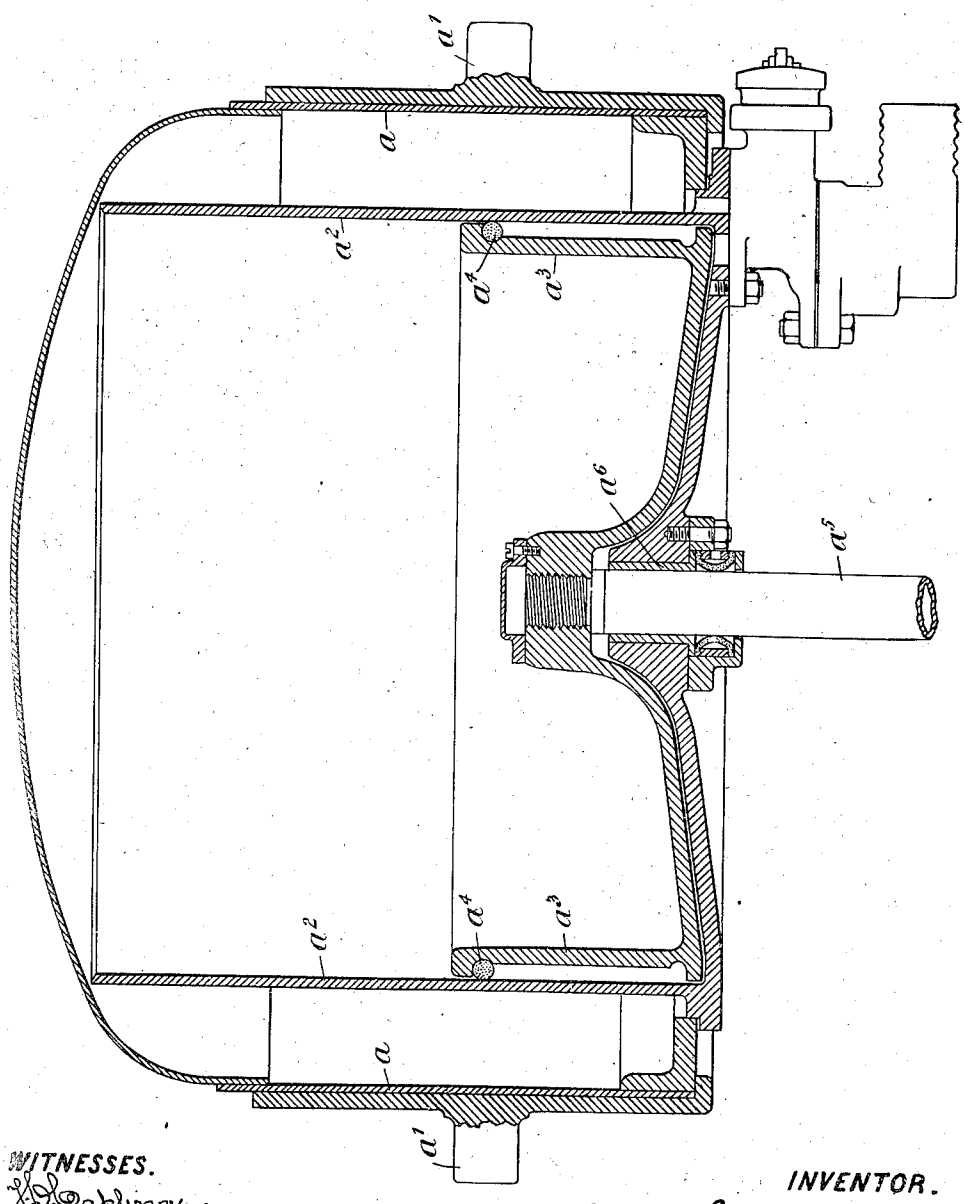
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J. GRESHAM.

ROD PACKING FOR VACUUM RAILWAY BRAKES.

No. 417,321. Patented Dec. 17, 1889.

FIG. 1.



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FIG. 2.

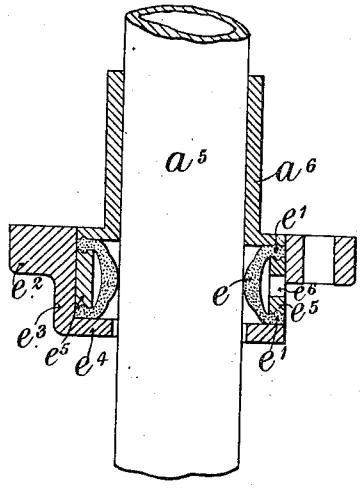
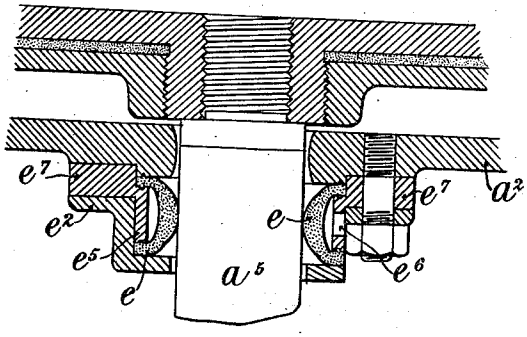


FIG. 3.



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UNITED STATES PATENT OFFICE.

JAMES GRESHAM, OF MANCHESTER, COUNTY OF LANCASTER, ASSIGNOR TO THE VACUUM BRAKE COMPANY, (LIMITED,) OF LONDON, ENGLAND.

ROD-PACKING FOR VACUUM RAILWAY-BRAKES.

SPECIFICATION forming part of Letters Patent No. 417,321, dated December 17, 1889.

Application filed January 5, 1889. Serial No. 295,536. (No model.) Patented in England April 28, 1888, No. 6,320.

To all whom it may concern:

Be it known that I, JAMES GRESHAM, a subject of the Queen of Great Britain and Ireland, of the firm of Gresham & Craven, engineers and machinists, of Craven Iron Works, Salford, Manchester, in the county of Lancaster, England, have invented a new and useful Improved Rod-Packing for Vacuum Railway-Brakes, (for which Letters Patent have been granted in Great Britain, to bear date April 28, 1888, No. 6,320,) of which the following is a specification.

This invention relates to means for packing the piston or brake rod of vacuum automatic brake apparatus; and it consists in the employment of a flexible packing-ring of peculiar form, hereinafter more particularly described, and adapted for automatic action, the pressure of the external air operating to force the working-face of the packing against the surface of the rod and to maintain the same in contact therewith, thus preventing leakage of air to the under side of the brake-piston when a vacuum is formed on that side of the piston for the purpose of holding the brakes "off."

In order that my improvements may be fully understood, I will proceed to describe the same with reference to the accompanying drawings, whereof—

Figure 1 is a vertical section of a brake-cylinder, showing the application of my invention thereto, Figs. 2 and 3 being vertical sections to an enlarged scale, illustrating the application of my improved packing to the piston or brake rod of vacuum-brake apparatus.

Similar letters of reference are employed in all the figures to indicate corresponding parts so far as they appear.

a is the vacuum-chamber provided with trunnions *a'*.

a^2 is the brake-cylinder arranged within the chamber *a*.

a^3 is the piston furnished with a rolling packing-ring a^4 and a piston-rod a^5, to which the lever for actuating the brake rods and blocks is connected.

The parts above referred to by reference-letters are ordinary and well-known parts appertaining to vacuum-brake apparatus.

The piston-rod a^5 passes through a bush a^6, this bush being fitted in the end of the brake-cylinder a^2, as shown in Fig. 1.

The packing-ring *e* is composed of india-rubber or other suitable elastic material, and in cross-section is of the form represented in Fig. 2, the edges of the ring terminating in two flanges e' e', whereof one bears upon the face of the bush a^6, while the other is held by a skeleton cap or plate e^2. The cap e^2 is secured by means of a flange and bolts to the end of the cylinder a^2, and has arms e^3, carrying its disk-shaped end e^4.

Between the flanges e' of the elastic ring *e* is inserted a metal ring e^5, provided with holes e^6, a cavity being formed at the back of the ring *e*, to which the atmosphere has access through the holes e^6. When a partial vacuum is formed in the brake-cylinder, the differential pressure of the atmosphere upon the back of the elastic packing-ring *e* presses the latter against the surface of the piston-rod a^5. Grooves are cut in the two edges of the metal ring e^5 and in the face of the bush a^6, into which the material whereof the elastic ring is composed is forced when the bolts whereby the cap e^4 is secured are tightened, air-tight joints between these parts being thus insured. This improved packing-gland permits the piston-rod a^5 to move laterally to a slight extent.

In Fig. 3 is illustrated a similar construction of packing to that described with reference to Fig. 2, the metal ring e^5 being, however, subtended by a flange e^7, which is held between the cap e^2 and the face of the brake-cylinder a^2, both the cap e^2 and ring e^5 being secured to the cylinder a^2 by means of the same studs. According to this modification the bush a^6, embodied in the construction represented in Fig. 2, is dispensed with, and greater freedom for lateral play is permitted to the rod a^5, the construction being thus rendered applicable for use with a fixed instead of an oscillating brake-cylinder, or when a diaphragm is employed instead of a piston.

I prefer to give to the cross-section of the

packing-ring *e* the concavo-convex form seen in the drawings, the inner face bearing on the rod a^5.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination, with a brake-piston rod or diaphragm-rod, of a packing actuated by atmospheric pressure and comprising a skeleton cap or frame secured to the brake-cylinder, and a ring of flexible material having a flange at each end and arranged next the rod, each of the flanges on the flexible ring being secured between annular surfaces within the cap or frame, substantially as and for the purposes set forth.

2. The combination, with a brake-piston rod or diaphragm-rod, of a skeleton cap or frame secured to the brake-cylinder and surrounding said rod, a ring of flexible material having two flanges and arranged next the rod, and a rigid perforated ring located outside the flexible ring and in contact with both the flanges thereon, the rigid ring serving to hold each extremity of the flexible ring in place and containing perforations to enable the atmosphere to act on the flexible ring, substantially as and for the purposes set forth.

3. In a vacuum railway-brake, the combination, with the packing-ring *e*, having its inner face rounded, of a perforated ring e^5 and an inclosing-cap or frame-work e^2, bolted to the brake-cylinder a^2, substantially as set forth.

4. The combination, with the cylinder a^2, provided with a flanged bush a^6, through which the piston-rod plays, the skeleton cap e^2, secured to the end of the cylinder a^2, and the perforated ring e^5, of the packing-ring *e*, provided with outwardly-projecting marginal flanges *e'*, the said flanges being clamped one between the ring e^5 and the bush and the other between said ring and the skeleton cap, substantially as set forth.

JAMES GRESHAM.

Witnesses:
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Solicitor, Manchester.
JOSEPH WIMLANLEY,
His clerk.