

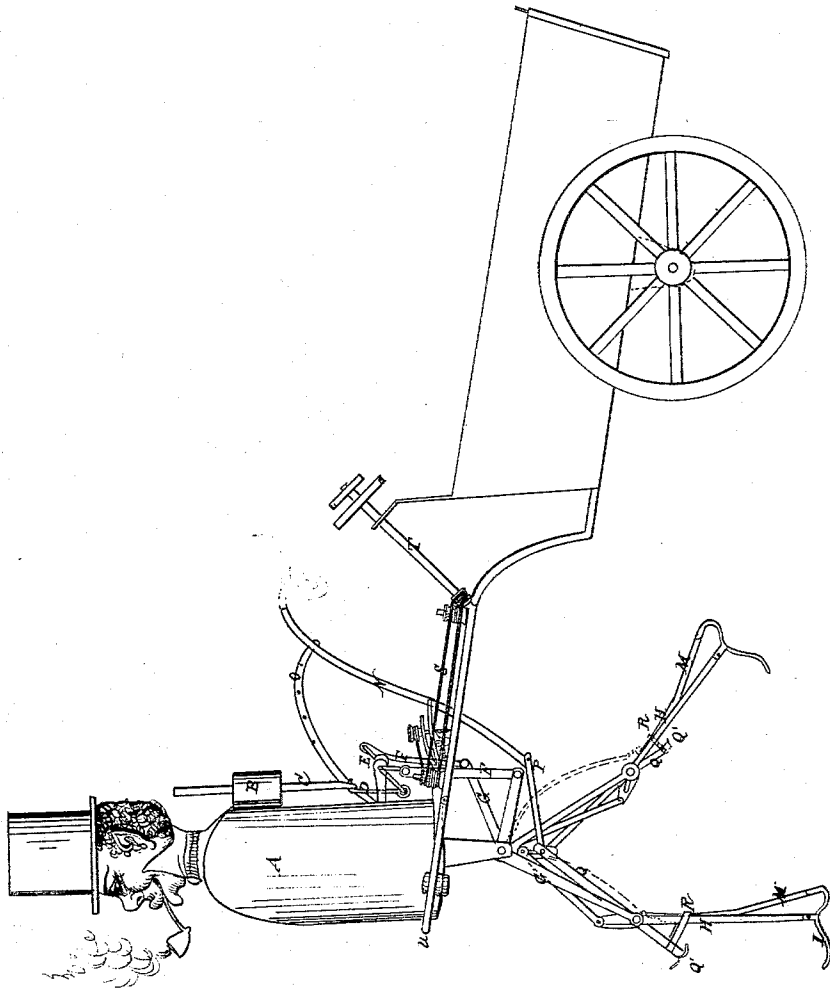
2 Sheets sheet 1.

Drederick & Grass.

Steam-Carriage.

N<sup>o</sup> 75874

Patented Mar. 24, 1868



Witnesses  
S. Answorth  
Chas. Clausen

Inventors  
Lador P. Dedmon  
Isaac Grass  
By  
B. P. McAlway & Co  
their Atty

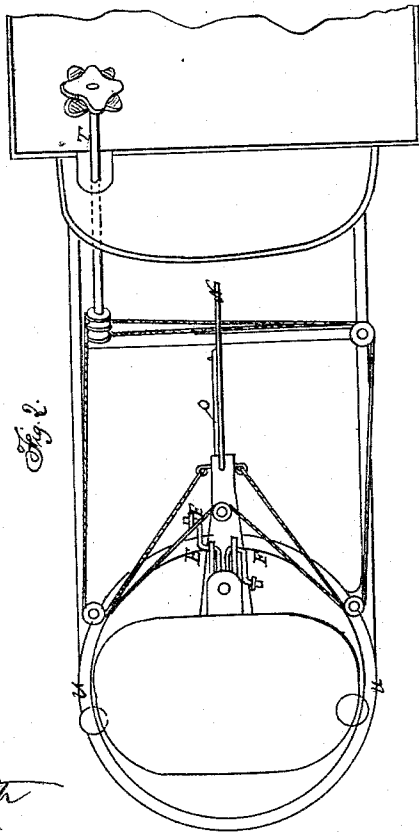
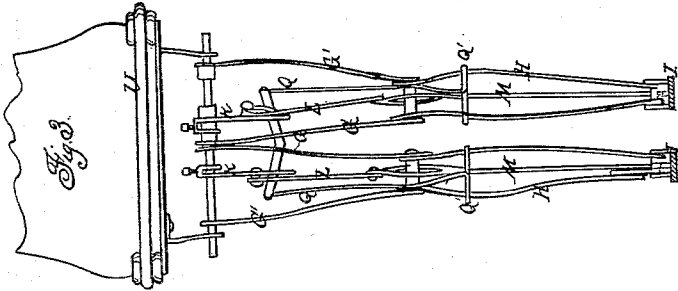
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# United States Patent Office.

ZADOC P. DEDERICK AND ISAAC GRASS, OF NEWARK, NEW JERSEY.

Letters Patent No. 75,874, dated March 24, 1868.

## IMPROVEMENT IN STEAM-CARRIAGE.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that we, ZADOC P. DEDERICK and ISAAC GRASS, of Newark, in the county of Essex, and State of New Jersey, have invented a new and useful Improvement in Locomotive-Apparatus; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a perspective view,

Figure 2 is a plan, and

Figure 3 a front elevation of the walking-mechanism.

The same letters in all the figures indicate identical parts.

This invention consists in connecting a steam-engine or other motor to a system of levers, which, in imitation of the action of the legs of a man, by the reciprocating motion of the piston, are made to walk over the ground, and draw a vehicle attached thereto.

In the annexed drawings, A is a boiler, constructed as shown, to resemble in form the outlines of the human body. The boiler is one of that class in which the fire-box is in the centre, and the water-jacket around the same. It is unnecessary to describe this part of the mechanism, as there is nothing peculiar in it. B is a steam-engine, of which the piston-rod C is attached to a pitman, D, which drives the double crank E. Any motor may be applied to this crank instead of the steam-engine. A coiled spring, with clock-work, may be used to drive a toy machine constructed on the same principle. The cranks communicate a reciprocating motion to the connecting-rods F F, which are attached to the arms G G of two bell-crank levers, of which the arms G' G' represent the thigh-bones of a man. There are two of these bell-crank levers attached to one connecting-rod, forming one thigh. They are pivoted to a rod, which passes through hangers attached to the base of the boiler. The lower end of the arms G' G' are pivoted upon transverse rods, forming the knees, to which rods are also pivoted two rods, H, which form the lower part of each leg. These rods are pivoted to lugs on the pieces I I, which form the feet, at points represented by the ankle of a man. The vertical oscillation of the arms G G will cause the legs to oscillate backwards and forwards, and as the cranks E are set opposite to one another, the legs will be alternately operated in different directions, just as the legs of a man move alternately in walking. Arms K K are attached to the rods, to which the bell-cranks are pivoted. These arms have slots in their lower ends to receive a set-screw, passing through slots in the upper ends of the rods L L. The latter rods are placed between the arms G' G', and are attached by pivots to the rods M, which, extending above the knee-joints, have slots, through which the pivot forming the knee-joints of the arms G' and rods H passes. This rod, extending downwards, is pivoted to lugs at the heel of the foot-pieces I I, as clearly shown in fig. 1. As the rods L L are attached to the arms K K, and as the latter are inclined in front of the arms G' G', and as the two sets of rods turn, therefore, upon different centres, the foot is turned down at the toe as one leg falls behind the other, and the knee bent, so that as the foot is thrown forward, it is raised by bending the knee, to step over any obstacle, the foot being turned downwards at the toe before being placed on the ground. This action may be increased by moving the set-screw, by which the rod L is attached to the arm K, nearer to the lower end of the slot in the latter. The length of the step is controlled by the lever N, held in any required position by a pin passing into a hole in the arc O. This lever is attached to two connecting-rods, P P, attached to rods Q Q, which, being pivoted on the knee-rod, extend below it, and are bifurcated at the lower end at Q', said bifurcations pressing against the front of the rods H H. Elastic bands, R R, are passed around the rods Q, H, and M, below the knee, and immediately above the bifurcations Q'. Instead of this spring, a spring like that shown in dotted lines may be used. The machine must be supported by a frame, running on wheels. I have shown it attached to a cart. The front part of the shafts U is made circular, and the body is attached thereto by eyes, so that it may be turned by cords S, attached to a tiller, T. The driver may, by means of the tiller, turn the machine as may be desired. This cart can be used on smooth ground; for rougher ground, lateral supports of wider base may be necessary, or the boiler may be changed in position, so as to lower the centre of gravity. The purpose of the spring R is to straighten the leg, when the foot has been drawn back in passing an obstacle.

The reverse movement of the apparatus is regulated by the same lever, N, by which the length of the steps is regulated. When the lever is in the first hole of the arc O, as shown in fig. 1, the machine will make its longest steps; when in the second hole, the steps will be shortened; in the third or middle hole, it will not step; in the fourth hole, it will move backward with short steps; in the fifth hole, it will move backwards with long steps.

Having fully explained the construction and mode of operating this apparatus, what we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of the crank E, connecting-rods F, bell-crank levers G' G', and rods H H, the said parts being arranged to produce an alternately-stepping motion, substantially as described.

2. The combination of the rods G' G' and H H with the rods L L and M M, and foot-pieces I I, substantially as described.

3. The combination of the rods H H and Q Q', substantially as and for the purpose set forth.

4. The foot-piece I, pivoted to the rods H centrally, and at the heel to the rod M, when said rods are so actuated as to cause an oscillating motion of the foot, substantially as and for the purpose set forth.

5. The combination of the lever N, rods P and Q, with the rods G' and H, substantially as and for the purpose set forth.

6. The arrangement of the circular support U to the machines, and the cords S and tiller T, substantially as set forth.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

ZADOC P. DEDERICK,  
ISAAC GRASS.

Witnesses:

A. H. HUBBARD,  
PETER GEIMER.