

No. 677,135.

Patented June 25, 1901.

J. IMLER.

ANTIFRICTION STEAM PISTON HEAD.

(Application filed July 13, 1900.)

(No Model.)

FIG. 1.

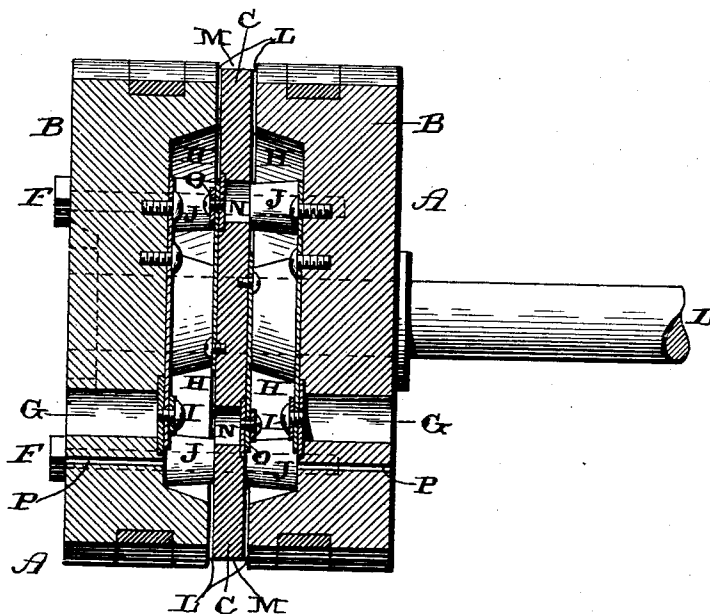
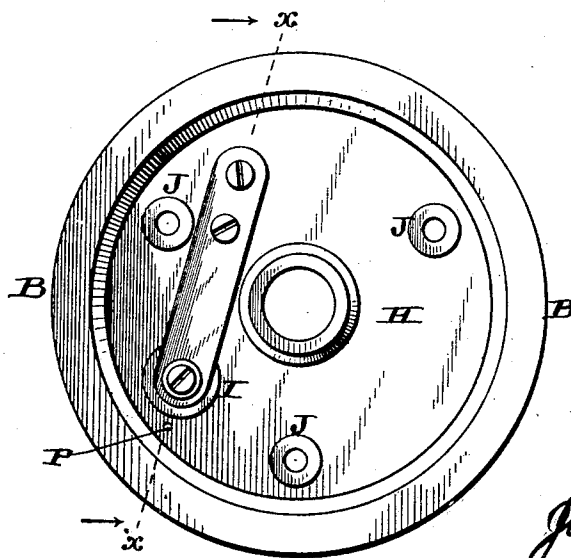


FIG. 2.



Witnesses

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ANTIFRICTION STEAM PISTON-HEAD.

SPECIFICATION forming part of Letters Patent No. 677,135, dated June 25, 1901.

Application filed July 13, 1900. Serial No. 23,472. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH IMLER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Antifricition Steam Piston-Heads; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in steam piston-heads; and it consists in, first, a piston-head composed of two hollow sections and a central diaphragm or partition which separates the two steam-chambers from each other and which diaphragm or partition is of less diameter than that of the two hollow sections; second, two hollow sections provided with lugs or projections upon their inner sides and a central diaphragm or partition against which the lugs strike for the purpose of preventing the two sections from closing tightly against the central diaphragm or partition, and thus leaving seams through which the steam can freely escape; third, a piston-head composed of two hollow sections and a central dividing-partition placed between them and which partition is provided with two valves which open in opposite directions, so as to admit steam from one chamber into the other, and, fourth, in the arrangement and combination of parts, which will be more fully described hereinafter.

The object of my invention is to provide a piston-head having two steam-spaces into which the steam is admitted and from which chambers the steam escapes to the outer edge of the piston-head for the purpose of freely lubricating it as it is moved back and forth in the cylinder.

In the drawings, Figure 1 represents a vertical longitudinal section of a piston-head which embodies my invention. Fig. 2 is a side view of one of the hollow sections.

A represents the piston-head, which is composed of the two hollow sections B and the central dividing-partition C; all three parts

of which are secured to the piston-rod D, which is passed through them and which piston-rod receives a nut upon its end. These parts are also held together by clamping-bolts F, of which there are three; but a larger number may be used, if so desired. Each of the hollow sections is provided with an opening G, leading from the outer side of the section into the chamber H, and each of these openings is closed at its inner end by a spring-actuated valve I, as shown in Fig. 2. The spring used in this instance is a flat spring, to the outer free end of which the valve is attached. This valve opens inwardly for the purpose of admitting the steam from the cylinder, and then it instantly closes, so that none of the steam can escape when the exhaust upon that side of the piston-head takes place.

For the purpose of preventing the end sections from abutting closely against the dividing-partition each end section is provided with any desired number of lugs or projections J, which are just long enough to strike against the sides of the partition and prevent the inner edges of the end sections from coming in close contact with the partition, and thus forming seams or spaces L, through which the steam freely escapes against the inner sides of the cylinder for the purpose of lubricating the cylinder as the piston-head is moved back and forth. In order to form a chamber at the center of the piston-head to receive steam, the diameter of the central partition is somewhat less than that of both of the end sections, and hence a circular chamber M is formed all around the piston-head into which the steam freely passes, and this steam forms a cushion to prevent friction and the dragging of the piston-head upon the bottom of the cylinder, and thus enables the piston-head to be held in equilibrium. When the piston-head is held in equilibrium by the pressure of the steam, much less friction, and consequently less wear upon the piston-head, takes place and less power is required to drive the piston and less fuel to generate steam.

As here shown, each one of the lugs or projections is provided with an opening through it, and these lugs are placed in axial alignment with each other, so that the clamping-

bolts can clamp the three parts of the piston-head rigidly together, and thus hold the parts together independently of the piston-rod.

In order to admit steam from one chamber to the other, there are formed two openings N through the central partition, and these openings are controlled by the automatically-operating valves O, placed upon opposite sides of the partition. By means of these valves the steam admitted under pressure to one chamber passes through one of the openings into the other chamber, and thus both chambers are always kept supplied with steam under pressure, and thus provide steam lubrication to the piston-head under full pressure, for the steam passes through the seams against the inner sides of the cylinder, as already described.

Through each one of the end sections is formed a small opening P, which is always open, and through which openings P and large openings G a portion of the trapped steam left in the cylinder after the exhaust-valve has closed is alternately forced into the steam-chambers, and thus relieves the piston of the heavy back pressure of the trapped steam on the exhaust side, and which trapped steam has a tendency to check the motion of the piston. The steam being forced into the steam-chambers relieves the cylinders, and hence takes just so much pressure away from against the end of the piston as it is reaching the end of its stroke. Through these small openings P a small quantity of steam can pass from one side of the piston-head to the other; but the quantity is so minute that it makes little or no practical difference. The two chambers H form compression-spaces in which the steam remaining in the cylinder is compressed.

Having thus described my invention, I claim—

1. A piston composed of two hollow end sections, and a dividing-partition placed between them, each of the end sections being provided with a small opening through which the trapped steam in the cylinder is forced into the steam-chambers as the piston approaches the inner end of its stroke combined with means for permitting the steam to pass through the partition, and means for preventing the steam from escaping to the opposite side of the piston, substantially as shown.

2. In a piston, two hollow sections, combined with a central partition placed between them, the partition being provided with open-

ings, and valves placed upon opposite sides of the partition and controlling said openings, whereby the steam from one chamber is forced into the other combined with means for permitting the entrance of the steam into the hollow sections, and valves for preventing the steam from escaping therethrough, substantially as described.

3. In a piston-head, the two hollow end sections, and the central partition placed between them, and which partition is of less diameter than that of the end sections, combined with a piston-rod upon which the end sections and the partition are secured out of contact with each other, the said partition being provided with openings for the passage of steam from one side to the other; and the valves placed upon opposite sides of the partition and controlling said openings for the passage of the steam through the partition, substantially as set forth.

4. In a piston-head, the two hollow sections, combined with a partition placed between the sections, the end sections being provided with lugs or projections which bear against opposite sides of the central partition so as to prevent the end sections from coming in contact with the partition, substantially as specified.

5. In a piston-head, hollow end sections provided with projections upon their inner sides, combined with the central partition of less diameter than the end sections and against which partition the lugs or projections bear, and the clamping-bolts which are passed through the lugs or projections so as to hold the parts of the piston-head in position independently of the piston-rod, substantially as shown.

6. In a piston-head, the two hollow end sections having the same diameter combined with a partition placed between the two end sections and which partition is of less diameter than the end sections, said partition being held out of contact with the inner edges of the two head end sections, so as to leave an outward passage for the steam upon each side of the partition, substantially as specified.

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

JOSEPH IMLER.

Witnesses:

LEONIDAS G. WOOLLEY,
ROSANN S. SMITH.