

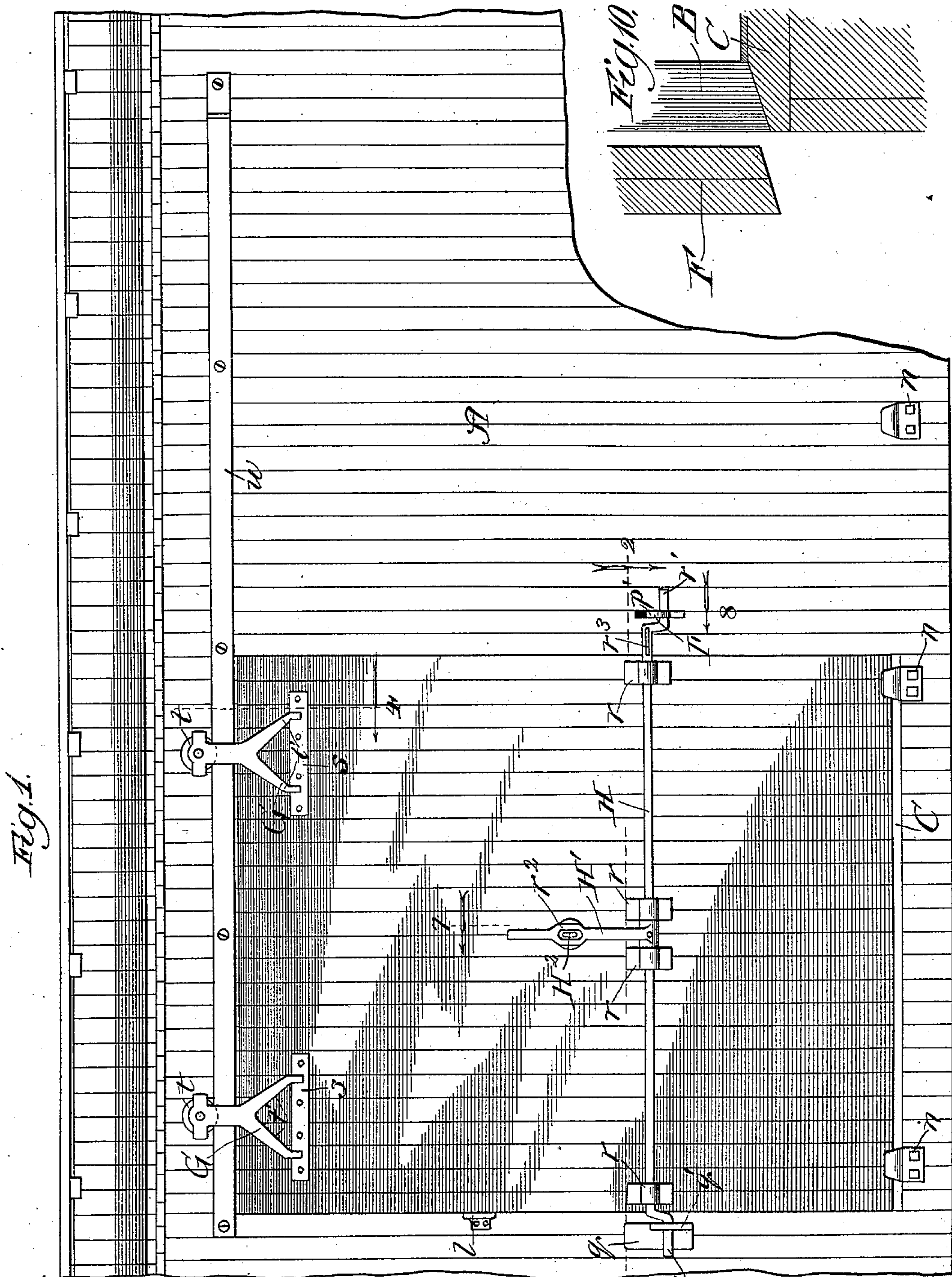
(No Model.)

2 Sheets—Sheet 1.

C. K. CHAMBERLAIN.
FREIGHT CAR DOOR.

No. 548,955.

Patented Oct. 29, 1895.



Witnesses:
Eas. & Gaylord,
Lute & Allen.

Inventor:
Clarence K. Chamberlain,
By Dyrenforth & Dyrenforth,
Attorneys.

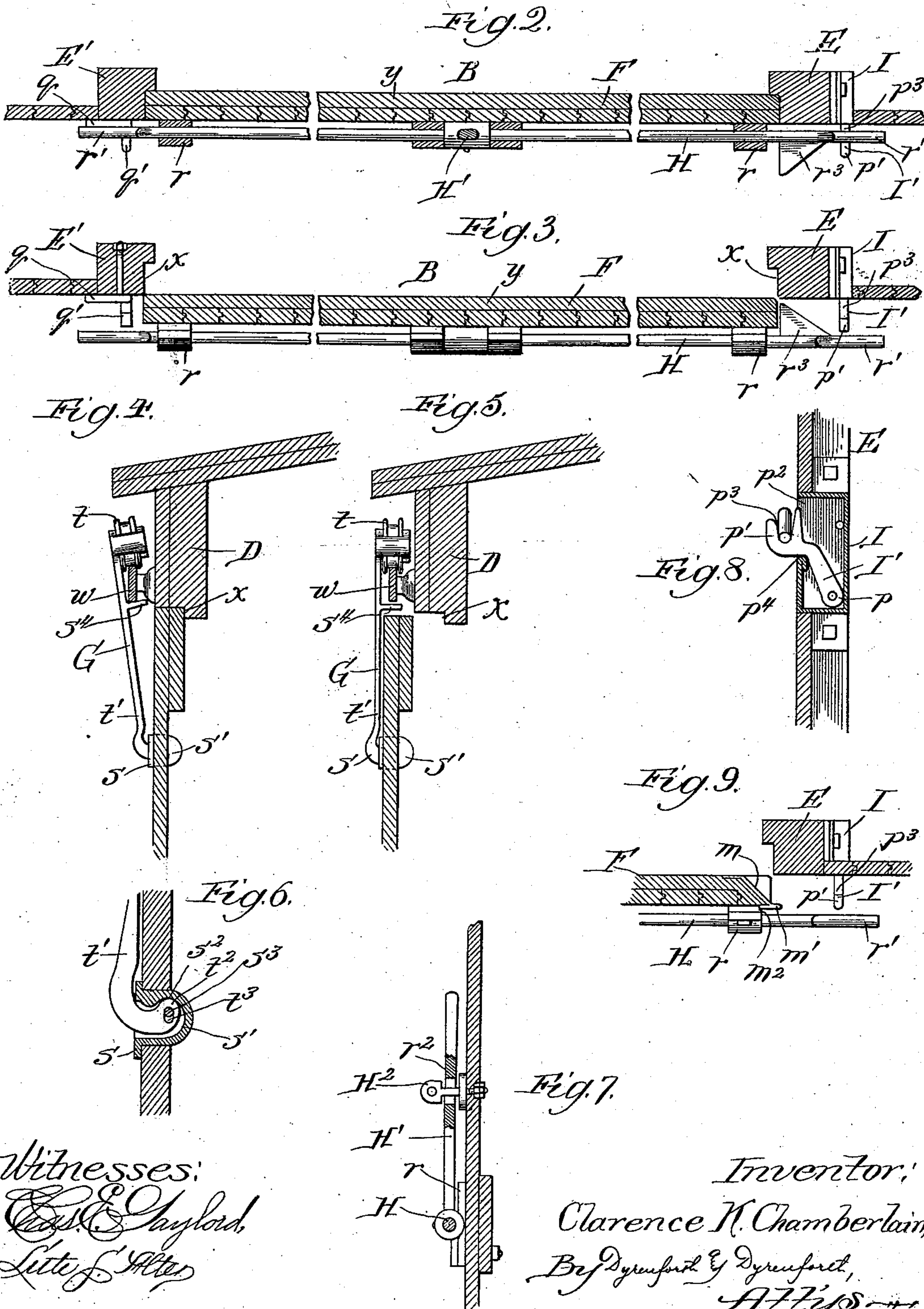
(No Model.)

2 Sheets—Sheet 2.

C. K. CHAMBERLAIN.
FREIGHT CAR DOOR.

No. 548,955.

Patented Oct. 29, 1895.



Witnesses:
C. E. Gaylord,
L. J. Miller

Inventor:
Clarence K. Chamberlain,
By Dyrenforth & Dyrenforth,
Attys.

UNITED STATES PATENT OFFICE.

CLARENCE K. CHAMBERLAIN, OF CHICAGO, ILLINOIS.

FREIGHT-CAR DOOR.

SPECIFICATION forming part of Letters Patent No. 548,955, dated October 29, 1895.

Application filed March 21, 1895. Serial No. 542,660. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE K. CHAMBERLAIN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Freight-Car Doors, of which the following is a specification.

My invention relates to improvements in the construction of sliding doors for box-cars and of the class which fit when closed in the casings of the door-openings to extend at their outer surfaces flush with the sides of the cars.

In the construction of box-cars for use in transporting grain or other merchandise which may be injuriously affected by moisture, dust, and cinders, or is more or less inflammable and liable to be ignited by sparks from a locomotive which may enter the car, the desirability of providing a door which will more thoroughly and effectively close the door-opening than the doors hitherto in common use is generally recognized. In making such a door sufficiently practicable to render its adoption desirable, however, necessary requirements—such as security against theft of articles from the car, ease of operation, strength, durability, and economy of construction—must be taken into consideration.

So far as I am aware all freight-car doors hitherto devised for thoroughly closing the door-openings have fallen short in one or more of the necessary requirements or have contained undesirable features which proved fatal to their adoption.

My object is to provide a door of the above class of an improved construction which renders it free from the objections attending doors of the same class hitherto provided; and to this end my invention consists in the general construction of my improvements and also in details and combinations of parts, all as hereinafter set forth, and claimed.

In the drawings, Figure 1 is a side elevation of a broken portion of a box-car, showing my improvements with the door closed; Fig. 2, an enlarged broken section taken on line 2 of Fig. 1 and viewed in the direction of the arrow; Fig. 3, a similar section showing the positions of parts when the door is released from its fastening; Figs. 4 and 5, enlarged broken sections taken on line 4 of Fig. 1 and showing, respectively, the relative positions

of parts when the door is fastened and released; Fig. 6, an enlarged broken section of the door, showing a detail of the construction of the door-hangers; Figs. 7 and 8, enlarged broken sections taken, respectively, on lines 7 and 8 of Fig. 1; Fig. 9, a view of the same character as Fig. 3, but showing a modified construction; and Fig. 10, a broken and enlarged vertical section of the door-sill and lower end portion of the door.

A is a side wall of the car; B, a door-opening therein; C, the door-sill; D, the plate, which also forms the lintel of the door-opening, and E E' the door-posts. F is a door suspended upon hangers G, which are provided with grooved wheels *t* to run upon a top door-track *w*. The plate D and door-posts are rabbeted to afford sockets *x*, into which the door fits when closed, producing joints sufficiently tight for all requirements. The hangers which I employ are bifurcated, as shown, the forks *t'* being turned backward at their lower end portions and formed with rounded upward-projecting toes *t*². On the outer face of the door are metal strips *s*, formed with sockets *s'*, into which the toe portions of the hangers extend. In the upper inner sides of the sockets are shallow recesses *s*², at which they rest upon the toes *t*², and the forks are provided adjacent to the toes with preferably elongated sockets *t*³ to receive pins *s*³, extending transversely through the socket-pieces. By the means described the hangers are pivotally mounted upon the tracks *w* and the door pivotally suspended upon the hangers. The weight of the door when opened is upon the toes *s*², and the bearings or points of pivotal contact are far enough back from the outer surface of the door to cause the latter as it hangs suspended to extend in the vertical plane parallel with the side A of the car. Owing to the weight of the door and the rough handling to which it is subject in use, the construction of the hangers, which gives to them particularly great strength and durability, is important. On the hangers are backward-projecting lugs or stops *s*⁴, which extend just below the track *w* and operate to prevent undue jarring of the car from disengaging the wheels *t* from the track. The forks *t'* operate to prevent rattling or binding of the parts at the point of suspension, and thus

tend to prevent wear of the meeting surfaces and sagging of the door.

Mounted in bearings r on the outer surface of the door is a rock-shaft H , provided at its 5 opposite ends beyond the edges of the door with crank projections r' . Rigidly secured upon the center of the rock-shaft is a lever or handle H' , provided between its ends with an eye r^2 , adapted to receive an eyebolt H^2 , 10 secured upon the door in the position shown. At the edge of the door-opening toward which the door moves in closing is a plate or casting q , having a projection q' , provided with a socket in its upper side. Fastened upon the 15 door-post E at the opposite side of the door-opening is a casing I , containing a yielding, preferably gravity, latch I' . The latch I' is pivoted at its end p in the lower rear portion of the casing and has a head portion p' , 20 adapted to extend normally through a slot p^2 beyond the side A of the car. In the head p' is a socket p^3 , and when in its normal position the latch rests at the base of its head portion upon a stop p^4 , formed by the casing. 25 On the rock-shaft H in the position shown is a cam projection r^3 . On the side of the car at the lower edge of the door are door-track brackets n , of common construction, to prevent outward swinging of the door.

30 To close the door, it is slid to the door-stop l in position to register with the opening B , and the handle or lever H' is raised to cause the crank portions r' of the rock-shaft or crank-rod H to engage the socket projection 35 q' and socket p^3 of the latch I' . In the movement of the handle to the position shown in Figs. 1 and 7 the engagement of the cranks with the socket-bearings forces the door bodily into the recesses x to the position shown 40 in Fig. 2, when the opening will be closed at all parts and the door held secure by means of a padlock or car-seal passed through the eyepiece H^2 to prevent movement of the lever or handle.

45 To render the closing of the door easy to accomplish, I locate the rock-shaft and attendant parts preferably about one-third the height of the door above the lower edge thereof, the effect of this construction being to 50 cause the door in its initial movement while closing to pitch inward at its upper edge while swinging upon the hangers G , and the lever in its final movement to force the door home at the lower edge. The closing of the door is 55 thus rendered much more smooth and easy to accomplish than were the rock-shaft and attendant parts at the lower edge portion of the door, because in that case the engagement of the cranks with the socket projections would 60 tend to draw the door inward primarily at its lower edge and force the door upward in longitudinal line with the hangers, making it necessary for the operator to force the upper part of the door inward with his hands, if 65 possible, or with a suitable staff, before the door can be closed. In practice I prefer to

bevel the lower edge of the door and the upper surface of the sill, as indicated in Fig. 10.

To open the door, the lever or handle H' is swung outward from the position shown in 70 Fig. 1 until it extends vertically downward. In the turning of the rock-shaft thus produced the door is moved bodily outward to rest suspended upon the hangers, as indicated in Fig. 5. When in this position the door ex- 75 tends in the vertical plane, its inner surface being parallel with and just beyond the plane of the outer surface of the side A . The turning of the rock-shaft described swings the cranks r' out of the socket-bearings and turns 80 the cam r^3 to the inner side of the rock-shaft. As the door is slid to the right to uncover the opening B , the cam r^3 engages the gravity-latch I' and swings the latter on its pivot into the casing I . The inner surface of the door 85 or the door center girth y , usually provided thereon, will keep the latch in its casing until it is passed by the door, when it will swing outward again to its normal position and operate as a stop against movement of the door 90 to the left. As it frequently happens that a car is loaded or unloaded while standing upon a grade, which would cause the door when open to slide by gravity to its closed position, the presence of a stop I' , which operates au- 95 tomatically to prevent such sliding of the door, is desirable. The stop also prevents the door while open from being slid and jammed against its stops during the switching of the car. 100

In the modification shown in Fig. 9 I dispense with the cam r^3 on the rock-shaft and provide the equivalent thereof with a cam consisting of an inclined plate m set into the 105 edge of the door, the latter being chamfered at that point to receive the plate. As I prefer to construct it, the plate m forms part of a casting having a projecting lip m' and face-plate m^2 , secured in place with the adjacent shaft-bearing r . The lip m' overlaps 110 the edge of the door-post when the door is shut, and thus closes any opening that might exist at that point due to the cutting away of the edge of the door.

In the sliding doors hitherto generally pro- 115 vided it has been usual to lock and seal at one edge, and it has frequently happened that unauthorized persons by removing the lower-track bracket at the opposite edge have been able thus to pry the door outward at its 120 lower corner and abstract merchandise from the car without injuring the seal. To guard against the doors being opened in any manner without breaking a seal at the eyepiece H^2 , I provide the socket-plate q and bearings 125 r with bolts formed, preferably, integral therewith and which pass through bolt-openings to the inner sides of the door-post and door, where they are fastened by means of nuts. Thus besides possessing the advantages of 130 ease of operation and thorough closing of the door-opening my improved door is burglar-

proof in the sense that it cannot be opened without breaking the car-seal, which would lead to ready detection.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the door-opening and upper door-track of a freight-car, of a door seating when closed in said door-opening and movable bodily out of said door-opening to slide on the track, and suspending means for the door, comprising socket-pieces set into the door and provided with concave bearing surfaces s^2 , and hangers pivotally mounted upon the track, to slide thereon, and having forks t' provided with toes t^2 which extend into and pivotally engage said socket-pieces at the said bearing-surfaces, substantially as and for the purpose set forth.

2. The combination with the door-opening and upper door-track of a freight-car, of a door seating when closed in the said door-opening, sliding hangers suspending the door on the track and pivotally connected with the door behind its outer surface, a crank rod on the door between its transverse center and lower end and provided with an operating handle, bearings at the opposite lateral edges of the door, above its lower edge, to receive the crank ends of the rod, the bearing in the path of the door in sliding being yielding, and shifting means for the yielding bearing at one edge of the door, operating in the initial movement of the door from the door-opening, to move the said yielding bearing out of the path of the door, substantially as and for the purpose set forth.

3. The combination with the door-opening and upper door-track of a freight-car, of a door seating when closed in the said door-opening, sliding hangers suspending the door on the track and pivotally connected with the door behind its outer surface, a crank-rod on the door between its transverse center and lower end and provided with an operating handle, bearings at the opposite lateral edges of the door, above its lower edge, to receive the crank ends of the rod, the bearing at the side across which the door slides in opening being pivotally supported at the door-post to extend normally into the path of the door, and bearing engaging means, at the edge of the door, operating in the initial movement of the door, from the door opening, to move the said pivotal bearing out of the path of the door, substantially as and for the purpose set forth.

4. The combination with the door-opening and upper door-track of a freight-car, of a door seating when closed in the said door-opening, sliding hangers suspending the door on the track and pivotally connected with the door behind its outer surface, a crank-rod on

the door between its transverse center and lower end and provided with an operating handle, bearings at the opposite lateral edges of the door, above its lower edge, to receive the crank ends of the rod, the bearing at the side across which the door slides in opening being pivotally supported at the door-post to extend normally into the path of the door, and a cam at the edge of the door, operating in the initial movement of the door, from the door opening, to engage and move the said pivotal bearing on its pivot out of the path of the door, substantially as and for the purpose set forth.

5. The combination with the door-opening and upper door-track of a freight-car, of a door seating when closed in the said door-opening, sliding hangers suspending the door on the track and pivotally connected with the door behind its outer surface, a crank-rod on the door between its transverse center and lower end and provided with an operating handle, bearings at the opposite lateral edges of the door, above its lower edge, to receive the crank ends of the rod, the bearing at the side across which the door slides in opening being pivotally supported at the door-post to extend normally into the path of the door, and a cam on the said crank-rod at the edge of the door, operating in the initial movement of the door, from the door-opening, to engage and move the said pivotal bearing on its pivot out of the path of the door, substantially as and for the purpose set forth.

6. The combination with the door-opening and upper door-track of a freight-car, of a door seating when closed in the said door-opening, sliding hangers suspending the door on the track and pivotally connected with the door behind its outer surface, a crank-rod on the door between its transverse center and lower end and provided with an operating handle, bearings at the opposite lateral edges of the door, above its lower edge, to receive the crank ends of the rod, the bearing at the side across which the door slides in opening comprising a casing I secured at the side of the door-post and presenting a recess p^2 and stop p^4 , a latch I' pivoted at one end portion in the said casing and having a head p' provided with a socket p^3 resting normally upon the stop p^4 to project from the casing, and shifting means for the latch operating in the initial movement of the door from the door-opening to swing the said latch on its pivot into the said casing and out of the path of the door, substantially as and for the purpose set forth.

CLARENCE K. CHAMBERLAIN.

In presence of—

M. J. FROST,
J. H. LEE.