

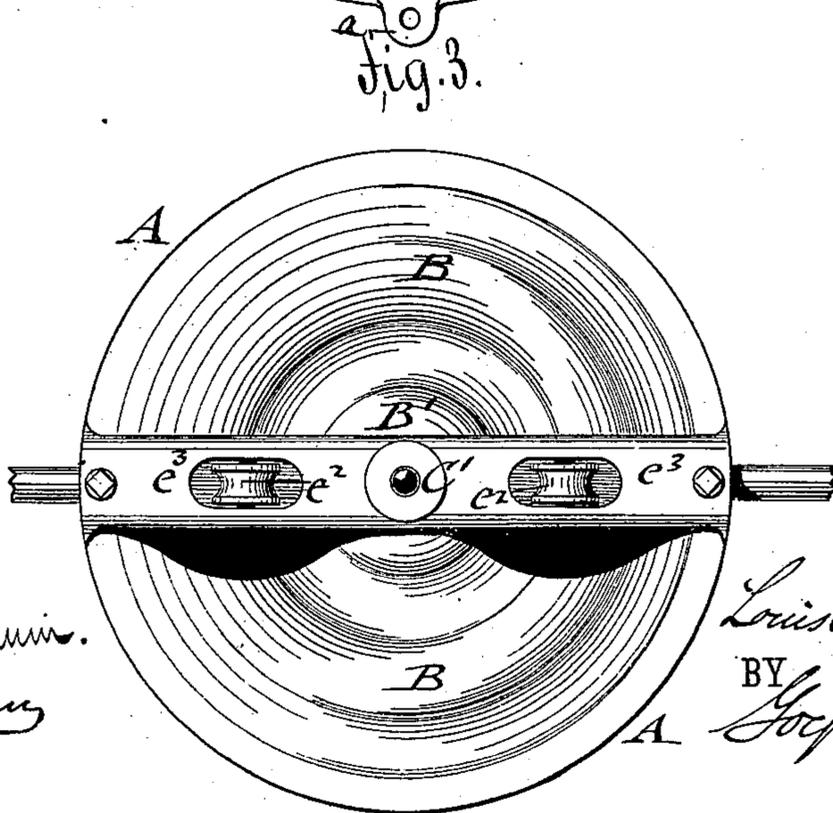
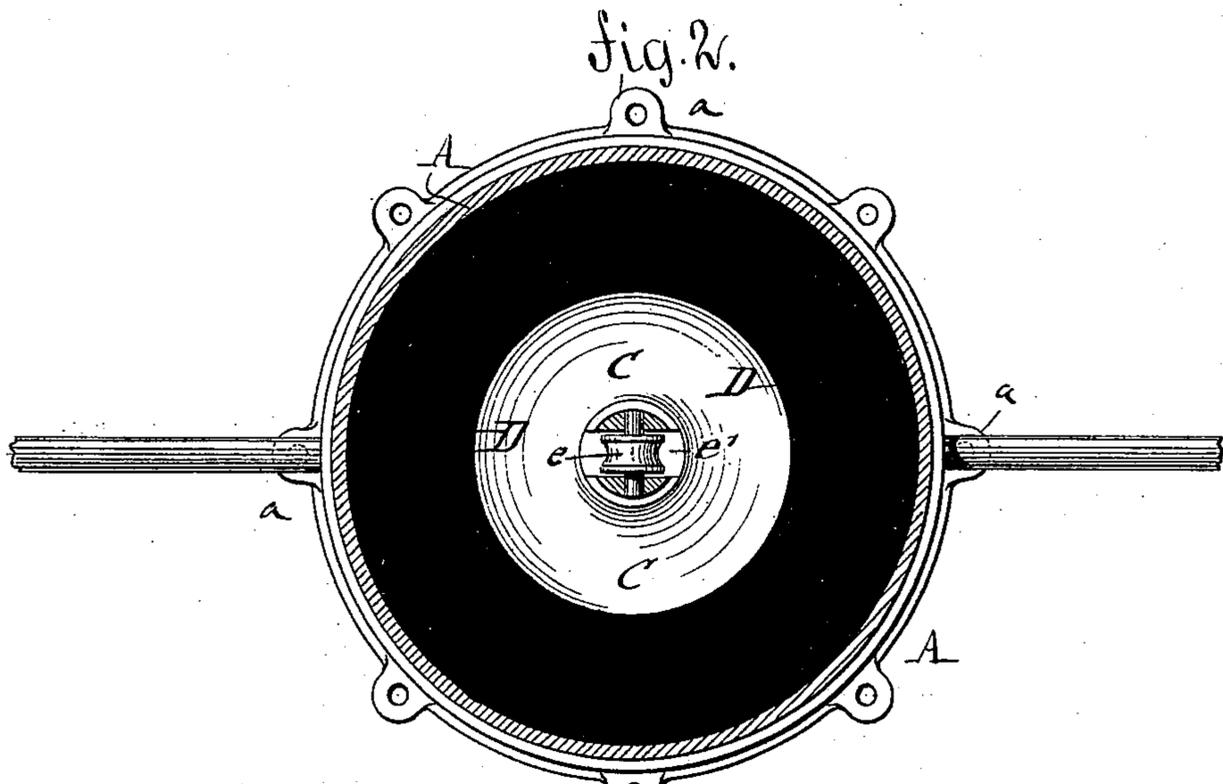
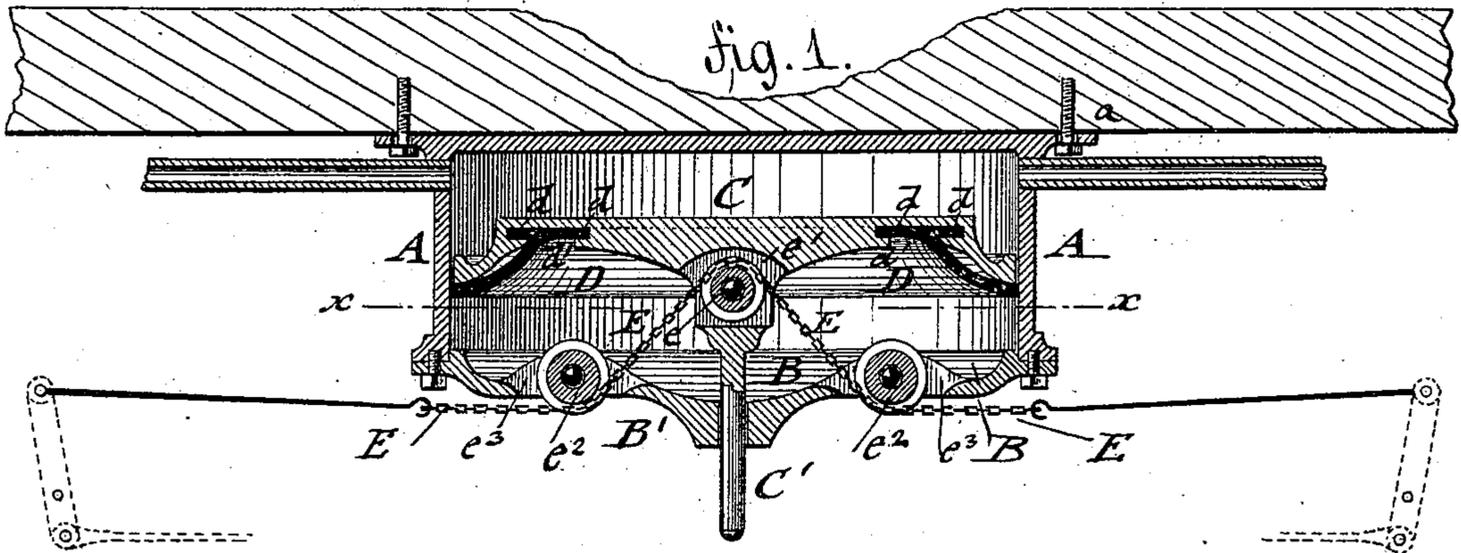
(No Model.)

L. P. LAWRENCE.

VACUUM CYLINDER FOR RAILWAY CAR BRAKES.

No. 300,877.

Patented June 24, 1884.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## VACUUM-CYLINDER FOR RAILWAY-CAR BRAKES.

SPECIFICATION forming part of Letters Patent No. 300,877, dated June 24, 1884.

Application filed February 27, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS P. LAWRENCE, of Passaic, county of Passaic, and State of New Jersey, have invented certain new and useful  
5 Improvements in Vacuum-Cylinders for Railway-Car Brakes, of which the following is a specification.

This invention has reference to an improved vacuum-cylinder for railway-car brakes, which  
10 is of simple and effective construction, and specially adapted for the equipment of freight-cars, to which vacuum-brakes were not applied heretofore, owing to the expense connected therewith.

The invention consists of a vacuum-cylinder attached to the bottom of the car-frame, and of a vertically-guided piston provided with a packing of peculiar construction. The piston is guided by a central stem in a central perforation of the detachable bottom of the cylinder, the bottom being provided with slots and guide-rollers for the connecting-chain of the brake-levers, which chain is passed over a third intermediate guide-roller that is  
20 located in a recessed hub of the piston, said recess being in line with the guide-rollers of the bottom.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section of my vacuum-cylinder for railway-car brakes. Fig. 2 is a bottom view of the same, partly in horizontal section on line *xx*, Fig. 1; and Fig. 3 is a bottom view of the vacuum-cylinder.

Similar letters of reference indicate corresponding parts.

A in the drawings represents a vacuum-cylinder, the head of which is applied by lugs *a a* and slots to the bottom of the car-frame, the side walls of the cylinder being cast integral with the head. The vacuum-cylinder A is closed at its lower end by a bottom, B, that is rigidly secured to the cylinder A. A piston, C, is tightly fitted by a ring-shaped rubber packing, D, to the interior of the cylinder, the packing D being attached by flanges  
45 *dd* into a circular recess, *d'*, at the under side of the piston C. The outer circumference of the piston C is made of downwardly-flaring shape, against which bears the packing-ring D. The packing-ring D is sprung by its

flanges *dd* into the recess *d'* of the piston, and is retained thereby rigidly without riveting or any other means of attachment. It may, therefore, be readily replaced at any time when worn out by use. The vacuum-cylinder A is  
55 connected to the air-ejector of the locomotive by connecting-pipes and intermediate pipe-couplings in the usual manner. When a vacuum is established in the cylinder A, the piston C is lifted by the pressure of the atmosphere. The packing-ring D is sucked tightly around the edge of the piston and against the side wall of the cylinder, so that the admission of atmospheric air is entirely prevented, and a high degree of vacuum is established  
65 in the cylinder. As soon as the vacuum is discontinued and atmospheric pressure established at both sides of the piston, the same glides easily downward without interference by the packing D. The piston C is provided with a central downwardly-extending stem, C', which is guided in a central perforation of the bottom B. A diametrical recess, *e'*, is arranged in a central hub of the piston C, said recess being of sufficient width to arrange  
75 therein a guide-roller, *e*. Equidistantly from the stem C' the cylinder-bottom B is provided with guide-rollers *e''*, which are arranged in slots of a diametrical re-enforcement of the bottom, and in line with the recess *e'* of the piston-hub. The chain E, which connects the brake-levers of the car-trucks, is passed from one brake-lever over one roller, *e''*, then over the intermediate roller, *e*, of the piston, then over the second guide-roller, *e''*, and to the opposite brake-lever, as shown clearly in Fig. 1. On establishing the vacuum in the cylinder A, the brake-levers are actuated and the brake-shoes applied to the car-wheels. As soon as the vacuum is discontinued, the piston is lowered by the gravity of the different parts, and the brakes thereby released without the use of springs. In this manner a very effective vacuum-cylinder for railway-car brakes is obtained, which is of quick and effective operation and of simple construction, so that it is not only adapted for the equipment of passenger-cars, but also to freight-cars, whereby the application of vacuum-brakes is considerably enlarged, and freight-trains brought,  
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in the same manner, within the full control of the engineer as passenger-trains equipped therewith.

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

1. The combination of a vacuum-cylinder applied to the car-bottom, a vertically-guided piston having a recessed hub and a guide-roller, and a cylinder-bottom having guide-rollers—one at each side of the guide-roller of the piston—for the passage of the chain connecting the brake-levers, substantially as and for the purpose set forth.

2. The combination of the vacuum-cylinder A, a vertically-guided piston, C, having a guide-stem, C', a packing-ring, D, applied to the recessed under side of the piston, and guide-rollers  $e$  and  $e^2 e^2$ , arranged in the hub of the piston and the bottom of the cylinder, and a brake-chain, E, passing over said rollers, substantially as set forth.

3. The combination of a vacuum-cylinder, A, a cylinder-bottom, B, having slots  $e^3$  and guide-rollers  $e^2 e^2$ , a vertically-guided piston, C, having a recessed hub, a guide-roller,  $e$ ,

the slots of the cylinder-bottom being in line with the recess of the piston-hub, and a brake-chain, E, passing over the guide-rollers  $e$  and  $e^2 e^2$ , substantially as and for the purpose set forth.

4. The combination of a vacuum-cylinder, a piston having a flaring circumference and a circular recess or seat, and an elastic packing-ring having flanges at the inner edge, that are sprung into the recess of the piston, substantially as set forth.

5. A piston for vacuum-cylinders of railway-car brakes, having a circular recess or seat, and being provided with an elastic packing-ring having flanges at the inner edge that are sprung into the recess of the piston, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

LOUIS P. LAWRENCE.

Witnesses:

WM. C. CLIFFORD,  
SIDNEY MANN.