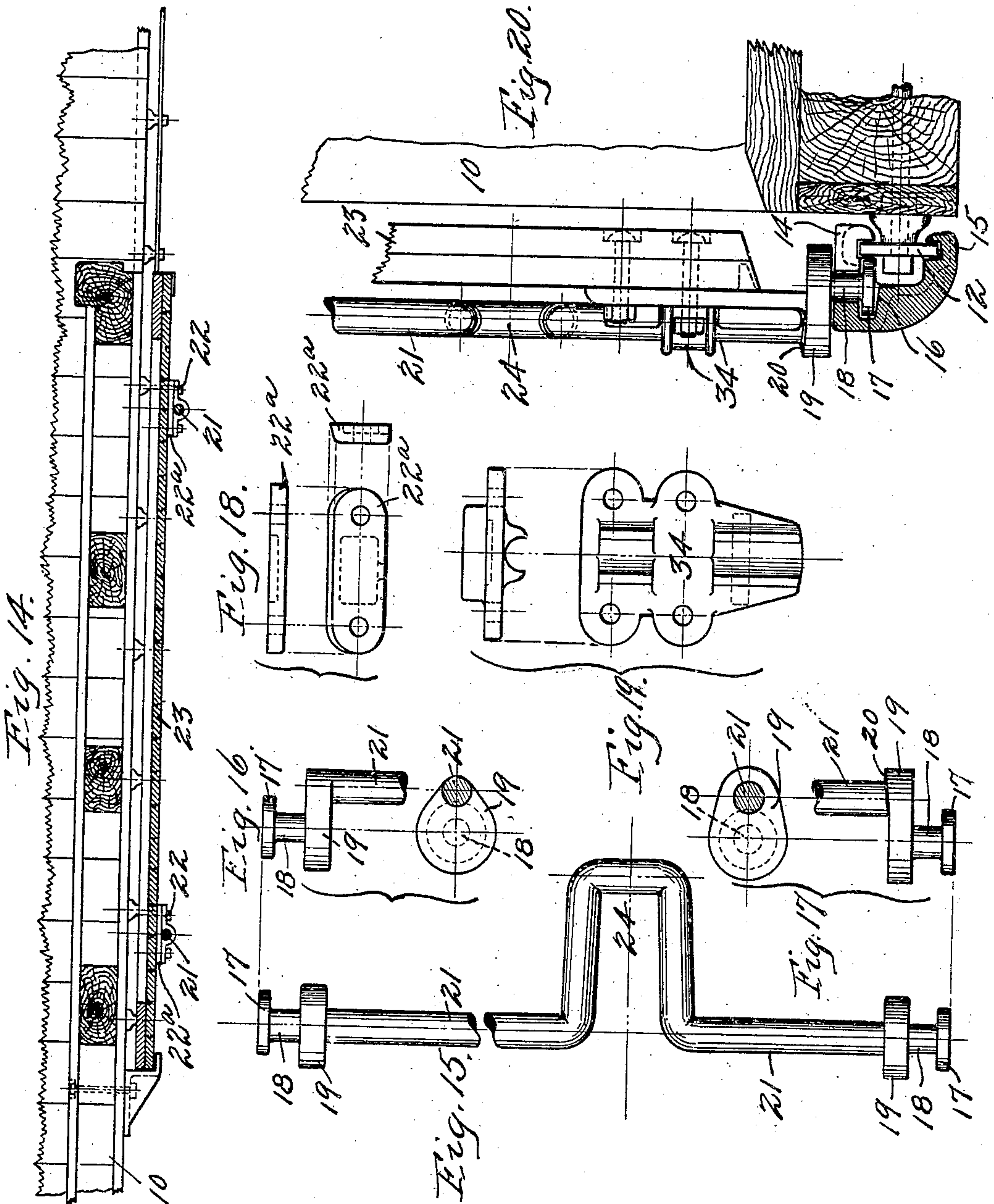
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UNITED STATES PATENT OFFICE.

DAVID F. NOLL, OF ALTOONA, PENNSYLVANIA.

FLUSH-CAR-DOOR SUPPORTING AND OPERATING MEANS.

955,537.

Specification of Letters Patent.

Patented Apr. 19, 1910.

Application filed November 30, 1908. Serial No. 465,151.

To all whom it may concern:

Be it known that I, DAVID F. NOLL, a citizen of the United States, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Flush-Car-Door Supporting and Operating Means, of which the following is a specification.

This invention relates to car doors of the flush closing type, and has specially in view certain improvements in the mounting and operating mechanism therefor which will facilitate the opening and closing of the same.

In carrying out the objects of the invention generally stated above it will, of course, be understood that changes in details and structural arrangements may be resorted to, certain practical examples of which are shown in the accompanying drawings, wherein,—

Figure 1 is a side elevation of a portion of a car showing the same equipped with the improved door operating mechanism. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a view similar to Fig. 1, but showing a modification of the door operating mechanism. Fig. 4 is a vertical sectional view of the construction shown in Fig. 3. Fig. 5 is a plan view of the operating bar shown in Figs. 3 and 4. Fig. 6 is a sectional view of the locking means for the operating mechanism of the structure shown in Figs. 3 and 4. Fig. 7 is a horizontal sectional view taken on the line 6—6, Fig. 1. Fig. 8 is a plan view of the operating bar shown in Fig. 1. Fig. 9 is a vertical sectional view taken on the line 9—9, Fig. 8. Figs. 10, 11, and 12 are detail views of a side latching mechanism for the car door. Fig. 13 shows a series of elevational views of the outer plates of the bearing clips for the rock shafts. Fig. 14 is a sectional view taken on the line 14—14, Fig. 1. Figs. 15, 16 and 17 are detail views of one of the door supporting rock shafts. Figs. 18 and 19 are detail views of bearing clips and plates for the rock shafts. Fig. 20 is an enlarged sectional view of the lower portion of one of the rock shafts showing the mounting of their terminals on the side rail of the car.

Like characters of reference designate corresponding parts.

Referring to the accompanying drawings, 10 designates a car body provided with the upper and lower outstanding rails 11—12

upon which are slidably mounted the door carrying castings 13, each casting being provided with an upper and a lower horizontally projecting hook 14—15 adapted to engage with the top and bottom edge respectively of said rails. Said castings each have an inverted T-shape opening 16 formed through their top portion, the bottom of which forms a pivot base for an enlarged circular disk head 17 of a pivot shaft 18 carried by an eccentric 19. It will be observed that the door carrying castings are arranged in pairs two upper and two lower sets, said castings being of duplicate construction. The eccentrics journaled in the lower castings have their upper faces provided with a cam surface 20, and the oppositely disposed eccentrics of each pair are carried by a door-supporting rock shaft 21. The said rock shafts are held in rotatable engagement with the car door 23 by means of the bearing clips 22—22^a, and are provided with crank portions 24. Preferably said crank portions of the door supporting rock shafts are formed by bending the same to a substantially U-shape, and are connected by means of an operating lever 25.

In the embodiment of the invention shown in Figs. 1, 2, 7 and 8, the operating lever 25 is shown provided with two hand holds 26, and adjacent to each hand hold, two oppositely disposed latching and stop members 27, 28 are carried by said lever, which engage with a pivoted latch 29 and an abutment 30 carried by a casting 31 rigidly secured on the car door 23, and thereby serve to limit the movement of said operating lever and also to lock the same to retain the door 23 in an open or closed position, as will be described more fully later. An opening 32 is formed through the stop member 28 and the abutment 30, said openings registering with one another and being adapted to receive an ordinary seal or other lock to hold the said stop and abutment together.

Any suitable or preferred means may be employed for connecting the ends of the operating lever 25 with the cranks of the rock shafts, such for example as by the use of shackles 33.

In the form of the invention above described the crank portions of the supporting rods are located adjacent to their lower ends so that the operating rod 25 will be in convenient reach of a person standing upon the ground.

The car door 23 has fixed bearing plates 34 for the lower ends of the supporting rock shafts 21, said plates depending below the plane of the bottom edge of the door and resting upon the lower eccentrics 19 so as to be raised by the cam surface 20 thereof when the eccentrics are turned to close the door.

The operation of the invention as thus described is as follows:—Assuming the door to be in the position shown in Fig. 1, the seal or lock is removed from the stop 28 and abutment 30, and the pivoted latch 29 disengaged from the latching member 27, which releases said rod 25, whereupon a slight outward pull thereon will turn the rock shafts 21 so as to place their cranks in a position so that a pull to the left on the rod 25 will throw the said cranks to an opposite position to that shown, which turns the eccentrics in their mountings, and thereby swings the door 23 outwardly from the doorway to a position such as shown in Fig. 20, whereupon the door may be readily moved along the guide rails so as to clear the doorway. A reversal of the described operation will swing the door to a closed position, as will be obvious.

It will be observed that the depending guide plates 34 on the car door 23 are so arranged relatively to the cam surface 20 of the eccentrics 19, that the door will be lifted vertically during its closing movement, which insures of the door being tightly closed at its top so as to prevent any water or the like entering the car.

In Figs. 3, 4, 5 and 6 of the accompanying drawings a modified operating mechanism for the car door is shown, in which the operating bar 34^a that connects the cranks of the rock shafts is in two parts having a pivotal hook connection 35, which permits of a limited outward movement of the car door to compensate for swelling or to the pressure of the cargo against the same. In this form of the invention the connecting lever is somewhat higher up than in the preferred embodiment, and is provided with a central slot 36 through which a supplemental operating lever 37 passes. Said lever 37 has its upper end pivoted to the car door, and its lower end is provided with a sliding catch 38 for engagement with end notches 39 in a guide segment 40. Said guide segment 40 is fast on the car door and has an opening 41 formed through each end with which an opening 42 formed through the said catch 38 registers and through said openings a seal 43 or other locking medium may be secured to lock said lever to said segment.

The ends 44 of the two-part connecting rod 34^a are provided with a V-shaped slot 45 open at its apex to facilitate the entrance of the door supporting rock shafts. In this form of the invention when the door is in

a closed position the rock shafts are in the portion of the V-shaped slot marked "A", and to open the door, the lever 37 is moved to the left which imparts a similar movement to the connecting rod 34^a, and causes the ends 44 to pull upon the cranks and cause them to ride up the central partition in the said slot and over into the part marked "B", whereupon a continued movement of the rod 34^a causes the cranks to turn to an opposite position to that shown, turning with them their eccentrics, and thereby moving the door out of the doorway, as has been previously described. A reversal of this operation will, of course, close the door. In connection with this two-part connecting rod 35 it is to be understood that the lever 37, and the flat face of the car door 23, hold the said rod against outward or lateral movement so that the same is guided to slide over the surface of the car door when it is moved longitudinally in either direction under the force applied to the lever 37. The pivotal connection between the two sections of the rod simply causes the same to adapt itself to swelling or bulging of the door.

In Figs. 10, 11, 12 and 13 a side latching mechanism for the door 23 has been shown, the same consisting of a casting 46 fast on the door and having a socket 47 formed therein in which a ball 48 is seated and which has a projecting stem 49, the end of which carries a flattened eye 50. Said end also carries an outstanding latch 51 which projects at right angles to the eye 50. A casting 52 is carried by the door frame of the car, and is provided at one end with an outstanding and overhanging vertical side 53 in which a latching notch 54 and an eye 55 is formed. Said casting is also provided at its opposite end portion with an additional latching notch 56 which is formed by upturning the lower edge of the body portion thereof and immediately behind said notch 56, a horizontally projecting eye 57 is formed. This described latching mechanism permits of the door being held partly open or entirely closed through the medium of the described universally mounted latch stem whereby the end eye and angular latch thereof may be engaged with the first or end sets of notches and eyes carried by the car frame casting, seals or other suitable locking means being employed to retain the eye of the stem in engagement with either of the eyes of the car frame casting.

I claim as my invention:—

1. The combination with the door and guide rails, of slide castings mounted on said rails, rock shafts having terminal eccentrics journaled in the castings and also having cranks, means for effecting a lifting action for the door upon rotation of the rock shafts, an operating rod connecting the cranks of the rock shafts, and coöperating

latching mechanism carried by the door and said operating rod.

2. The combination with the door and guide rails, of slide castings mounted on 5 said rails, rock shafts having terminal eccentrics journaled in the castings and also having cranks, a fixed casting on the door having an abutment projection and a latch, and a hand controlled operating lever con- 10 nected at its terminals with the cranks of the opposite rock shafts and provided with two sets of oppositely disposed latching and stop members.

3. The combination with the door having

fixed abutments and the guide rails, of slide 15 castings engaging said rails, vertical rock shafts journaled on the door and having terminal eccentrics and intermediate cranks, the lower eccentrics of the shafts having cam surfaces engaging the fixed abutments on 20 the door, and an operating rod connecting the cranks of the opposite rock shafts.

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

DAVID F. NOLL.

Witnesses:

N. E. GEE,

MERLE BURKHOLDER.