

F. CRONEMILLER.

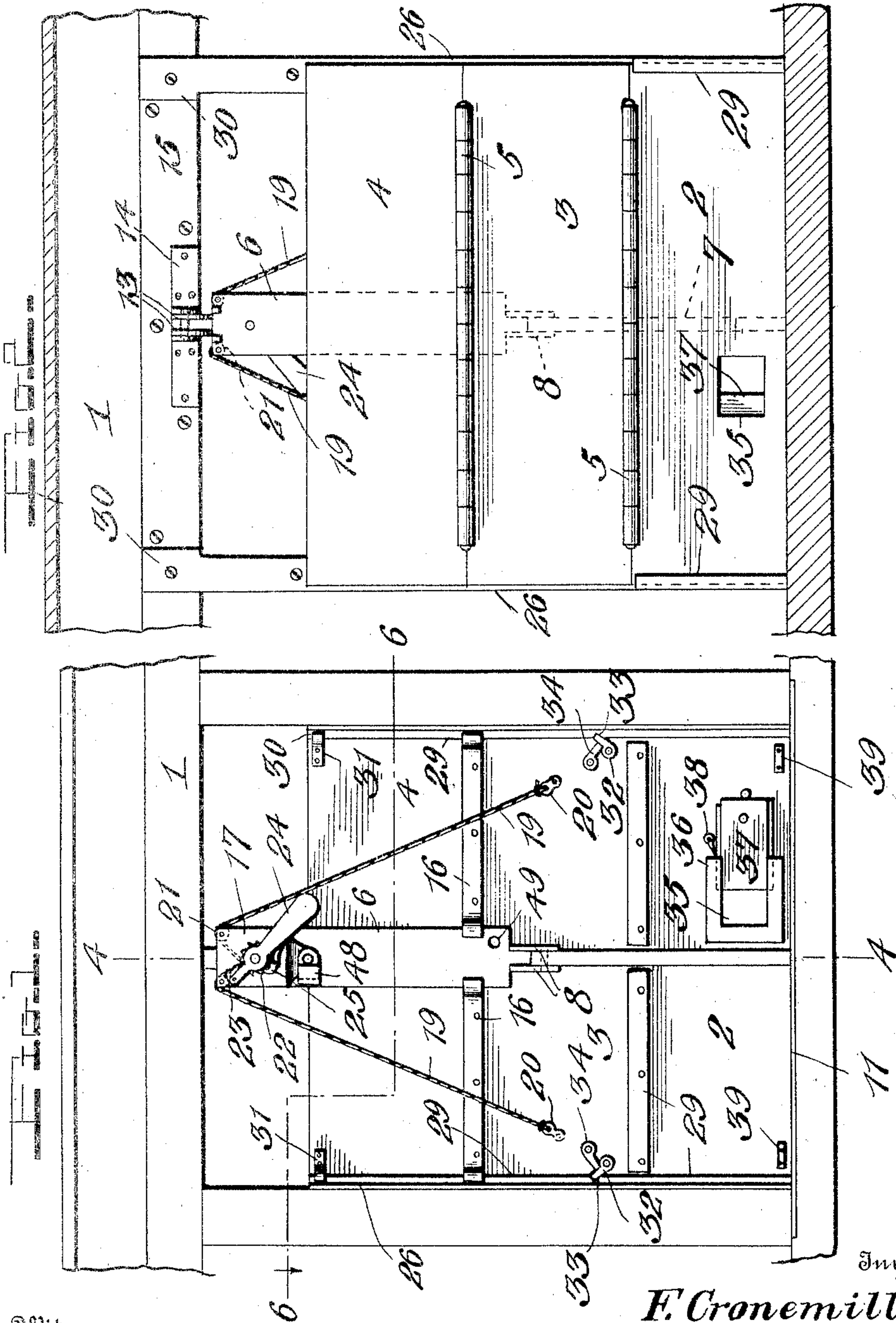
CAR DOOR.

APPLICATION FILED MAY 2, 1910.

Patented May 30, 1911.

3 SHEETS—SHEET 1.

994,062.



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Witnesses

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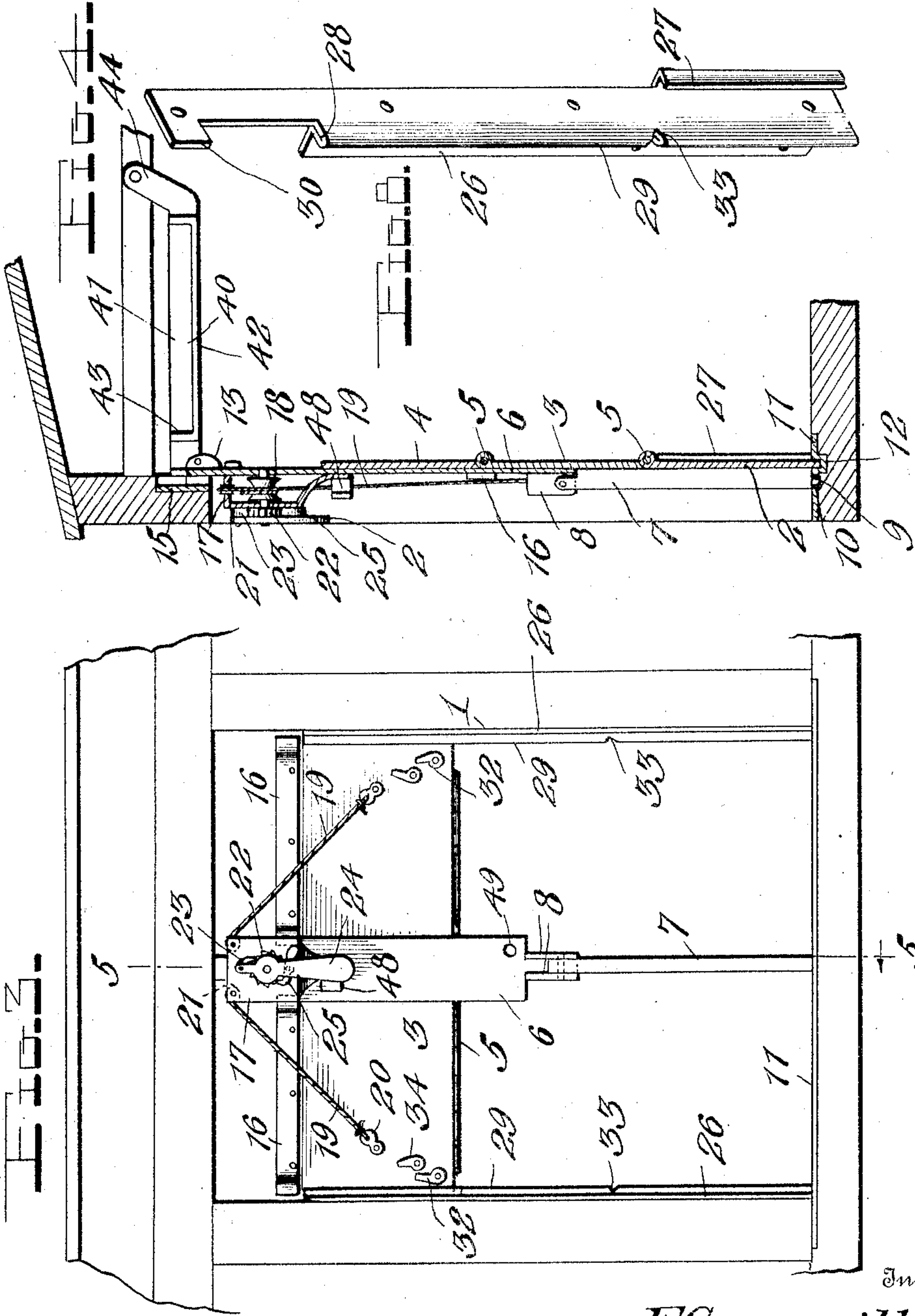
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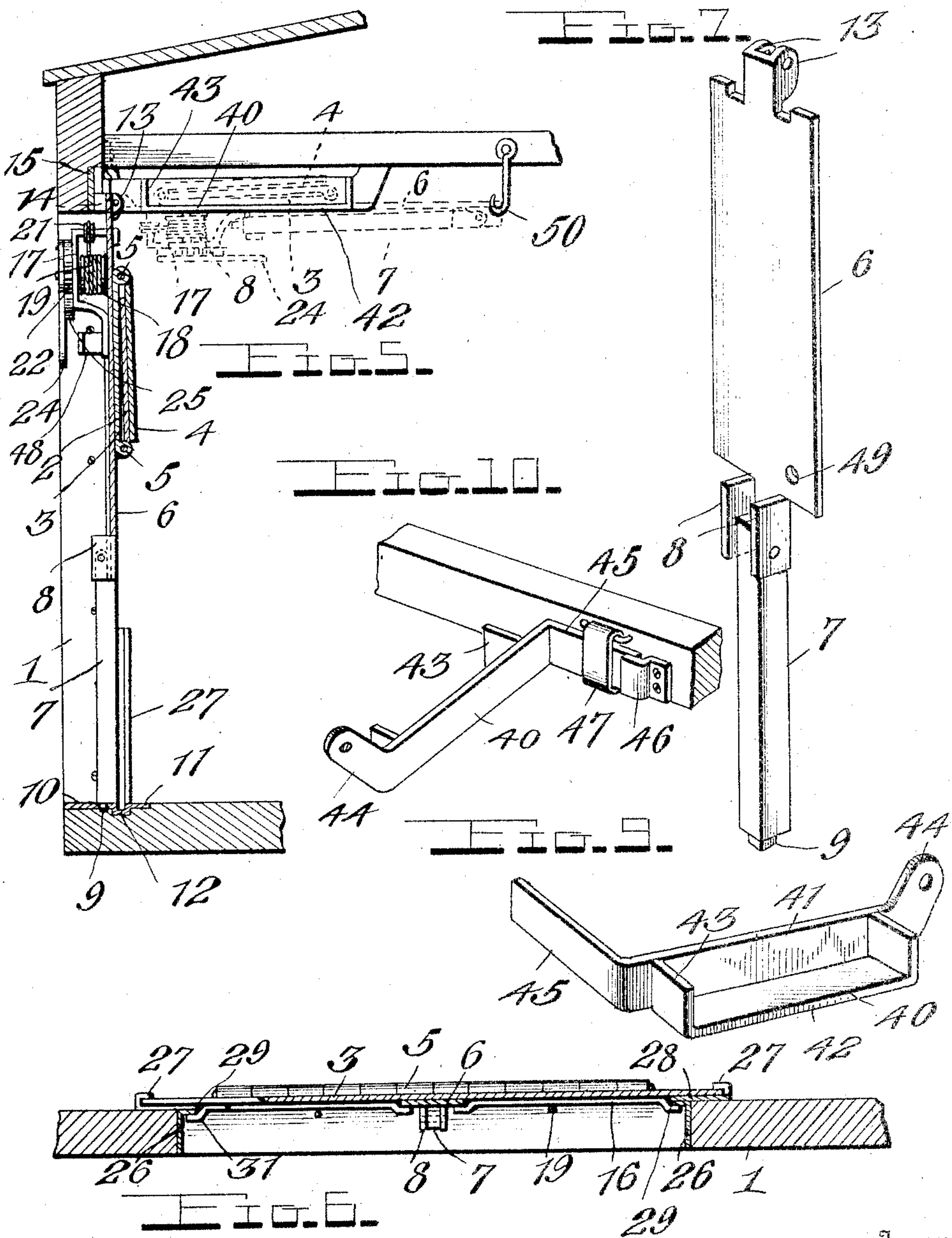
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UNITED STATES PATENT OFFICE.

FREDERICK CRONEMILLER, OF SUPERIOR, WISCONSIN.

CAR-DOOR.

994,062.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FREDERICK CRONEMILLER, a citizen of the United States, residing at Superior, in the county of Douglas and State of Wisconsin, have invented certain new and useful Improvements in Car-Doors, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in grain doors for railway freight cars.

One object of the invention is to provide a simple and practical door of this character which may be applied to freight cars as well as regular grain cars, and which will effectively prevent the loss of grain or similar commodities.

Another object of the invention is to provide a grain door which is constructed of steel or other metal and adapted to be folded horizontally.

Further objects of the invention are to provide improved means for mounting, guiding, elevating and supporting the door.

With the above and other objects in view, the invention consists of the novel construction, combination and arrangement of parts, hereinafter fully described and claimed, and illustrated in the accompanying drawings in which:

Figure 1 is an outside view of a portion of a car equipped with my improved door, the latter being in closed position; Fig. 2 is a view looking at the inner side of the door; Fig. 3 is a view similar to Fig. 1 but showing the door in partly elevated and folded position; Fig. 4 is a vertical section taken on the plane indicated by the line 4—4 in Fig. 1; Fig. 5 is a detail section taken on the plane indicated by the line 5—5 in Fig. 3 and showing in dotted lines the door in its extreme elevated and folded position; Fig. 6 is a horizontal section taken on the plane indicated by the line 6—6 in Fig. 1; Fig. 7 is a detail view of the folding hanger or post; Fig. 8 is a detail view of one of the door guiding members or "plates" which are arranged on the side of the door opening; Fig. 9 is a detail view of one of the supporting members or plates for holding the door in its elevated and folded position beneath the roof of the car; and Fig. 10 is a detail view illustrating the means for fastening the swinging supports which hold the folded door in elevated position.

Referring more particularly to the drawings 1 denotes a portion of a railway car or any other structure in which my improved door is used; and 2, 3, 4, denote the three sections of my improved door, which latter may be constructed of a greater or less number of sections which are hingedly united along their longitudinal edges so as to fold over upon each other and which are mounted on a swinging suspending device and adapted to have their end edges engage suitable guiding and retaining members on the sides of the door opening. The three door sections are constructed of sheet steel or other metal and the lower and upper sections 2, 4, are united to the longitudinal edges of the intermediate section 3 by means of hinges 5, which latter permit the lower section 2 to swing upwardly and inwardly, and the upper section 4 to swing downwardly and inwardly as indicated in Fig. 5.

The hanger or post which suspends the door from the upper portion of the car consists of a main upper section 6 and a folding lower section 7, the latter being pivoted between spaced ears 8 on the lower end of the upper section 6 so that it can swing upwardly and inwardly but will be prevented from swinging outwardly beyond the longitudinal axis of said section 6. The lower extremity of the folding section 7 has a reduced portion or tenon 9 to enter a socket 10 formed in a metallic threshold or sill plate 11 which is secured in the bottom of the door opening and has a longitudinal groove or channel 12 for the reception of the bottom edge of the lower section 2 of the door. The upper or main section 6 of the hanger has spaced ears 13 which are pivoted between angle brackets 14 secured to a metallic reinforcing plate 15 which is in turn secured on the inner face of the wall of the car above the center of the door opening, as will be seen on reference to Fig. 2. This pivotal mounting of the hanger enables it to swing downwardly to a perpendicular position or upwardly to a substantially horizontal position, in which latter position the folded door sections are disposed close to the roof of the car, as indicated in dotted lines in Fig. 5.

The several door sections 2, 3, 4, are adapted to move longitudinally of the main section 6 of the hanger or post, and to support and guide them I preferably provide on the

intermediate section 3, metallic straps or cleats 16, the inner ends of which are offset to slidably engage the side edges of the hanger section 6, as seen in Fig. 1; and I also provide within a supporting bracket 17 on the upper portion of the hanger section 6, a small winding drum or windlass 18 for a pair of cables or other flexible elements 19. The latter have their lower ends connected to pivoted I-plates 20 on the door section 3, and their upper ends are passed over guide pulleys 21 on the upper edges of the bracket 17 and are then attached to and wound upon the windlass 18 so that when the latter is rotated to wind the cables 19 upon it the several door sections will be slid longitudinally of the hanger section 6. On the outer end of the pivot or shaft of the windlass 18 is fixed a ratchet wheel 22 adapted to be engaged by a gravity actuated pivoted pawl 25 on one end of a hand lever 24 mounted intermediate its ends on said pivot or shaft so that its lower handle end may be oscillated to cause the pawl 23 to intermittently actuate the ratchet 22. A pivotally mounted pawl or dog 23 is provided on the bracket 17 to co-act with the ratchet wheel and prevent retrograde rotation of the windlass or drum 18.

In order to guide the end edges of the door sections 2, 3, 4, in their sliding movement and to prevent them from shifting laterally when they are lowered in position to close the door opening, I provide on the sides of the door opening or frame metallic guiding and retaining plates 26. Each of these members 26 is preferably formed from a single sheet of metal and has its main portion secured on the inner face of the wall of the car adjacent the door opening. Formed on the inner edge of the bottom portion of the plate 26 is an angularly bent flange 27 which forms a guide channel to receive one end of the lower section 2 when the latter is in its lowered or closed position in the door opening. The outer edge of the main or body portion of the plate 26 is folded upon itself to provide a guide rib 28 and an outwardly projecting flange 29, which latter is disposed in a plane at right angles to the plane of the main portion of the plate 26 and is secured to one of the side walls of the door opening as shown. The guide ribs 29 on the two plates 26 are adapted to be engaged by the offset outer ends 30 of the metallic straps or cleats 16, and also by the offset ends of metal straps or plates 31 secured to the upper section 4 of the door. Owing to the construction just described it will be seen that when the several sections of the door are in lowered position shown in Fig. 1 they will effectively close the door opening and will be prevented from moving horizontally or laterally in either direction.

In order to prevent the door from work-

ing upwardly after it has been closed, I preferably provide adjacent the ends of the intermediate section 3 pivoted dogs 32 which engage notches or seats 33 in the guide ribs 28 and which are locked in position by similar pivoted dogs or pawls 34, as clearly shown in Fig. 1.

35 denotes a small outlet opening in the bottom or lowermost door section 2 to permit of the escape of sufficient grain to relieve the pressure against the inner side of the door when the car is filled and it is desired to empty it. This door opening 3 has adjacent its end and top and bottom edges undercut guides 36 to receive the edges of a horizontally sliding door 37, which latter may be locked in closed position by a pivoted dog or pawl 38 as shown, or in any other suitable manner.

39 denotes blocks or cleats secured to the lower door section 2 adjacent its bottom edge, and with which a bar or other tool may be engaged for working the door loose and starting it on its upward sliding movement when the car is filled with grain and there is considerable pressure against the inner face of the door.

In order to retain the door in its folded and elevated position indicated in dotted lines in Fig. 5, I provide on the roof, rafters or other framework at the top of the car, swinging supporting members 40. The latter are formed from metal plates cut and bent, as shown more clearly in Fig. 9, and they have longitudinal body bars 41 provided with door engaging and supporting flanges 42 which latter have upturned ends 43. One end of the body bar 41 is upturned and pivotally mounted at 44 and the other end 45 of the body bar is bent at right angles. By pivotally mounting the supporting members 40 at their inner ends in this manner, it will be seen that their outer ends may be swung downwardly to permit the folded door to have the ends of its sections placed on the supporting flanges or ledges 42. When this has been done and the members 40 are swung upwardly, the ends 45 of said members swing under guide plates 46 arranged on the inner face of the upper portion of the wall of the car or the framework of the car and also mounted on this framework or wall are depending catches 47 which engage the ends 45 and effectively support the members 40 so that they cannot drop notwithstanding the rocking and shaking of the car. The catches 47 are pivoted at their upper ends and have hook-shaped lower ends to engage the parts 45.

48 denotes a laterally disposed hook on the upper section 6 of the post adapted to receive the lower section 7 when the latter is folded.

49 denotes an opening formed in the lower end of the section 6 and adapted to receive a pivoted supporting hook 50 depending from

the roof of the car, whereby the parts of the folded door will be more effectively supported.

In operation, assuming the door to be in its closed position as shown in Fig. 1, when it is desired to remove the grain or other contents of the car the small door 37 is first opened to permit of the discharge of sufficient grain to relieve the pressure against the sections 2, 3, 4, of the door. After this has been done the locking pawls or dogs 32 are disengaged from the ribs 28, and the hand lever 24 is then oscillated to rotate the windlass 18 to wind the cables 19 thereon, and thereby simultaneously move the three sections of the door vertically on the hanger or post. As the door is thus moved upwardly the guide straps or cleats 31 disengage the ribs 28 so that the upper section 4 of the door can swing downwardly and after the door has been raised to a predetermined height the bottom edge of the lower section, 2 clears the upper ends of the channeled guide flanges 27 of the plates 26 so that said section 2 may swing upwardly and inwardly. The door section 2 is first swung upwardly and the section 4 is then swung downwardly so that the sections will overlap and retain each other in folded position, the upper section 4 being preferably larger and of greater weight. When the parts are in the position last mentioned the lower section 7 of the hanger is disengaged from the socket or seat 10 in the threshold plate and then folded upwardly and engaged with the hook 48, and the hanger 6 is then swung upwardly and inwardly to a substantially horizontal position, and the hook 50 at the top of the car is engaged with the opening 49 in the section 6 of the post. The supporting members 40 are then swung upwardly to engage the ends of the folded door sections and are fastened by the catches 47 whereby all parts of the folded door will be effectively retained in elevated position adjacent to the roof of the car. By reversing the operation just described the door may be lowered and secured in its closed position.

While the preferred embodiments of the invention have been shown and described in detail, it will be understood that I do not wish to be limited to the precise construction set forth, since various changes in the form, proportion and arrangement of parts, and in the details of construction may be resorted to within the spirit and scope of the invention.

Having thus described the invention, what is claimed is:

1. In combination with a structure of the class described, having a door opening, a hanger bar pivotally suspended at its upper end, from the structure and comprising an upper section and a lower section, the latter being pivoted to the upper section and so

engaged at its lower end as to prevent lateral movement thereof, and a door comprising an upper section and lower section pivotally connected together, and foldable one against another, the upper section of the door being slidably mounted on the upper section of the hanger.

2. In combination with a structure of the class described having a door opening, a hanger bar pivotally suspended at its upper end from the structure, and comprising an upper section and a lower section, the latter being pivoted to the upper section and so engaged at its lower end as to prevent lateral movement thereof, and a door comprising an upper section and lower sections pivotally connected together, and foldable one against another, the upper section of the door being slidably mounted on the upper section of the hanger, and means on the upper section of the hanger and connected to the door to raise and lower the latter.

3. In combination with a structure of the class described, having a door opening, a hanger bar comprising an upper section and a lower section pivotally connected thereto, the upper section being pivotally connected to the structure, at a point opposite said opening to swing inwardly, and the lower hanger bar section being foldable against the outer side of the upper section, means to secure the lower end of the lower hanger bar section when the hanger bar is in vertical position, a door comprising an upper section and lower sections, said door sections being pivotally connected together and foldable one against another, the said upper door section being slidably mounted on the upper section of the hanger bar, means to raise and lower the door, on the hanger bar, means at the sides of the door opening to secure the door, when in lowered position, outwardly swinging supporting members in the structure above the door opening, to engage the door when the latter is swung together with the hanger bar inwardly in the structure, and means to secure said swinging supports when thus engaged with the door to cause said supports to hold the door and the hanger in elevated position, swung inwardly.

4. The combination of a structure having a door opening, a hanger pivotally suspended from the structure, and composed of two sections, one being movable with respect to each other, a door upon the hanger, a keeper at the bottom of the door opening, to receive the movable section of the hanger, and means at the sides of the door opening to engage the door.

5. The combination of a structure having a door opening, a hanger pivotally suspended from the structure, a door carried by the hanger, a keeper at the bottom of the door opening, a folding section pivoted to the

hanger and adapted to engage said keeper, and means at the sides of the door opening to engage the door.

6. The combination of a structure having
5 a door opening, plates secured to the opposite sides of the door opening, and having at their lower portions, channeled flanges and on their opposing inner edges guide ribs, a hanger pivotally mounted on the structure
10 at the top of the door opening, a door having a main section slidably engaged with the hanger and upper and lower folding sections hinged to the longitudinal edges of each other and the main section, the lower
15 door section being adapted to engage said channeled flanges, and guide cleats upon the main and upper door sections to engage said ribs.

7. The combination of a structure having
20 a door opening, plates secured to the opposite sides of the door opening and having at their lower portions channeled flanges, and on their opposing inner edges, guide ribs, the latter having notches a hanger pivotally
25 mounted on the structure at the top of the door opening, a door having a main section slidably engaged with the hanger, and upper and lower folding sections hinged to the longitudinal edges of each other and the
30 main section, the lower door section being adapted to engage said channeled flanges, guiding means on the main and upper door sections to engage said ribs locking dogs carried by one of the door sections, to en-
35 gage the notches in said ribs, and means carried by the hanger for shifting the main door section upon it.

8. The combination of a structure having a door opening, plates secured to the opposite sides of the door opening and having at
4 their lower portions channeled flanges and on their opposing inner edges guide ribs, a hanger pivotally mounted on the structure at the top of the door opening, a door having a main section slidably engaged with the
4 hanger, and upper and lower folding sections hinged to the longitudinal edges of each other and the main section, the lower door section being adapted to engage said
5 channeled flanges, guide cleats upon the main and upper door sections to engage said ribs, and means carried by the hanger for shifting the main door section upon it.

9. The combination of a door composed of sections disposed horizontally and hingedly
5 connected to fold upon each other and upwardly and into a car, outwardly swinging supporting members in the top of the car to engage the ends of the folded door sections, and catches for securing said swinging
6 supports.

10. The combination of a door mounted to swing upwardly and into a car, an outwardly swinging support mounted in the
6 top of the car to engage and support the folded door and a catch for said swinging support.

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

FREDERICK CRONEMILLER.

Witnesses:

BLANCHE A. LAFFITTE,
HERMAN E. LAFFITTE.