(No Model.) 2 Sheets—Sheet 1.

R. H. BROWN.

EXTENSION STEP FOR CARS.

No. 435,731. Patented Sept. 2, 1890.

Fig. 1

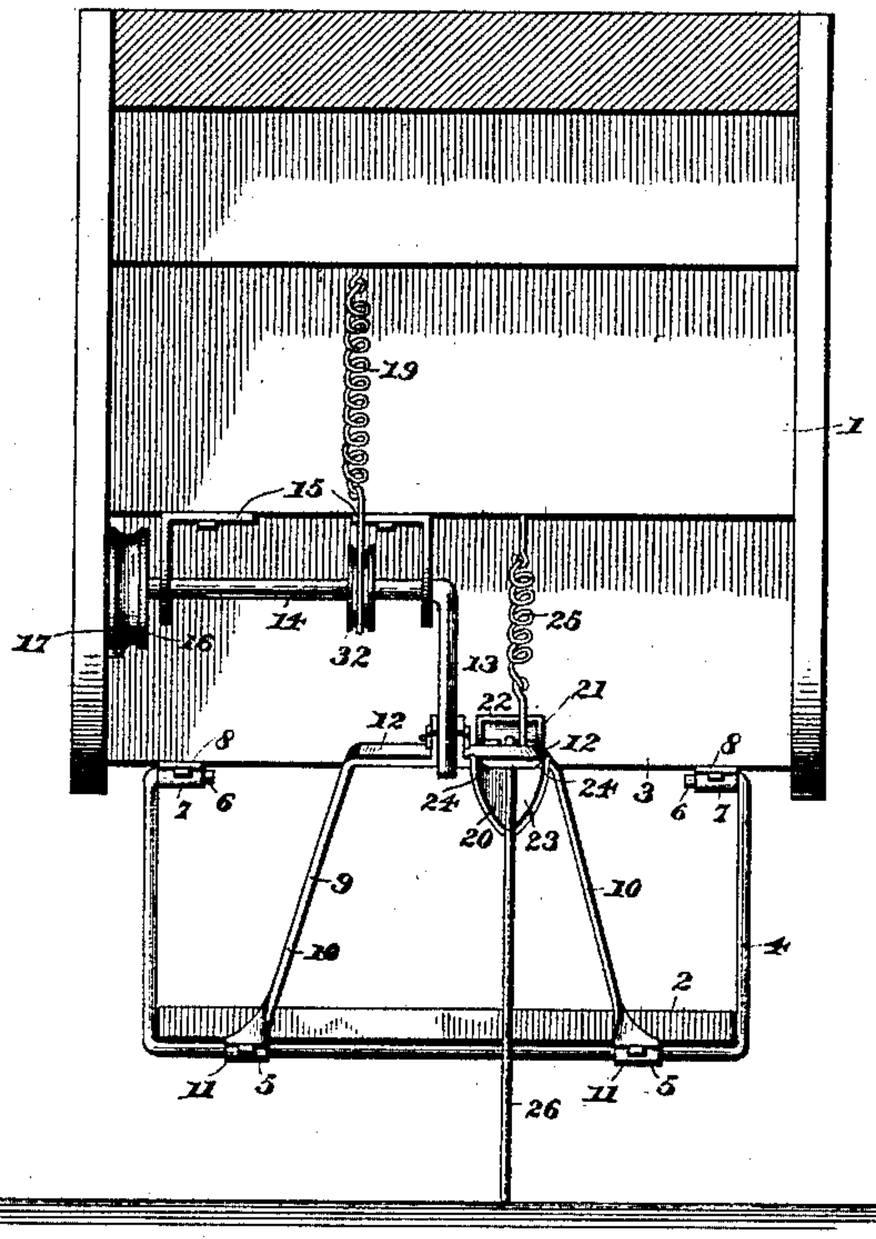


Fig. 2.

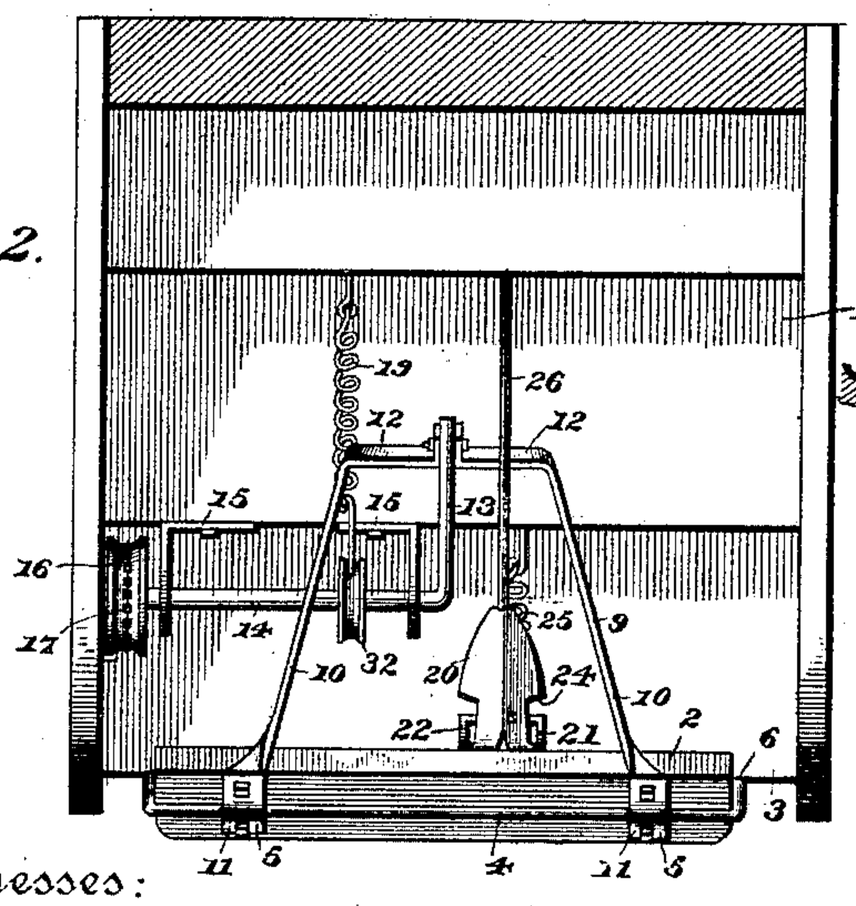
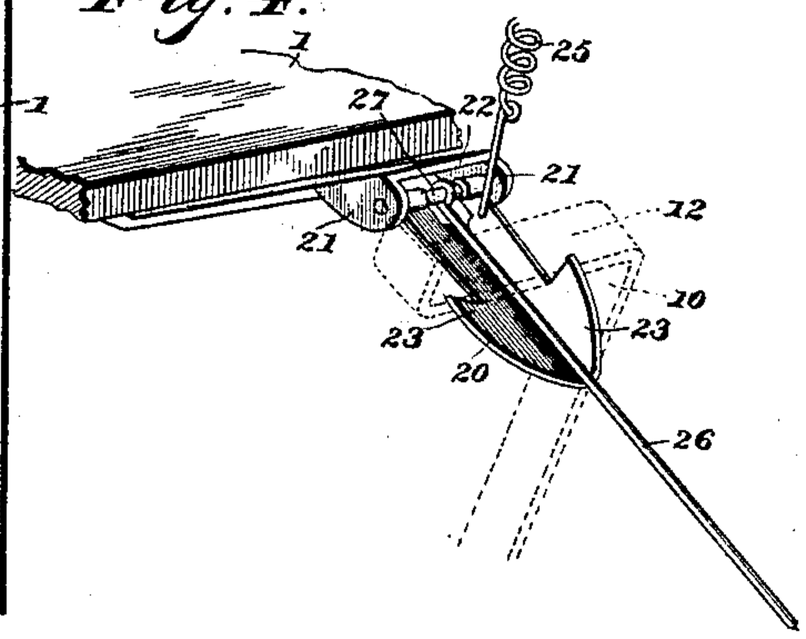


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

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EXTENSION STEP FOR CARS.

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Fig. 3.

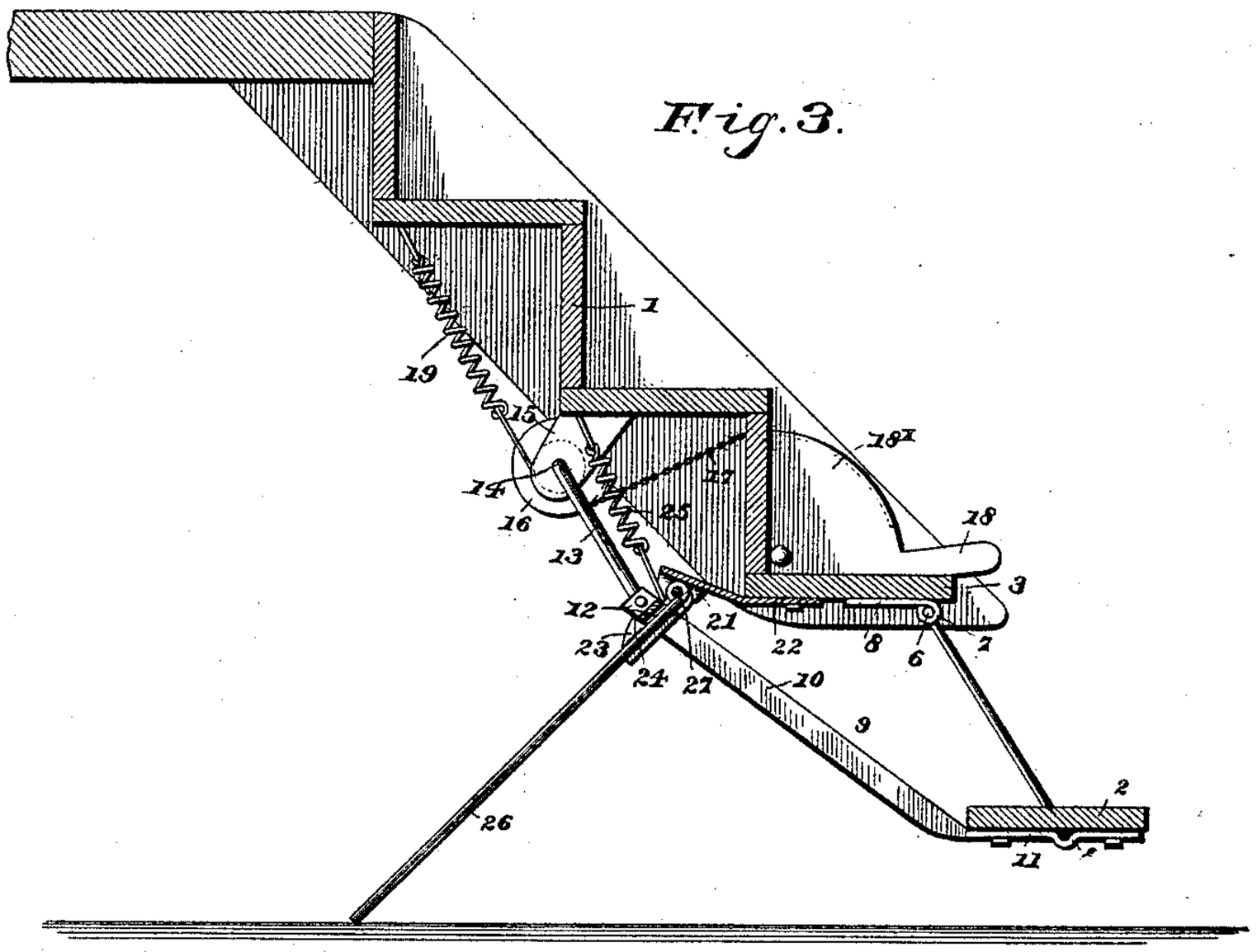
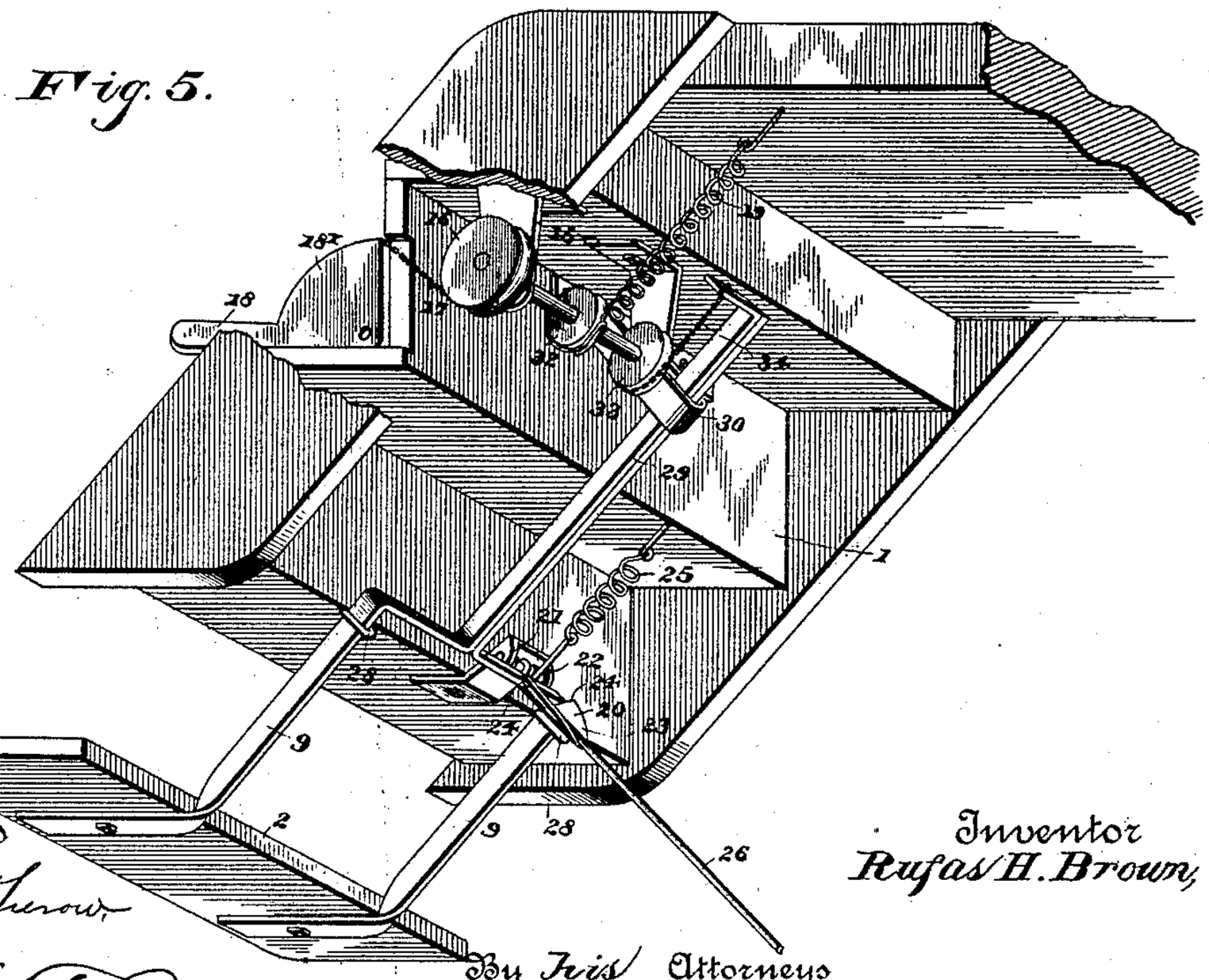


Fig. 5.



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UNITED STATES PATENT OFFICE.

RUFUS H. BROWN, OF MARION, VIRGINIA.

EXTENSION-STEP FOR CARS.

SPECIFICATION forming part of Letters Patent No. 435,731, dated September 2, 1890.

Application filed April 5, 1890. Serial No. 346,643. (No model.)

To all whom it may concern:

Be it known that I, RUFUS H. BROWN, a citizen of the United States, residing at Marion, in the county of Smyth and State of Virginia, have invented a new and useful Extension-Step for Railway-Coaches, of which the following is a specification.

The invention relates to improvements in extension-steps for railway-coaches.

The object of the invention is to provide a simple and inexpensive construction of extension-step for railway-coaches adapted to be readily lowered to its operative position and capable of being automatically returned to its folded position by the moving of the car.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a rear elevation of an extension-step constructed in accordance with this invention and shown in operative position. Fig. 2 is a similar view, the parts being folded. Fig. 3 is a vertical sectional view. Fig. 4 is a detail view of the hinged pawl. Fig. 5 is a perspective view of a modification of the invention.

Referring to the accompanying drawings, 1 designates the steps of the railway-coach, the lower step of which has hinged to it an extension-step 2, which is connected with the lower step 3 by a rod 4. The rod 4 is journaled in suitable bearings 5 and is approximately U-shaped and has its ends 6 bent laterally and journaled in bearings 7, which are formed by plates 8, that have their outer ends bent upon themselves and forming eyes to receive the rod.

The extension-step has secured to it a frame 9, which consists of side bars 10, which are similar in construction, and have their ends 11 bolted to the lower face of the extension-step and have their upper ends 12 bent inward and pivoted to the arm 13 of a rock-shaft 14. The rock-shaft 14 is journaled in suitable brackets 15, mounted upon the lower face of one of the car-steps, and the said rock-shaft is provided at its end opposite to the arm with a grooved pulley 16, which has secured to it a chain 17, that is wound upon the pulley when the parts are in their folded position, and has one end attached to a lever 18, pivoted to one of its sides of the step and adapted to rotate the grooved-pulley and the rock-shaft and cause the frame 9, which is vertically movable, to be lowered and brought into operative position. The lever 18 is provided with a quadrant-plate $18^{\times}$, which has its periphery grooved to receive the chain and which operates in a slot in the riser of the step. The extension-step is normally held in its vertical or folded position by a spiral spring 19, which has one end fastened to a grooved wheel 32 and its other end secured to the car-steps.

The extension-step is held in its operative or lowered position by a hinged pawl 20, that is journaled in perforated ears 21 of a bracket 22. The pawl 20 is bent longitudinally along its center and has its sides 23 arranged at an angle to each other and provided with shoulders 24, adapted to engage the upper inwardly-bent end 12 of the frame 9 and hold the extension-step in its lower or operative position and prevent the same being accidentally raised by the spring 19, which rotates the rock-shaft. The hinged pawl 20 is actuated by a spring 25, that has one end secured to the hinged pawl in advance of the pivotal point and has its other end fastened to the car-step. The sides of the hinged pawl are beveled from the shoulders 24 to the free end of the pawl and are adapted to be engaged by a rod 26 to depress the spring-actuated pawl and carry its shoulders out of engagement with the frame 9 of the extension-step and permit the latter to be folded beneath the car-steps by the spring 19. The rod 26 is hinged to the pintle 27 of the pawl 20 and lies in the bend of the pawl beneath and away from the inwardly-bent arm of the frame 9 when the extension-step is lowered and the said arm is engaged by the shoulders. The free end of the hinged rod rests upon the ground when the step is lowered and is adapted to automatically raise the step when the train starts. As the car moves, the rod 26 drags upon the ground and is caused to engage one of the beveled sides 23 and depress the pawl and carry the latter out of

engagement with the frame 9 and allow the spring 19 to raise the extension-step and carry it to its folded position beneath the car-step, and the pawl after being released from engagement with the frame 9 is acted upon by the spring 25, which raises the pawl and carries the hinge-rod upward against the frame 9, and the parts are out of the way and not liable to become broken.

The extension-step is hinged to the lower step 3 of the car and swings vertically; but it may be arranged to slide vertically, as I have illustrated in Fig. 5 of the accompanying drawings, and I desire it to be understood that I do not limit myself to the precise details of construction herein shown and described, as I may, without departing from the spirit of the invention, make minor changes therein.

In the modification shown in Fig. 5 the sides of the frame 9 are mounted in guides 28 and slide vertically and have formed integral with them extension-bars 29, which are guided in a bracket 30, and the same frame is designed to be provided with a hinged pawl and an operating-rod similar to that heretofore described.

The extension-step is operated by a lever 18, a chain, and a grooved pulley, which is mounted upon a shaft, and the other end of said shaft is provided with a grooved pulley 33, upon which is wound a chain 34, that is secured to the upper ends of the extension-bars 29, whereby when the shaft is rotated the step 2 will be lowered.

It will readily be seen that the extension-step and mechanism for operating the same are substantial, inexpensive, and easily operated, and are capable of automatically folding as the train starts, and can be readily applied to the ordinary construction of car-steps without necessitating change of the latter.

Having thus described my invention, I claim—

1. The combination of the vertically-movable extension-step, the frame 9, secured to the step, the hinged pawl arranged to engage the frame 9 and hold the extension-step in its operative position, and the rod arranged to engage the hinged pawl to release the said frame, substantially as described.

2. The combination of the extension-step 2, hinged to the car-steps, the frame 9, having its lower end secured to the extension-step, the rock-shaft having its arm pivoted to the said frame, and the hinged pawl arranged to engage the frame and the springs, substantially as described.

3. The combination of the extension-step 2, hinged to the car-steps 1, the frame 9, secured to the extension-step, the rock-shaft provided at one end with an arm pivoted to the frame 9 and having its other end provided with a pulley, and the lever 18 and grooved quadrant connected with the pulley and the hinged pawl, substantially as described.

4. The combination of the extension-step 2, hinged to the car-step, the frame 9, secured to the extension-step, the rock-shaft having its arm pivoted to the frame and provided with a grooved pulley, the lever and grooved quadrant connected with the pulley, the hinged pawl mounted in the bracket and provided with shoulders arranged to engage the frame and having its sides bent at an angle and beveled or sloping, and the hinged rod arranged between the sides of the pawl and the springs, substantially as described.

5. The combination of the extension-step attached to the car-steps, the frame 9, secured to the step, the slides attached to the car-steps, the lever and grooved quadrant, the rock-shaft and grooved pulleys connected with the lever and spring, the hinged pawl mounted in the bracket and provided with shoulders arranged to engage the frame and having its disk bent at an angle and beveled or sloping, the hinged rod arranged between the sides of the pawl, and the springs, pulleys, and chains, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

RUFUS H. BROWN.

Witnesses:
B. F. BUCHANAN,
E. J. HALLER.