

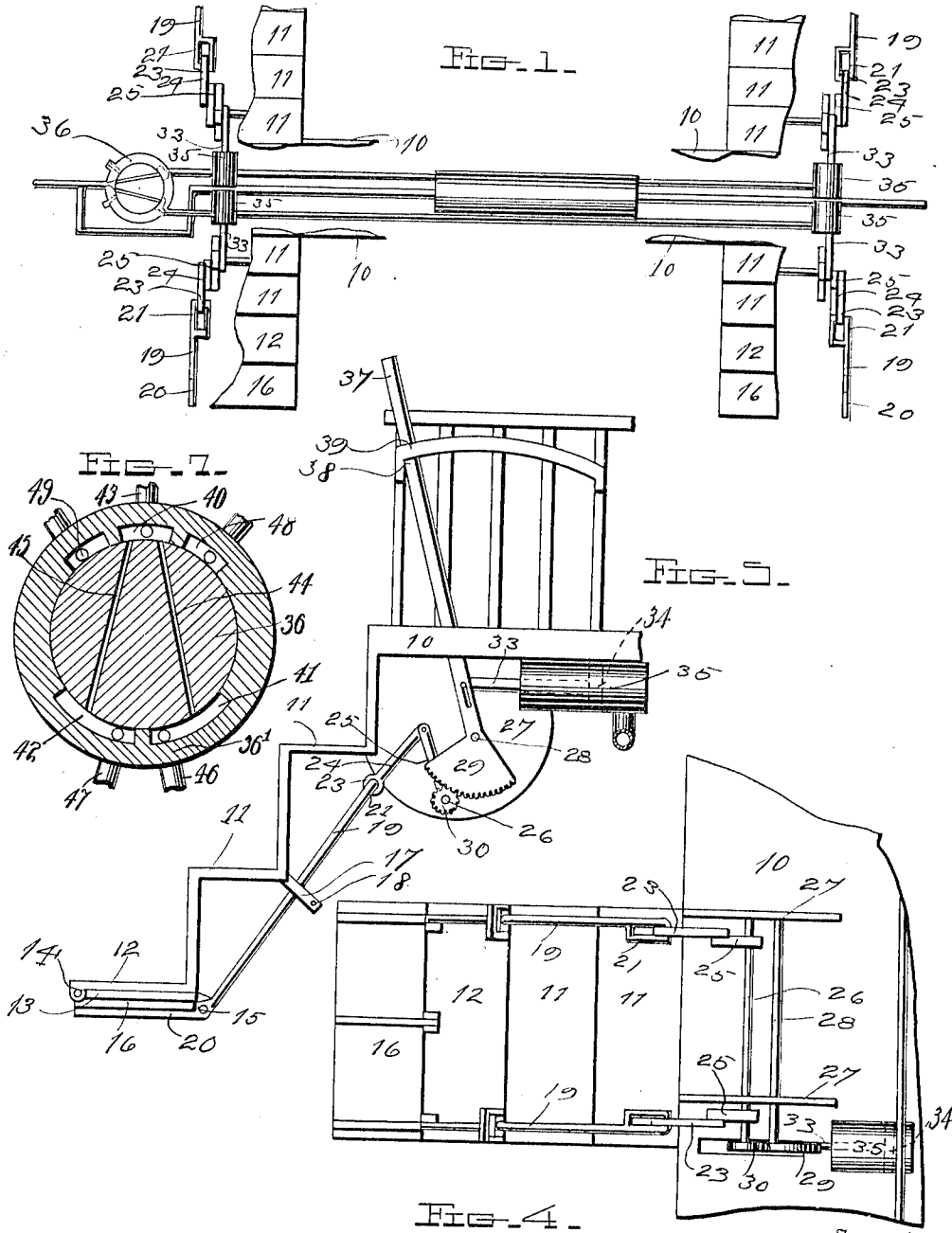
J. SCHWERTNER.
FOLDING CAR STEP.

APPLICATION FILED SEPT. 28, 1911.

1,064,094.

Patented June 10, 1913.

2 SHEETS-SHEET 1.



Witnesses
Herbert A. Porter.
Harry M. Test.

Inventor
J. Schwertner.

By *Harry Ellis Chausse*

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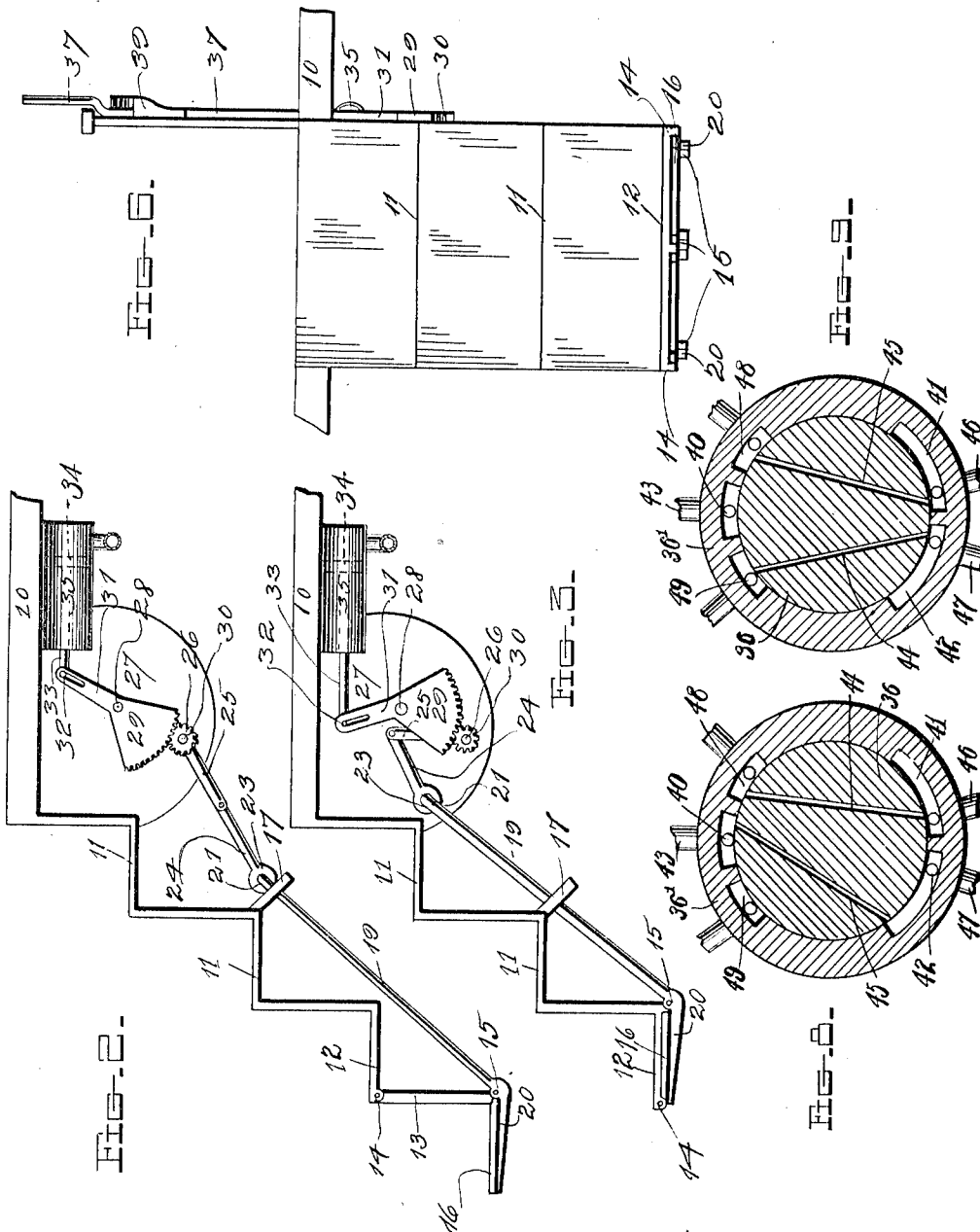
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UNITED STATES PATENT OFFICE.

JOSEPH SCHWERTNER, OF OTTOVILLE, OHIO.

FOLDING CAR-STEP.

1,064,094.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed September 28, 1911. Serial No. 651,872.

To all whom it may concern:

Be it known that I, JOSEPH SCHWERTNER, a citizen of the United States, residing at Ottoville, in the county of Putnam and State of Ohio, have invented certain new and useful Improvements in Folding Car-Steps, of which the following is a specification.

This invention relates to improvements in folding car steps.

The principal object of the invention is to provide a simple device of this character, and one which may be quickly and easily operated.

Another object is to provide means for automatically operating the steps of all the cars.

These and other objects will be apparent from the following description and with particular reference to the accompanying drawings.

In the drawings: Figure 1 is a diagrammatic view of an automatically operated step system. Fig. 2 is a side elevation of one flight of steps, the auxiliary step being extended. Fig. 3 is a similar view, the auxiliary step being folded. Fig. 4 is a bottom plan view of the steps. Fig. 5 is a side elevation of the steps showing means for manually operating the same. Fig. 6 is a front elevation of the same. Fig. 7 is a detail view of the valve, in the running position, Fig. 8 is a similar view in the position to lower the steps on one side, Fig. 9 is a similar view in the position to lower the steps on both sides.

Referring to the drawings, 10 represents the platform of each of the cars, and 11 the usual steps. Pivoted to the forward edge of the bottom step 12 is a riser 13 attached thereto by means of the hinges 14, so that said riser may fold back under the step 12. Connected to the bottom of the riser by means of the hinges 15 is the tread of the auxiliary step 16. In the angle between the step 12 and the next riser above and at either end of the step is a hanger 17, having therein a roller 18, through which the supporting arm 19 passes, said arm being bent at an angle at its lower end and secured to the under face of the step 16 as at 20. One of these arms 19 is arranged at each end of the step, and the upper end of each of the arms has a loop 21, interlocked with a similar loop 23 on a connecting rod 24, whose other end is pivotally attached to a crank arm 25 projecting from a shaft 26. At each end of

the step below the platform is attached a triangular plate 27 in which are journaled the shaft 26 and a second shaft 28 arranged adjacent thereto. On the shaft 28 is a large pinion 29 which is adapted to mesh with a smaller pinion 30 on the shaft 26, so that upon rotation of the shaft 28, similar movement will be communicated to the shaft 26, thus moving the arm 25 to operate the connecting link 24 and the arm 19 to extend or fold the step 16. As represented in Figs. 1, 2, 3 and 4 the shaft 28 has a crank arm 31 which is pivotally connected at 32 to a piston rod 33. The rod 33 has on its opposite end a piston head 34 which works on the cylinder 35 connected to a supply of compressed air, a suitable valve 36 being disposed on each of the cars, and so connected that said valve may be operated simultaneously or independently to let air into the cylinders 35 or to exhaust it therefrom to fold or extend the steps.

Referring particularly to Figs. 1 and 7 it will be seen that the valve 36 is seated in a casing 36', in which are formed the by-passes 40, 41 and 42. The pass 40 is connected to the reservoir A by means of the pipe 43. Formed transversely through the valve 36 are the passages 44 and 45, which when the valve is in position of Fig. 1, registers with the by-passes 41 and 42, respectively, at one end and with the pass 40 together with their other ends. In this position air flows from the reservoir through the pass 40, across the valve and to the cylinders 35 on both sides of the car, by means of the pipes 46 and 47. In the casing at diametrically opposite points to the passes 41 and 42 are outlets 48 and 49 leading to the atmosphere.

When it is desired to lower the steps on one side of the train, the valve 36 is thrown to the position represented in Fig. 8. In this position air continues to flow through the passage 45 to the cylinders on one side of the car, but the passage 44 is in register with the pass 41, and the outlet 48, so that the air in the cylinders of one side of the car, will exhaust therefrom, and permit their steps to fall. A movement of the valve to the opposite position will exhaust air through the passage 45 and outlet 49. It is of course understood that constant pressure of air is held in the cylinders 35, which holds the steps up, as represented by dotted lines in Fig. 8. When it is desired to lower

all of the steps on both sides, the valve 36 is turned so that the passage 44 registers with the pass 42 and outlet 49, while the passage 45 registers with the pass 41 and the outlet 48, thus exhausting the air to the atmosphere, from the cylinders 35 on both sides of the car. This is clearly shown in Fig. 9.

In Figs. 5 and 6 a shaft 28 is provided with a hand lever 37 which extends upwardly above the platform, the lever having a stop member 38 adapted to engage a projection 39 to limit the movement of the lever. Thus when the lever is moved, or air is let into the cylinders 35, the shaft 28 will be rotated, and through the meshing of the gears rotate the shaft 26 and pull upwardly on the link 24 and the arm 19 so that the step 16 and riser 13 will be folded together under the step 12. A reversal of this operation causes the rotation of the shafts 26 and 28 in the opposite direction which push down on the arm 19 and link 24 and unfolds the riser 13 and step 16 to extended position. The rollers 18 guide the arms 19 and provide an anti-friction bearing so that the parts will work easily.

It will thus be seen that the device is simple and easy of operation, and that it is possible to throw all of the steps down at the same time, or operate the steps individually.

It will be understood that one of the valves 36 is located on each of the cars of a train, including the engine, so that the engineer may have control of the raising and lowering of the steps. When the engineer has control of the steps, all of the valves 36 on the car are thrown into the position as represented in Fig. 7, the engineer's valve being located in the pipe 43 between

the valve on the first car and the tank, the engineer's valve being of a structure identical with those on the car, and the various positions being also the same, so that the engineer can raise or lower all of the steps on either side or both sides of the cars of the train.

What is claimed is:

1. A system of auxiliary steps for railway trains consisting of risers and treads hinged together and to the bottom steps, a driving shaft and a driven shaft arranged beneath the steps, means on the driving shaft to cause the rotation of the driven shaft, connections between the driven shaft and the tread, cylinders arranged adjacent the shafts a piston in the cylinder, connections between the driving shaft and the piston, connections between a cylinder and the compressed air supply, and means for controlling the flow of air to said cylinders whereby said shafts will be rotated to fold or extend said risers and treads.

2. The combination with the steps of a railway train, of auxiliary steps mounted at the bottom of said steps, a compressed air supply, air cylinders adjacent the steps, pistons in the cylinders, connections between the pistons and the auxiliary steps, valves for controlling the flow of air from the compressed air supply to the cylinders to hold the auxiliary steps in elevated position, at times, and to exhaust the air from the cylinders to lower the steps at times.

In testimony whereof I affix my signature, in the presence of two witnesses.

JOSEPH SCHWERTNER.

Witnesses:

J. W. BOWMAN,
GEO. ALTENBURGER.