E. M. CONDOS.

EXTENSION STEP FOR RAILWAY CARS.

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1,072,207. Patented Sept. 2, 1913.

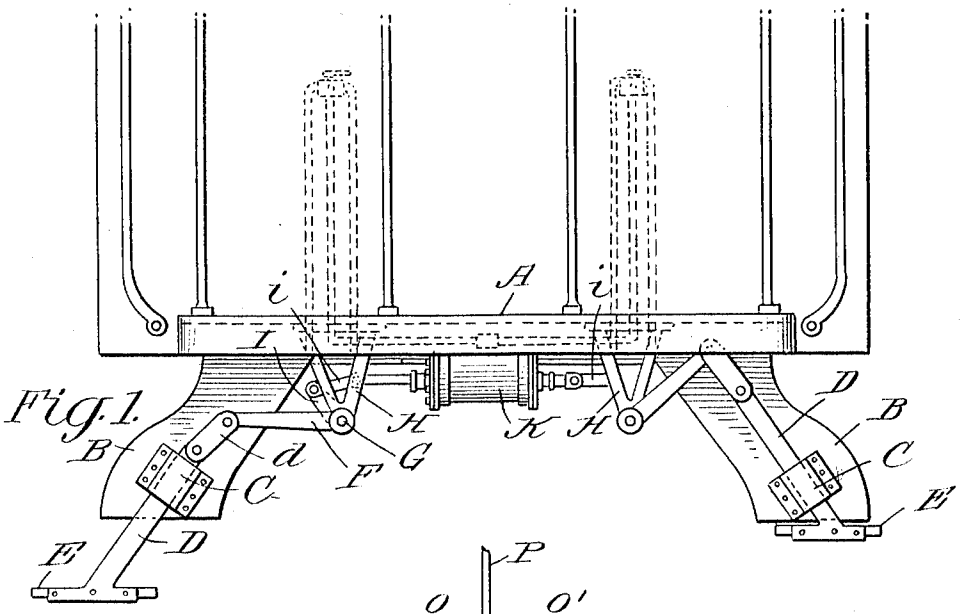


Fig. 1.

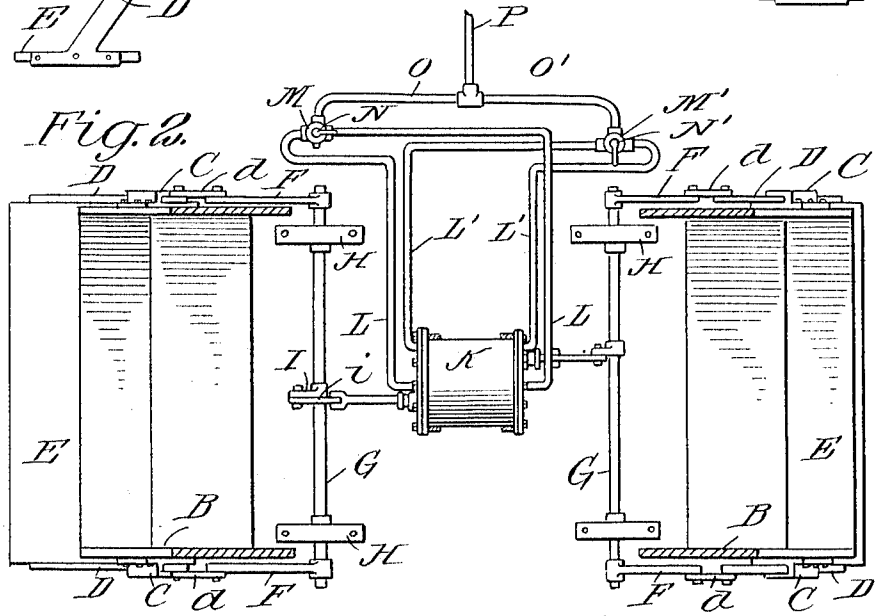


Fig. 2.

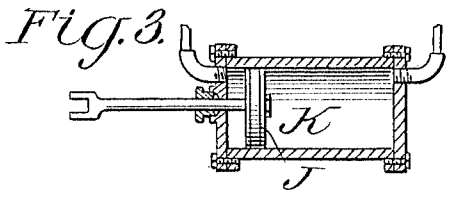


Fig. 3.

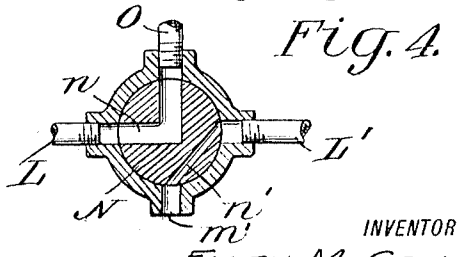


Fig. 4.

WITNESSES

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EXTENSION-STEP FOR RAILWAY-CARS.

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To all whom it may concern:

Be it known that I, ELLEN M. CONDOS, a citizen of the United States, and a resident of Goldfield, in the county of Esmeralda and State of Nevada, have invented a new Improvement in Extension-Steps for Railway-Cars, of which the following is a specification.

My invention relates to novel means for operating a movable step which is so associated with the ordinary steps of a railway car that it may be extended or projected below the latter when required for the convenience of passengers entering or leaving the car.

The details of construction, arrangement, and operation of my invention are hereinafter described and illustrated in the accompanying drawing, in which—

Figure 1 is an end view of a car with extensible steps and my improved mechanism for adjusting the same. Fig. 2 is a plan view of the main steps of a car, together with extensible steps and mechanism connected therewith for adjusting the latter. Fig. 3 is a longitudinal section of one of the fluid cylinders together with its reciprocating piston, the same forming part of the mechanism for actuating the extensible steps. Fig. 4 is a transverse section through one of the four-way valves controlling admission to the piston cylinders of air under such pressure as required to actuate the piston and thereby adjust the extensible steps.

The car platform A illustrated in the drawing is provided at its opposite sides with the usual pendent, permanent steps B to which extensible steps E are applied. The latter lie directly beneath and parallel to the lowermost tread member of the permanent steps B, and, when not in use, the extensible step is adjusted in the position shown at the right in Fig. 1, it being thus in flat contact with the lower member of the permanent steps.

The means for directly supporting and adjusting the extensible steps E are bars D, which are adapted to slide in guideways C consisting of metal keepers attached to the sides of the permanent steps B. The said bars D are set in an inclined position so that the extensible steps E are duly projected outward beyond the steps B, when required for use, as illustrated on the left side of Fig. 1.

The upper ends of the slide bars D are connected by links *d* to radial arms F of a rock-shaft G which extends beneath the car platform horizontally and directly in rear of the permanent steps B, as shown in the drawing, the same being journaled in pendent brackets H. Said shaft G is further provided with a shorter radial arm I which is connected by a link *i* with the reciprocating piston J of a cylinder K—see Figs. 2 and 3.

It will be understood that, so far as described the mechanism directly connected with the extensible step is duplicated on each side of the car platform and that there is a separate cylinder and piston for each one. For economy in manufacture and in weight and space, the two cylinders are constructed in one body.

Air or other fluid under pressure is admitted to the respective cylinders at opposite ends, as required for moving the pistons in one direction or the other, according as it is desired to extend a step E, or to retract it into the position of non-use illustrated at the right in Fig. 1.

Two pipes L are connected with the respective ends of one of the cylinders and two similar pipes L′ are connected with the other cylinder. The outer ends of the pipes L are connected with a valve casing M having a four-way cock N—see Fig. 4—and the pipes L′ are similarly connected with a valve casing M′ having a four-way cock N′. Pipes O and O′ are similarly connected with the casings of the respective valves and they are also connected with a pipe P which, in practice, extends to a reservoir in which the air is under pressure.

It is apparent that when the valve N is adjusted in the position shown in Fig. 4, its angular passage *n* puts one of the pipes L in communication with the supply pipe O and thus air under pressure is admitted to one side of the piston in the cylinder connected with the extensible step on the left. Supposing the piston to be in the position indicated in Fig. 3, the air admitted through the connecting pipe L will force the piston to the right and thus the extensible step E will be raised. On the other hand, supposing the piston to be at the right hand end of the cylinder and the valve N be adjusted in the alternative position, air will be admitted through the right-hand pipe L and force the piston to the left, which would have the effect of rocking the shaft G and projecting

the extensible step downward and outward, or into the position required for use. It is apparent that the operation of the right-hand extensible step will be the same, so that detailed description thereof is unnecessary. In other words, by adjusting the valves N and N′, either step E may be extended as required for use, or retracted into contact with the lower member of the permanent steps B.

By observing Fig. 4, it will be seen that when the valve is in the position indicated, the effect of which has already been described, the right-hand pipe L is opened to the atmosphere through the valve passage n' and the opening in the valve casing indicated by m', so that air is always exhausted from one side of the piston when being fed in on the other side.

The illustration in Fig. 2 of the mechanism for adjusting the extensible steps is in part diagrammatic; and in Fig. 1 the drawing shows, by dotted lines, that the controlling valves may be extended vertically so as to be operated very conveniently by the conductor or brakeman.

What I claim is:—

1. The combination with fixed car steps, of a movable step, bars connected therewith and guides in which they are adapted to slide, a rock-shaft journaled under the car transversely of the same, devices connecting said rock shaft with the said bars, a fluid pressure cylinder having a reciprocating piston and means connecting it with the said rock shaft, whereby the movement of the piston adjusts the movable step for use or non-use, pipes connected with the ends of said cylinder, a four-way valve applied at the junction of such pipes, and an air supply pipe also connected with the valves, as described.

2. An extensible step for vehicles, means for supporting the step for movements relatively of the main step, a fluid cylinder, a reciprocating piston mounted in the cylinder, controlling connections between the piston and the extensible step, a fluid supply pipe, and means for introducing fluid to the cylinder from the supply pipe and for normally maintaining an inoperative adjustment of the extensible step.

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Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."