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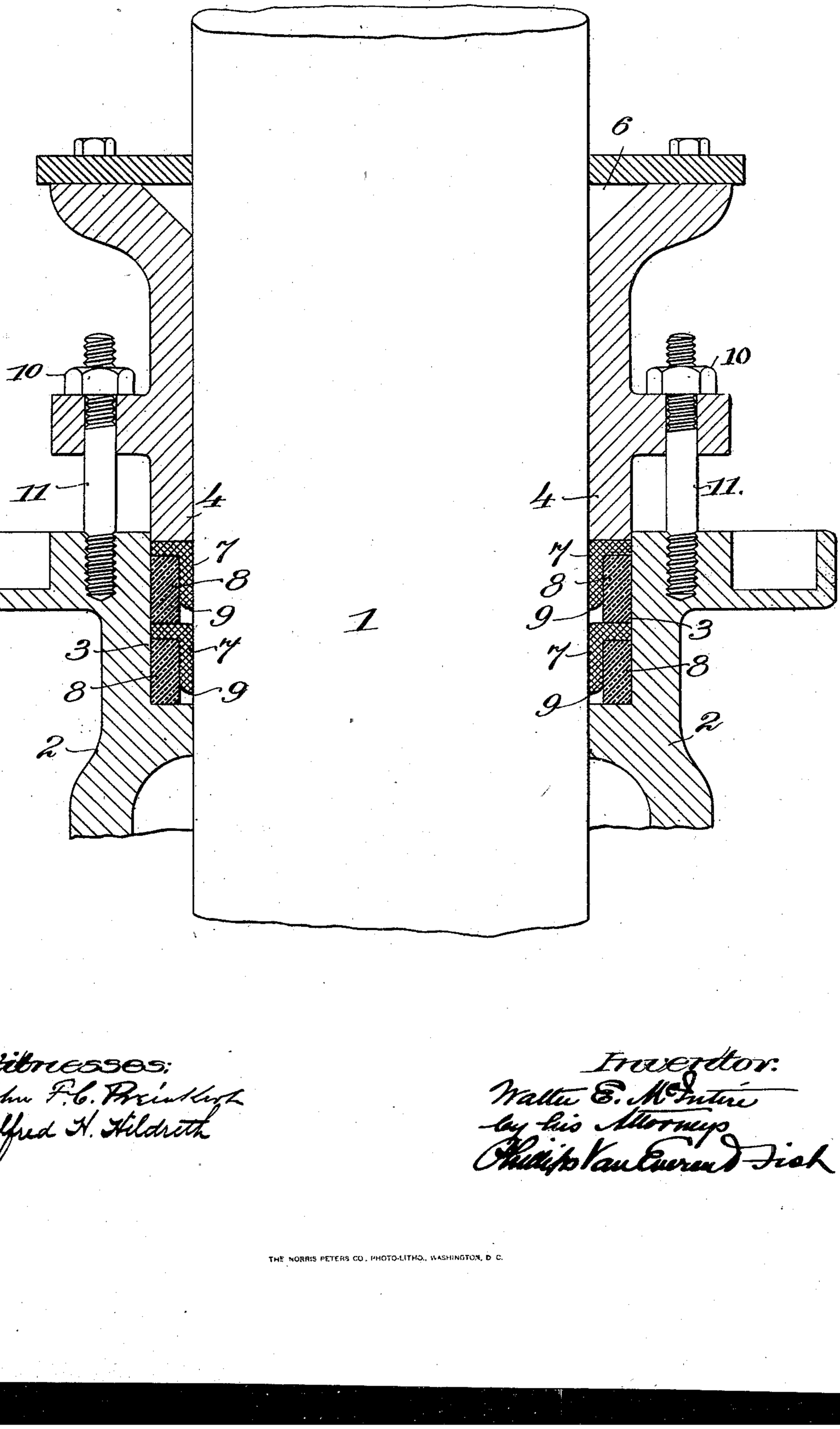
W. E. McINTIRE.

PACKING FOR PLUNGERS.

APPLICATION FILED SEPT. 3, 1903.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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PACKING FOR PLUNGERS.

SPECIFICATION forming part of Letters Patent No. 756,880, dated April 12, 1904.

Application filed September 3, 1903. Serial No. 171,788. (No model.)

To all whom it may concern:

Be it known that I, WALTER E. McINTIRE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Packing for Plungers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to an improvement in packing for plungers, and more particularly to an improved packing for the rods or pistons of plunger-elevators.

Heretofore it has been common to pack plungers, pistons, and piston-rods with packings of a form in which a part of the packing is held against the moving surface by the pressure of the fluid in the cylinder. Such packings vary in form, according as they are fixed or mounted in the moving or the fixed member of the mechanism to be packed, and are known under various names, as "cup-leather" and "hat-packing." They all consist, however, of a ring of flexible material, usually partly or wholly leather, having a short cylindrical portion in contact with the moving surface and an annular portion extending at an angle from one edge of the cylindrical portion by which the ring is secured in place. The other edge of the cylindrical portion is free, and it is directed toward the direction of pressure, so that the fluid pressing upon the outer surface of the cylindrical portion will hold it firmly against the moving surface. It has been found that when the pressure of the water alone is relied upon to hold the packing-rings in contact with the moving surface the action of the packing is not entirely reliable, and it has therefore been proposed to provide mechanical means for supporting the rings. In one proposed form of packing the cylindrical part of the rings is supported by a rigid metal ring, which is designed to leave between its bearing-surface and the moving surface a space only equal to the thickness of the packing-ring. This arrangement is not entirely satisfactory, however, since the packing-ring after some use wears thinner and no longer fills the space between the moving surface and the supporting-ring, so that the latter can no longer maintain the packing-ring in contact with the moving surface. It has also been proposed to pack elevator-plungers with a packing comprising a rubber ring having an annular recess on its lower side, the bearing portion of the ring being faced by leather in the form of hat-packing. This packing acts as an automatic packing in the manner above described, and its action is aided by the elasticity of the rubber, which helps to maintain the sealing portion in contact with the plunger. This packing is unsatisfactory, however, owing to the fact that the pressure of the rubber ring is not adjustable and is not in all cases an adequate support for the hat-packing. Moreover, owing to the construction of this packing it is possible to use but one ring. Consequently some leakage occurs at the joints where the rings are cut to permit their insertion.

The object of the present invention is to produce a packing of the kind above generally described having improved means for supporting the sealing part of the packing-ring, and to this end the invention consists in the improved packing, of which the preferred embodiment is herein described, and illustrated in the drawing.

The drawing illustrates by a vertical section a preferred embodiment of the invention as applied to the plunger of an elevator.

The construction illustrated may be described as follows: The plunger 1 moves in a cylinder 2, in which is formed a stuffing-box 3, provided with a gland 4. An annular space 6 is supplied with lubricating material. The leather packing-rings 7, which are made in the usual hat shape, are separated and held in place by backing-rings 8 of rubber, which are of such size as to fill the space between the packing-rings and the walls of the stuffing-box. The lower edges of the packing-rings 7 are beveled at 9 for a purpose to be presently described. The gland is adjusted by nuts 10 on studs 11, secured to the cylinder, and these parts comprise adjustable means for compressing the backing-rings 8. When the packing is first installed, the gland is set up

so as to compress the backing-rings to cause them to press the packing-rings 7 firmly against the plunger. As the packing-rings 7 wear thinner by continued use the gland is further tightened to expand the backing-rings to compensate for the reduced thickness of the leather. By adjusting the pressure of the elastic backing-rings the packing-rings 7 may be held against the plunger with any desired pressure, which may be kept constant by occasional adjustment. Thus the joint will remain tight irrespective of any decrease in the pressure of the water; but upon a rise of the water-pressure, however great, the joint will still be tight, for as soon as the pressure of the water becomes greater than the pressure between the leather and the plunger, due to the pressure of the backing-rings, the water will enter between the leather and the backing-rings and press the leather against the plunger with a force proportionate to the water-pressure. This action is facilitated by beveling the lower edges of the packing-rings, as described. The constant compression of the cylindrical part of the packing-rings maintains their entire surfaces in close contact with the plunger and prevents the excessive wear upon one side.

An advantageous feature of the present invention resides in excluding the rubber from all contact with the moving part, so that when the packing-rings are worn out their replacement alone is sufficient to restore the packing to its original condition. By this means the expense of maintenance is materially reduced.

It is to be observed that a plurality of rings of the present packing may be employed, with the advantage of breaking joints, and thus diminishing the liability of leakage.

Where in the claims the term "cup-ring" is used it is to be understood as applying generally to packing-rings of the form broadly described above—namely, packing-rings of flexible material having a cylindrical portion free at one edge and arranged to be held in contact with the moving surface partly or wholly by the fluid-pressure in the cylinder. By "moving surface" is meant the surface having a motion relatively to the part on which the packing is mounted, whether the latter be piston or cylinder.

Having thus described the invention, what is claimed is—

1. A packing comprising a cup-ring and adjustable means for maintaining the same in contact with the plunger, substantially as described.

2. A packing comprising a cup-ring and adjustable elastic means for maintaining the same in contact with the plunger, substantially as described.

3. A packing comprising a cup-ring and an elastic backing compressed against the outside of the cup-ring to maintain the same in contact with the plunger, substantially as described.

4. A packing comprising a leather cup-ring, a rubber supporting-ring, and means for compressing the supporting-ring against the outside of the cup-ring to maintain the same in contact with the plunger, substantially as described.

5. A packing for plungers, having, in combination, a cup-ring located in a stuffing-box through which the plunger passes, an elastic supporting-ring filling the space between the cylindrical part of the cup-ring and the walls of the stuffing-box, and a gland for compressing the elastic supporting-ring to adjust and maintain the pressure of the same against the cup-ring, substantially as described.

6. A packing comprising a plurality of alternate leather cup-rings and solid-rubber supporting-rings adapted to be located in a stuffing-box, and adjustable means for compressing the same, substantially as described.

7. A packing comprising a cup-ring, an elastic supporting-ring surrounding the same, and adjustable means for compressing the supporting-ring to adjust the pressure of the same against the cup-ring, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER E. McINTIRE.

Witnesses:
HORACE VAN EVEREN,
FARNUM F. DORSEY.