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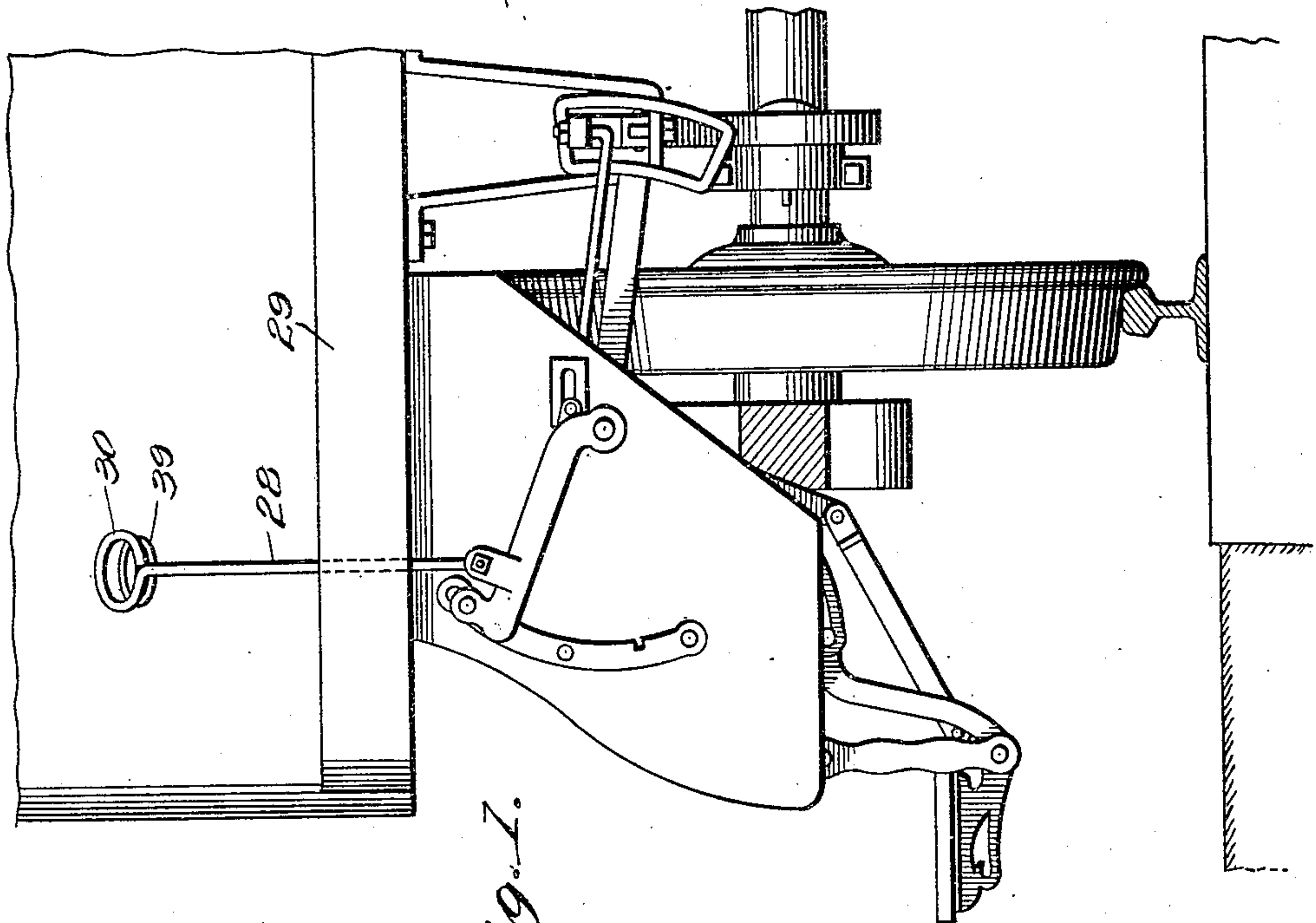
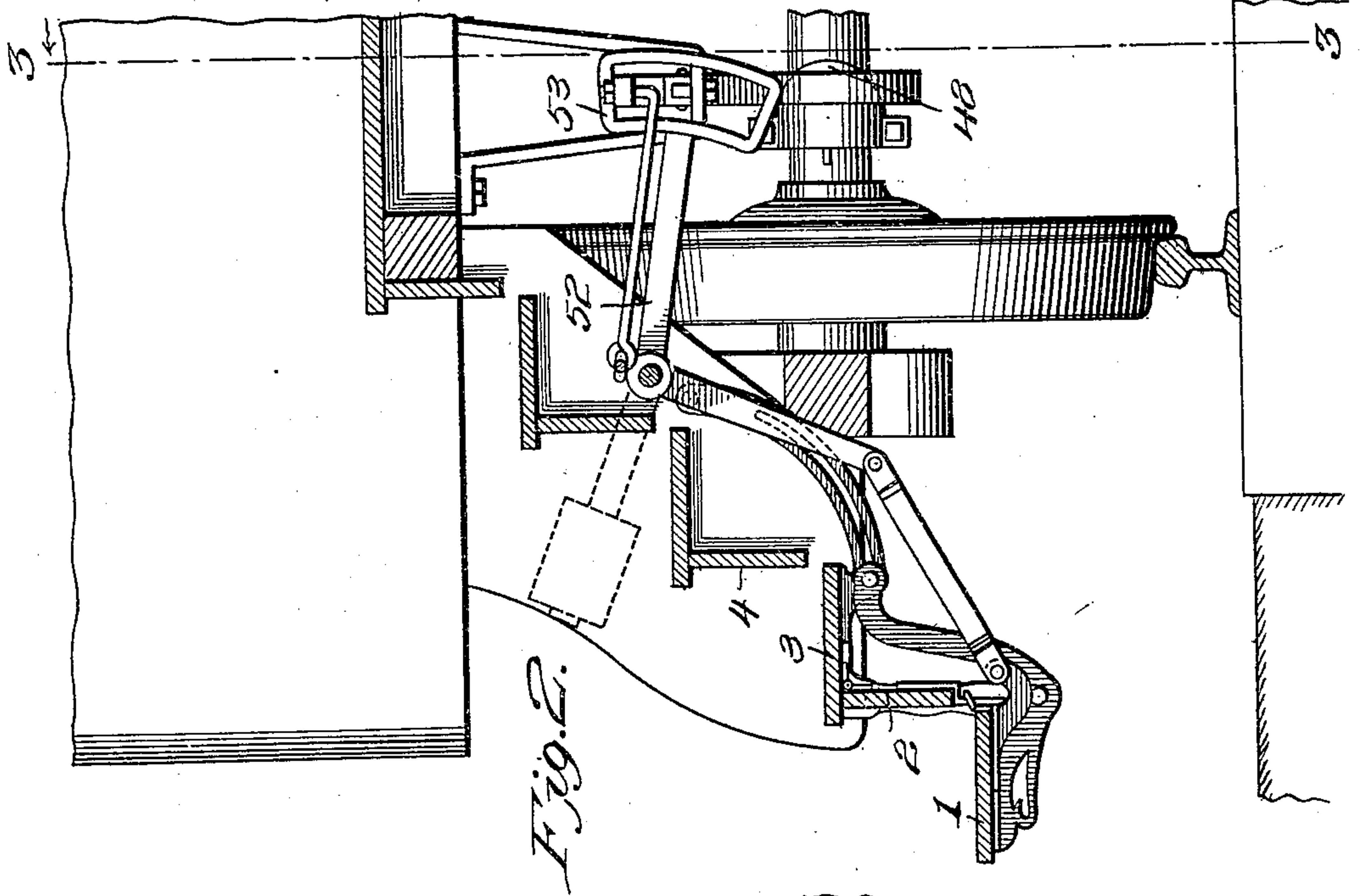
CAR STEP.

APPLICATION FILED NOV. 3, 1909.

Patented May 17, 1910.

3 SHEETS—SHEET 1.

958,657.



Witnesses

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D. W. Gould.

Inventors

John Lavery
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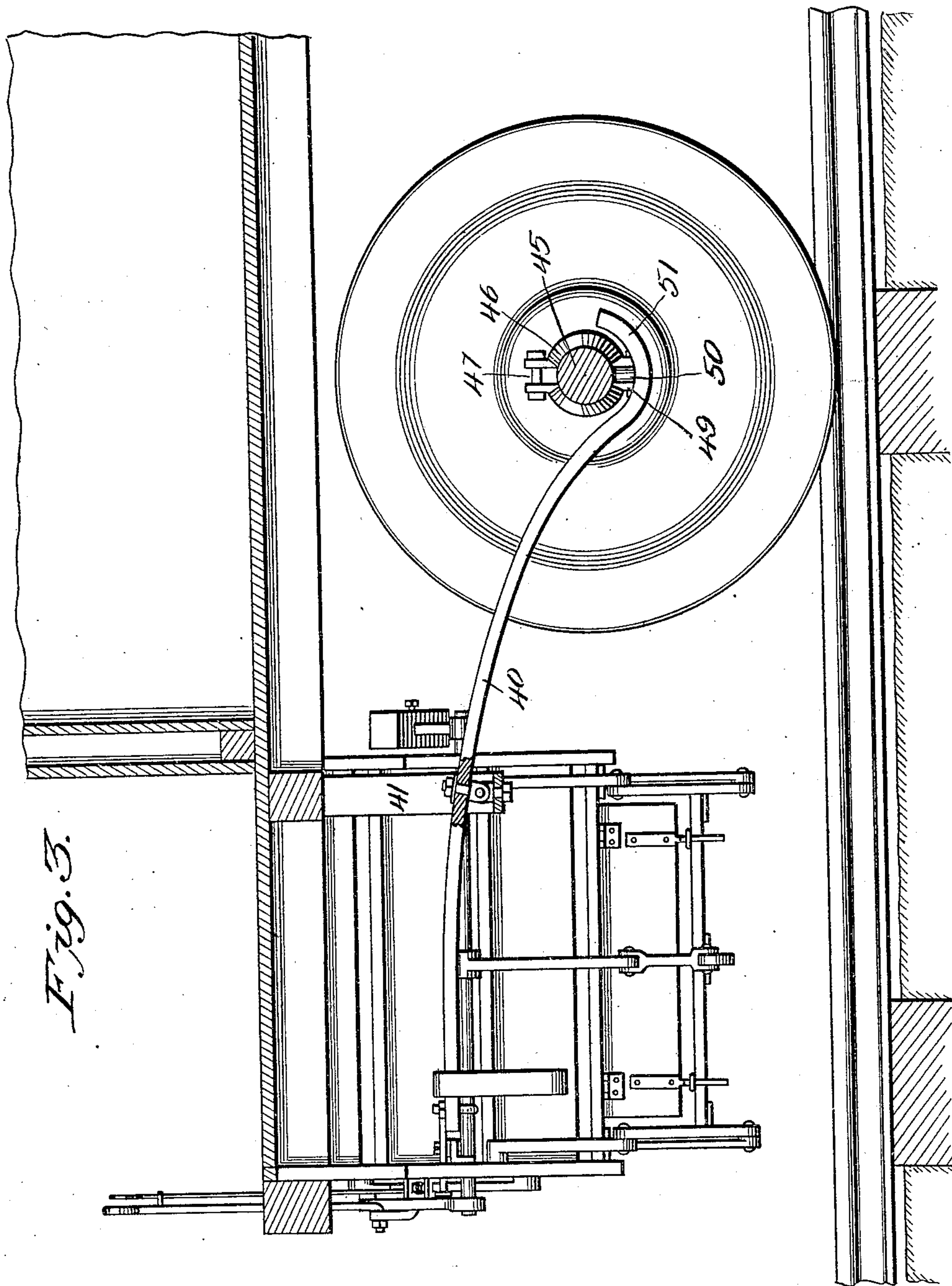


Fig. 3.

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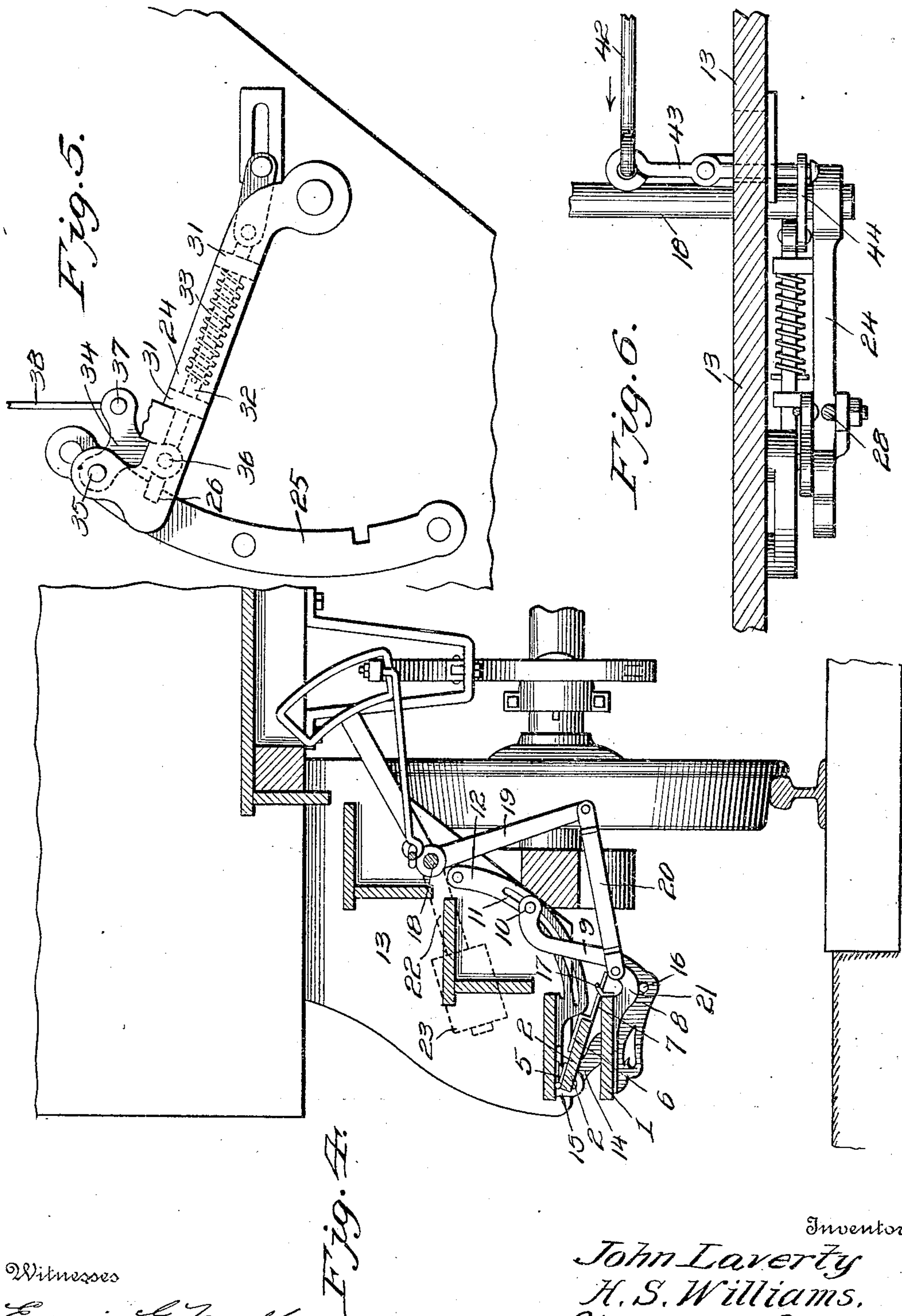
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Fig. 7.

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UNITED STATES PATENT OFFICE.

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CAR-STEP.

958,657.

Specification of Letters Patent.

Patented May 17, 1910.

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To all whom it may concern:

Be it known that we, JOHN LAVERTY and HAL S. WILLIAMS, citizens of the United States, residing at Columbia, in the county of Richland and State of South Carolina, have invented new and useful Improvements in Car-Steps, of which the following is a specification.

The invention relates to an improvement in railroad car steps being more particularly directed to an auxiliary step adapted to be manually projected into operative position when desired for use and to be automatically withdrawn to folded or inoperative position in the initial movement of the car, whereby said steps can be manually projected to operative position by the trainmen or passenger when the car is in a position to permit egress of passengers and to be automatically folded into a position to avoid projection as the car starts.

The main object of the present invention is the provision of an auxiliary car step arranged to be held in inoperative position under the influence of a weight, the construction including means whereby the step may be manually projected and locked in operative position against the influence of the weight in the initial starting of the car thereby returning the step to inoperative or folded position.

The invention in its preferred details of construction will be described in the following specification, reference being had particularly to the accompanying drawings, in which—

Figure 1 is a view in elevation of a portion of the car illustrating the application of the improved auxiliary step thereto. Fig. 2 is a central transverse section of the same, the step being shown in projected operative position. Fig. 3 is a section on line 3—3 of Fig. 2. Fig. 4 is a view similar to Fig. 2 showing the step in folded or inoperative position. Fig. 5 is an elevation illustrating the locking means whereby the step is secured in set position. Fig. 6 is a plan of the same, the side rail of the steps being shown in section.

Referring particularly to the accompanying drawings, the improved step includes a tread 1 and a riser 2 corresponding in size to the treads and risers 3 and 4 of the fixed steps. The auxiliary step is secured in place by fixing the riser 2 to the lowermost tread of the fixed step by a hinged connection 5,

said riser 2 being provided with guide brackets 6 on its rear surface which project below the lower edge thereof in the form of guide rods 7. The tread 1 of the auxiliary step is secured upon plane portions of the spaced brackets 8 the ends of which extend rearwardly beyond the tread and upwardly to provide supporting arms 9 which are rearwardly bent at their terminals and provided with laterally projected pins 10 to seat in slots 11 formed in guide strips 12 secured to the carriages 13 of the steps. By means of the arms the treads 1 are guided in movement, and to maintain said treads at all times in a relatively horizontal position links 14 are pivotally connected at one end to brackets 15 depending from the lowermost tread of the fixed steps and at the opposite end to brackets 8, as at 16. To insure a proper movement of the riser 2 under the influence of the tread, the latter is provided with eye members 17 which engage the guide rods 7 of the riser, whereby as the tread 1 moves the riser is correspondingly operated.

The operating or main shaft 18 is mounted at its respective ends in the carriages 13, and centrally provided with a relatively fixed depending arm 19 which at its lower end is, through the medium of a link 20, connected to the bracket 21 secured to the under surface of the tread 1 adjacent its rear edge. From this construction it will be seen that from the movement of the shaft in one direction the tread 1 will be forced forwardly which, through the travel of the arms 9 in the slots 11, will tend at the same time to lower the tread, the relative position of the parts providing that the tread portion, 1, when the arms 9 have reached the limit of the slots 11, will be projected to form an additional tread below the lowermost fixed tread. The riser 2 follows the tread in this movement being appropriately positioned at the completion of the movement. The reverse application of the shaft 18 tends to withdraw the tread 1, the arms 9 acting simultaneously to elevate the same so that at the completion of the movement the tread 1 is positioned in vertical alinement with but slightly spaced from the lowermost fixed tread 3.

Beyond the innermost carriage 12 the shaft 18 is provided with a fixed forwardly projecting arm 22 terminally provided with a weight 23, said weight being designed to overbalance the movable tread

riser and said parts so that when said parts are released to the influence of the weight the weight will operate to move the tread into folded or inoperative position. In connection with the step described, I have provided means for manually operating the parts to project the step into operative position. These parts are more particularly illustrated in Figs. 5 and 6, from which it will be seen that the main shaft 18 beyond the relatively uppermost carriage 13 is provided with an arm 24 which projects outwardly and at its forward terminal overlies the locking segment 25 formed with spaced notches 26 and 27 located at the respective positions of the arm 24 in the folded and operative positions of the step. This arm 24 is arranged for manual operation through the medium of a rod 28 which extends upwardly through a platform 29 of the car and terminally provided with an operating handle 30, being located in a position for convenient manipulation from the platform. Slidably mounted in ears 31 on the inner side of the arm 24 is a locking rod 32 normally spring pressed in the upward direction through the medium of a spring 33. The forward end of the locking rod is formed for cooperation with the respective notches 26 and 27, and is adapted to be manually moved against the influence of the spring 33 through a lever member 34 of approximately triangular form having one angle pivotally connected to the rod 24, as at 35, and the second angle pivotally connected to the rod 32, as at 36, and the third angle connected at 37 to a rod 38 hereinafter termed the unlocking rod which projects through the platform 29 and is terminally provided with a handle 39. The rods 28 and 38 are arranged immediately adjacent each other so that the operator can grasp the handle 39 and elevate the rod to withdraw the locking rod 32 from the notch and practically simultaneously elevate the rod by means of the handle 30. This movement tends to operate the shaft 18 with the effect to project the step to operative position against the influence of the weight 23. It is to be understood that when the arm 24 is locked in the lowermost notch 27 the step is in inoperative or folded position.

From the above description it will be understood that the trainmen or passenger desiring to use the auxiliary step will so operate the rod as to move it into operative position. Ordinarily the auxiliary step forms a projection beyond the car which is dangerous and it is frequently urged as an objection to devices of this kind that in the event the trainmen forget to move the step to folded or inoperative position dangerous results are liable to follow. Therefore, I have prepared means whereby the step returns to inoperative position immediately upon the

starting of the car. Such means is more clearly illustrated in Fig. 3 from which it will be seen that a tripping lever 40 is pivotally supported in a bracket 41 depending from one of the sections of the car frame, the lever being so mounted as to permit independent movement thereof in either of two directions, that is vertically or horizontally. The forward end of the lever is connected through the medium of a link 42 with one end of the lever 43 pivotally supported upon the forward carriage 13, the forward end of this lever 43 being connected by means of a link 44 with the rear or inner end of the locking rod 32. Therefore in the horizontal movement of the forward end of the lever in one direction, that is toward the auxiliary step, the locking rod will be withdrawn from engagement with the particular notch. To operate the lever I secure upon the adjacent axle 45 of the car a cam ring 46, preferably split and clamped about the axle 45 of the car at an appropriate point by a bolt 47 having the usual nuts. That surface of the cam arranged adjacent the trip lever is formed with a cam projection 48 which, when the lever is in proper position, is arranged to engage a roller 49 revolvably mounted upon a pin 50 projecting from the lever, the contiguous portion of the lever being preferably curved, as at 51, to conform to the curvature of the axle. Therefore, as the cam engages the roller, the lever will be swung on its horizontal pivot with the effect to withdraw the locking rod as previously described.

It is of course desirable that after the initial operation of the lever 40 to automatically return the step to normal position that said lever be moved beyond the influence of the axle cam in order to avoid the useless wear on the parts. To this end I secure upon the main shaft 18 an inwardly or rearwardly projecting arm 52 at the outer end of which is arranged an approximately rectangular loop member 53 adapted to encircle the trip lever between its pivot and connecting with the link 42. The arm is so arranged on the shaft 18 that when the step is in folded or inoperative position the lower cross bar of the loop will engage the lever and elevate the forward end thereof on the pivot mounting so as to lower the rear end into a position beyond the influence of the cam 46. The upper cross bar of the loop acts reversely, that is when the step has been projected to operative position the said cross bar will engage the forward portion of the trip lever and force the lever into a position to be effected by the cam upon the initial starting of the car.

The operation of the improved auxiliary step will be readily apparent from the foregoing it being understood that the trainmen or passenger desiring to leave the car will op-

erate the rods 38 and 28 to project the step. This movement causes the arm 24 to lock in the upper notch 26, elevate the weight 23 and move the trip lever into inoperative position 5 with the cam 46. Immediately upon the starting of the car the trip lever is actuated to withdraw the locking rod from the notch 36 whereupon the weight acts to return the auxiliary step to folded or inoperative position. 10 It will of course be apparent that the weight 23 is designed to slightly overbalance the parts to be operated thereby and that if the trip lever should be operated by the cam while a person is standing upon the auxiliary step, as frequently happens, the weight will 15 not be sufficient to elevate the step and hence no disadvantageous movement of the step will follow. The step can only move to inoperative position when relieved of the 20 weight.

The various parts are to be constructed of such material and of such size as will best adapt the details of the invention to the particular use to which they are to be put.

25 Having thus described the invention, what is claimed as new, is—

1. An auxiliary car step including a step proper, a weight operative to normally maintain the step in folded position, means 30 for manually operating the step against the influence of the weight and means operative under predetermined conditions to release the step to the influence of the weight.

2. An auxiliary car step including a step 35 proper, a weight normally operative to maintain the step in folded relation, means for manually operating the step against the influence of the weight, means for locking the step in the position assumed as a result 40 of the manual operation, and means for automatically releasing the lock in the initial movement of the car.

3. An auxiliary car step including a step proper, manually operable means to move 45 the step to operative position, a weight tending to move the step to inoperative position, a lock for holding the step in either position, and a trip lever automatically actuated in the initial movement of the car to release 50 the lock and free the step to the influence of the weight.

4. An auxiliary car step including a step proper, a weight for normally holding the step in inoperative position, means for manually moving the step to operative position 55 against the influence of the weight, means for locking the step in the position assumed as a result of the manual operation, a trip lever connected with the lock, and a cam actuated in the movement of the car to engage and operate the trip lever to release 60 the lock.

5. An auxiliary car step including a step proper, a weight for normally holding the 65 step in inoperative position, means for

manually moving the step to operative position against the influence of the weight, means for locking the step in the position assumed as a result of the manual operation, a trip lever connected with the lock, a cam 70 actuated in the movement of the car to engage and operate the trip lever to release the lock, and means operated by the step to engage and move the trip lever beyond the influence of the cam when the step is in 75 folded relation.

6. An auxiliary car step including a step proper, a main shaft, a connection between said shaft and step, a weight arranged to influence the shaft to move to folded position, manually operable means to actuate 80 the shaft in a direction opposing that of the weight, means for locking the step in position assumed under the influence of the manually operable means, a trip lever connected with the locking means, and a cam 85 operated in the movement of the car to actuate the trip lever to release the locking means.

7. An auxiliary car step including a step 90 proper, a main shaft, a connection between said shaft and step, a weight arranged to influence the shaft to move to folded position, manually operable means to actuate 95 the shaft in a direction opposing that of the weight, means for locking the step in position assumed under the influence of the manually operable means, a trip lever connected with the locking means, a cam operated in the movement of the car to actuate 100 the trip lever to release the locking means, means connected to the shaft and engaging the trip lever to move the same beyond the influence of the cam when the step is in 105 folded position.

8. An auxiliary car step including a step proper, a main shaft, a connection between said shaft and step, a weight arranged to influence the shaft to move to folded position, manually operable means to actuate 110 the shaft in a direction opposing that of the weight, means for locking the step in position assumed under the influence of the manually operable means, a trip lever connected with the locking means, a cam operated in the movement of the car to actuate 115 the trip lever to release the locking means, means connected to the shaft and engaging the trip lever to move the same beyond the influence of the cam when the step is in 120 folded position, said means operating to move the lever into coöperative relation with the cam in the movement of the step to operative position.

9. An auxiliary car step including a step 125 proper, a main shaft, a connection between said shaft and step, a weight arranged to influence the shaft to move to folded position, manually operable means to actuate the shaft in a direction opposing that of the 130

weight, means for locking the step in position assumed under the influence of the manually operable means a trip lever connected with the locking means a cam operated in the travel of the car, a loop encircling the trip lever and connected to the main shaft, said loop operating in one position of the shaft to move the trip lever beyond the influence of the cam and in the
5 other position of the shaft to move said
10

trip lever into coöperative position with the cam.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN LAVERTY.
HAL S. WILLIAMS.

Witnesses:

J. T. COATS,
J. W. BLUME.