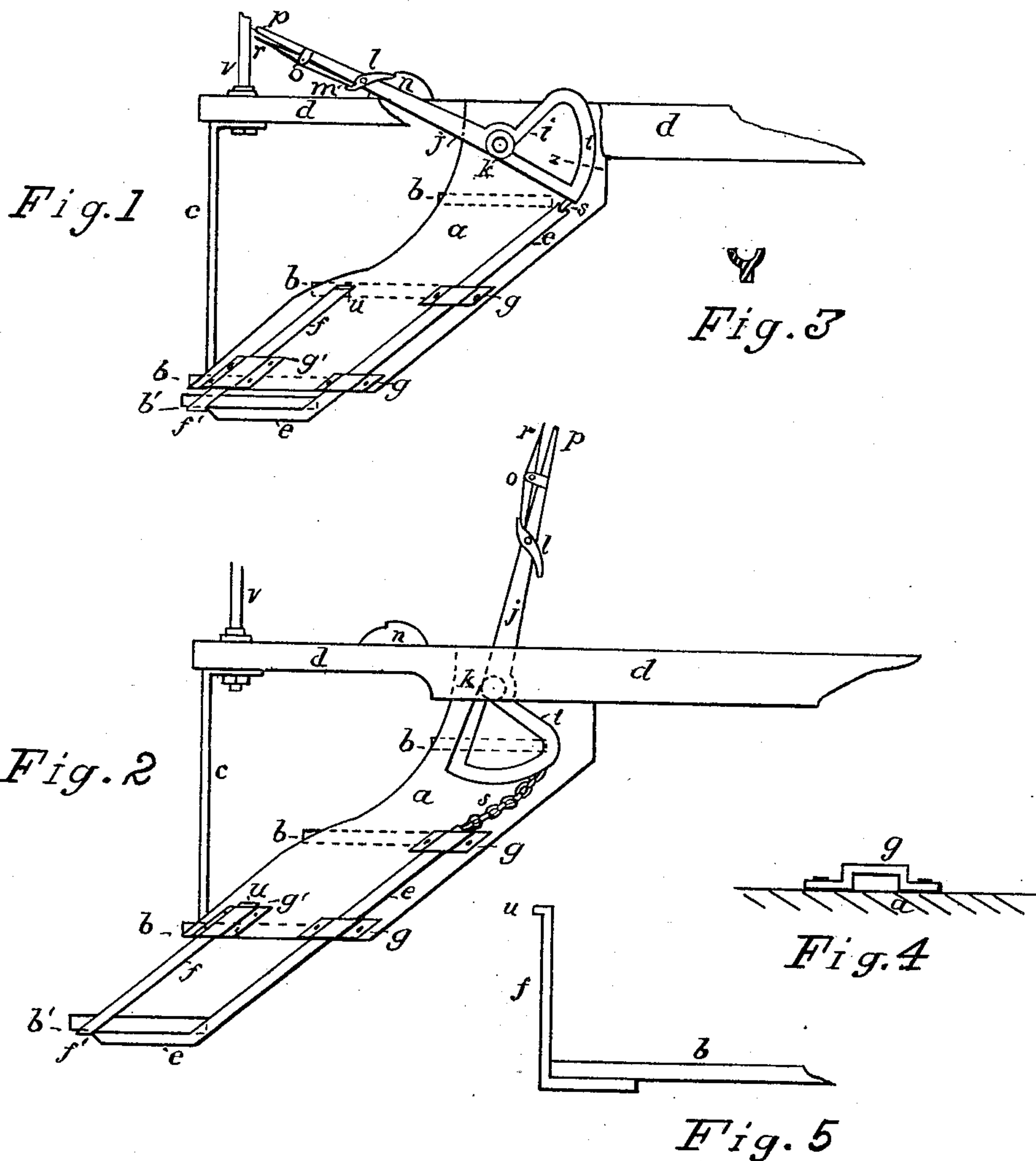


(No Model.)

J. H. CRUGER.
FOLDING CAR STEP.

No. 329,440.

Patented Nov. 3, 1885.



Witnesses:

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Inventor.

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UNITED STATES PATENT OFFICE.

JAMES H. CRUGER, OF CRUGER, NEW YORK.

FOLDING CAR-STEP.

SPECIFICATION forming part of Letters Patent No. 329,440, dated November 3, 1885.

Application filed September 7, 1885. Serial No. 176,339. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. CRUGER, a citizen of the United States, residing at Cruger, in the county of Westchester and State of New York, have invented certain Improvements in Folding Steps for Passenger-Vehicles, of which the following is a specification.

My invention relates to steps, particularly for passenger-cars, and has for its object the provision of an extra step that may be lowered for use at stations where there are no platforms, for the convenience of passengers stepping on and off cars, and by simply operative means for elevating the step when its use is not required.

The object I accomplish by means set forth in the accompanying drawings, in which similar letters refer to similar parts throughout the several figures.

Figure 1 is a side elevation showing the position of the extra step when not in use. Fig. 2 represents the step lowered for use, and Figs. 3, 4, and 5 are various details, to be explained in my general description.

The position of steps on railroad passenger-cars is so generally understood that I have confined my illustration to the steps themselves, not deeming it needful to show more of a car than the cross-timber *d*, which is the outer limit of a car-platform, the observer supposed to be looking directly toward the end of a car.

b b b represent the steps, supported sometimes by an iron frame-work, but in modern cars by side frames, *a*, which are upheld at their lower ends by a rod, as at *c*. Upon *a*, I secure strap-boxes *g g* and *g'*. (Shown in elevation and larger detail in Fig. 4.) Through *g g*, I place the rod *e*, which slides freely therein and through *g'*, which is made longer than the others because of using a single one, rod *f* is fitted to slide freely. The lower end of *e* is bent at a proper angle to support the tread *b'*, as shown, and *f* is likewise made to support the forward edge of *b'*, as shown at *f'*, and more clearly in the enlarged Fig. 5, which is a front elevation of *f*. This figure also shows how a hook is turned on the upper end of *f*, to serve as a catch or stop to prevent *f* from sliding all the way from its bearing *g'*. To the upper end of rod *e*, I attach a chain, which is also connected with the cam *i*. The face of this cam is provided with a groove, in which

the chain *s* will lie when the step is lifted. A cross-section of the cam through the dotted line *z* is shown in Fig. 3, indicating the form of the groove for the chain. Cam *i* turns about or upon the center *k*, which is fixed to the inner side of *d*. An extension, *j*, of the cam forms a lever for operating the combination. This lever extends upward, so as to be operative from the platform of the car. The lever is provided with a pawl, *l*, which drops into a notch (shown in *n*) when the lever is depressed. A smaller lever fulcrumed at *o* between the pawl and the upper end of the large lever is arranged to release the pawl from its notch, and the manner of doing this will be apparent from the illustration.

The step being folded up, as in Fig. 1, to lower it lever *j* is grasped at *p*, the hand inclosing in the grasp the end *r* of the small lever. Closing these two ends of the levers separates the lower end of the small lever from the large one, carrying before it a rear projection of the pawl *l*, which releases the pawl from the notch in *n*. The weight of the step *b'* and its connections is then sufficient to cause the step to fall to its place without further aid from an attendant. When down, the step *b'* and the lever *j* assume the positions shown in Fig. 2.

To close or fold the step, lever *j* is depressed toward the platform until pawl *l* is caught by *n*, the cam *i* taking up chain *s* and drawing the step *b'* upward by means of the bar *e*, the movement being steadied by bar *f*. The purpose of *f*, however, is as much to aid in supporting weight upon the step as to serve as a guide to the rising and falling of the step. Other rods similar to *f* are attached to the opposite end of *b'*, and are provided with bearings similar to *g'*, which are secured to the side of the steps similar to and opposite *a*, thus affording four supports to the step *b'*—two at each end.

I have found a single cam, as shown, to be effective, but if desirable to have a cam and connecting-chain on each side of the steps, both may be operated by the single lever by attaching the two cams to a shaft passing across the steps. In this case the pivot *k* would require to be moved farther to the right than herein shown, so as to get the shaft back from the steps.

A piece of wire rope or a steel strap may be

used instead of the connecting-chain herein shown.

In place of using bars *f* and *e* in the separated manner shown, both bars may be similar to *e*, and being united at their upper ends have the chain-connection made central between them, so the lifting would be on both alike; or a single bar may be used instead of a long and a short one, as shown, in which case it should be placed centrally on *a*. It will be understood, of course, that corresponding bars or equivalents would be also applied on the side of the steps opposite to the side herein shown.

So long as I adhere to the essential features of my combination I do not wish to be confined strictly to a construction as shown.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the fixed steps of a car, of the folding step *b'*, supported by the sliding bars *f* and *e*, having bearings on the framing of the steps, cam *i*, pivot *k*, connection *s*, and lever *j*, provided with a pawl and an operating lever, and stop *n*, substantially as and for the purposes described.

2. In combination with the platform of a car, for the purposes of a folding car-step, substantially as described, the cam *i*, supported on pivot *k* and united with lever *j*, which is provided with a pawl and pawl-operating lever, and a stop, *n*, substantially as shown and described.

JAMES H. CRUGER.

Witnesses:

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STEPHEN LENT.