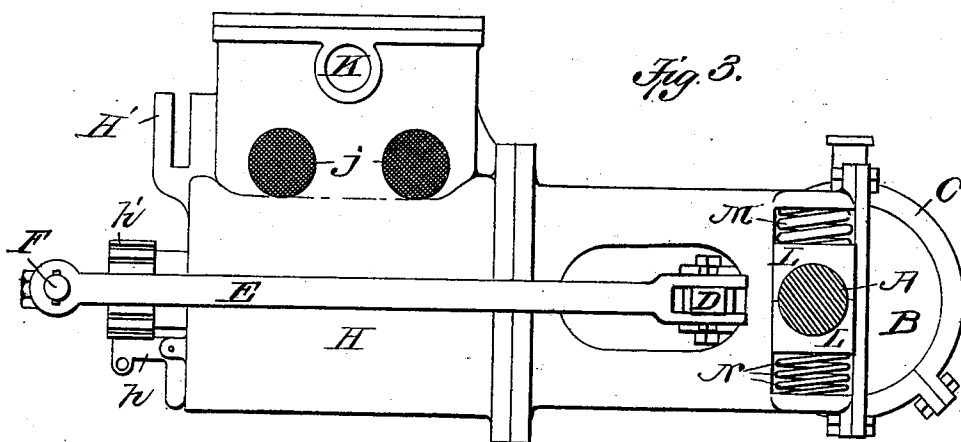
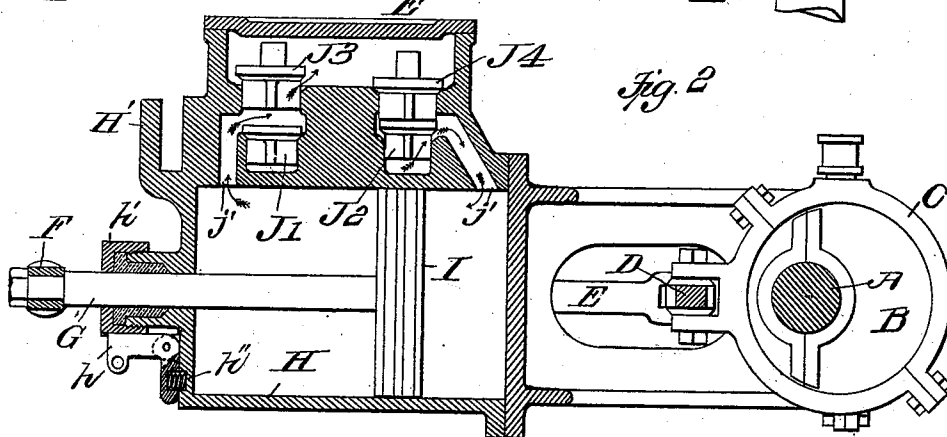
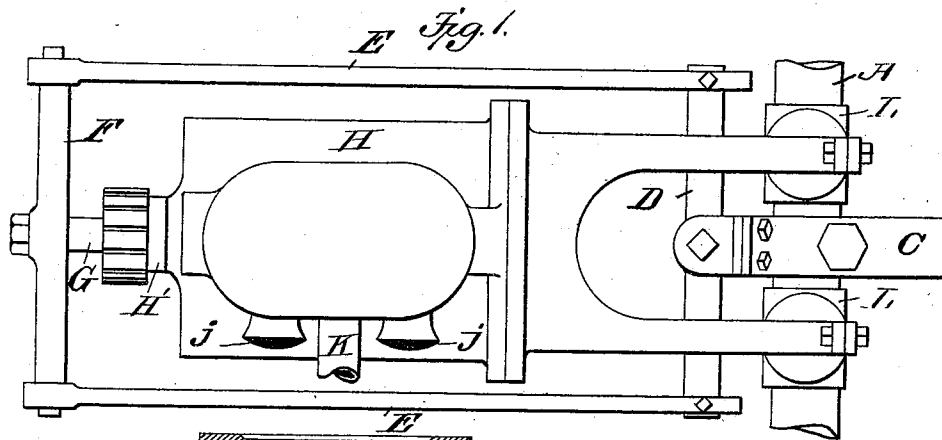


(No Model.)

W. C. WHITACRE.
AIR PUMP.

No. 544,473.

Patented Aug. 13, 1895.



Witnesses
J. R. Cornwall
Hugh H. Wagner.

In witness whereof
 Wm. C. Whitacre
 by Paul Baskewell
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UNITED STATES PATENT OFFICE.

WILLIAM C. WHITACRE, OF ST. LOUIS, MISSOURI.

AIR-PUMP.

SPECIFICATION forming part of Letters Patent No. 544,473, dated August 13, 1895.

Application filed October 18, 1894. Serial No. 526,240. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. WHITACRE, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a new and useful Improvement in Air-Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, wherein—

Figure 1 is a top plan view of my improved pump. Fig. 2 is a vertical longitudinal sectional view, and Fig. 3 is a side elevational view.

This invention relates to a new and useful improvement in air-pumps of that class which are especially adapted for use of street-cars to furnish power, in the form of compressed air, to operate the brake mechanism.

The objects of this invention are to provide a pump of the class described which may be operated from the car-axle, one whose operation will not be materially affected by the vibration of the axle upon which it is mounted, and one which is simple, compact, easily applied, and which will occupy but small space.

With these objects in view the invention consists essentially in the peculiar manner of mounting the pump on the axle, whereby the vibration of the axle will be absorbed before it is communicated to the piston and rod, as will hereinafter be described, and afterward pointed out in the claims.

In the drawings, A indicates the car-axle, upon which is clamped or otherwise secured an eccentric B.

C is the eccentric strap, preferably made in two pieces, for obvious reasons, which strap has means provided for the pivotal attachment of a beam or cross-head D. Pivotally connected to the ends of this cross-head D are two links E, which extend forward and are pivoted at their forward or opposite ends upon the piston-rod cross-head F, which cross-head F is secured to the outer end of piston-rod G.

From the above connections between the axle and piston-rod G it will be seen that any side play or lateral movement between the axle and cylinder will be taken up by the pivotal connection between the cross-head D and links E, while vertical motion of either

of the parts will be compensated for by the pivotal connection between the links E and the piston-rod cross-head F.

H indicates the pump-cylinder, in which is a plunger or piston I on the end of piston-rod G. Suitable packing is provided for this rod, and in order to preserve intactness I arrange on the end of the cylinder a pivoted angle-lever *h*, which engages in notches on the packing-nut *h'* and holds the same in position, said angle-lever being held to its work by the impelling force of a spring *h''*, seated beneath its depending member.

The valve mechanism of the pump is located in juxtaposition to the cylinder H, and may be said to consist, preferably, of four valves *J'*, *J²*, *J³*, and *J⁴*.

Leading to the chambers beneath the valves *J'* and *J²* are inlet-ports, the mouths of which are preferably covered by wire-gauze *j* to prevent as much as possible the passage of foreign particles in the form of dirt, cinders, dust, &c., into the pump. These valves *J'* and *J²* are inwardly-opening valves, and located thereabove or beyond said valves are ports *j'*, leading to each end of the cylinder H. Ports *j'* act as inlet and exit passages to each end of cylinder H, and when used as exit-passages, as illustrated to the left of Fig. 2, lead beneath the valves *J³* and *J⁴*, which are located relative to the ports *j'* opposite the valves *J'* and *J²*.

The operation of the valves of the pump will be clearly understood by reference to Fig. 2, where, assuming the piston is just commencing its out-stroke to the left, it will seat valve *J⁴* and suck in air through the right-hand port *j'*, valve *J²* rising to permit this. The air in the outer or left-hand end of the cylinder will seat valve *J'*, and raising valve *J³* will force the air into the chamber located beyond the valves *J³* and *J⁴*, whence the air will be conducted by pipe K into a suitable reservoir, ready to be drawn upon as needed. The inner end of the cylinder H is closed by a head, upon which are formed bracket extensions straddling the eccentric and its connections and forming substantially a housing therefor. These bracket-extensions are mounted upon the car-axle, and in this manner the cylinder may be said to be pivotally mounted on the axle, in order that lost play

in the connections between the eccentric and piston-rod may be avoided. I prefer in some instances, however, to yieldingly support these brackets on the axle, and to accomplish
 5 this arrange on the axle two split boxes L, which are slidably mounted in vertical ways formed in the bracket extensions, between which boxes and bracket extensions are arranged springs M and N, the former being a
 10 compression-spring to sustain the weight of the inner end of the cylinder and its associate parts and the latter being a buffer-spring to prevent the boxes or springs M being displaced and at the same time absorbing any
 15 shock or jar which might otherwise be communicated to the bracket extensions, due to the sudden drop or fall of the axle. The cylinder is supported at its opposite or free end in any suitable manner, but is preferably
 20 yieldingly suspended from a cross-bar on the truck-frame, which is not shown in the drawings. Suitable connection between the outer end of the cylinder and its support can be made through the medium of lug H', which
 25 is preferably arranged transversely to permit lateral movement of the cylinder without cramping.

It will be noted from the above that when the car is moving the eccentric will be revolved with the axle and communicate a reciprocating movement to the cross-head D, which in turn transmits such motion to the piston and its rod through the links E and the piston-rod cross-head F. On the reciprocation
 30 of the piston the air will be pumped through pipe K into a suitable receiver or reservoir, which is provided with an escape-valve to keep the pressure within certain limits. Any shock or jar due to the axle-wheels running
 35 over irregularities in the track will not be communicated to the cylinder, because of the interposition of the springs M and N and the pivotal connections between the eccentric and piston-rod. Lateral movement of the axle is
 40 permitted to a slight degree, but such move-

ment has no direct effect on the cylinder or piston-rod connections by reason of the pivotal connections between the cross-head D and the links E. Virtually there are no direct connections between the axle and piston-rod, and any movement of the axle which might be detrimental to the workings of the pump is counteracted in the manner heretofore described.

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

1. In an air-pump the combination with a car-axle, of an eccentric mounted thereon, a cross-head D which is pivoted to the eccentric links E which are pivotally connected to the ends of the cross-head, the cross-head F pivoted in the opposite end of links E, a piston rod having a piston, which rod is mounted in the cross-head F, and a cylinder in which the piston operates, said cylinder having bracket-extensions which are yieldingly and pivotally mounted on the car-axle, substantially as described.

2. In an air pump for railway cars, the combination with the pump cylinder, of bracket extensions thereon, a truck axle which is embraced by said extensions, and springs interposed between the extensions and axle, substantially as described.

3. In an air pump for railway cars, the combination with the pump cylinder, of bracket extensions thereon, which extensions are formed with ways in their ends, a truck axle, boxes on said axle which move in said ways, and springs M and N interposed between the bracket extensions and boxes, substantially as described.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 13th day of October, 1894.

WILLIAM C. WHITACRE.

Witnesses:

F. R. CORNWALL,
 HUGH K. WAGNER.