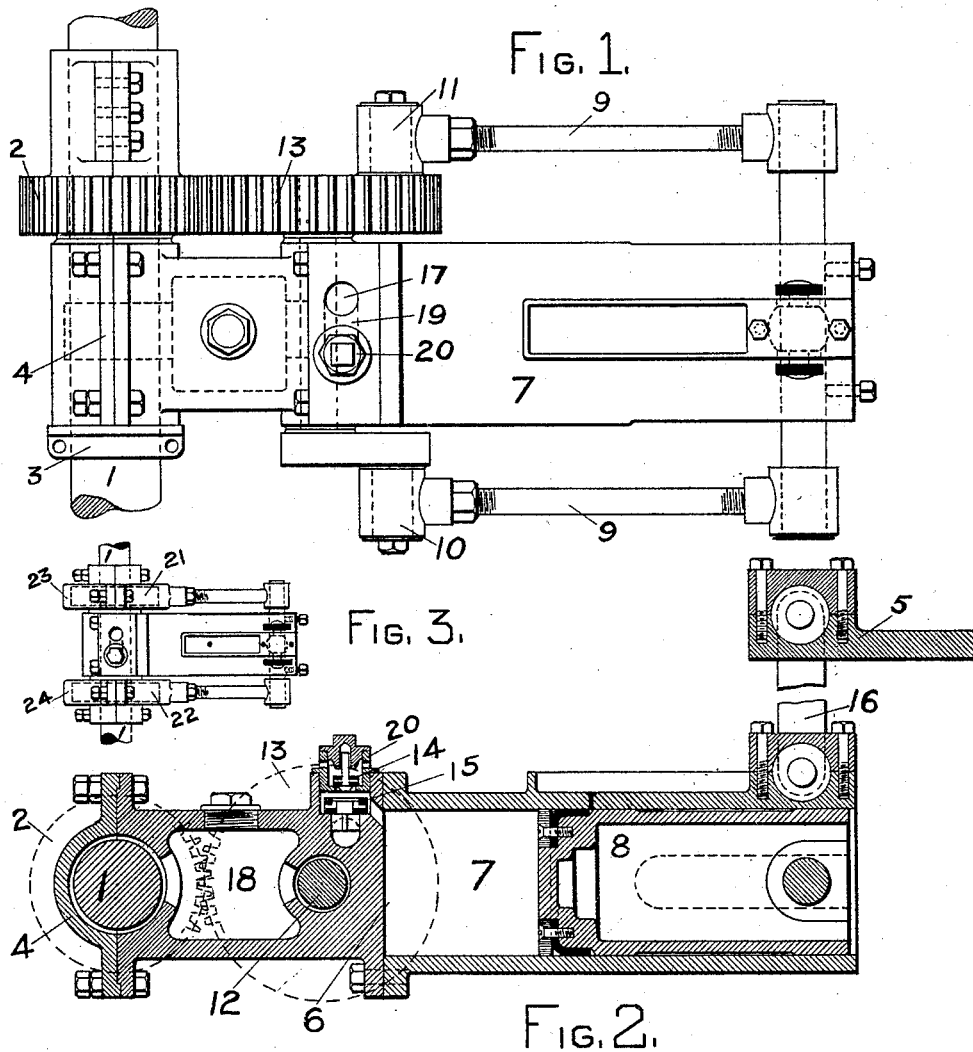


(No Model.)

A. P. MASSEY.
AIR PUMP.

No. 418,353.

Patented Dec. 31, 1889.



WITNESSES:

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AIR-PUMP.

SPECIFICATION forming part of Letters Patent No. 418,353, dated December 31, 1889.

Application filed September 16, 1889. Serial No. 324,153. (No model.)

To all whom it may concern:

Be it known that I, ALBERT P. MASSEY, a citizen of the United States, residing in the city of Watertown, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Air-Pumps, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to air-pumps attached to car-axles for the purpose of actuating brakes.

Figure 1 is a plan and Fig. 2 is a sectional view showing the relation of the pump to the axle when driven by gearing. Fig. 3 is a plan of same when driven by eccentrics.

In the drawings, 1 is a car-axle, which is rigidly attached to the wheels and revolves with them. 2 is a geared wheel keyed to said axle. 3 is a collar on said axle.

4 is a bearing in the cylinder-head, in which the axle is free to revolve. The outboard end of this bearing at 6 forms the head of pump-cylinder 7. The piston 8 is actuated in Figs. 1 and 2 by means of connecting-rods 9 and cranks 10 and 11. These cranks are in the same plane and are rigidly connected to shaft 12 and gear 13.

14 and 15 are valves.

16 is a link with universal joints at each end for attaching the outboard end of the pump to the car-frame by a suitable bracket 5. An oil-chamber 18 is arranged to oil both bearings in the cylinder-head.

21 and 22, Fig. 3, are eccentrics attached rigidly to the axle with their centers in the same plane.

23 and 24 are eccentric-straps, which actuate the piston through connecting-rods and a cross-head. The valves and cylinder are the same as shown in Fig. 2.

The various portions that go on the car-axle are made in halves, in order that they may be attached without removing the wheels.

I am aware that there are various designs of air-pumps driven by car-axles; but I have endeavored to overcome the difficulties under which they work. The end-play and vertical motion between the axle and the body of the car necessary for the action of the springs are very detrimental to the action of

an air-pump when the cylinder is attached to the truck or car-body and the piston is driven from the axle. In such a case the clearance between the piston and head has to be very large, enough so to allow for the extremes in variation between the axle and the point to which the cylinder is attached. In my invention the cylinder is attached to the axle in such a way that it partakes of every motion of the axle except to revolve with it, and is attached to the car or truck by universal joints, which leave it free to follow the motion of the axle. By this means the moving parts of the pump are always kept in line and the piston travels to the same point in the cylinder at every stroke. It can therefore be set with just sufficient clearance to prevent touching.

The valves seat by gravity and are placed in a single chamber in the cylinder-head, so that both may be removed by unscrewing one plug. As shown, they are designed for a vacuum-pump. The port 17 is to be connected by a flexible hose to a reservoir on the car. The outward movement of the piston would draw air from the reservoir through 17 19 and valve 15 into cylinder 7. The return motion would expel the air from cylinder 7 through valve 14 and the openings in 20 to the atmosphere. If used for compressing air, the hose should be connected to chamber 20, so that the air from the cylinder would be discharged into the reservoir. No other change would be needed.

What I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a car-axle, an air-pump cylinder having a bearing for the axle through the cylinder-head and connected at the outboard end to another part of the car by a link with universal joints, substantially as set forth.

2. In combination with a car-axle, an air-pump cylinder, a piston and cross-head, two connecting-rods, two cranks on one shaft in the same plane, a geared wheel on said crank-shaft, and a geared wheel keyed to said axle, substantially as set forth.

3. In combination with a car-axle, an air-pump cylinder having a bearing for the axle through the cylinder-head and connected at

the outboard end to another part of the car by a link with universal joints, the piston of the pump connected to be operated by the rotation of the axle, substantially as set forth.

- 5 4. In combination with a car-axle, an air-pump cylinder having a bearing for the axle through the cylinder-head and connected at the outboard end to another part of the car by a link with universal joints, and induction and eduction valves in said cylinder-head, substantially as set forth.
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In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 3d day of September; A. D. 1889.

ALBERT P. MASSEY.

Witnesses:

HENRY W. BOYER,
MICHAEL J. MORKIN.