



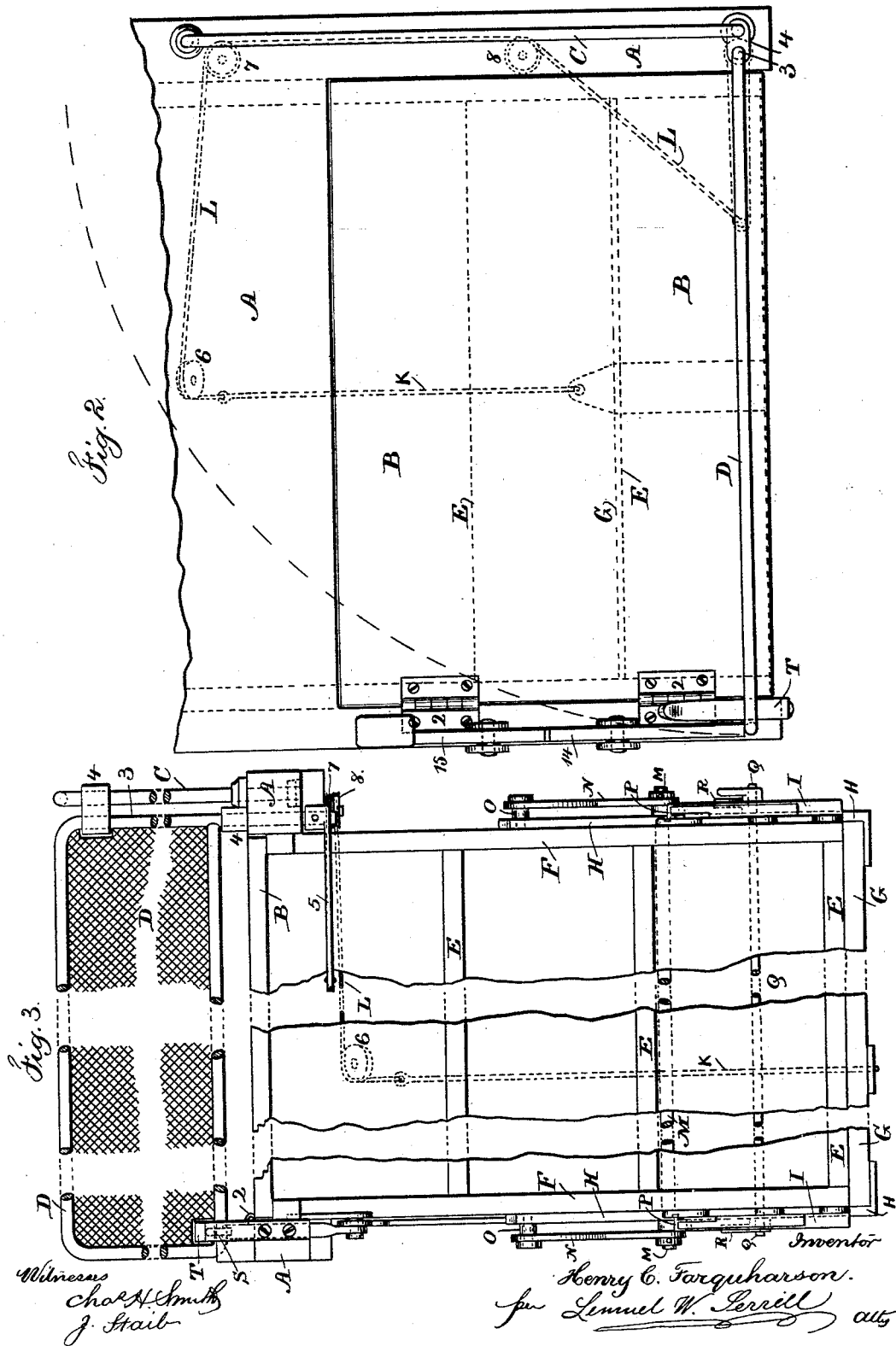
(No Model.)

2 Sheets—Sheet 2.

H. C. FARQUHARSON.  
CAR STEP.

No. 459,169.

Patented Sept. 8, 1891.



# UNITED STATES PATENT OFFICE.

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

## CAR-STEP.

SPECIFICATION forming part of Letters Patent No. 459,169, dated September 8, 1891.

Application filed January 8, 1891. Serial No. 377,104. (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.

Railway-trains are frequently provided with swinging gates at the ends of the platform, and in addition to these swinging gates a movable platform or trap is applied over the steps to adapt the platform to the reception of excursionists, so that the platform can be used as a place of observation in traveling.

In my present invention I have combined with the swinging gate a movable step, whereby the movable step is lowered when the gate is opened and it is drawn up when the gate is closed, and I provide for locking the movable step and unlocking it automatically and in harmony with the movements of the gate.

In the drawings, Figure 1 is a diagrammatic representation of the car-steps, platform, and swinging gate. Fig. 2 is a plan view showing the direction of motion of the respective parts; and Fig. 3 is an elevation of the car-steps, partially broken open for showing the respective parts. Fig. 4 is an elevation of the latch for the swinging gate.

A portion of the platform and end sill of the car are represented at A, and B indicates the movable trap or platform, hinged at 2, so that it may be swung up to allow parties to ascend or descend the steps, and when swung down it forms a continuation of the car-platform.

At C the end guard of the car is represented, the same being upon the end sill of the platform, and this may be of any usual character. It is represented as of lattice-work with the middle portion removed, as such end guard is generally about three feet high. The gate D is similarly represented, and it is to be of any desired construction, and the vertical shaft or axis 3 forms one side of the gate and it is supported in the bearings 4, and this lower end passes through the end sill of the platform and is provided with an arm 5, which is in the same plane, or nearly so, as the gate.

The stationary steps E are represented as provided with side pieces F of any usual construction, and the movable step G has the

side bars H permanently connected therewith and passing through the stationary guides or supports I upon the side pieces of the steps, and there is a lifting-bar K connected with the movable step G, preferably in the middle and at the back thereof, and such bar is united to the arm 5 by the cord or rope L, passing around the pulleys 6, 7, and 8, so that when the gate D is being closed the arm 5, drawing upon the rope L, raises up the lifting-bar K and the bottom movable step G, and when the gate is swung open the arm 5 lowers the rope or chain L and lifting-bar K and movable step G into the position shown by dotted lines in Fig. 1, thus causing the movable step to be operated by the opening and closing of the gate D.

The before-described parts may be used alone; but it is usually preferable to insure parallelism in the movement of the step and side pieces by employing a cross-shaft M, with slotted arms N upon the ends thereof and pins O in the upper ends of the side pieces H of the movable step, so that this shaft M is partially turned as the step is moved up or down and the parallelism of the motion is thereby insured. I also make use of suitable spring-latches P to enter notches in the side bars H of the movable step, and these spring-latches are actuated simultaneously by any suitable means.

I have shown a cross-shaft Q and arms R passing into notches upon the spring-latches. The cross-shaft, spring-latches, and arms represented are not my invention, but they are adapted to hold the step when raised by hand or when drawn up by the closing of the gate; but I combine with the latches an automatic mechanism actuated by the swinging gate, whereby the latches are withdrawn immediately before the movable step is lowered. To effect this object, suitable lever connections are made to the cam-piece S, over which the gate D moves, the lower bar of the gate being preferably beneath a stationary bar T and above the cam-piece S, so that such cam-piece will be depressed as the gate is closed and also as it is opened, and this cam-piece S is represented as upon a vertical bar hinged at its lower end to the lever U, that is pivoted at 10, and there is an intermediate lever V and

a latch-moving lever W pivoted at 11, the lower end of which is adjacent to one of the latches P, so that when the gate is opened the bottom bar of the gate depresses the cam-piece S' and through the system of levers forces back the spring-latches by moving the arms R and cross-shaft Q so that the side pieces of the movable step are liberated and the step commences to descend and it is lowered by the opening of a gate, and in closing the gate the last portion of the movement of the gate depresses the cam-piece S, and then such cam-piece is free to rise by the action of the spring S' upon the latches, as such latches are forced into position in holding the movable step in its elevated position; but it is preferable to employ a separate spring for raising the cam-piece S. This spring may be of any desired character.

I have shown a spring S' acting beneath the cam-piece, and it will be apparent that this cam-piece acts as a spring-latch in holding the gate in its closed position, because the gate cannot be opened until the cam has been depressed against the action of the spring; but I prefer to use a latch-lever 14 and a foot-piece 15, acted upon by the spring 16, so as to hold the gate when closed with great reliability.

I claim as my invention—

1. The combination, with a movable car-step and a swinging gate, of a connection between the swinging gate and the car-step for raising the step when the gate is closed, and a holding-latch acting independently of the gate, whereby the step can be held in position when closed by hand when the gate is open, substantially as specified.

2. The combination, with the stationary car-steps and the swinging gate, of an arm connected with the axis of the gate, a movable step and the side pieces for the same, and a connection between the arm upon the gate-axis and the movable step, and pulleys

around which such connection passes, substantially as set forth.

3. The combination, with the car-platform and stationary steps, of a movable step, side pieces for the movable step, stationary guides through which the side pieces pass, a cross-shaft, arms and connections to the side pieces of the movable step, a swinging gate and an arm moved by the same, and connections from the said arm to the movable step for raising and lowering the same by swinging the gate, substantially as set forth.

4. The combination, with the stationary car-steps, of a movable step, side pieces connected with the movable step and stationary guides through which the side pieces pass, latches for holding the movable step in its elevated position, a swinging gate, and a cam and connections to the latches, whereby the latches are withdrawn for dropping the step as the gate is opened, substantially as set forth.

5. The combination, with the stationary car-steps and the swinging gate, of a movable car-step, latches for holding the step in an elevated position, a connection between the swinging gate and the movable step for raising and lowering the same, and a connection to the latches for unlatching the step as the gate is opened, substantially as set forth.

6. The combination, with the swinging gate and the stationary step, of the movable step G, the side bars therewith connected and the stationary guides for such side bars, and a rope or its equivalent connected with the gate and step, respectively, and the pulleys for the same for drawing up the step as the gate is closed, substantially as specified.

Signed by me this 19th day of December, 1890.

H. C. FARQUHARSON.

Witnesses:

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