

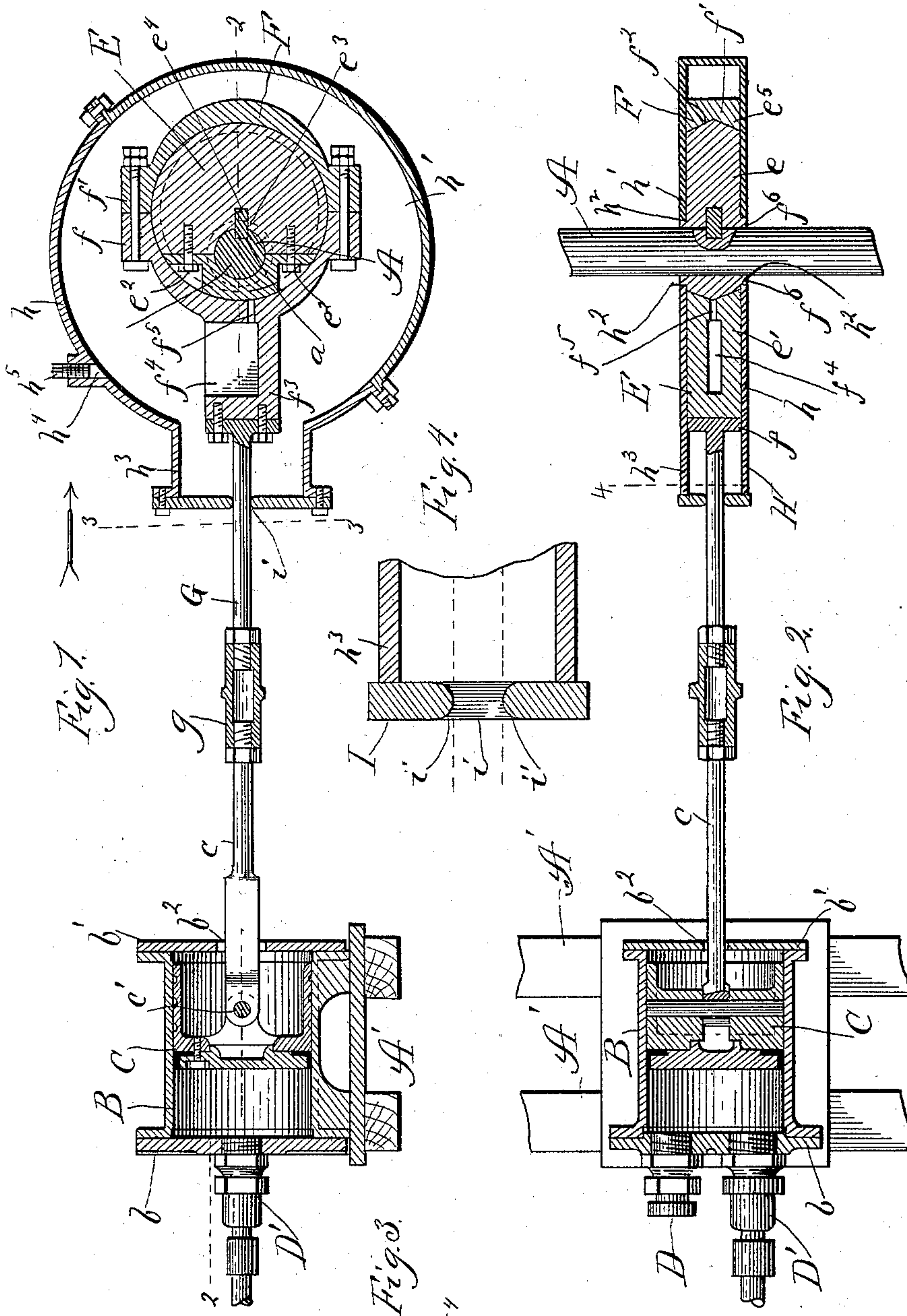
No. 612,963.

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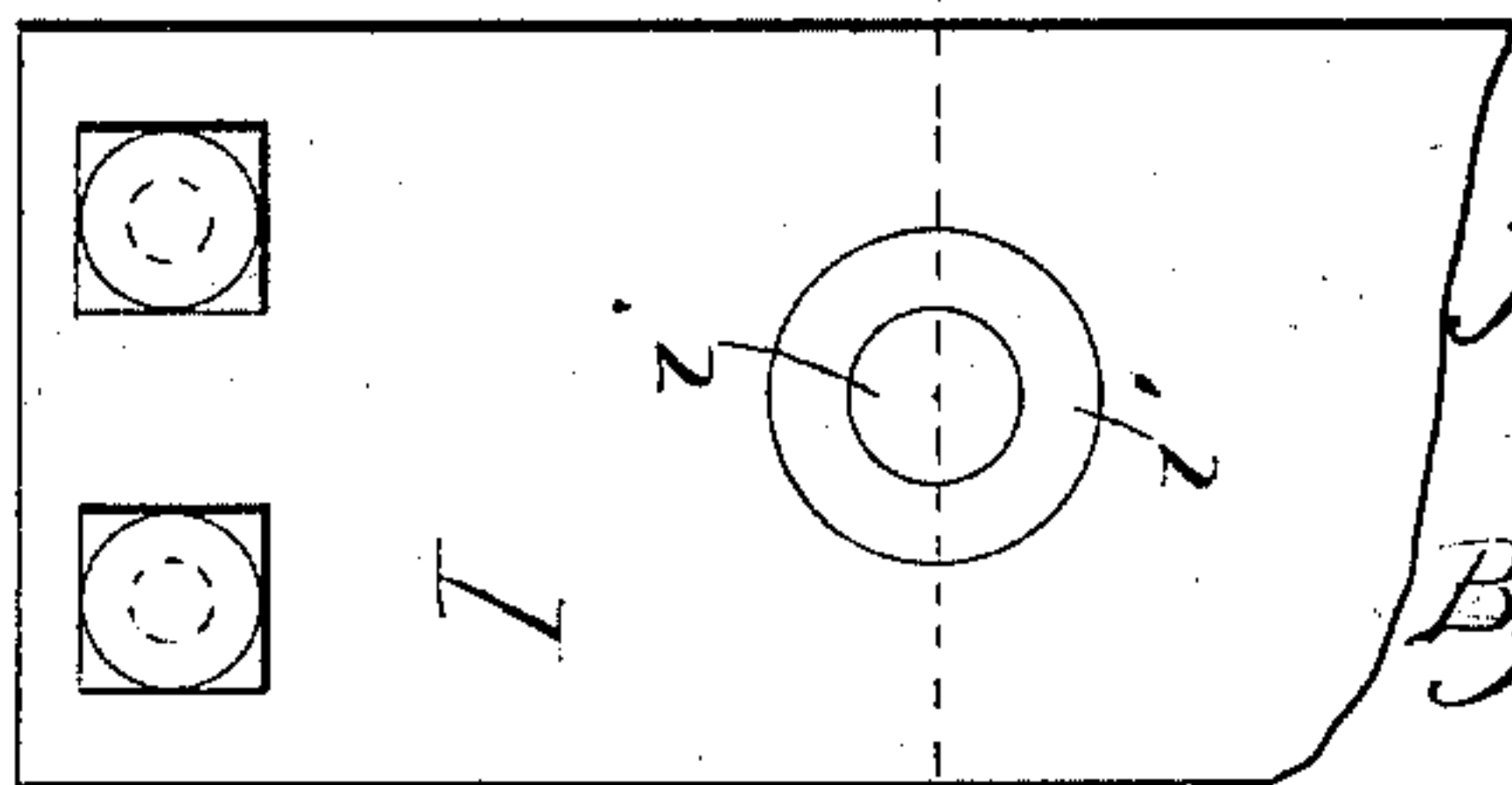
N. A. CHRISTENSEN.
AIR BRAKE PUMP.

(Application filed Apr. 18, 1893.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

NIELS ANTON CHRISTENSEN, OF CHICAGO, ILLINOIS.

AIR-BRAKE PUMP.

SPECIFICATION forming part of Letters Patent No. 612,963, dated October 25, 1898.

Application filed April 18, 1893. Serial No. 470,816. (No model.)

To all whom it may concern:

Be it known that I, NIELS ANTON CHRISTENSEN, a subject of the King of Denmark, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Air-Brake Pumps, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical longitudinal section through the pump and its operating devices on a car constructed in accordance with my present invention; Fig. 2, a plan section of the same, taken on the line 2 2 of Fig. 1; Fig. 3, a detail elevation of the front plate at the forward end of the eccentric-casing, partly broken away and with the eccentric-rod removed; and Fig. 4, a detail plan section of the same, taken on the line 4 4 of Fig. 3.

In the drawings, Figs. 1 and 2 are upon one scale and Figs. 3 and 4 upon another and enlarged scale.

My invention relates to air-brake apparatus designed for use upon street-railway cars on the same general plan as shown and described in my prior patent, No. 534,813, issued February 26, 1895. In general features the mechanism is the same as in the said patent, and the present invention may be said to be an improvement upon the construction of certain parts of the apparatus therein shown and described.

The present invention relates especially to the pump and the devices whereby it is operated directly from one of the axles of the car to which the apparatus is applied; and I will now describe in detail the construction and operation of so much of the apparatus as is necessary to an understanding of my present invention and will then point out more definitely in the claim the improvements which I believe to be new and wish to secure by Letters Patent.

In my prior patent the pump is operated by an eccentric on one of the car-axles, and this eccentric is inclosed by a casing mounted on the axle and secured in a fixed position, and the cylinder of the air-pump is made a part of this casing, being formed by projecting the latter at one end or one side of the axle. In my present invention I separate the said pump-cylinder from the casing, making it a part by

itself and mounting it independently of the casing, while the casing itself is mounted on the axle, substantially as in my said prior patent, but is not secured to the car by any additional device, being left free to vibrate as required about the bearings upon which it is mounted.

In the drawings, A represents one of the axles of a car to which the apparatus is to be applied, and A' the transverse bars or sills of a truck-frame, which in a well-known construction of truck are arranged between the two truck-axles. The cylinder B of the air-pump is mounted upon these cross-sills, as shown in the drawings, though it may be mounted or supported in any other suitable and convenient way by any part of the truck-frame, provided it is firmly fixed in a stationary position. This cylinder, however, is made in a separate piece and is mounted separately from the other parts of the mechanism. The pump-piston C is fitted to the cylinder and may be of any suitable construction. The back cap or head b of the cylinder also carries a suction-valve case D and a discharge-valve case D', the latter being connected up with the air-reservoir. These parts may be of the same construction shown and described in my said prior patent; but as they form no part of my present invention it is not necessary that they be shown and described in detail in the present case.

The front cap or head b' of the cylinder is of ordinary construction and is provided with a central aperture b² for the piston rod or stem c, this aperture being elongated vertically somewhat to provide for vibration of the piston-rod. The eccentric E is fastened to the axle A in any suitable way, and, as shown in the drawings, this eccentric is made in two parts e e', which inclose the axle and are secured together by screw-bolts e². The section e is provided with a small socket e³ on its inside face, in which a pin e⁴ is set, the other end of which finds a seat in a corresponding recess a in the axle, so that when the two parts of the eccentric are secured together this pin serves as a stop to prevent lateral movement thereof on the axle. The surface or face e⁵ of this eccentric, as shown in the drawings, is beveled on each edge, thus producing a face of inverted-V shape. An

eccentric-strap F is applied to this eccentric in the usual way. This is made in two parts $f f'$, adapted to inclose the eccentric, and is secured together around the same by suitable bolts, as seen in Fig. 1. The inner surface of the strap is V-shaped, as seen at f^2 in Fig. 2, thereby adapting it to fit the face of the eccentric. The section f of the strap has an arm f^3 extending forward in front thereof, and to this arm is secured the eccentric-rod G, which extends outward toward the cylinder, which is placed in line with the eccentric, and this eccentric-rod and the piston-rod c are connected together between the pump-cylinder and the eccentric by a turnbuckle g , which provides for the proper adjustment of the two parts. The piston-rod c is hinged to the piston, as seen at c' , so as to provide for a slight independent vibration of the said rod. The projecting arm f^3 is provided with a recess f^4 , sunk in its upper face, which serves as a receptacle for a lubricant, and the latter finds its way to the eccentric by means of a port f^5 , passing through the strap-section f from the lubricant-receptacle to the surface of the eccentric. On each side of the eccentric there is a slightly-projecting collar f^6 , extending a little beyond the side surfaces of the eccentric and forming a narrow sleeve-hub around the axle. A circular case H is constructed of such size and shape as to be adapted to entirely surround and inclose the eccentric and its strap. This case is circular in general contour and of a width a little greater than the thickness of the eccentric and is made in two parts $h h'$, adapted to be secured together by an ordinary bolt-fastening, as seen in Fig. 1. The case is provided with a circular opening h^2 in each side, which is adapted to receive the respective sleeve-hubs on the sides of the eccentric, which hubs therefore make a bearing for the case. The front portion h of this case is provided with a tubular projection h^3 , extending slightly outward in front thereof toward the pump-cylinder. This projection is closed by a cap-piece I, which thereby closes the case; but the cap is provided with a central aperture i for the accommodation of the eccentric-rod, which passes out through the same. The edges of the cap around this aperture are rounded or convex, as seen at i' in Figs. 1 and 4 of the drawings, for the purpose of accommodating the slight vertical movement of the eccentric-rod, as will be described presently. It will be seen from this description that the case H has no support except on its bearings at the axle and at the point where the eccentric-rod passes out through the cap. Obviously the case is therefore free to turn upon its bearings except as restrained by the eccentric-rod, which supports it at the front. If then there is any vertical movement of this rod, the case will turn on its bearings to accommodate the motion. In the upper part of the casing there is an opening h^4 just over

the recess in the upper part of the eccentric-rod. This opening is to provide for the introduction of the lubricant to its receptacle and is closed by a suitable screw-plug h^5 .

The air-pump is operated for supplying and compressing air into the reservoir by the revolution of the eccentric on one of the axles when the car is in motion. It is obvious that whenever the car is moved along its track the turning of the axle A by the traction of its wheels on the track will revolve the eccentric E, thereby giving a reciprocal movement to the eccentric-rod and pump piston-rod, whereby a similar movement is imparted to the piston and the usual action of the pump follows; but in this operation there will be, of course, a slight vertical movement of the eccentric-rod. This would not be possible if the case was fixed in position and the opening in the cap, through which the eccentric-rod passes, fitted the latter closely, as described and shown; but inasmuch as the case is not fixed in position, but is free to turn on its bearings, it accommodates this vertical movement of the rod by following the same at its front end where it rests on the rod, the case oscillating on its bearings for this purpose. The rounding of the edges about the opening in the cap through which the eccentric-rod passes facilitates this movement without strain, as obviously there will be a slight change in the relation of these two parts during the vertical movement of the rod which would result in a slight binding if the said edges were perfectly straight. The hinging of the piston-rod to the piston and the elongation of the slot in the cylinder-head through which the piston-rod passes are obviously features of construction necessary to accommodate the movement of the eccentric-rod just described. The turnbuckle connecting the two rods provides for the proper adjustment of the same lengthwise to give the required position and throw of the piston in its cylinder.

It will be seen that the operative parts attached to the axle of the car are all separable, so that they may be readily attached to the axle of any car and may at any time be detached easily from the axle to which they have been applied, the casing being supported entirely on its bearings at the axle and on the eccentric-rod and having no necessary connection with any other part of the car.

Changes may be made in the construction and arrangement of some of the parts here shown and described, and therefore I do not wish to be understood as limiting myself to the special details of the devices which have been set forth above and are shown in the drawings.

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

In an air-brake apparatus for cars, the air-pump cylinder B and piston C, in combina-

tion with the eccentric E fixed on one of the
car-axles; the eccentric-strap F applied there-
to; the eccentric-rod G; the piston-rod c, con-
nected at one end to the eccentric-rod and
5 the other end pivoted to the piston; the cyl-
inder-head b' provided with elongated slot b²
for the piston-rod; and the case H provided

with a cap I having an aperture i through
which the eccentric-rod passes.

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Witnesses:

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