

No. 764,902.

PATENTED JULY 12, 1904.

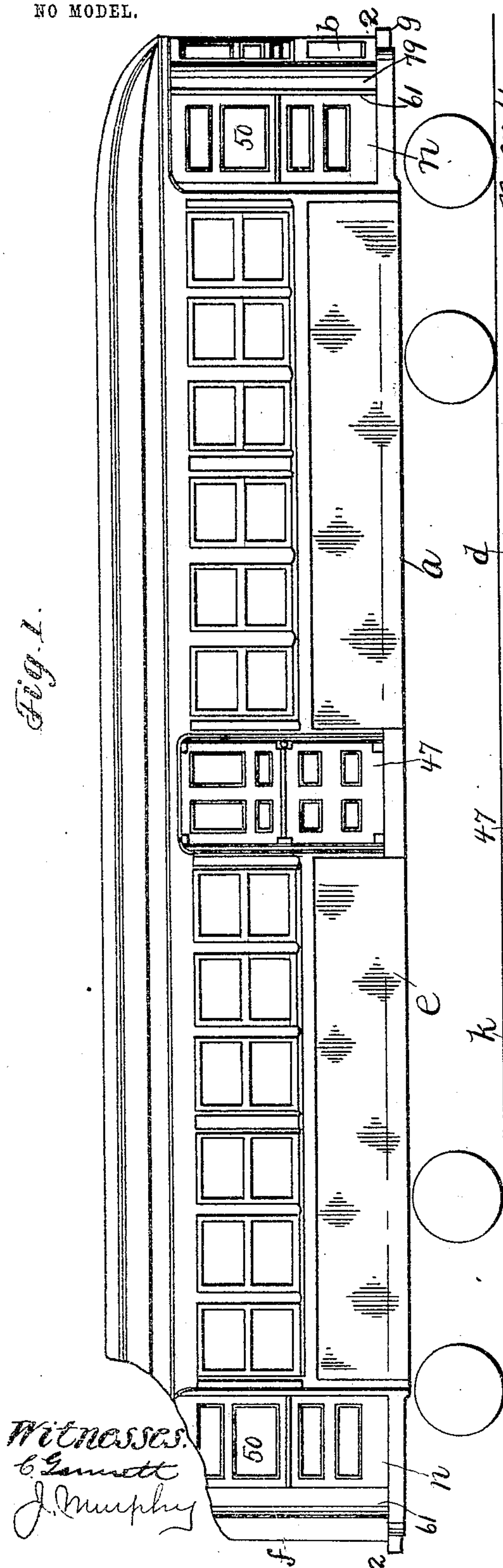
C. S. SERGEANT & J. LINDALL.

RAILWAY CAR.

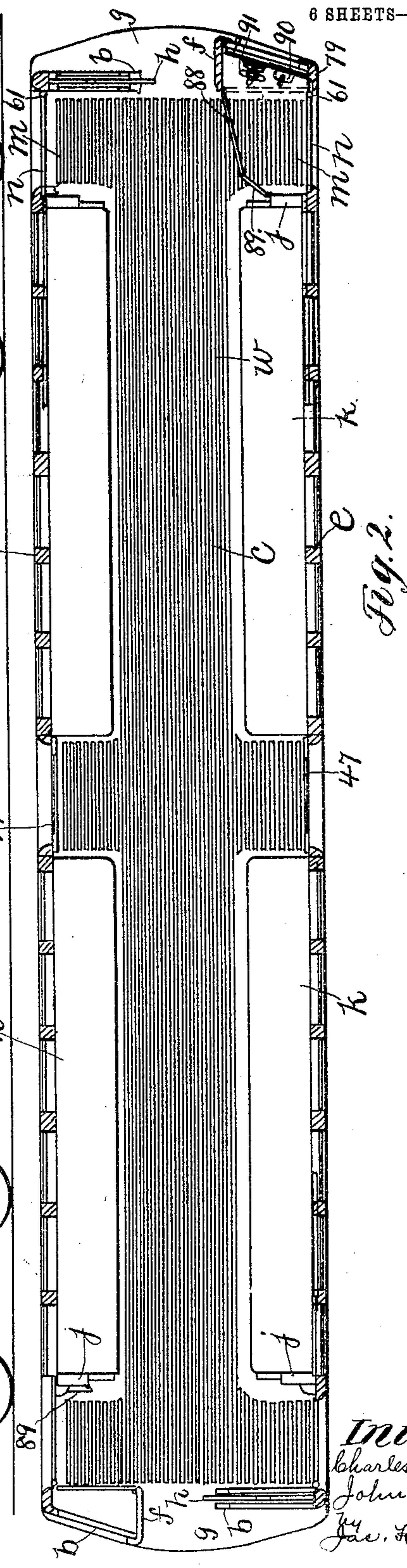
APPLICATION FILED FEB. 27, 1904.

NO MODEL.

6 SHEETS—SHEET 1.



Witnesses:
C. Gamett
J. Murphy



Inventors
Charles H. Sergeant
John Lindall
Jas. H. Churchill
Atty.

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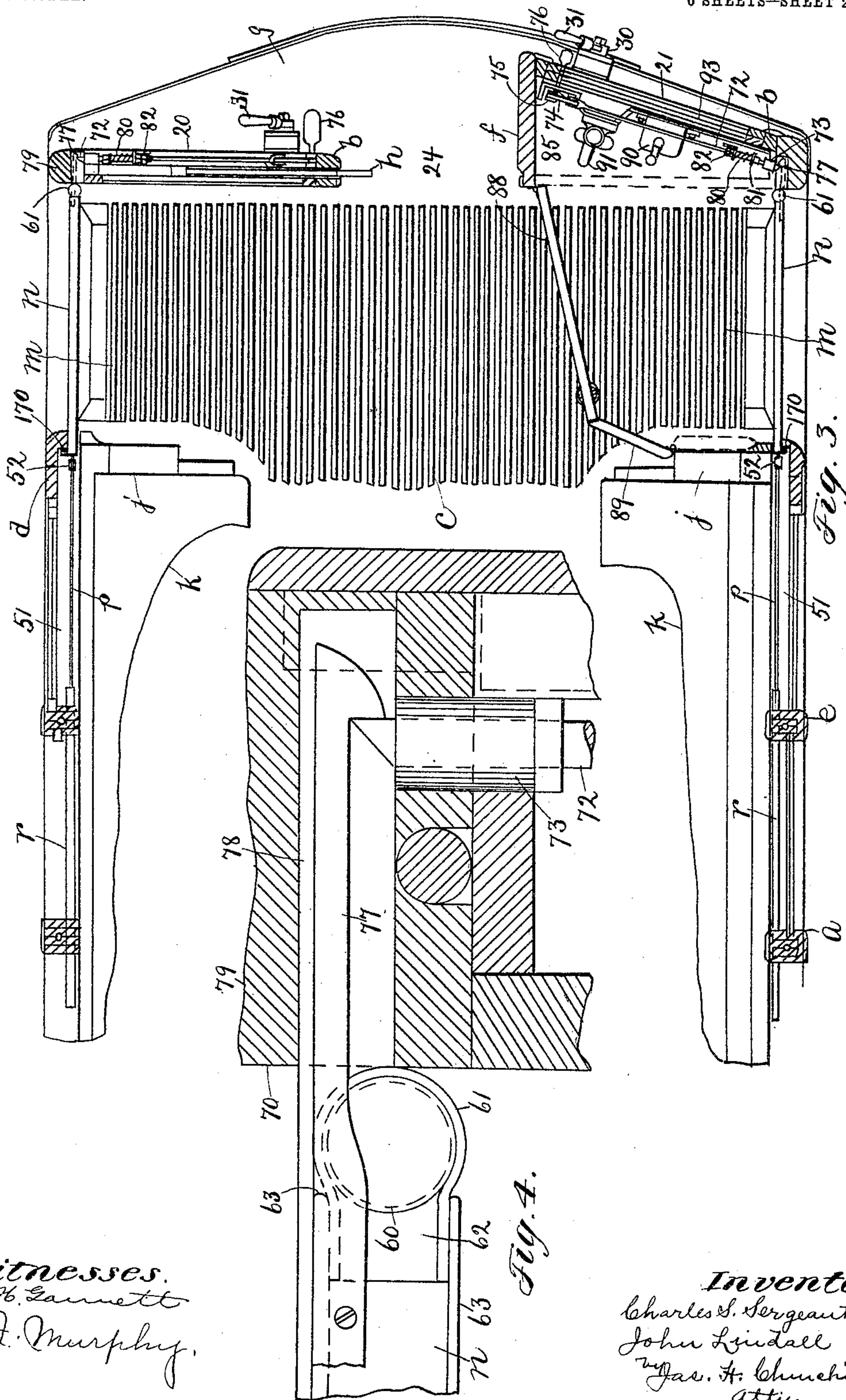
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6 SHEETS—SHEET 2.



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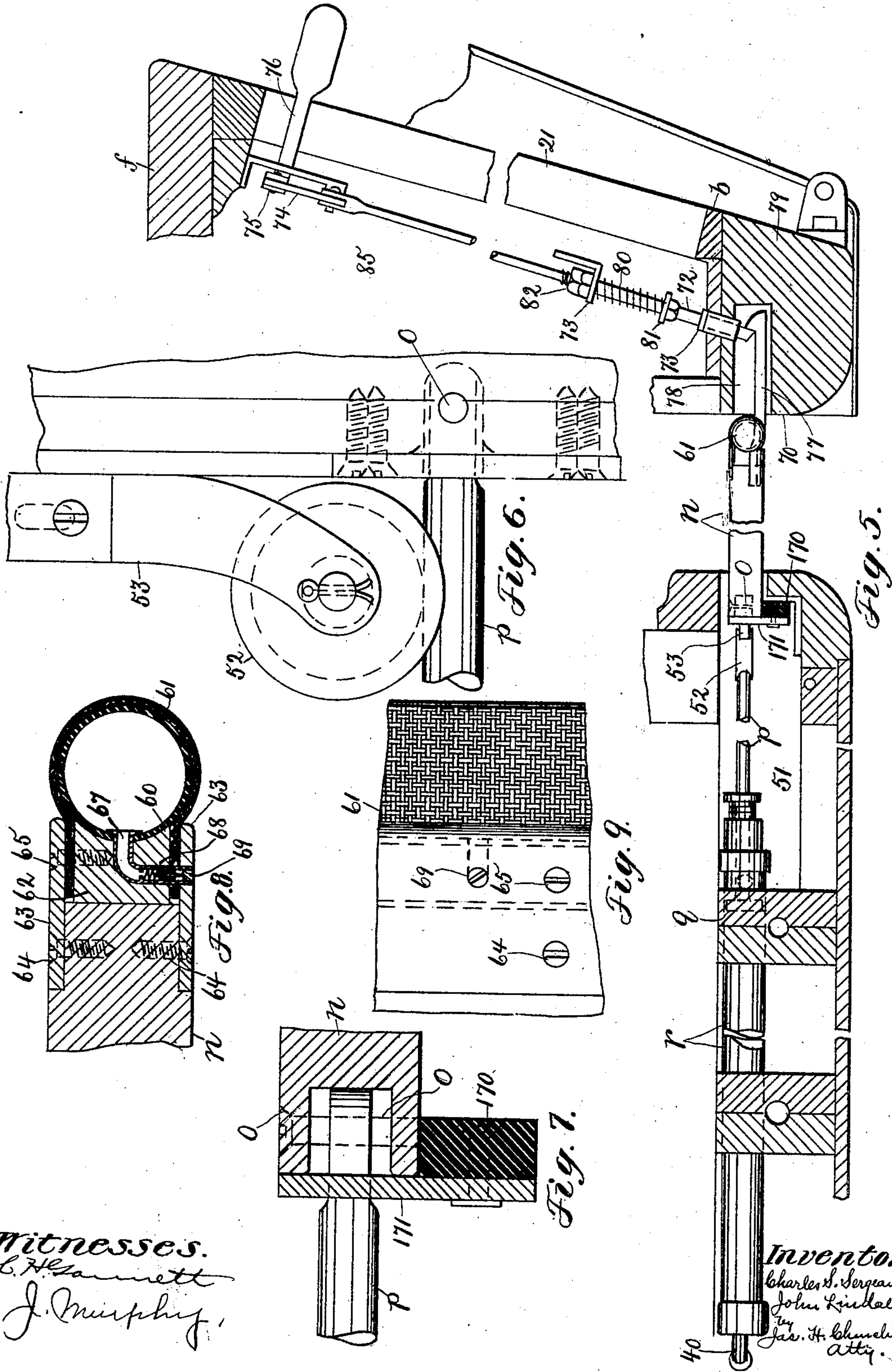
C. S. SERGEANT & J. LINDALL.

RAILWAY CAR.

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NO MODEL.

6 SHEETS—SHEET 3.



Witnesses.
C. H. Sammett
J. Murphy.

Inventors
Charles S. Sergeant
John Lindall
By Jas. H. Chumley
Atty.

No. 764,902.

PATENTED JULY 12, 1904.

C. S. SERGEANT & J. LINDALL.

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6 SHEETS—SHEET 4.

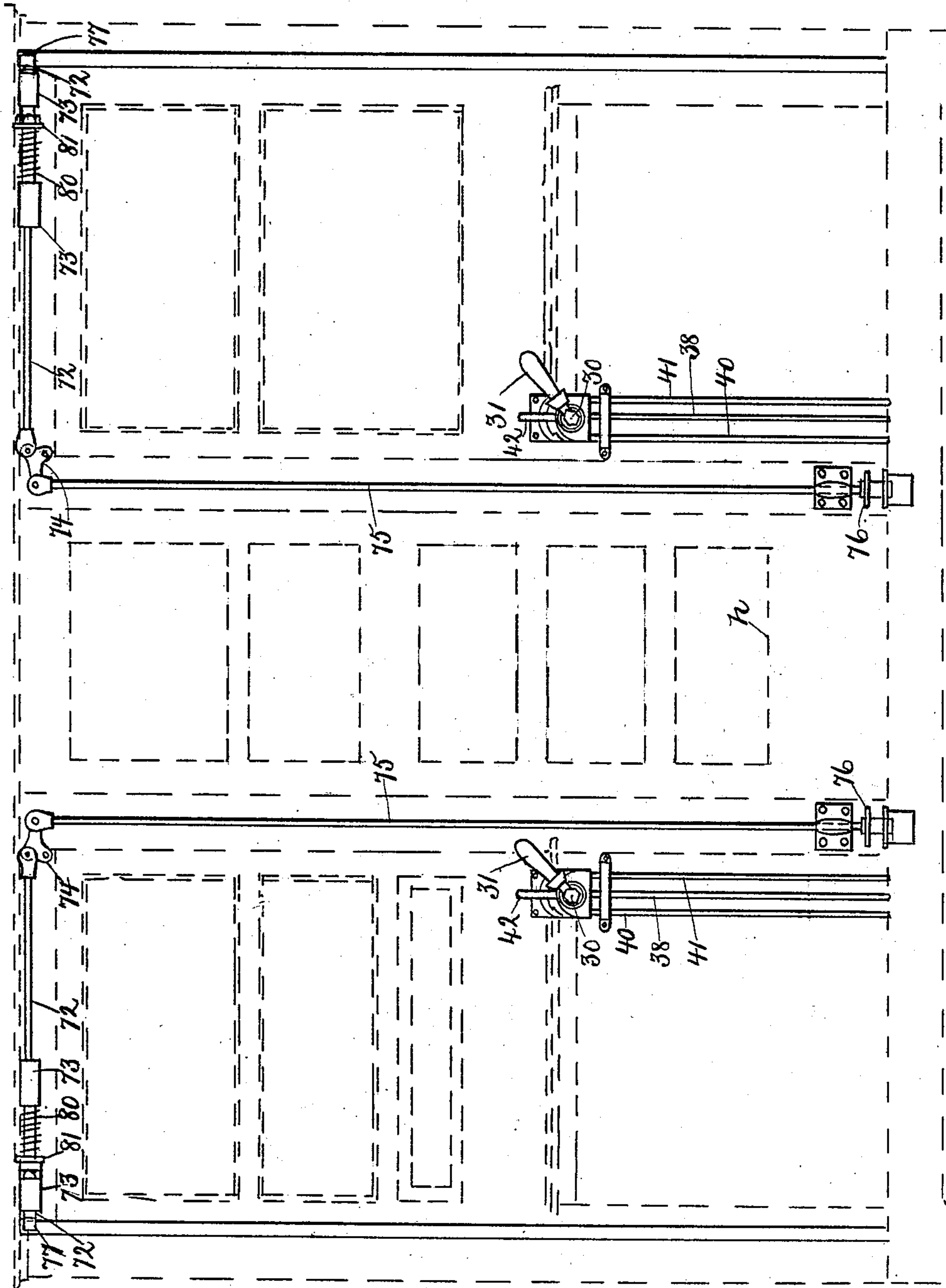


Fig. 10.

Witnesses.

636 Sammett

J. Murphy.

Inventors

Charles S. Sergeant

John Lindall

By Jas. H. Churchill
att'y.

No. 764,902.

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C. S. SERGEANT & J. LINDALL.

RAILWAY CAR.

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6 SHEETS—SHEET 5.

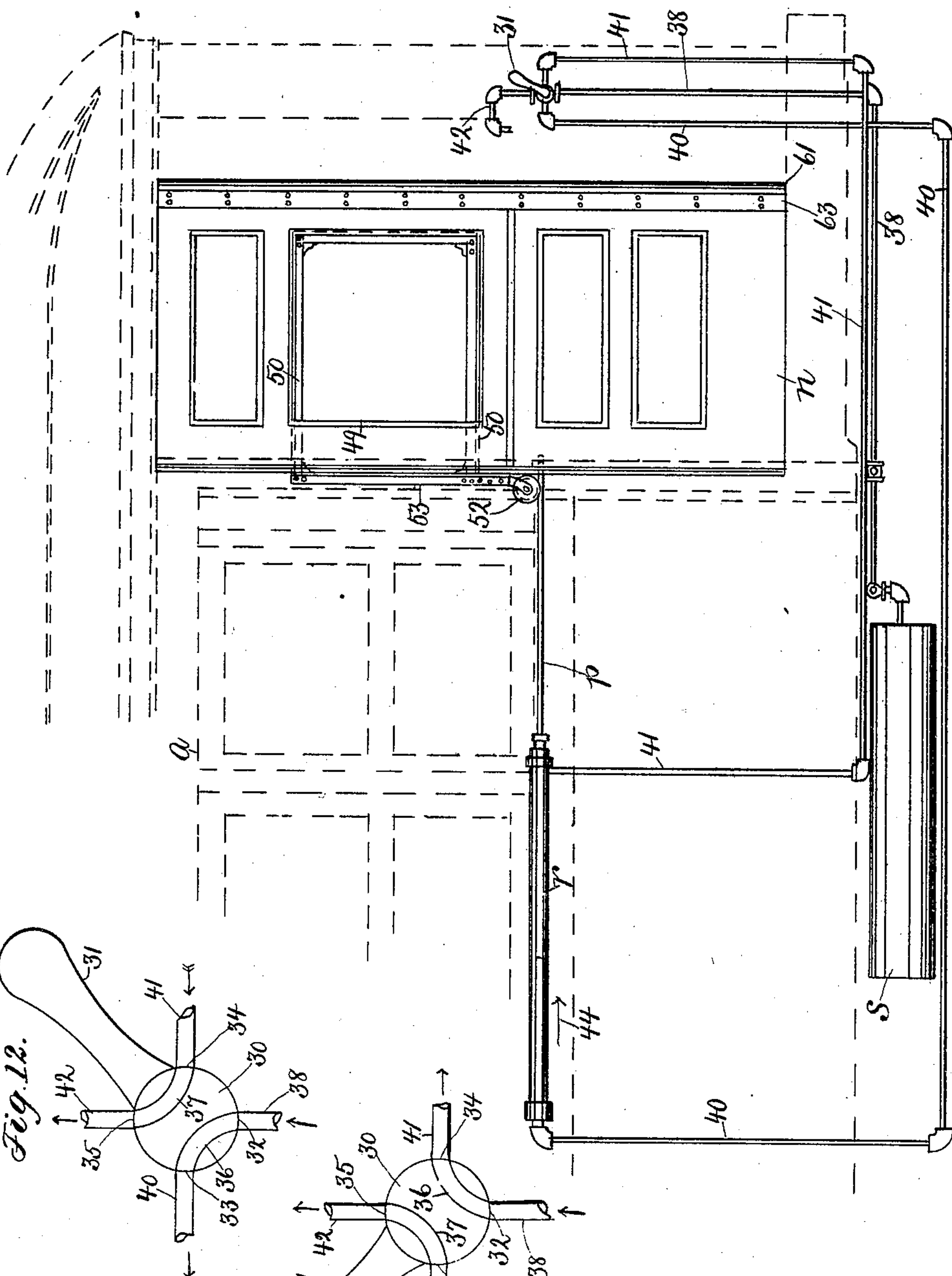
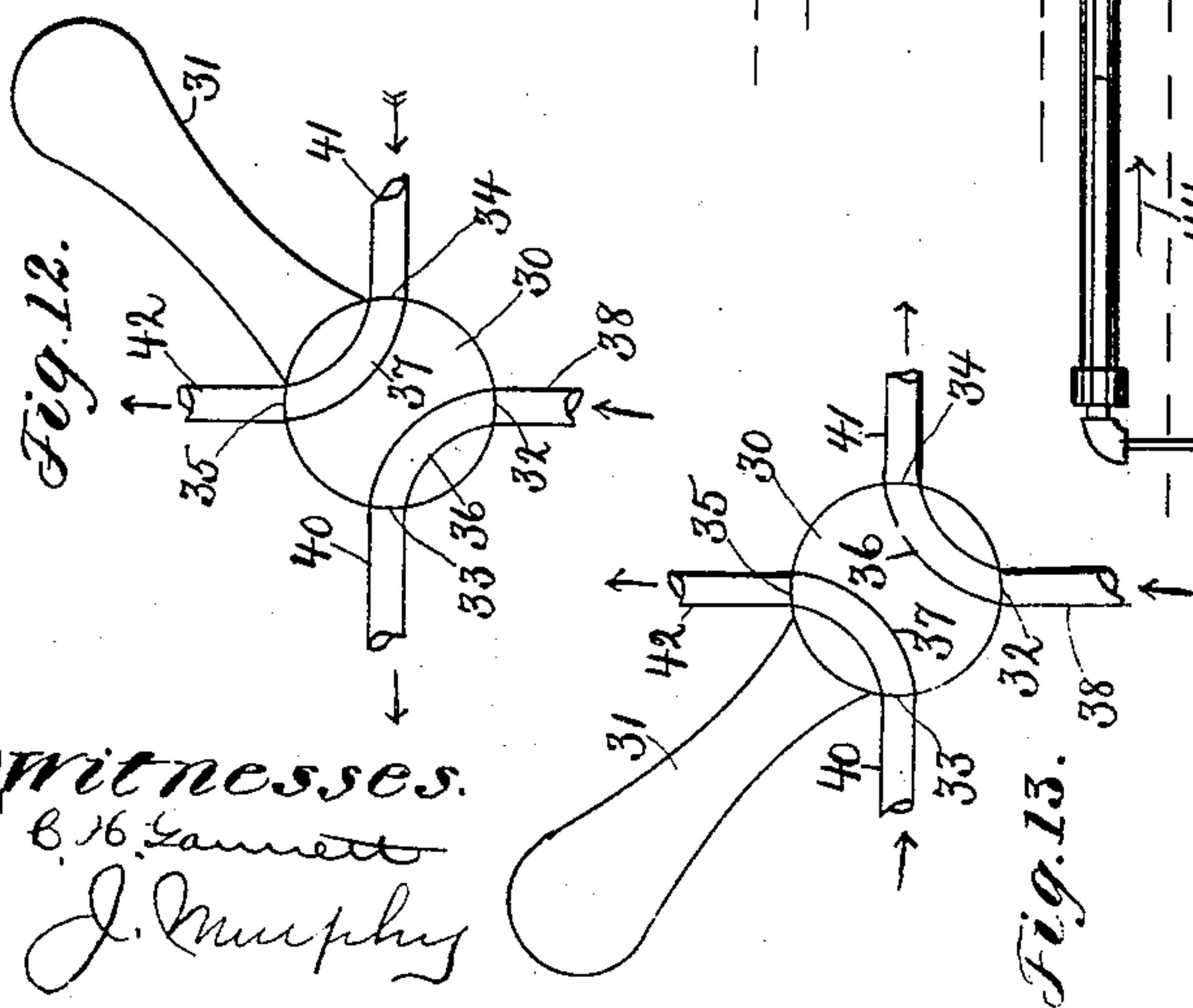


Fig. 11.



Witnesses.
B. B. Gamett
J. Murphy

Fig. 13.

Inventors.
Charles S. Sergeant
John Lindall
by Jas. H. Churchill
Atty.

No. 764,902.

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C. S. SERGEANT & J. LINDALL.

RAILWAY CAR.

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NO MODEL.

6 SHEETS—SHEET 6.

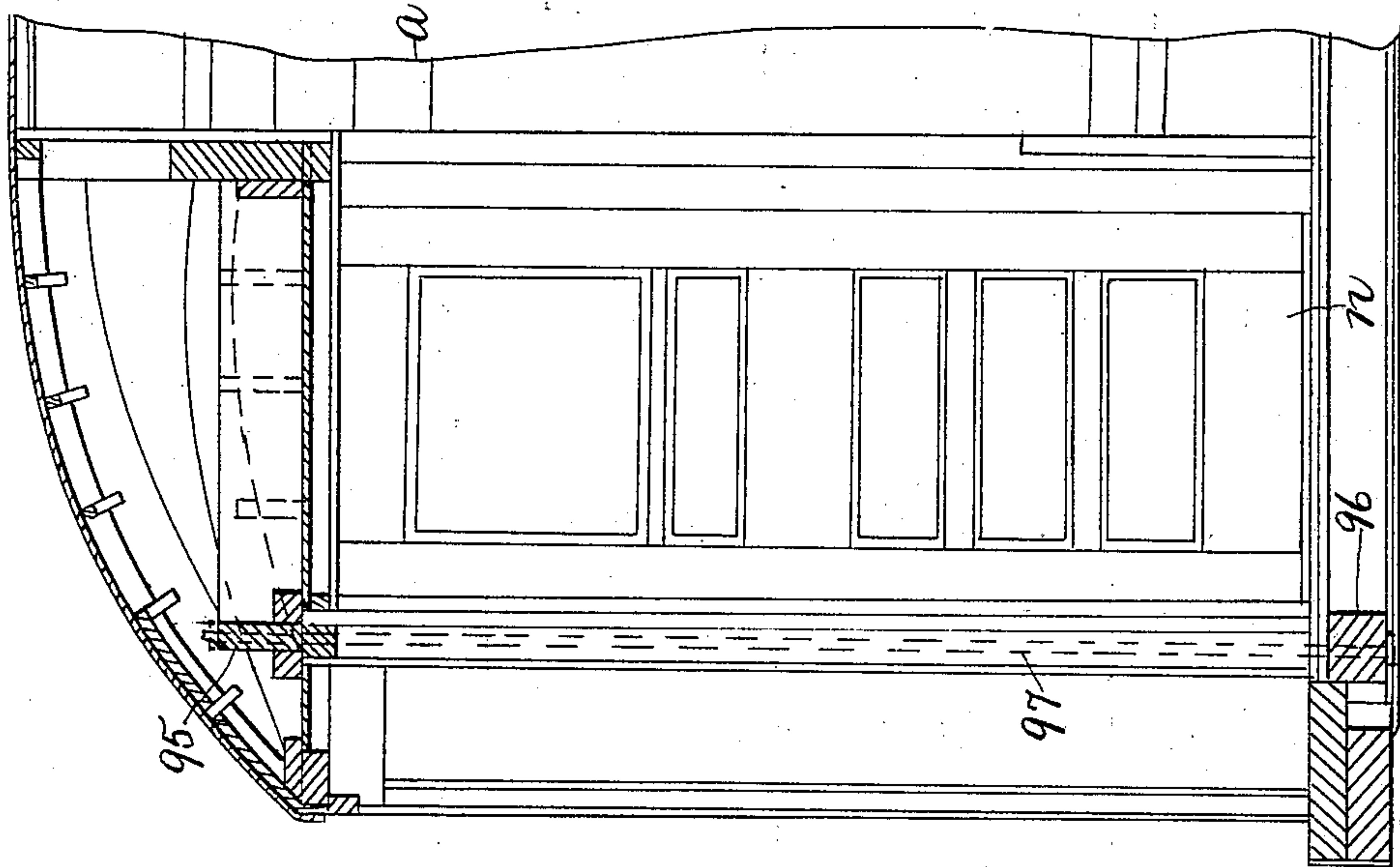


Fig. 14.

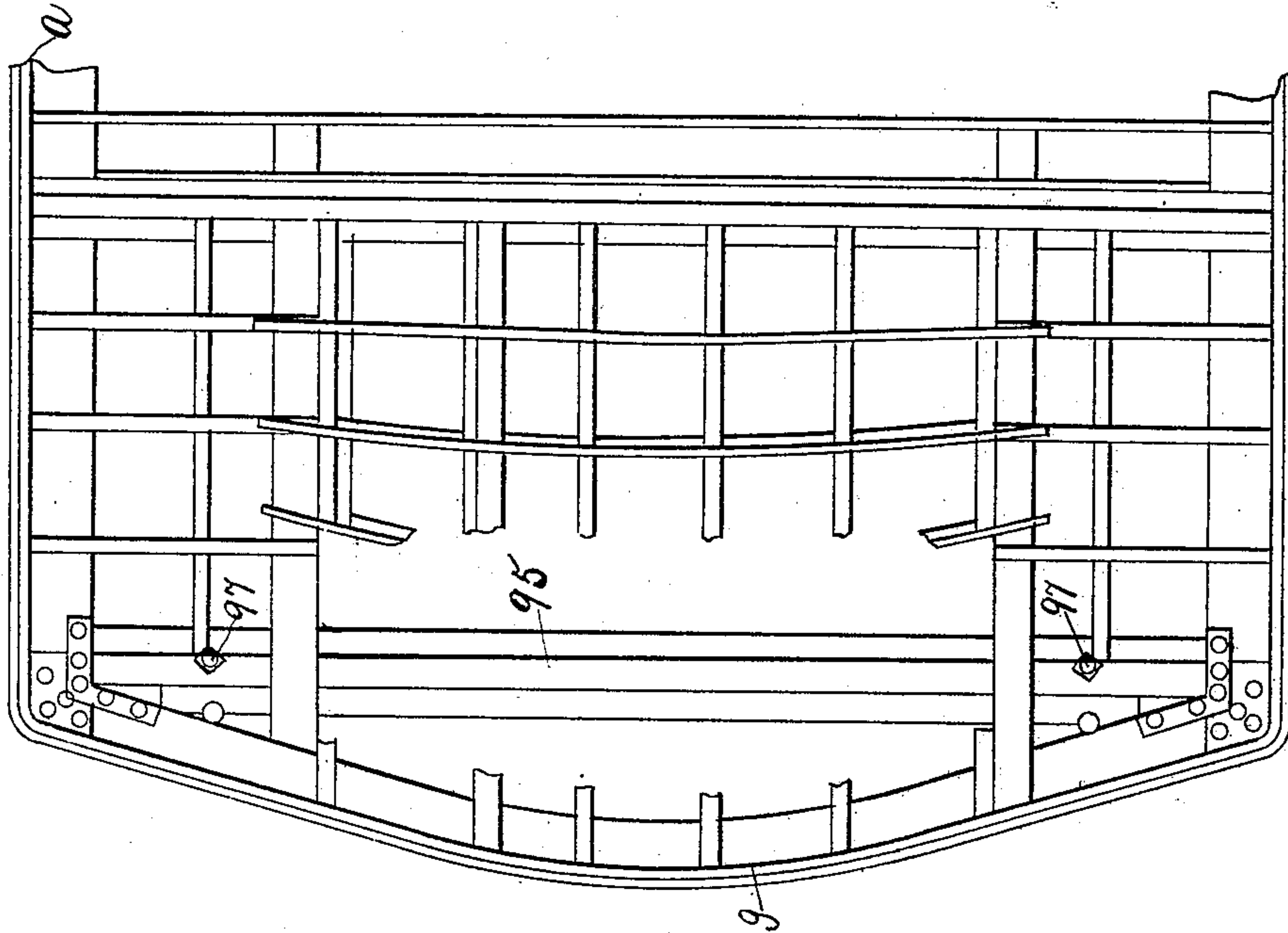


Fig. 15.

Witnesses.
C. H. Bennett
J. Murphy

Inventors.
Charles S. Sergeant
John Lindall
by Jas. H. Churchill
att'y.

UNITED STATES PATENT OFFICE.

CHARLES S. SERGEANT, OF BROOKLINE, AND JOHN LINDALL, OF
BOSTON, MASSACHUSETTS.

RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 764,902, dated July 12, 1904.

Application filed February 27, 1904. Serial No. 195,627. (No model.)

To all whom it may concern:

Be it known that we, CHARLES S. SERGEANT, a citizen of the United States, residing in Brookline, in the county of Norfolk and State of Massachusetts, and JOHN LINDALL, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Railway-Cars, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to a railway-car employed for passenger service, and more particularly to a car used on railway systems employing electricity as the motive power.

The invention is especially adapted to be embodied in a passenger-car provided with a controller and brake-operating mechanism and adapted to be employed as the motor or operating car of a train.

The invention has for its primary object to provide a passenger-car of standard or predetermined length which is of increased carrying capacity within the car-body, which can be filled with and emptied of its passengers in a minimum time, and with which the danger of accidents to the passengers is reduced to a minimum. For this purpose the car-body is constructed so as to practically eliminate the platforms at the opposite ends of passenger-cars as now commonly constructed and to carry such surfaces within the walls of the car-body to form part of the floor of the car, whereby the area of the floor of the car-body is increased to such extent as to enable the car to carry a greater number of passengers within the car-body. To provide for quick entrance into and exit from the car-body, the sides of the latter are provided at their opposite ends with doorways which lead directly into the car-body and communicate with a main passage-way extended longitudinally of the car between the seats therein, which doorways are normally closed by doors, preferably sliding doors, which may be operated by the guard from the platform of the car, the

said platform being made only large enough for the guard.

The doors referred to may be operated by power, as will be described, and provision is made for preventing accidents which might occur by the clothing or parts of the body of the passengers being caught in the door when the latter is closed. The doors referred to may be locked in their closed position, and provision is made for unlocking the doors from outside of the car-body.

Within the car-body movable partitions or doors are provided which cooperate in one position to shut off a portion of the car-body and to close the approach to one of the end doors, so as to form within the car-body a compartment for the motorman when the car is used as an operating-car and which doors in their open position leave an unobstructed passage to the end side door.

These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a side elevation of a car-body embodying this invention; Fig. 2, a horizontal section on the line 2 2, Fig. 1; Fig. 3, a detail, on an enlarged scale, of one end of the car shown in Fig. 2; Fig. 4, a detail in section, on an enlarged scale, showing an end side door and a portion of its locking device; Fig. 5, a sectional detail showing an end side door, its locking device, and the motor for opening and closing said door; Figs. 6 and 7, details showing the connection of the door with its motor; Figs. 8 and 9, details of one form of cushion for the door; Fig. 10, an end elevation of the car shown in Fig. 1, showing the mechanism for locking the door, the car-body being shown in dotted lines; Fig. 11, a side elevation of one end of the car-body and the end-side-door-operating mechanism; Figs. 12 and 13, details of the valve mechanism for controlling the door; and Figs. 14 and 15, details of the end portions of the car-body shown in Fig. 1.

Referring to Figs. 1, 2, and 3, the car-body *a* in accordance with this invention has its end

walls *b* located in close proximity to the end of the car-sills, so as to increase the length of the floor *c* between said end walls, and thereby increase the interior carrying capacity of the car. The end walls *b* may be made, as herein shown, in two sections 20 21, the section 20 being extended substantially at right angles to one side *d* of the car-body and the other section, 21, being extended at an angle to the opposite side *e* of the car-body and substantially parallel with the end or edge of the car-floor. The section 21 is connected at its inner end with a vertical partition or panel *f*, which coöperates with the section 20 of the end wall to form a passage-way 24 to the substantially small space or platform *g*, the said passage-way being normally closed by a door *h*, which is adapted to slide within the section 20 of the end wall when the said door is opened. Within the car-body *a* are upright partitions, walls, or posts *j*, which may be located within the car-body substantially in the places where the end walls of passenger-cars as now commonly constructed are located. The usual seats *k* are extended to the partitions, walls, or posts *j* and may be secured thereto, so as to maintain the seating capacity the same as in cars as now commonly constructed; but said partitions or posts are preferably made of less width than the said seats, so as to leave as much room as possible between the said posts or partitions. The partitions or posts *j* coöperate with the end walls *b* to form lateral passage-ways *m* within the car-body, which lead to the opposite sides of the car near the ends which communicate with the longitudinal passage *w* between the seats *k* of the same, and the passage-ways *m* are normally closed by doors *n*, which may and preferably will be power-operated, as will be described.

In the present instance we have illustrated one method of operating the doors *n* by power. For this purpose each door *n* has connected to it, as by the screw or bolt *o*, (see Figs. 5, 6, and 7,) the end of a piston-rod *p*, attached to a suitable piston *q*, located within a cylinder *r*, (see Figs. 5 and 11,) suitably supported within the side walls of the car-body. The piston *q* is designed to be moved in opposite directions by pressure admitted into the cylinder *r*, and we may prefer to use compressed air, which may be contained in a supply tank or reservoir *s*, (see Fig. 11,) which may be located below and supported from the car-body in any suitable manner.

The admission of air-pressure from the tank or reservoir *s* into the cylinder *r* may and preferably will be controlled by a single valve 30, located outside of the car-body at the end thereof within the easy reach of the guard or operator and provided with a suitable handle 31. The valve 30 may be of any suitable construction, and its shell is provided with four

ports or passages 32 33 34 35, (see Figs. 12 and 13,) and the valve proper, 30, is provided with two passages 36 37, which are adapted to be connected with the ports or passages in the shell of the valve, so as to admit the air-pressure into opposite ends of the cylinder *r*, and thereby effect movement of the piston *p* and the sliding door *n*, connected therewith, in opposite directions. In practice the port or passage 32 may be connected by the pipe 38 with the reservoir *s*, the port 33 by pipe 40 with one end of the cylinder *r*, the port 34 by pipe 41 with the opposite end of the cylinder *r*, and the port 35 by the pipe 42 with the atmosphere.

By reference to Figs. 11, 12, and 13 it will be seen that when the valve 30 is turned into the position shown in Fig. 12 the reservoir *s* is connected with the rear end of the cylinder *r* and air is admitted therein behind the piston *q*, which air moves the said piston in the direction indicated by the arrow 44 in Fig. 11, and thereby moves the door *n* into its closed position. (Shown in Figs. 1 and 11.) When the valve 30 is turned into the position shown in Fig. 12, the front end of the cylinder *r* is connected with the atmosphere, and the air in said cylinder in front of the piston is discharged into the atmosphere.

To open the door, the valve 30 is turned into the position shown in Fig. 13, so as to connect the reservoir *s* with the front end of the cylinder *r*, and thereby admit pressure into said cylinder in front of the piston, which is moved thereby in the direction opposite to that indicated by the arrow 44. With the valve 30 in the position shown in Fig. 13, air-pressure passes from the reservoir *s* through the pipe 38, port 32, passage 36, port 34, and pipe 41 into the cylinder *r*.

It will be understood that each end side door *n* is provided with its own operating-valve, and, if desired, a single reservoir may be employed to supply all the cylinders *r*, or a reservoir for each cylinder may be employed. So, also, if desired, the center side doors 47 may be opened and closed by power in a like manner. One of the end side doors *n* at each end of the car may and preferably will be provided with an opening 49, which is normally closed by a movable section or window 50, which may be carried by the door *n*, so as to slide thereon into a pocket 51 in the side wall of the car and which may be guided in its movement by a grooved roller or wheel 52, movable on the piston-rod *p* and supported by a bracket or arm 53, (see Figs. 6 and 11,) attached to the window 50 within the said pocket.

In order to safeguard against accidents which might be caused by the clothing of the passengers or by parts of the person—such, for instance, as the fingers—being caught by the door when closed, and especially when

closed by power, a yielding cushion or buffer is provided between the end of the door and its jamb or casing, which extends substantially the length or height of the said door, and which makes a weather-tight joint, yet is free to yield sufficiently to permit the clothing or other part of the passenger caught in the door when closed to be pulled without difficulty from between the door and its jamb without necessitating the opening of the door.

In the present instance we have herein represented one construction of cushion or buffer which we may prefer and which consists, essentially, of a rubber tube 60, (see Fig. 8,) containing air or other fluid and which may and preferably will be protected by a covering or jacket 61, of canvas, duck, or other suitable material. The pneumatic cushion 60 and its jacket 61 may be secured to a backing piece or strip 62, of wood or other suitable material, which in the present instance is firmly secured to the door *n*, as by the plates or strips 63, which are detachably secured to the door, as by the screws 64.

The clamping plates or strips 63 may be secured to the backing-piece 62 by screws 65, the free ends of the jacket 61 being firmly secured between the backing-piece 62 and the clamping-plates 63. The rubber tube 60 may be provided with an air-inlet nipple 67, extended into a passage in the backing-piece 62 and provided with a suitable valve 68, similar to the valve of a bicycle-tire, which valve is accessible from the side of the door by removing a short screw 69 in the plate 63, which normally covers said valve. The rubber tube 60 may be filled with air from outside the car by attaching a suitable pump to the nipple, and the pressure may be regulated to cause the cushion to make a weather-tight joint with the jamb or casing 70 of the door, yet which is such as to permit the cushion to yield sufficiently to avoid injuring the fingers of the passengers if by accident they should be caught in the door and to enable the fingers and clothing of the passengers to be readily pulled out of the door if the same should be caught therein, thereby avoiding accidents from this source.

We prefer to secure the cushion to the movable door, but do not desire to limit our invention in this respect, as it may be secured to the jamb or casing of the door in position to be engaged by the end of the door when closed.

It is to be observed that the jamb or casing of the door is flush and that the cushion, whether attached to the jamb or to the door, is in line with the door in its closed position and is interposed between said door and its jamb and cooperates with both to make a weather-tight joint.

The door *n* may and preferably will be provided at its rear end with a yielding stop or

buffer 170, which is adapted to engage the front wall of the pocket 51 when the door is in its closed position. The buffer 170 may be made of rubber and may be secured to a plate or bar 171, attached to the rear edge of the door and projecting laterally therefrom. The stop 170 extends the length of the door and is made yielding to deaden the blow of the door when moved into its closed position and also to form a weather-tight joint at the rear edge or end of the door. The stop 170, further, is to relieve the cushion on the front edge or end of the door from the full pressure of the motive power employed to close the door, thereby better enabling the front cushion to perform the function desired—namely, to safeguard against accidents, as above described.

We have herein shown one construction of cushion which we may prefer; but we do not desire to limit our invention to the construction shown.

Provision is also made for locking the door in its closed position, which may be accomplished by a locking mechanism under the control of the operator or guard on the platform. The locking mechanism may be made as herein shown (see Figs. 4, 5, and 10) and consists of a bolt 72, (see Figs. 5 and 10,) supported to slide in suitable bearings 73 within the car and connected to a bell-crank lever 74, which is joined by a connecting-rod 75 to a foot-lever or treadle 76, which is extended outside of the end wall of the car and is accessible to the operator or guard on the platform *g*. The bolt 72 engages a latch arm or bar 77, secured to the door *n* near its top and movable into a pocket 78 in the casing of the door, which casing is shown as secured to or forming part of the corner-post 79 of the car-body. The bolt 72 is normally held in the path of movement of the latch 77 by a spring 80 encircling the bolt between a bearing 73 and a nut 81, by means of which nut the tension or force of the spring 80 may be regulated. The bolt 72 may be limited in its movement into the pocket 78, as shown, by nuts 82 adjustable on said bolt and adapted to engage the bearing 73. (See Fig. 5.) Normally the bolt 72 is projected into the path of movement of the latch 77 and is engaged by the latter when the door is closed.

The door *n* remains locked until opened by the guard on the outside of the car depressing the lever or foot-treadle 76. The bolt 72 for the door *n* at one end of the car is located within the substantially triangular space 85, formed by the inclined section 21 of the end wall *b* and the panel or partition *f*, and the bolt for the door *n* on the opposite side of the car is located within the section 20 of the end wall, as represented in Figs. 3 and 4. The substantially triangular space 85 is designed to be closed within the car-body when all the

floor area is used for carrying passengers—that is, when the car is being used as a trailer—and this may be effected by a movable door 88, which is hinged to the panel *f* within the car-body and is adapted to be turned into the position represented by dotted lines, Fig. 3.

The movable door 88 coöperates with a smaller door 89, hinged to the partition wall or post *j*, to shut off a passage-way *m* within the car-body and form a compartment or cab for the motorman when the car is used as the operating-car.

When the car is not being used as an operating-car, the door 88 is swung back into its dotted-line position to close the smaller compartment 85, in which the controller 90 and the brake-operating mechanism 91 are located, and thereby render these and the bolt mechanism inaccessible to the passengers in the car. The smaller door 89 under these circumstances is also swung back against the partition or upright post *j*, as represented by dotted lines in Fig. 3 and by full lines at the left-hand end in Fig. 2. When the doors 88 89 are in their full-line position, (shown in Fig. 3,) the door *n* for that end of the car remains closed; but by means of the sliding window 50 in the said door the motorman can look out at the side of the car. The angular section 21 of the end wall may be provided with a window 93, by means of which the motorman can see ahead of the car.

In order to carry the end walls of the car-body substantially to the ends of the car-sills, and thereby lengthen the sides of the car-body sufficiently to permit the end doors to be placed in the sides of the car-body, the overhanging portion or bonnet of the roof or superstructure of the car-body is reinforced by a header 95, extended transversely of the car, and preferably secured to a cross-floor beam 96 by a bolt 97 at each end of said header. (Indicated in Figs. 14 and 15.)

By reference to Figs. 1, 2, and 3 it will be seen that the floor area of the car-body within its side and end walls is materially enlarged, thereby increasing the carrying capacity of the car-body both when the car is used as an operating-car and when used as a trailer or one of a train. So, also, it will be observed that the inlets and exits in the car-body have been increased without diminishing the seating capacity of the car, thereby enabling the car to be filled and emptied of its passengers in a minimum time without inconvenience to the passengers and with a material saving in the time required for a train to make a trip, which on some roads would mean a sufficient saving in time to enable an additional train to be run, thereby increasing to this extent the efficiency of the road.

It is further to be observed that danger from accidents caused by passengers riding on the platforms of cars as now commonly con-

structed is entirely avoided by reason of the fact that in the car constructed in accordance with this invention the platforms are reduced to a size sufficient only for the guard or operator and are not accessible to the passengers who are not required to utilize the guard's platform to gain access to the car. Furthermore, accidents due to passengers getting their fingers and clothing caught in the doors is avoided or at least reduced to a minimum by means of the cushion employed in connection with the doors in the sides of the car.

The inlet and exits for passengers are located in the sides of the car-body, and their doors are under the control of the guards located between adjacent cars and being power-operated may be opened and closed by the said guards.

We have herein shown and described the car-body as provided with doors; but we desire to be understood as including within the term "door" a gate or other structure having the functions of a door.

We claim—

1. A car of the class described provided with a body portion having its end walls located near the ends of the car-sills to form passage-ways leading to the sides of the car, movable doors in the sides of the car-body near its opposite ends governing said passage-ways, power-operated mechanism for operating said doors, means for controlling said mechanism from outside the car-body, and locking mechanism for said doors in their closed position, said locking mechanism being operable from outside the car-body, substantially as described.

2. A car of the class described provided with a body portion having doorways in its sides near the opposite ends thereof, power-operated doors for closing said doorways, cushions forming the front edges of said doors, and means for controlling said power-operated doors, substantially as described.

3. A car of the class described provided with a body portion having a doorway in its side, a power-operated sliding door for closing said doorway, and a cushion coöperating with said door in its closed position to form a weather-tight joint and yet yield to permit of the release of obstacles caught in the door without necessitating the door being opened, substantially as described.

4. A car of the class described, provided with a body portion having end walls, upright partitions or posts within said car-body coöperating with said end walls to form lateral passage-ways, doors in the sides of the car-body governing said passage-ways, and a movable partition normally forming a side wall for said lateral passage and movable into a position at an angle to the end wall of the car-body to close said lateral passage, substantially as described.

5. A car of the class described, having a body portion, provided with doorways in its sides at one end thereof, sliding doors cooperating with said doorways, mechanism to lock said doors in their closed position, and means accessible from outside the car-body for operating said locking mechanism to unlock said doors, substantially as described.

6. A car of the class described having a body portion provided with doorways in its sides at one end thereof, sliding doors cooperating with said doorways, power-operated mechanism for operating said doors, and means for controlling said power-operated mechanism accessible from outside the car-body, substantially as described.

7. A car of the class described, having a body portion provided with a doorway having a flush jamb or casing, a door for closing the said doorway, and a cushion interposed between said door and its casing or jamb in line with said door and projecting into said doorway when the door is in its closed position, substantially as described.

8. A car of the class described having a body portion provided with a doorway having a flush jamb or casing, a sliding door for closing said doorway, and a cushion attached to the front edge of said door to engage the flush jamb or casing and projecting into said doorway when the door is closed, substantially as described.

9. A car of the class described provided with a body portion having a doorway in its side at the end thereof, a door to close said doorway, a power-operated mechanism for opening and closing said door, and means accessible from outside the car-body to control said power-operated mechanism, substantially as described.

10. A car of the class described provided with a body portion having a doorway in its side at the end thereof, a door to close said doorway, a power-operated mechanism for opening and closing said door, means accessible from outside the car-body to control said power-operated mechanism, a locking mechanism for said door in its closed position, and means accessible from outside the car-body to operate said locking mechanism and release said door, substantially as described.

11. A car of the class described having its body portion provided with a doorway in its side, a sliding door to close said doorway, a piston having its piston-rod attached to said door, a cylinder in which said piston reciprocates, a source of power carried by the car and connected with said cylinder to admit power therein to effect movement of said piston and its attached door, and means carried by the car-body and accessible from outside thereof to control the admission of power into said cylinder, substantially as described.

12. A car of the class described having its

body portion provided with a doorway in its side and with a pocket, a sliding door to close said doorway and movable into said pocket when the door is moved into its open position, mechanism for moving said door, a cushion cooperating with the front edge of the said door and interposed between the same and the jamb of said door, and a yielding buffer attached to the portion of the door within said pocket to relieve said cushion from excessive pressure when the door is closed, substantially as described.

13. A car of the class described having its body portion provided with a doorway in its side and with a pocket, a sliding door to close said doorway and movable into said pocket when the door is moved into its open position, a sliding window in said door, a guide for said window movable in said pocket, and means to support said guide within said pocket, substantially as described.

14. A car of the class described, having a body portion provided with a doorway, a door for closing said doorway, a pneumatic cushion containing air under pressure and provided with a protective covering and interposed between said door and its casing when the door is in its closed position, substantially as described.

15. A car of the class described, having a body portion provided with a doorway, a door for closing said doorway, a pneumatic cushion attached to the edge of the door and provided with an air-inlet, said door having an opening in its side in communication with said air-inlet, and means to close said opening, substantially as described.

16. A car of the class described provided with a doorway, a door for closing said doorway, a cushion located in said doorway in the closed position of the said door in line with the latter and cooperating therewith to complete the closure of the doorway, said cushion comprising a closed hollow tube of compressible material having an inlet provided with a valve to close the same, substantially as described.

17. A car of the class described provided with a doorway, a door for closing said doorway, an air-tight cushion containing a compressible fluid under pressure and located in said doorway in the closed position of the same to permit of the release of obstacles caught in the door without necessitating the door being opened, substantially as described.

18. A car of the class described provided with a doorway having side walls, a door for closing said doorway, and a cushion in line with the door and interposed between said door in its closed position and a side wall of said doorway, substantially as described.

19. A car of the class described provided with a doorway, a door to close said doorway, a piston having its piston-rod connected with

said door, a cylinder in which said piston reciprocates, a source of power carried by the car and connected with said cylinder to admit power therein to effect movement of said piston and door, and means carried by the car and accessible from outside the car to control the admission of power into said cylinder, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES S. SERGEANT.
JOHN LINDALL.

Witnesses:

JAS. H. CHURCHILL,
J. MURPHY.