W. M. LEIGHTON.

PISTON PACKING RING.

APPLICATION FILED JULY 28, 1909.

953,627. Patented Mar. 29, 1910.

Fig. 1.

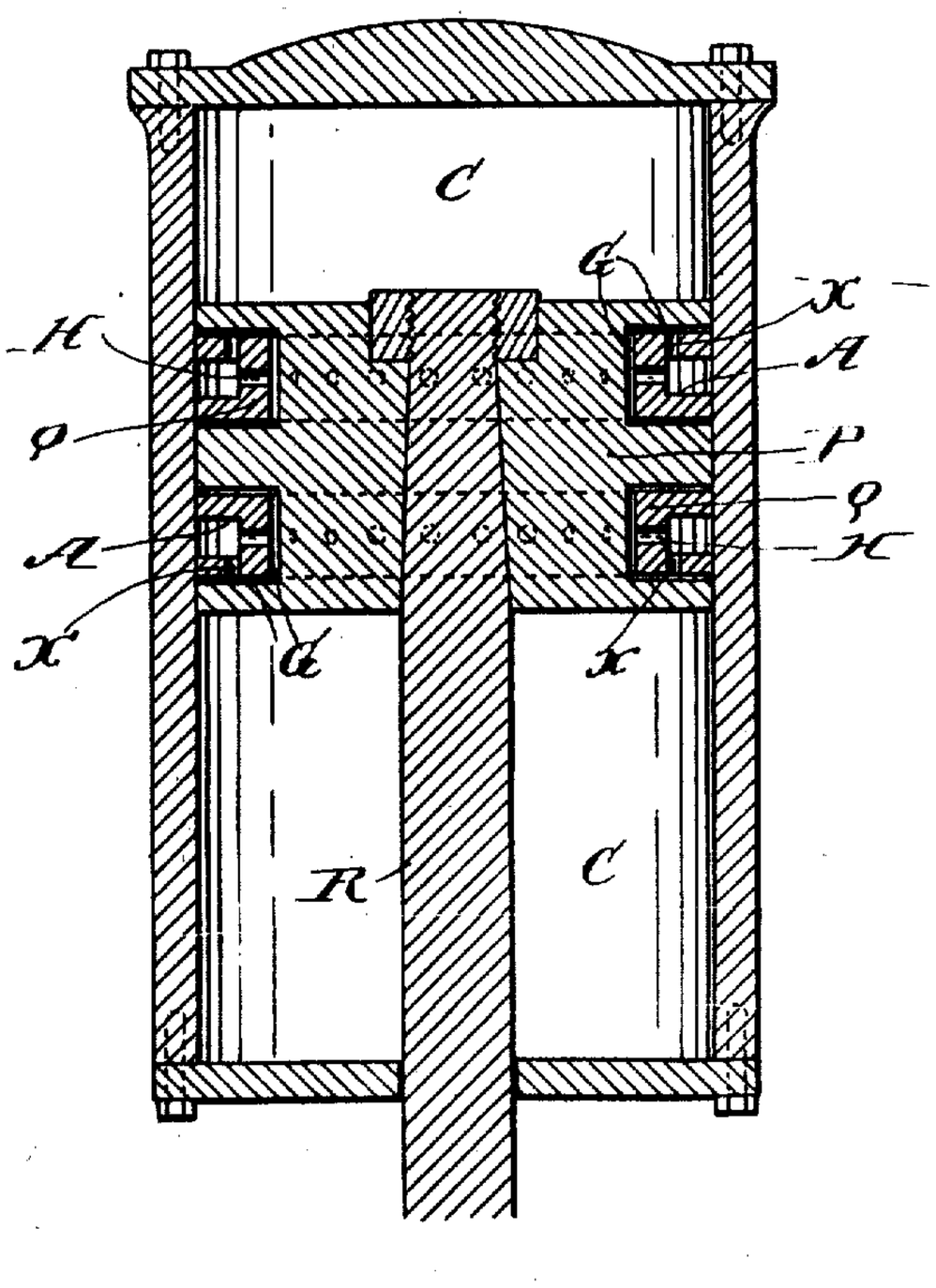
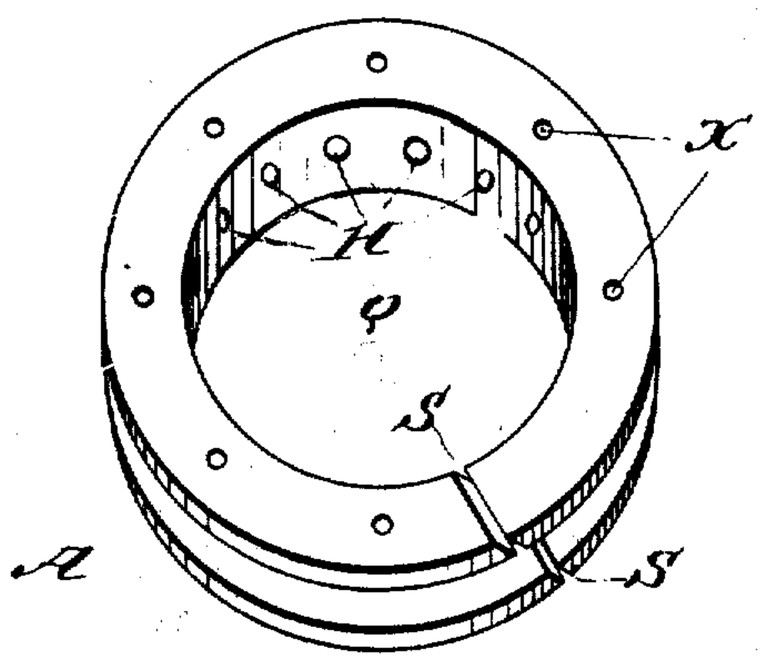


Fig. 2.



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UNITED STATES PATENT OFFICE.

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PISTON PACKING-RING.

953,627. Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed July 28, 1909. Serial No. 510,147.

To all whom it may concern:

Be it known that I, WILLIAM M. LEIGHTON, a citizen of the United States, and resident of Clinton, in the county of De Witt and State of Illinois, have invented certain new and useful Improvements in Piston Packing-Rings, of which the following is a specification.

This invention relates to steam engines, and more especially to packing for the pistons thereof, and the object of the same is to produce an improved piston packing ring which will permit proper lubrication for the full length of the stroke and overcome a too great contact between the ring and cylinder at times when the steam pressure is at its highest.

To this end the invention consists in a piston packing ring having an annular groove in its outer edge, holes extending from the bottom of said groove straight radially inward to its inner face, and other holes extending from said groove axially through one of the side walls of the ring.

The following specification sets forth the preferred embodiment of my idea, as illustrated in the drawings wherein—

Figure 1 is a sectional view of a cylinder and piston with two of these rings in place; and Fig. 2 is a perspective view of one ring.

In the drawings the letter C designates the cylinder, R the rod, and P the piston, which latter reciprocates within the cylinder under the admission of live steam at alternately opposite ends as usual, although the invention is applicable to engines employing steam or gas or other fluid where the working pressure may be exerted at one side of the piston only.

The letter Q designates my improved ring as a whole, the same fitting loosely within a groove G surrounding the piston. By preference said groove is of rectangular and about square cross section, and the contour of the ring is sufficient to fill it rather loosely, as usual in devices of this character. The ring is split as at S at one side as shown in Fig. 2, or otherwise rendered resilient in any suitable manner forming no part of the present invention.

The improvements contemplated by me are the provision in the outer edge of the ring of an annular groove A, preferably proportioned about as shown with respect to the size of the ring itself, the cutting through the remaining inner portion of the ring from the bottom of this groove to its inner face of holes H extending radially inward, and the cutting through of one of the side portions of this ring of other holes X at right angles to those lettered H and leading from the groove A to one of the side faces of the ring. This construction is well illustrated in the drawings attached.

The advantages claimed for the present invention are as follows: In piston rings now in use, when the fluid agent is fed into the cylinder and passes between the same and the outer edge of the piston the ring is forced radially inward against the resiliency which it possesses, and what lubricant there may be present is driven past the point of contact between the ring and cylinder by the force of the agent when under its highest pressure. By my invention the fluid agent following the course just outlined passes into the groove A, through the holes H, and into the groove G within the piston head, where it exerts pressure tending to force the ring outward into closer contact with the cylinder so that the lubricant within the annular groove A of the ring is carried by it for the full length of the stroke. Hence I consider it of advantage to provide a piston packing ring with an annular groove in its wear face, especially when combined with holes extending radially inward from said groove to the rear or inner face of the ring. Furthermore, the fluid agent traveling in the course outlined after passing into the groove A flows to some extent through the axial holes X and into that side of the groove G in the piston head which is behind the ring in the direction in which the piston is traveling. This presses the ring forward in the direction of travel instead of allowing it to slip backward as its contact with the cylinder would naturally cause it to do, and the result is the provision of a cushion behind the ring in its direction of movement. The use of both sets of holes with a single ring will therefore produce a cushion of the fluid agent along two sides of the ring—radially inward between it and the head and also axially behind it between it and the head—and the tendency of this cushion is to force the ring radially outward against the cylinder and axially forward in the direction of movement.

In the use of piston packing rings of this character with engines employing steam or

other agent where the pressure occurs alternately at opposite sides of the head, at least two of the rings are provided as shown in Fig. 1 and those near each end of the head are disposed with their holes X outward as illustrated. Between these two extreme rings there could be others, with or without the axial holes as preferred. In the use of this ring in an engine where the power impulse occurs at only one side of the head, the holes X are by preference disposed in a direction toward said pressure. However, the use of the device is a matter of preference, as also are the minor details of its construction.

What is claimed as new is:

1. The combination with a cylinder, and a piston reciprocating therein and having an annular groove; of a packing ring disposed in said groove and provided in its outer edge with an annular groove and through its body with holes leading from its groove to one of its side faces.

2. The combination with a cylinder, and a piston reciprocating therein and having an annular groove substantially rectangular in cross section; of a packing ring disposed in said groove and fitting it rather loosely, said ring being provided in its outer edge with an annular groove facing toward the cylinder and through its body with holes leading from its groove to one of its side faces.

3. The combination with a cylinder, and a piston reciprocating therein and having an annular groove; of a packing ring disposed in said groove and provided in its outer edge with an annular groove and through that wall which is adjacent the inlet of the fluid agent with axial holes leading from its groove to one of its side faces.

4. The combination with a cylinder, and a piston reciprocating therein and having an annular groove; of a packing ring disposed therein and itself having an annular groove in its outer edge and provided through that wall which is at the bottom of its groove with a series of holes leading radially from the groove to its inner face.

5. The combination with a cylinder, and a piston reciprocating therein and having two annular grooves; of a packing ring disposed in each of said grooves and itself having an annular groove in its outer edge and provided through that wall which is adjacent the inlet of the fluid agent with axial holes leading from its groove to one of its side faces.

6. The combination with a cylinder, and a piston reciprocating therein and having two annular grooves; of a packing ring disposed in each of said grooves and provided in its outer edge with an annular groove facing toward the cylinder, in that wall which is adjacent the inlet of the fluid agent with axial holes leading from said groove outward, and in its inner wall with a series of other holes leading from said groove to its inner face.

7. The combination with a cylinder, and a piston reciprocating therein and having an annular groove; of a packing ring disposed in said groove and provided in its outer edge with an annular groove facing toward the cylinder, in that wall which is adjacent the inlet of the fluid agent with axial holes leading from said groove outward, and in its inner wall with a series of other holes leading from said groove to its inner face.

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