Nov. 1, 1938. C. C. FARMER 2,135,251

SEALING AND LUBRICATING DEVICE

Filed Aug. 24, 1935

Fig. 1.

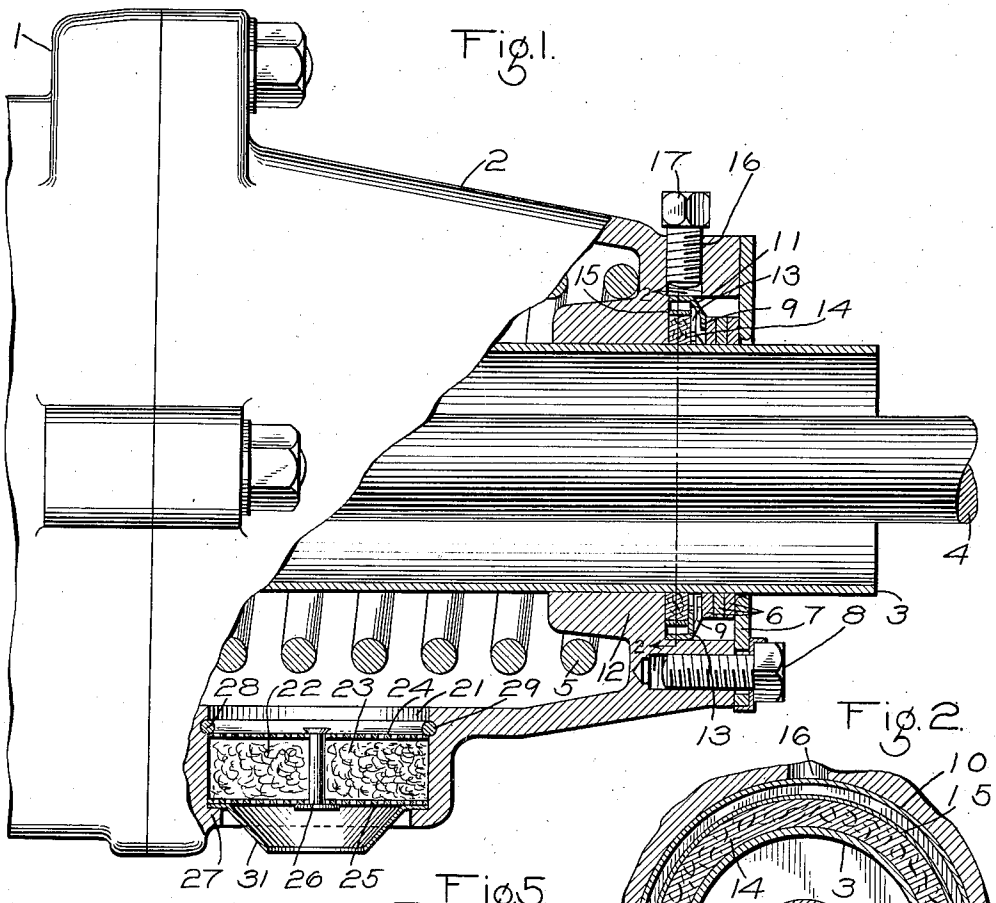


Fig. 2.

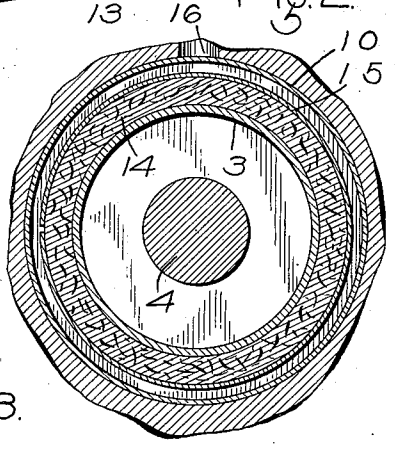


Fig. 5.

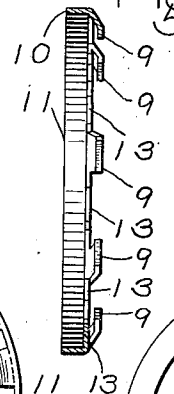


Fig. 4.

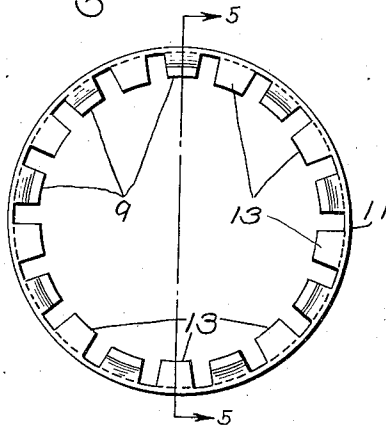
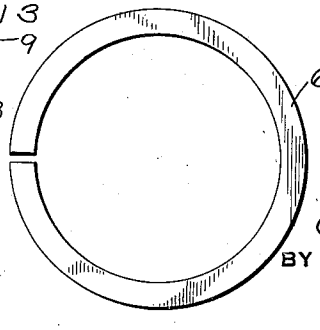


Fig. 3.



INVENTOR
CLYDE C. FARMER
BY Wm. M. Leady
ATTORNEY

Patented Nov. 1, 1938 2,135,251

UNITED STATES PATENT OFFICE

2,135,251

SEALING AND LUBRICATING DEVICE

Clyde C. Farmer, Pittsburgh, Pa., assignor to The Westinghouse Air Brake Company, Wilmerding, Pa., a corporation of Pennsylvania

Application August 24, 1935, Serial No. 37,707

8 Claims. (Cl. 286—27)

This invention relates to brake cylinders such as are employed on railway vehicles for controlling the brakes by fluid under pressure, and has for an object the provision of means for preventing water, snow, and dirt or other foreign matter from entering the non-pressure end of the brake cylinder.

A further object of the invention is the provision of an air strainer and ring type dust protector and lubricating means for lubricating the dust protecting ring.

Other objects and advantages of the invention will appear from the following description of a preferred embodiment thereof taken together with the accompanying drawing.

In the drawing

Fig. 1 is a view of the non-pressure end of the brake cylinder with parts broken away to show the outer portion of the non-pressure head in section.

Fig. 2 is a sectional view taken along the line 2—2 in Fig. 1,

Fig. 3 is a side view of one of the protector rings,

Fig. 4 is a side view of the swab retaining ring, and

Fig. 5 is a sectional view through line 5—5 of Fig. 4.

Referring to the drawing, and more particularly to Fig. 1 thereof, a brake cylinder 1 is illustrated having a non-pressure head 2, the brake cylinder containing a piston (not shown) the stem of which terminates in the form of a hollow piston rod or sleeve 3 that extends outwardly through the non-pressure end of the cylinder in a well known manner. A solid piston rod, or push rod, 4 is positioned within the sleeve and is forced to the right by the piston when fluid under pressure is supplied to the pressure end of the brake cylinder. A spring 5 is provided for biasing the piston and the sleeve 3 to the left.

In order to prevent the entrance of dirt or foreign material from the atmosphere into the non-pressure end of the brake cylinder around the piston sleeve the non-pressure head is fitted with metallic packing rings, or protector rings 6 which are designed to form a seal against atmospheric dirt. The protector rings 6 are preferably of the split ring type as shown in Fig. 3, and are applied about the sleeve 3 so as to provide a snug sliding fit on the sleeve.

The protector rings are held against outward movement by a protector ring retaining plate 7 which engages the outer side of the outer ring and is secured to the non-pressure head by bolts 8, one only of which is shown in the sectional view. The protector rings are held against inward movement by alternate projections or lugs 9 of a swab retaining ring 11, which projections extend inwardly from a cylindrical body portion 10 as best shown in Figs. 4 and 5. The inner ends of the lugs 9 extend axially from the body portion and yieldingly engage the inner face of the inner protector ring. The swab retaining ring 11 abuts against a shoulder 12 on the non-pressure head, and, in addition to the lugs 9, is also provided with inwardly extending lugs 13 equally spaced about the ring and positioned alternately with respect to the lugs 9. The lugs 13 are bent substantially at right angles to the outer rim or body portion 10 of the member 11 to provide fingers for retaining a lubricant distributing ring or lubricating swab 14 which may be in the form of a felt oil retaining ring positioned adjacent to the shoulder 12 and in contact with the sleeve 3. An outer cylindrical ring 15 is provided surrounding the oiling ring 14 and forming a protecting covering therefor.

A tapped opening 16 is provided in the non-pressure head to provide means for introducing lubricant into the chamber formed between the shoulder 12 and the protector ring retaining plate 7, for lubricating the piston sleeve and packing rings. A screw-threaded plug 17 is provided for closing the tapped opening 16. The wick action of the felt swab prevents the outflow of oil from the packing ring chamber by becoming saturated with lubricant, and lubricates the piston rod or sleeve with each application and release movement of the piston.

The protector rings 6, which bear against the protector ring retaining plate 7 and against the piston sleeve 3, substantially prevent air from flowing from the atmosphere into the non-pressure end of the brake cylinder, and, consequently, prevent the entrance with the air of any dirt or particles of foreign matter.

Having provided means for making a tight joint to prevent the flow of air to the non-pressure end of the brake cylinder it is necessary to provide means for permitting the flow of air to and from the non-pressure end of the brake cylinder as the brake cylinder piston moves back and forth. For this purpose an opening 21 is provided in the under side of the non-pressure head 2 and a strainer device 22 is applied to the opening. The strainer device 22 may be a hair strainer of the cartridge type comprising curled hair 23 held between two perforated plates 24 and 25 by a suitable member 26 and held in position against a shoulder 27 by a split spring ring 28 that fits into a groove 29 in the wall of the opening 21. A breather cover 31 is provided, the outer rim of which is positioned between the shoulder 27 and the outer perforated plate 25 of the cartridge strainer, and serves to prevent flying water or dirt from contacting directly with the strainer.

While one illustrative embodiment of the invention has been described in detail, it is not my in-

tention to limit its scope to that embodiment or otherwise than by the terms of the appended claims.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a brake cylinder construction having a non-pressure head and a piston stem extending through an opening in said head, packing and lubricating means comprising a split ring having a sliding engagement with said stem, a lubricant distributing ring in said head, and means for preventing longitudinal movement of said rings with respect to said non-pressure head comprising a retaining member having an annular body portion surrounding said lubricant distributing ring and provided with resilient inwardly extending lugs or fingers positioned between said lubricant distributing ring and said split ring and pressing against said split ring.

2. In a brake cylinder construction having a non-pressure head and a piston rod extending through an opening in said head, packing and lubricating means comprising a piston rod packing ring in sliding engagement with said rod, a shoulder on the head for preventing longitudinal movement of the ring in one direction, a retaining ring for preventing longitudinal movement of the packing ring in the opposite direction, and means for communicating the thrust of said packing ring to said shoulder comprising a cylindrical swab retaining ring abutting against said shoulder and provided with lugs for engaging the inner face of said packing ring, and a lubricant distributing ring within said retaining ring in engagement with said piston rod.

3. In a brake cylinder construction having a non-pressure head and a piston rod extending through an opening in said head, packing and lubricating means comprising a plurality of metallic dust protecting rings disposed in said head and having a snug sliding fit on said rod, means in said non-pressure head for lubricating said piston rod and dust protecting rings including an oil distributing swab positioned adjacent said dust protecting ring in engagement with said rod, and a swab retaining ring positioned about said swab and having a portion extending radially inwardly between said swab and said dust protecting rings to hold said swab in position and to maintain said dust protecting rings spaced from said swab.

4. In a brake cylinder construction having a non-pressure head and a piston rod extending through an opening in said head, a packing ring chamber in said non-pressure head formed between an inner shoulder therein and an outer packing ring retaining plate, a plurality of metallic packing rings disposed in said chamber and having a snug sliding fit on said rod, means for preventing longitudinal movement of said packing rings comprising a retaining ring having a cylindrical portion abutting against said shoulder and an inwardly extending portion for engaging the innermost of said packing rings, means through which oil may be supplied for oiling said packing rings and rod, and a felt oil distributing ring within said retaining ring for limiting the outflow of lubricant from said packing ring chamber and for lubricating said piston rod with each application and release movement of the piston.

5. The combination with a brake cylinder having a non-pressure head and a piston stem extending through an opening in said head surrounded by a recess having a shoulder at one end thereof, a dust protecting ring disposed in said recess and having a snug sliding fit on said stem, a lubricating swab mounted in said recess in engagement with said stem adjacent said ring, and a swab retaining ring comprising a cylindrical portion positioned about said swab and engaging said shoulder and a plurality of radial inwardly extending lugs some of which are in engagement with said swab and some of which are in engagement with said ring.

6. The combination with a brake cylinder having a non-pressure head and a piston rod extending through an opening in said head, a packing ring chamber in said non-pressure head formed between an inner shoulder therein and an outer packing ring retaining plate, a plurality of metallic packing rings disposed in said chamber and having a snug sliding fit on said rod, a lubricant swab mounted in said packing ring chamber surrounding said piston ring, means for preventing longitudinal movement of said packing ring comprising a swab retaining ring having a cylindrical portion engaging the wall of said shoulder and a plurality of radial inwardly extending resilient lugs some of which are in engagement with said swab and some of which are in engagement with said ring to space said swab and said ring laterally along said piston rod.

7. The combination with a brake cylinder non-pressure head having a substantially central bore and a brake cylinder piston stem extending through and guided by said bore, of a retaining member secured to said non-pressure head and cooperating therewith to provide an annular chamber surrounding said piston stem adjacent said bore, a plurality of packing rings mounted on said piston stem within said chamber at a point adjacent one end wall of said chamber and slidably engaging said stem, a lubricating swab mounted on said piston stem within said chamber at a point adjacent the other end wall of said chamber, and means positioned radially outwardly of said lubricating swab and extending between said other chamber wall and said packing rings for preventing movement of said packing rings toward said other chamber wall.

8. The combination with a brake cylinder non-pressure head having a substantially central bore and a brake cylinder piston stem extending through and guided by said bore, of a retaining member secured to said non-pressure head and cooperating therewith to provide an annular chamber surrounding said piston stem adjacent said bore, a plurality of packing rings mounted on said piston stem within said chamber at a point adjacent one end wall of said chamber and slidably engaging said stem, a lubricating swab mounted on said piston stem within said chamber at a point adjacent the other end wall of said chamber, and a member mounted in said chamber and having a portion positioned radially outwardly of said lubricating swab and extending between said other chamber wall and said packing rings for preventing movement of the packing rings toward said other chamber wall, said member also having a portion adapted to engage said lubricating swab to prevent movement thereof away from said other chamber wall.

CLYDE C. FARMER.

CERTIFICATE OF CORRECTION.

Patent No. 2,135,251. November 1, 1938.

CLYDE C. FARMER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 23, claim 6, for the word "ring" read rod; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 31st day of October, A. D. 1939.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)