

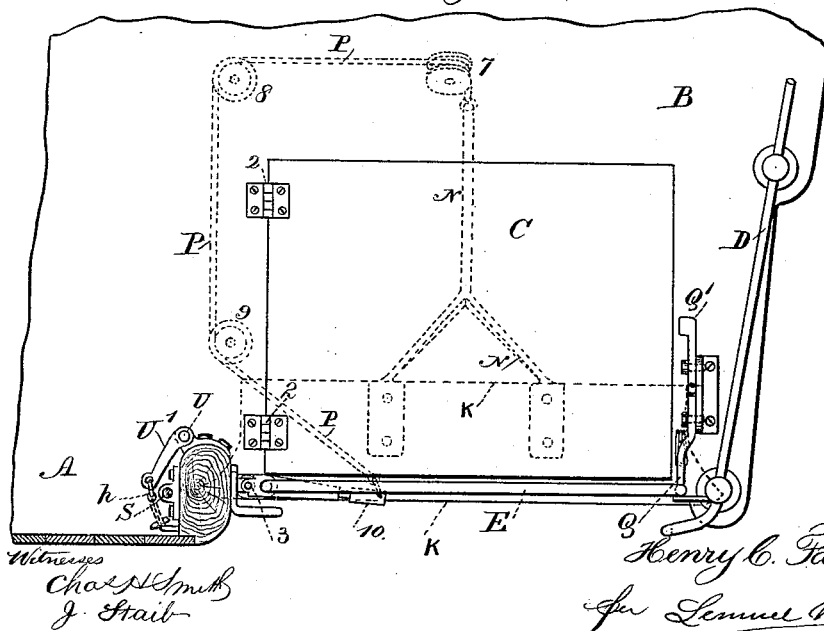
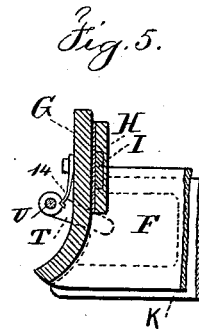
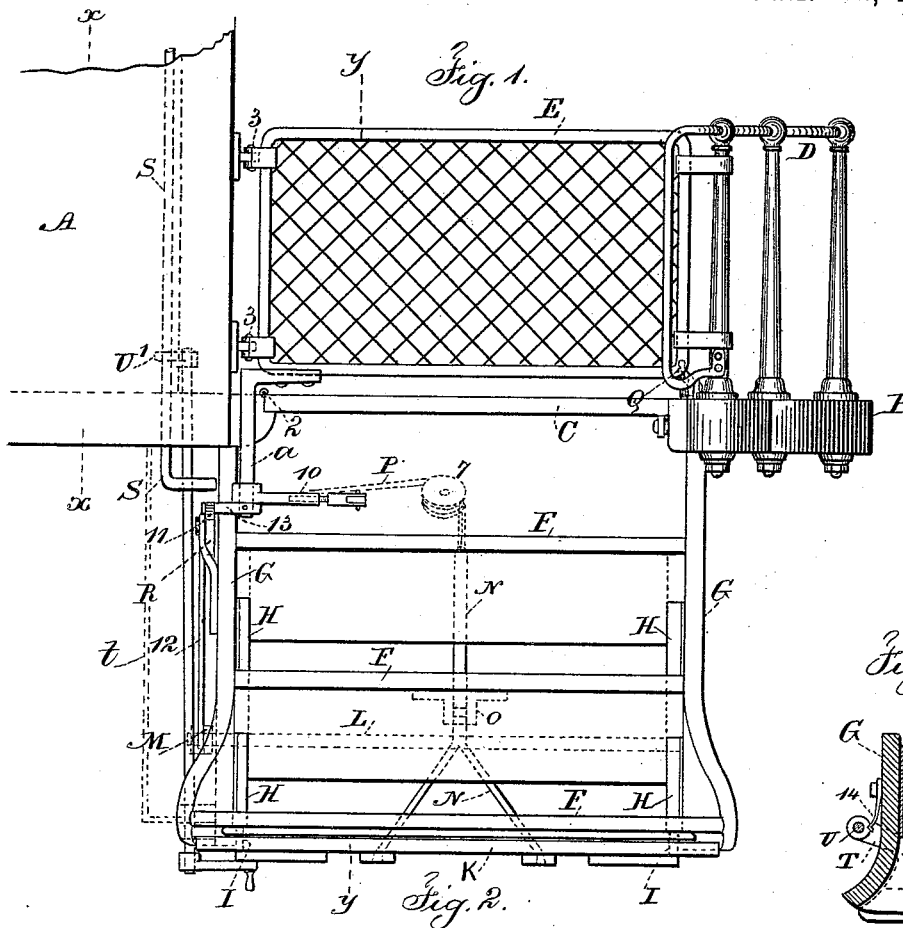
(No Model.)

2 Sheets—Sheet 1.

H. C. FARQUHARSON.
RAILWAY CAR STEP.

No. 490,344.

Patented Jan. 24, 1893.



Witnesses
Charles Smith
J. Straub

Inventor
Henry C. Farquharson
per Lemuel W. Ferrell atty

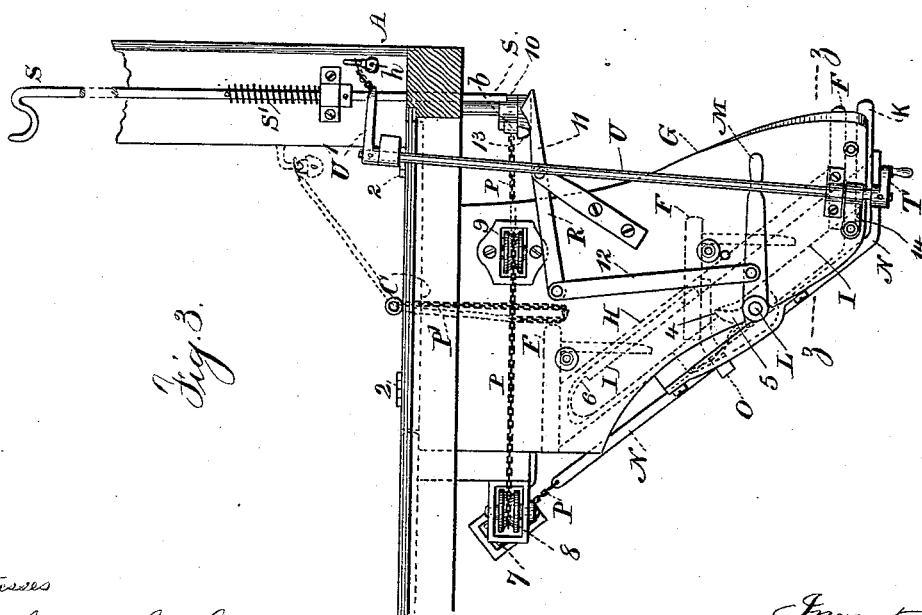
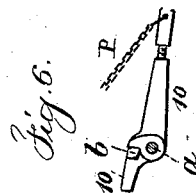
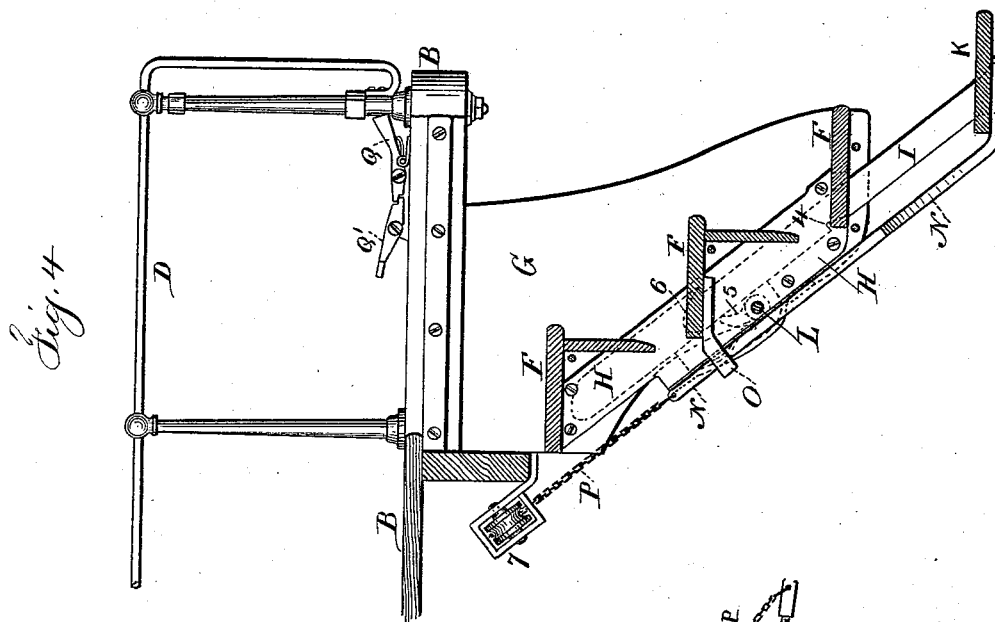
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2 Sheets—Sheet 2.

H. C. FARQUHARSON.
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Witnesses

Charles H. Smith
J. Stair

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Atty

UNITED STATES PATENT OFFICE.

HENRY C. FARQUHARSON, OF NEW YORK, N. Y.

RAILWAY-CAR STEP.

SPECIFICATION forming part of Letters Patent No. 490,344, dated January 24, 1893.

Application filed October 28, 1891. Renewed July 20, 1892. Serial No. 440,638. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. FARQUHARSON, a citizen of the United States, residing in the city and State of New York, have invented an Improvement in Railway-Car Steps, of which the following is a specification.

A reference is hereby made to my applications, Serial Nos. 377,104 and 377,105 and to the application of Claus Freese, Serial No. 377,102, heretofore filed and allowed, and my present invention is a modification of and improvement upon the devices set forth in said applications, and the invention relates to the devices hereinafter set forth and claimed.

In my present improvements the lower step or platform is movable and when elevated is held by pawls upon a cross shaft, as in my application Serial No. 377,105, and I arrange these parts in connection with a swinging gate and a hinged platform covering the steps as usually provided in observation cars, and I combine the parts with a central forked lifter for the movable step which also forms a guide to insure parallelism in the movement, and I employ a sustaining arm that is movable from the platform, so that in cases where the gate is opened the step will not be dropped when this arm is beneath the same. This is a convenience where the station platform is on a level or nearly so with the car platform, and the step can also be sustained by this arm at stations where the platform is at the level or nearly so of the lower fixed step upon a car, and the step can be drawn up by a person on the platform whenever desired.

In the drawings Figure 1 is a front elevation. Fig. 2 is a plan view representing my improvement as applied to the steps at one end of a car. Fig. 3 is an elevation of the step mechanism with the car platform in section at the line *x, x* of Fig. 1. Fig. 4 is a section at the line *y, y* of Fig. 1. Fig. 5 is a section at the line *z, z* of Fig. 3, and Fig. 6 is a plan of the lever arm to which the lifting chain is connected.

A portion of the end of the car is represented at A and a portion of the car platform at B, and C is a drop or swinging platform hinged at 2 and adapted to be swung up for allowing a person to ascend or descend upon the steps and when turned down it is

upon the level of the platform B so as to adapt the platform to an observation car.

At D a portion of the fixed railing at the end of the car platform is represented, and at E is a gate pivoted upon the vertical edge thereof by the hinges 3, and the stationary steps F are supported by any suitable framework or side pieces G. The parts thus far described may be of any desired size or construction.

Upon the supports or stationary side pieces of the steps there are affixed slide ways or boxes H receiving the slide bars I which are fastened at their lower end to the movable step K, and I find it preferable to inclose these slide bars in the slide way or box H to exclude foreign substances and to prevent the slide bars I being obstructed in their movement, and in these slide bars I are notches 4 receiving the pawls 5 upon the cross shaft L that is supported in suitable bearings upon the slide ways H; these pawls and cross shaft act similarly to those represented in my application Serial No. 377,105, and there is a lever M at one end of the cross shaft L, the weight of which tends to bring the pawls 5 into the notches 4, and when this lever M is lifted both pawls 5 are simultaneously disengaged so that the step K can slide downwardly by its weight, and there are hook ends 6 to the slide bars I to limit their downward movement.

I combine with the movable step K a central fork lifter N, the forked lower end of which is provided with treads or flanges passing under and riveted to the movable step K, and this lifter slides through a guide O upon the back of one of the stationary steps F, and there is a chain P connected upon the upper end of the central lifter N so that by drawing upon this chain the step will be moved bodily and uniformly as it is elevated, and the guide O and lifter N insure parallelism in the movement. This chain P may pass to the platform in any desired manner so as to be drawn up by hand in cases where the gate E is not made use of, or there may be a branch chain connected with the chain P, as seen at P', having a ring at its upper end above the platform so that the step can be drawn up by hand if desired when the gate is open. I have shown the chain and pin as passing around the pulleys 7 8 9, and the end fastened to an

arm 10 or lever upon a bar *a* attached to and moving with the gate E, so that when the gate E is being closed, the arm 10 will draw upon the chain P and lifter N so that the movement will be completed and the pawls 5 will hold the slide bars I before the gate is closed, and when the gate is swung open, the chain will be slackened so that the step K can be dropped whenever the pawls 5 are liberated from the slide bars I. If desired the arm 10 may be loose on the vertical bar *a* and be acted upon by a finger *b* fastened to said rod, so that the gate may receive more than a quarter circle movement without again drawing on the chain.

I have represented a latch at Q to hold the gate when closed. This may be of any desired character; I have represented it as provided with a foot lever Q' to disengage the latch by the pressure of the foot.

When the cross shaft L and pawls 5 are to be operated automatically I move the lever M by a connection to the gate. With this object in view, I have shown the lever R with a cam end 11 and connection 12 to the lever M, and the arm 13 that is upon the vertical bar *a* swings over the cam 11 and depresses the same and raises the lever M sufficiently to unlatch the pawls 5. It will be apparent that when this arm 13 is not provided or when it may be thrown out of action the pawls 5 can be moved by either the lever R or the lever M, or I usually provide a rod S adapted to slide vertically at one corner of the car and held up by a spring S' or other suitable device, and the foot or lower end of this rod S is in its normal position above the end of the lever R and also above the arm 13, but this rod S can be forced down by hand to act upon the lever R and unlatch the pawls 5 and allow the movable step K to drop independently of the action of the gate.

In instances where it is necessary to provide for holding up the step K the sustaining arm T is used at the lower end of the shaft U, and this shaft extends up to any desired position adjacent to or above the platform and is fitted with a handle U' by which it may be partially rotated to throw the sustaining arm T beneath the step K when in its elevated position and to turn such sustaining arm aside and out of the way of the movable step K, so that by these provisions the movable step can be controlled from the platform without reference to the gate and without reference to the swinging platform, so that the position of the step may be regulated according to the landing or platform at the station or depot, and the closing of the gate insures the elevation of the movable step by the connections to the same as described.

It is advantageous to employ a spring 14 with a double inclined end, as represented in the detached view, Fig. 5, and to notch the hub of the sustaining arm T in such a position that the spring will pass into this notch at the time the sustaining arm is beneath the

movable step, so that the jar or motion of the car will not be liable to swing the sustaining arm out of its place.

A casing may be applied to inclose the moving parts at the side of the step as illustrated by dotted lines at *t* Fig. 1.

It is preferable to secure the movable step K by a lock so that said step cannot be let down by an unauthorized person when the car is standing in or being moved about the yard of a depot, or under other circumstances where it is desired to prevent the step being lowered. By preference the locking device should be above the floor or platform of the car and may be applied to any desired part of the device for moving or holding the movable step.

In Fig. 3 the dotted lines represent the lifting chain P as connected to a staple or hook and secured by a padlock, so that after said chain has been secured, the step K cannot be lowered except by the person who has the key to said lock.

In Figs. 2 and 3 I have shown a chain and lock applied to the arm U' to secure said arm and prevent it and the shaft U being turned, thereby preventing the step K being lowered except by the proper person.

I claim as my invention.

1. The combination with a movable step and its slide bars, of stationary slide ways for such slide bars and a central forked lifter connected at its lower end with the movable step, and a stationary guide through which such lifter passes and a chain or connection to the upper end of the lifter for drawing up the step, substantially as set forth.

2. The combination with the movable step and its slide bars and stationary slide ways, of a central lifter connected with the movable step, a stationary guide through which the lifter passes, a chain connected to the upper end of the lifter and passing through the platform for lifting the movable step by hand from above the platform, substantially as set forth.

3. The combination with the stationary car steps and their side pieces, of a movable step, slide bars connected with the step, and stationary slide ways for the slide bars, a central lifter connected with the movable step and a stationary guide through which the lifter passes, the cross shaft and pawls for sustaining the slide bars and movable step, substantially as set forth.

4. The combination with the stationary steps, swinging platform and gate, of a movable step, a central lifter connected with the movable step and a stationary guide for the lifter, a chain extending from the lifter, pulleys for the chain and an arm upon the gate to which the chain is connected, substantially as set forth.

5. The combination with the stationary steps and the movable step, of slide bars, stationary slide ways for the bars, a cross shaft and pawls engaging the slide bars when the

step is elevated, the levers M and R for moving the pawls, substantially as set forth.

6. The combination with the stationary steps and the movable step, of slide bars, stationary slide ways for the bars, a cross shaft and pawls engaging the slide bars when the step is elevated, the levers M and R for moving the pawls, and the rod S extending above the platform for actuating the parts to drop the step, substantially as set forth.

7. The combination with the stationary car steps, of a movable step, slide bars for the same and means for holding the step when elevated and a sustaining arm adapted to being turned beneath the movable step for holding the same in an elevated position, substantially as set forth.

8. The combination with the stationary car steps, of a movable step, slide bars for the

same and means for holding the step when elevated, a sustaining arm adapted to being turned beneath the movable step for holding the same in an elevated position, and a shaft extending from the stationary arm above the platform for actuating the same, substantially as set forth.

9. The combination with the stationary car steps, of a movable step and means for holding the step when elevated, and a locking device for securing the movable step so that it cannot be lowered until the locking device is opened, substantially as set forth.

Signed by me this 10th day of August, 1891.

HENRY C. FARQUHARSON.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.