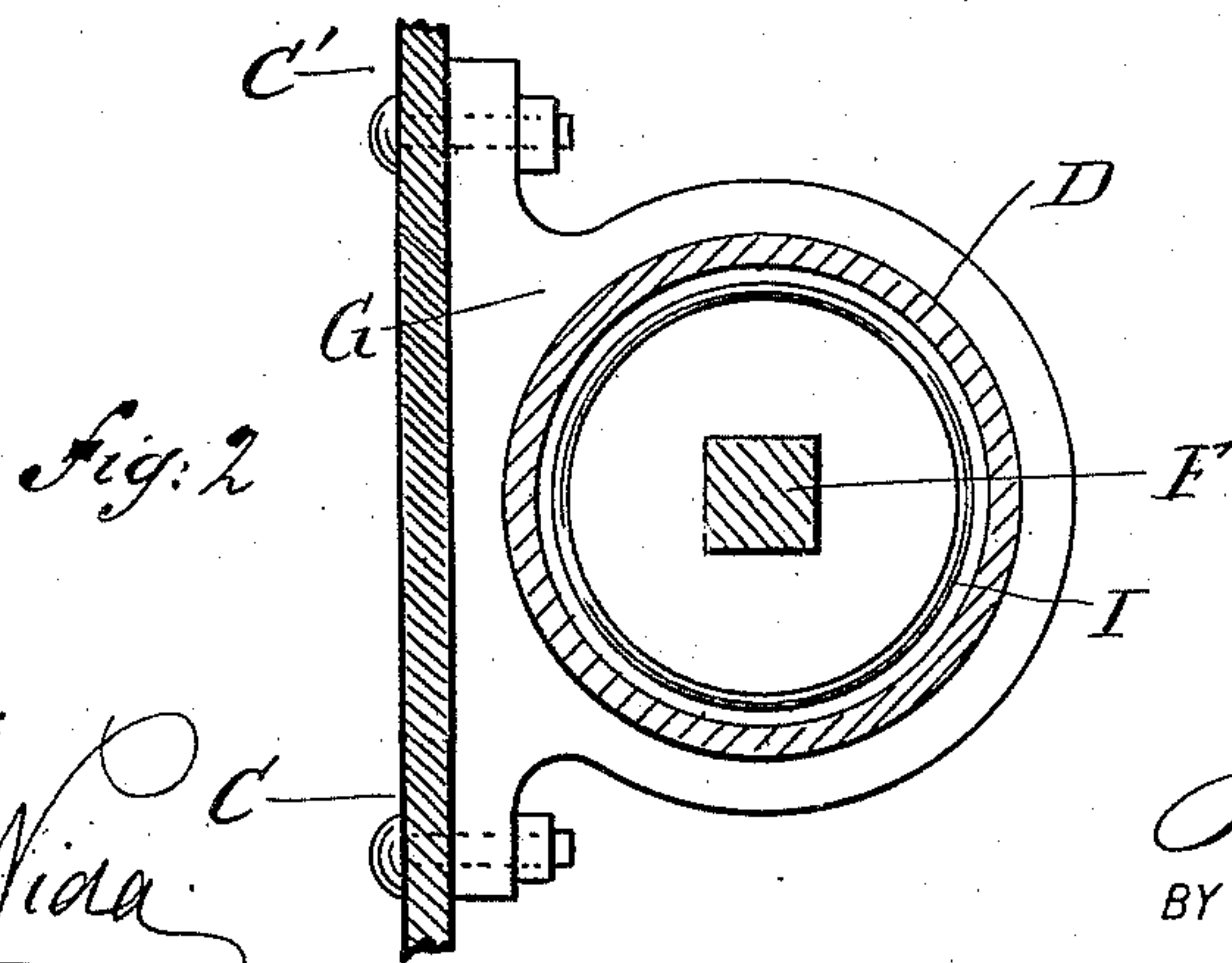
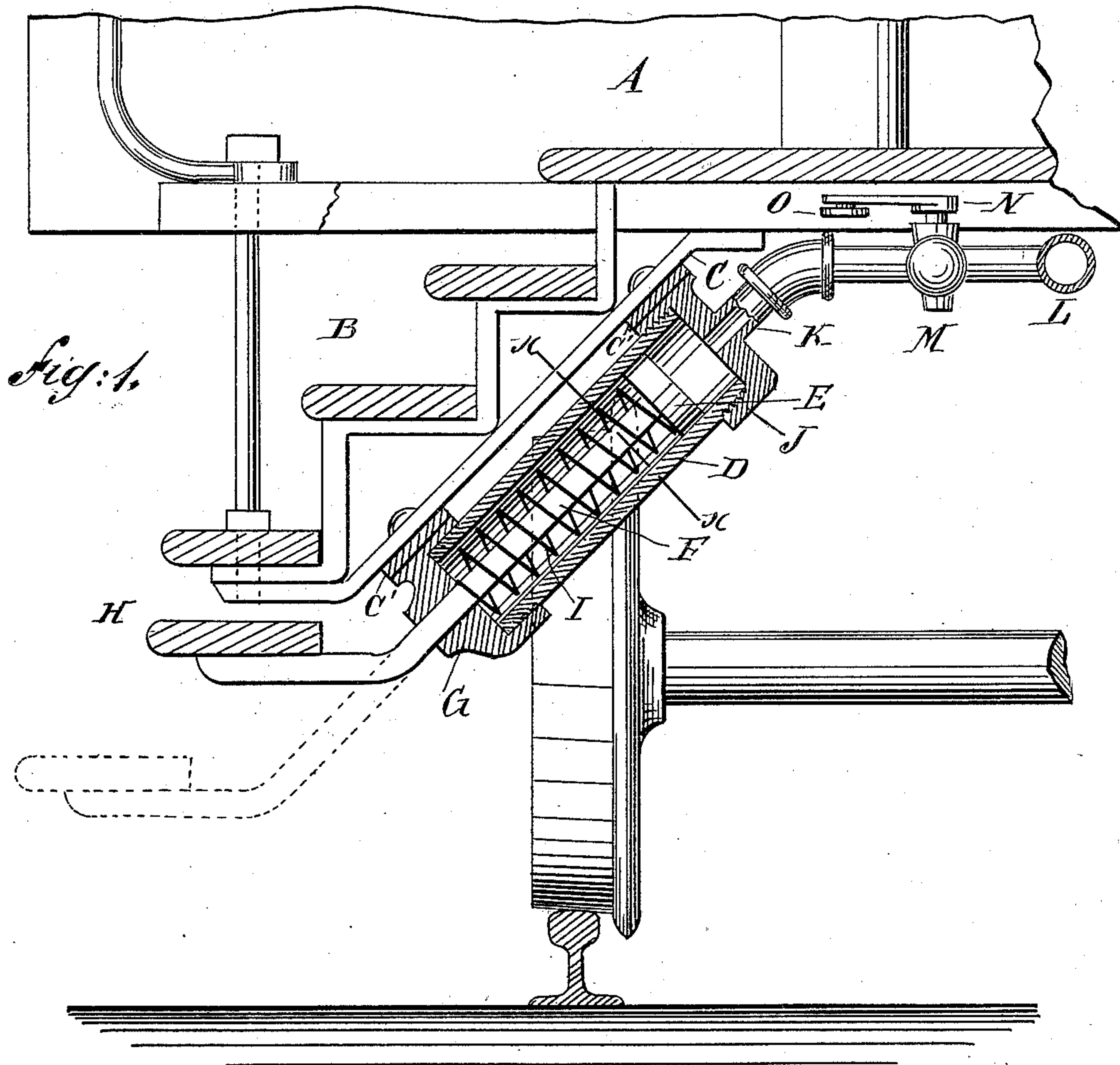


(No Model.)

JAMES F. WOOD & JOHN F. WOOD.
EXTENSIBLE CAR STEP.

No. 431,307.

Patented July 1, 1890.



WITNESSES:

Chas. Nida
C. Sedgwick

INVENTOR:

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UNITED STATES PATENT OFFICE.

JAMES F. WOOD AND JOHN F. WOOD, OF WILMINGTON, DELAWARE.

EXTENSIBLE CAR-STEP.

SPECIFICATION forming part of Letters Patent No. 431,307, dated July 1, 1890.

Application filed May 10, 1890. Serial No. 351,250. (No model.)

To all whom it may concern:

Be it known that we, JAMES F. WOOD and JOHN F. WOOD, both of Wilmington, in the county of New Castle and State of Delaware, have invented a new and Improved Extensible Car-Step, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a vertical transverse section of a car-step with our improvement applied, and Fig. 2 is a transverse section taken on line $\alpha \alpha$ in Fig. 1.

Similar letters of reference indicate corresponding parts in both views.

The invention relates to the car-step for which United States Letters Patent No. 417,896 were granted us on the 24th of December, 1889.

The object of the invention is to obviate the necessity of the guide-rods 13 shown in said patent.

The invention will be first described, and then specifically pointed out in the claim.

To the car A are attached the steps B in the usual way, and to the risers C of the steps are attached plates C', to which is secured an air-cylinder D, containing a piston E, having a piston-rod F, of polygonal form, preferably of square section, as shown. The piston-rod F extends through a hole of corresponding form in the lower cylinder-head G, and the lower extremity of the piston-rod is bent outward into a horizontal position. To the horizontal extremity of the piston-rod F is attached the lower step H. By thus forming the piston-rod angular in cross-section it will be impossible for it to turn axially, and thus the step 14 will not tilt laterally in either direction when persons stand thereon. By this means we are enabled to dispense with the rods 13 and guides 12 in the patent before referred to. Between the piston E and the cylinder-head G is placed a spiral spring I, which is capable of lifting the piston, piston-

rod, and the step H and holding them in an elevated position.

The cylinder-head G slips on the end of the cylinder, and is secured to the plate C' by means of bolts. This construction holds the head securely, so as to prevent it from turning, and at the same time permits of readily removing the head and the parts contained by the cylinder.

The upper end of the cylinder D is closed by the head J, and in the said head is inserted a pipe K, which communicates with the pipe L, leading to the air-brake pipe. In the pipe K is arranged a valve M, furnished with an arm N, which is connected by a rod O with suitable levers for working the valve or valves carried by the car. When a station is reached, the valve M is opened, allowing air under pressure to enter the cylinder D and push down the cylinder E against the pressure of the spring I, thus forcing the step H downward into the position indicated by dotted lines. The step remains in this position until the air is allowed to escape from the upper end of the cylinder through a valve provided for that purpose, or through the valve M when it is constructed as a three-way valve.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

The herein-described car-step, provided with a piston-rod angular in cross-section and provided with a piston, and a cylinder in which the piston works, provided with a head having an opening corresponding to the shape of the piston-rod, whereby said step will be prevented from tilting, substantially as set forth.

JAMES F. WOOD.
JOHN F. WOOD.

Witnesses:

JAMES O'TOOLE,
C. P. JOHNSON.