(No Model.)

A. BLUM.

CAR STEP.

No. 587,073. Patented July 27, 1897.

Fig. 1.

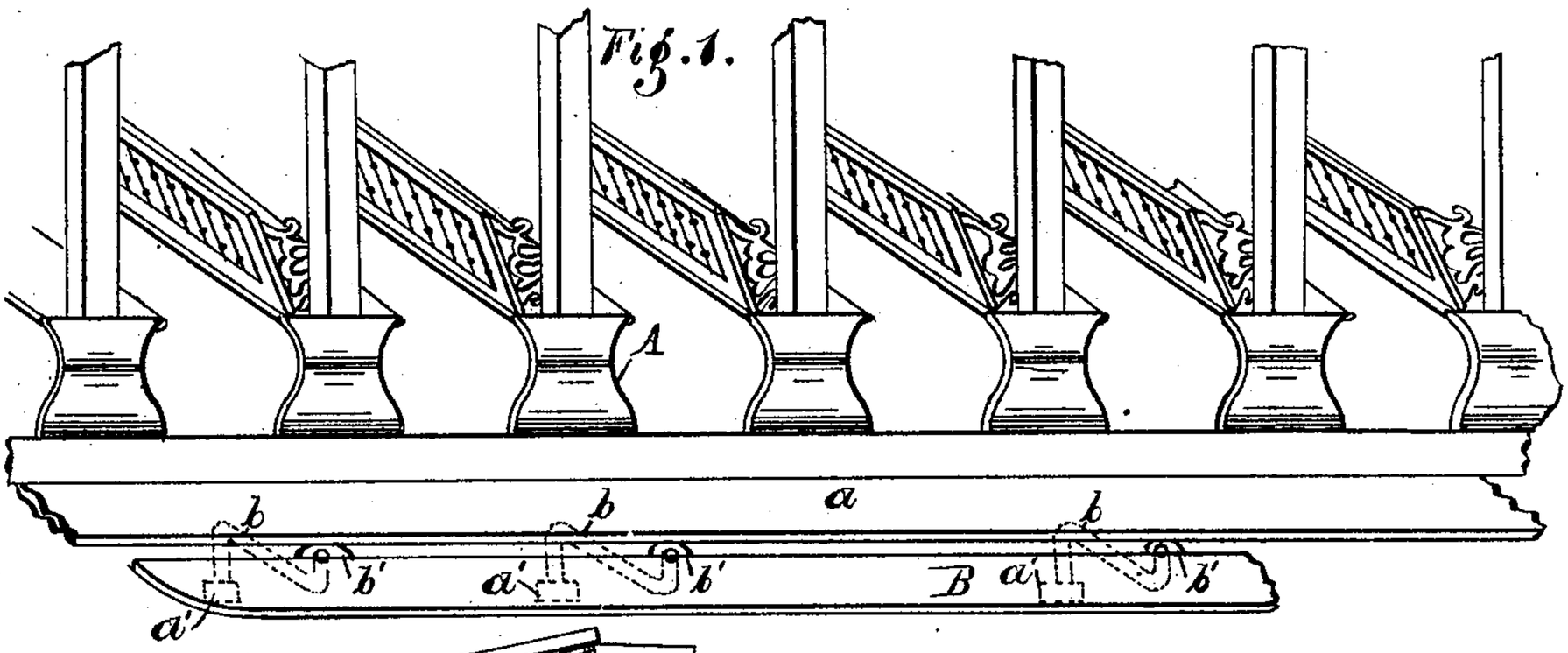

Fig. 2.

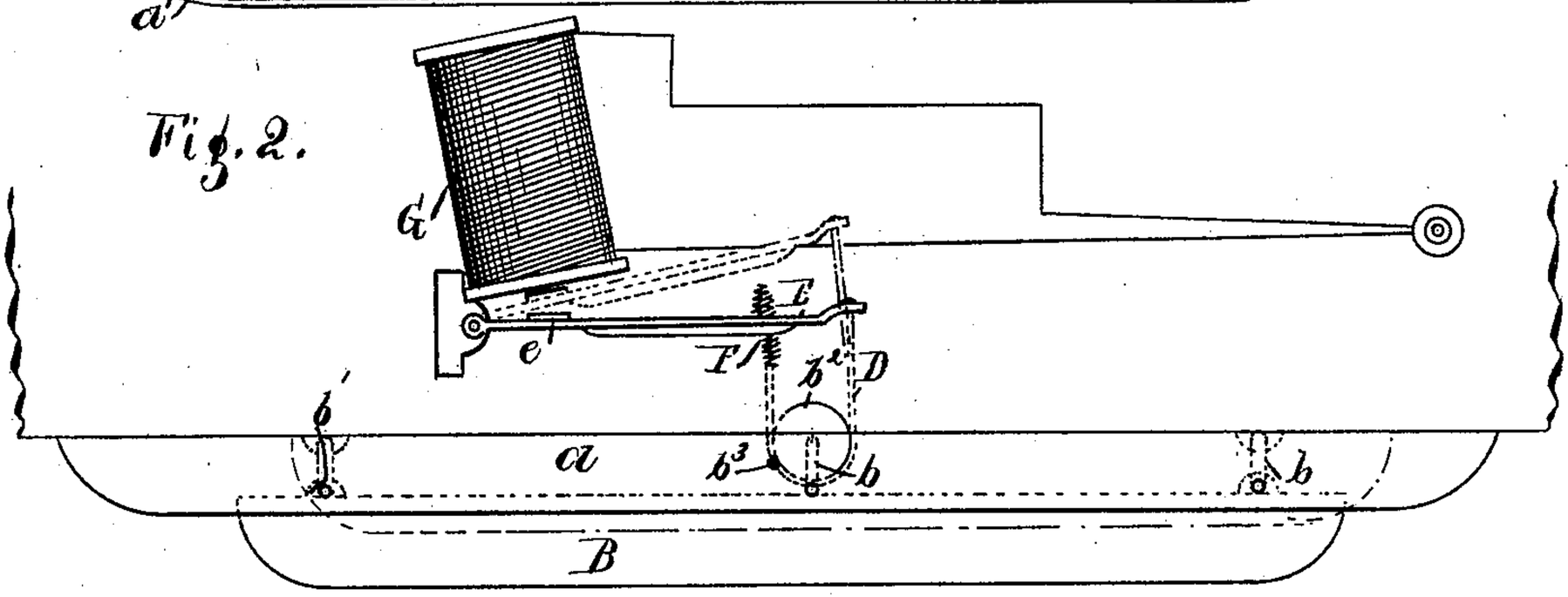

Fig. 3.

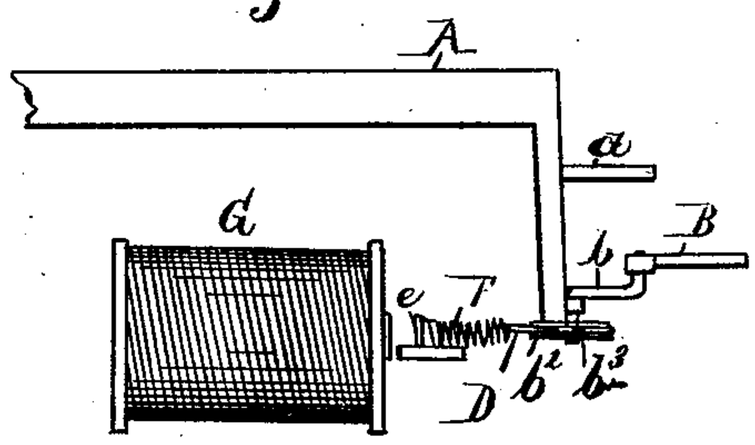

Fig. 4.

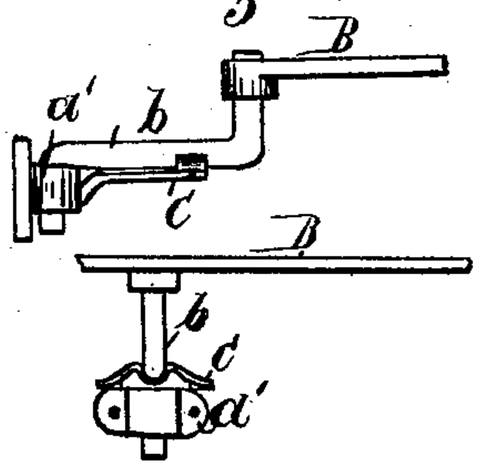

Fig. 5.

Witnesses
Arthur K Hood
Arthur E. Giorgi

Inventor
Albert Blum.
By Attorney
Geo. B. Harrison.

UNITED STATES PATENT OFFICE.

ALBERT BLUM, OF CINCINNATI, OHIO.

CAR-STEP.

SPECIFICATION forming part of Letters Patent No. 587,073, dated July 27, 1897.

Application filed August 3, 1896. Serial No. 601,461. (No model.)

To all whom it may concern:

Be it known that I, ALBERT BLUM, a citizen of the United States of America, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Car-Steps, of which the following is a specification.

It is frequently desirable, especially in street-cars provided with runner-boards, to have an additional step, but such a step cannot be provided for in the ordinary way, inasmuch as it would so increase the width over all as to increase the liability to and danger from collisions. Various methods of overcoming this objection have been suggested, but one serious objection to those which place the step in the desired position is that the care of the operator must be depended upon to get them out of the way when not in use.

The object of my invention is to provide a step which may be thrown in or out of its position of use and which if left in its position of use will be automatically thrown into its idle position by contact with any object having a resistance sufficient to cause danger by impact with a fixed part of the car.

My invention is more especially adapted for use with cars having a fixed step, such as the "runner-board" of an open street-car; and my invention consists in the parts and the combination and arrangement of parts hereinafter described and claimed.

In the drawings, Figure 1 is a perspective view of a portion of a car equipped with my invention; Fig. 2, a diagrammatic plan of the same; Fig. 3, an end elevation; Fig. 4, a detail of one of the step-hangers, and Fig. 5 a front elevation of the same.

A represents a car provided with a runner-board *a* extending along its side.

B is a step carried below the runner-board by arms *b*, pivoted to the car-body and adapted to swing outwardly and backward or forward into a position underneath the runner-board.

The hinge-arms preferably consist of arms *b* bent at each end and pivoted at one end to suitable brackets *a'*, secured to the car-body, and at the other end to brackets *b'*, carried by step B.

By swinging the step upon its hinge-arms it is thrown outwardly from its position of rest into a position below and outside of the runner-board or into the proper position for a lower step. To hold the step against accidental displacement when in its position of use, I provide a grooved spring C, secured to the car-body and so arranged that the groove embraces a portion of the hinge-arms when the step is in its position of use. The surfaces adjacent to the groove are inclined so that the arm can slide thereon and force the spring out of its path until the groove is reached, and so that the contact of the step with any considerable resistance will free it from the locked position and return it to its position of non-use.

In case the step is left in its position of use and strikes an object with sufficient force to overcome the resistance of grooved spring C it will swing back and under the runner-board. For moving the step into its position of use or non-use I provide the following mechanism.

Mounted on the lower end of one of the hinge-arms *b* is a circular plate b^2, to which is attached at b^3 a cord D, having one end secured to a lever E, pivoted to a suitable bearing underneath the car, and having the other end secured to a tension-spring F. Lever E carries an armature *e*, mounted adjacent to an electromagnet G. With the step in its position of use if a current is passed through a circuit, including the coil, the armature is drawn toward the magnet G, carrying the lever E with it. This movement of the lever rotates the plate and hinged arms *b*, thereby moving the step horizontally into a position directly below the runner-board. As long as the electromagnet is excited the step is held in its position of non-use under the runner-board, but as soon as the circuit is broken the spring F rotates the hinge-arms and brings the step into its outer position or position of use.

I do not wish to confine myself to this special construction, as the device will work equally well when the lever, magnet, and spring are so arranged that the magnet moves the step outwardly and the spring moves it inwardly, or two electromagnets may be used, one for throwing the step inwardly and outwardly, or other means may be used.

The circuit may be provided with as many

make-and-break switches as required, so that either conductor, motorman, or passenger can operate the step.

I claim as my invention—

1. The combination, with a car having stationary steps, of a step, mounted upon arms hinged to the car, and adapted to swing horizontally into a position vertically beneath the stationary step or into a position vertically outside and below the stationary step, and yielding means for locking the step in the latter position, substantially as and for the purpose set forth.

2. The combination, with a car having stationary steps, of a series of arms hinged to the car-body below the stationary step; a step pivoted to the arms and adapted to swing horizontally thereunder, or into a position vertically outside and below the stationary step; a lever secured to one or more of the arms, an armature connected with the hinge-lever, and an electromagnet, adapted to cooperate with the armature and move the step, substantially as and for the purpose set forth.

3. The combination, with a car having stationary steps, of a series of arms hinged to the car-body below a stationary step; a step pivoted to the arms and adapted to swing horizontally thereunder, or into a position vertically outside and below the stationary step; a lever secured to one or more of the arms; an armature connected with the hinge-lever; an electromagnet, adapted to coöperate with the armature and move the step in one direction, and a spring adapted to move it in the opposite direction, substantially as and for the purpose set forth.

ALBERT BLUM.

Witnesses:
ARTHUR E. GEORGE,
ERNEST K. HOOD.