

No. 661,452.

Patented Nov. 6, 1900.

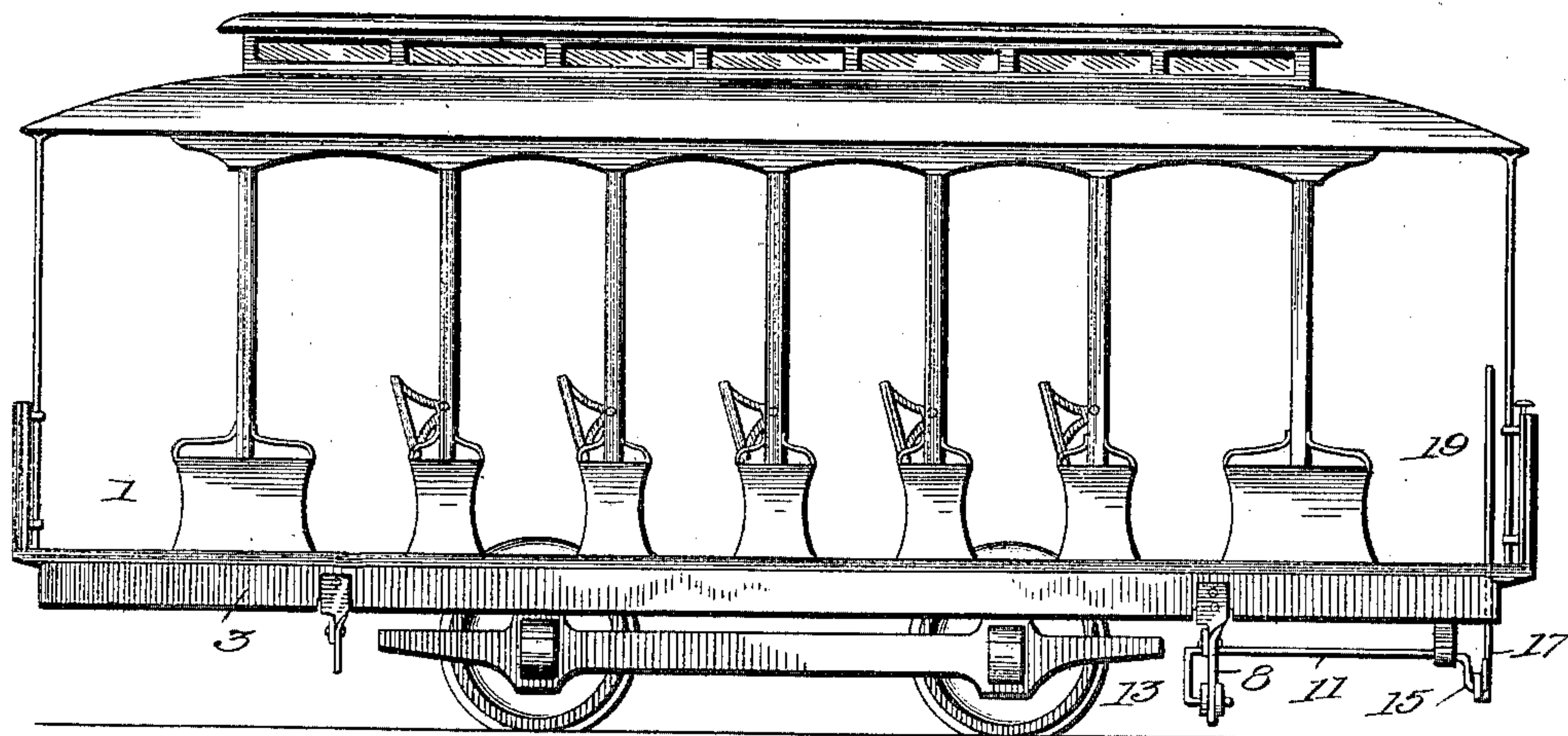
J. A. KRATZ.  
RAILWAY CAR.

(Application filed Mar. 22, 1900.)

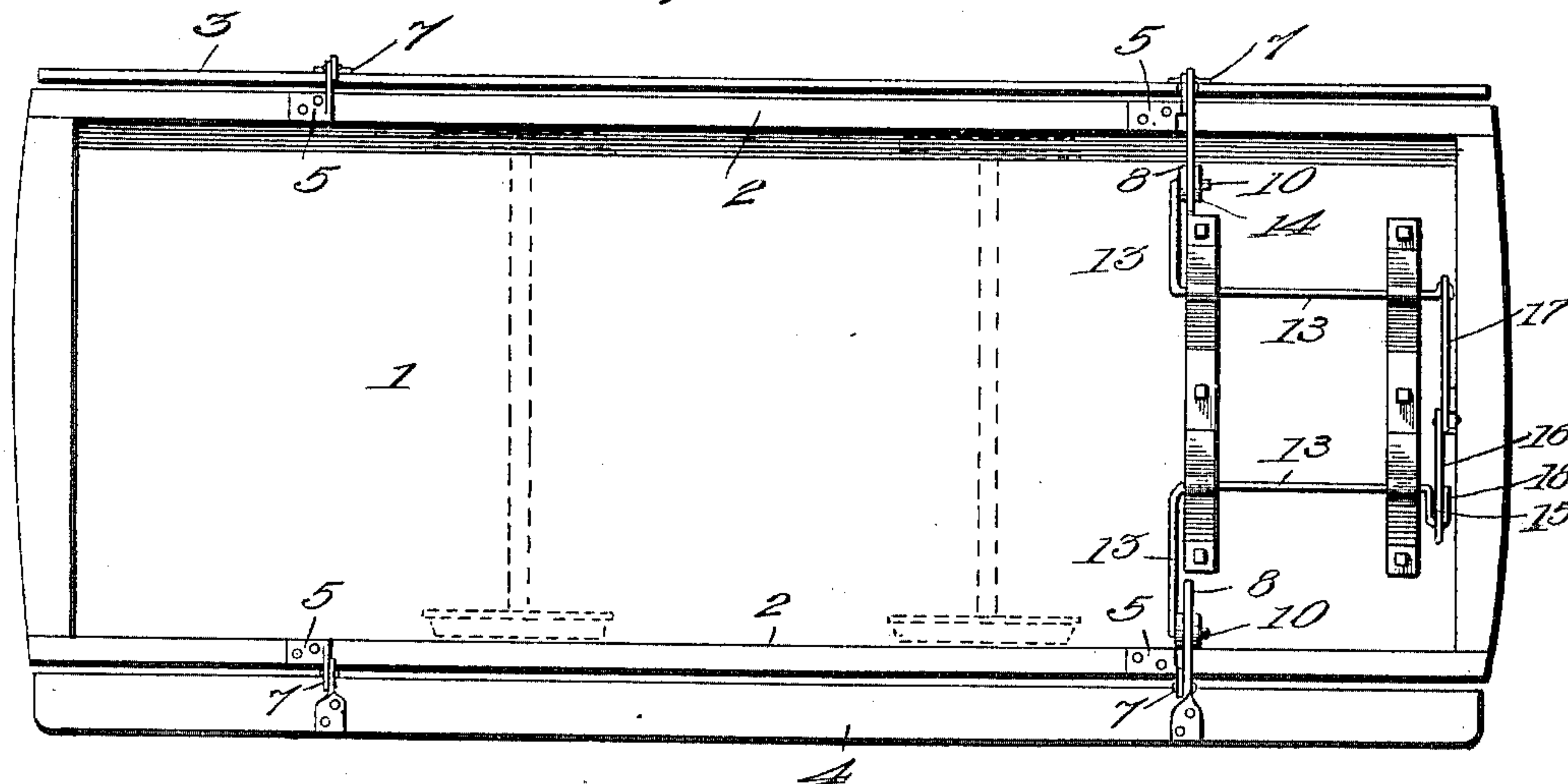
(No Model.)

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*Fig. 1.*



*Fig. 2.*



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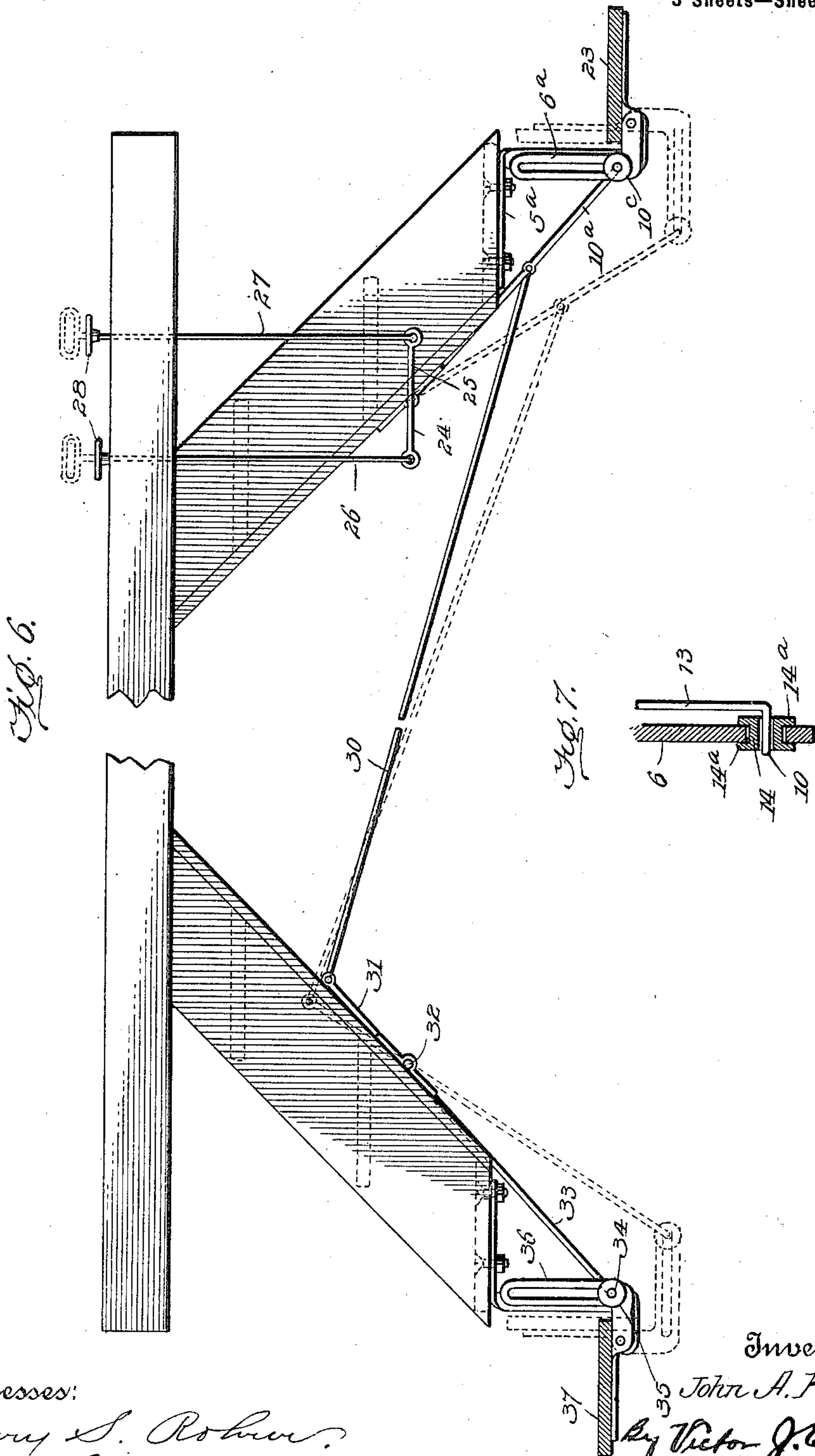
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# UNITED STATES PATENT OFFICE.

JOHN A. KRATZ, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-FOURTH  
TO ROBERT ROSENBUSH, OF SAME PLACE.

## RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 661,452, dated November 6, 1900.

Application filed March 22, 1900. Serial No. 9,777. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. KRATZ, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Railway-Cars, of which the following is a specification.

My invention relates to railway-cars, and more particularly to folding steps or running-boards for cars, the primary object being to provide simple and effective means for raising and lowering the step or running-board of a street-car or the step of a Pullman or other railway-car.

A further object of the invention is to provide a street-car with pivoted running-boards and means for simultaneously raising one of said boards and lowering the other.

The construction and characteristic features of the invention will be fully described hereinafter and defined in the appended claims, in connection with the accompanying drawings, which form a part of this specification.

In the drawings, Figure 1 is a side elevation of a street-railway car equipped with my improvements. Fig. 2 is a reverse plan of the same. Fig. 3 is a transverse section of the car, showing the improved mechanism in elevation. Fig. 4 is an end elevation of a portion of a steam-railway-car platform provided with a modified construction of the invention. Fig. 5 is a view in perspective of the mechanism shown in Fig. 4 detached from the car. Fig. 6 is an end elevation of a portion of a car, showing a further modification; and Fig. 7 is a detail sectional view of one of the anti-friction-rollers of the device.

The reference-numeral 1 designates the body of the car, Figs. 1, 2, and 3, and 2 the side rails thereof.

3 and 4 designate the running-boards, constituting steps and pivotally secured to the side rails 2 by means of angle-brackets 5, secured to the under surfaces of the side rails, spirally-twisted angle-arms 6, secured to the under sides of the running-boards, and rivets 7, connecting the laterally-projecting ears of the brackets 5 with the angle-irons.

The inner arms 8 of the angle-irons are formed with elongated slots 9, through which extend the bent ends 10 of the oppositely-dis-

posed double cranks 11. These cranks are supported in bracket-hangers 12, secured to the under side of the car-floor.

Upon the ends 10 of the inner cranks 13 are mounted antifriction-rollers 14, which travel in the slots of the arms 8 and are formed with flanges 14<sup>a</sup>, serving to guide the rollers in their movement.

The outer cranks 15 are connected together by links 16 and 17, the outer ends of which are perforated to be engaged by hooks 18, formed on the cranks 15, while their inner ends overlap and are secured pivotally to the lower end of a lever 19, which extends through an opening 20 in the car-platform and is fulcrumed on a pin or bolt 21.

The operation of the mechanism as thus far described will be readily understood by reference to Fig. 3. When it is desired to use the running-board 4, the lever 19 is thrown to the left, which movement, through the medium of the link 17 and the right-hand double crank, throws the adjacent arm 8 upward and lowers the running-board to the position shown in Fig. 3. At this same movement of the lever 19 the angle-iron 6, connected to the running-board 3, is tilted to raise the board 3 to the position shown in Fig. 3. While this double arrangement or duplication of the mechanism is preferable for street-car service, so that the step at one side can be raised as the one at the opposite side is lowered, I would have it understood that only a single angle-iron, double crank, and link may be used, if desired, for each running-board, so that said boards can be operated independently, one from each end. Each of the brackets 5 is provided with a lateral projection 22 to form shoulders, against which the angle-irons 6 abut to limit the upward movement of the inner sides of the boards 3 and 4.

In Figs. 4 and 5 I have shown a modification of the invention adapted for use with the steps of a Pullman or other steam-railway car. In these figures, 5<sup>a</sup> designates brackets adapted to be secured to the under side of the bottom step of the car-platform, and 6<sup>a</sup> angle-irons secured to the under side of a supplemental folding step 23. 11<sup>a</sup> is a crank-shaft supported in suitable keepers under the car-steps and having at one end a crank 10<sup>a</sup>,



the end 10<sup>b</sup> of which extends through the slot 9 of the angle-iron and carries an antifriction-roller 10<sup>c</sup>. The opposite end of the crank-shaft 11<sup>a</sup> is provided with oppositely-extending arms 24 and 25, the ends of which are pivotally secured to push-rods 26 and 27, extending up through the car-platform and provided with treadles 28, as shown in full lines in Fig. 4, or with handles, as indicated by dotted lines in the same figure. The operation of this modified form of the invention is substantially the same as that above described in connection with Figs. 1, 2, and 3, and the supplemental step 23 may be readily raised and lowered, as required.

Any suitable means may be employed for locking the lever 19 or the push-rods 26 and 27—as, for example, a notched plate adjacent to the openings through which the lever or rods pass.

I preferably inclose the tilting angle-irons within a box or casing 29, as shown in Fig. 4, to protect the parts from snow, dirt, dust, &c. This casing is secured by bolts or other suitable means to the under side of the bottom step of the car, as shown, and is suitably slotted to permit the required movement of the mechanism.

In Fig. 6 I have shown a form of the device adapted for simultaneously operating supplemental steps at opposite sides of a railway-car platform. In this embodiment of the invention the crank 10<sup>a</sup> at one side of the platform is connected by a rod 30 with a crank-arm 31, projecting from a crank-shaft 32, supported in bearings below the steps at the opposite side of the platform and having a crank-arm 33, the bent end 34 of which carries an antifriction-roller 35, working in the slot of an angle-bracket 36, secured to a supplemental step 37.

The operation of this modification will be readily understood and is illustrated by dotted lines in Fig. 6, the simultaneous raising and lowering of both supplemental steps 23 and 37 being effected through the medium of the push-rods 26 and 27.

It will be apparent that while the invention is specially adapted for open or summer street-cars it is also applicable to cars of all kinds

employing either a platform-step or a side running-board, and I would have it understood that the invention includes all such modifications or changes in the details of construction as may fall within the scope of the following claims.

I claim—

1. The combination with a car, of a pivoted step, and means for raising and lowering said step, comprising a bracket secured to the car, a slotted angle-arm secured to the step and pivotally secured to said bracket, a crank-shaft, one end of which extends through the slot in said angle-iron and carries a roller and means for operating said crank-shaft from the platform of the car.

2. The combination with a car, of a pivoted step, and means for raising and lowering said step, comprising a bracket secured to the car, and provided with a shoulder; a slotted angle-iron secured to the step and pivotally secured to said bracket, a crank-shaft, one end of which extends through the slot in said angle-iron, and carries a roller and means for operating said crank-shaft from the platform of the car.

3. The combination with a car, of a pivoted step, and means for raising and lowering said step, comprising a bracket secured to the car, a slotted angle-iron secured to the step and pivotally secured to said bracket; a crank-shaft, one end of which is bent to form an arm which projects through the slot of the angle-iron, a roller on said arm, and means for tilting said crank-shaft.

4. The combination with a car, of pivoted running-boards one at each side of the car, and means for raising one of said boards and simultaneously lowering the other, comprising slotted angle-irons secured to the boards, oppositely-disposed double cranks supported in bearings below the car, an operating-lever and links connecting the lever and double cranks.

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

JOHN A. KRATZ.

Witnesses:

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F. W. KLEHM.