No. 654,211. Patented July 24, 1900.

J. T. WILSON.

PISTON PACKING.

(Application filed Nov. 9, 1899.)

(No Model.)

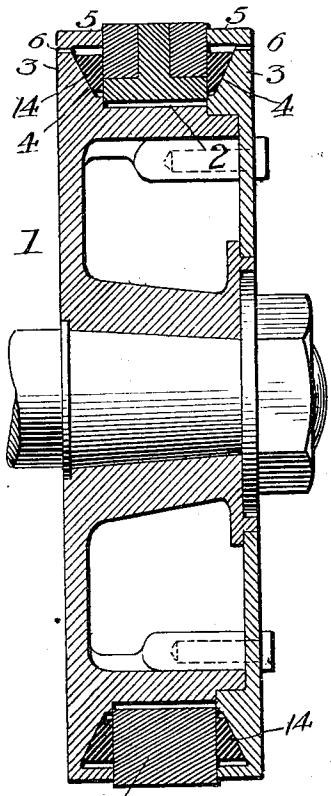


Fig. 1.

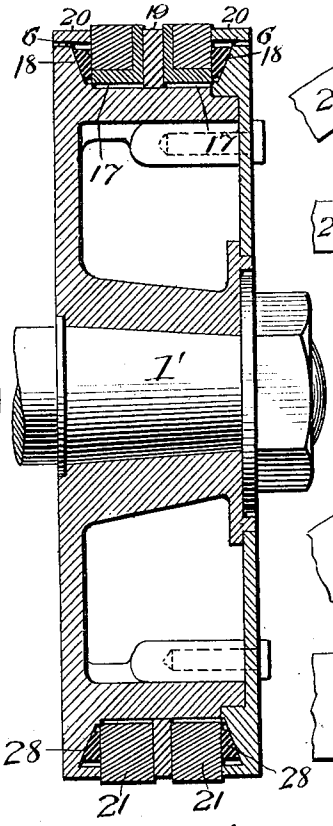


Fig. 4.

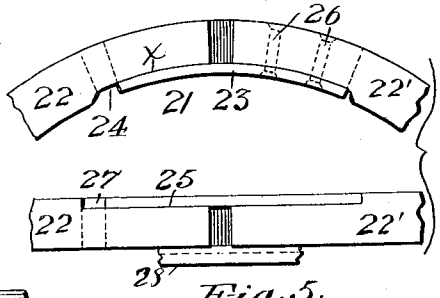


Fig. 5.

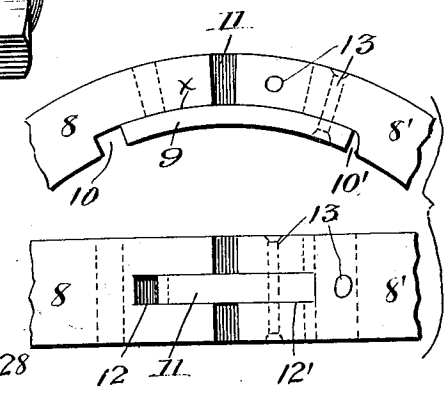


Fig. 2.

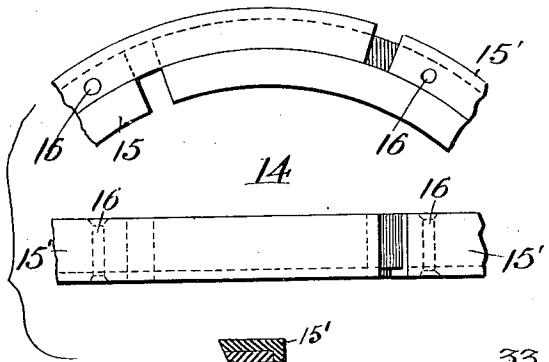
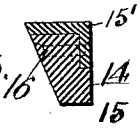


Fig. 3.



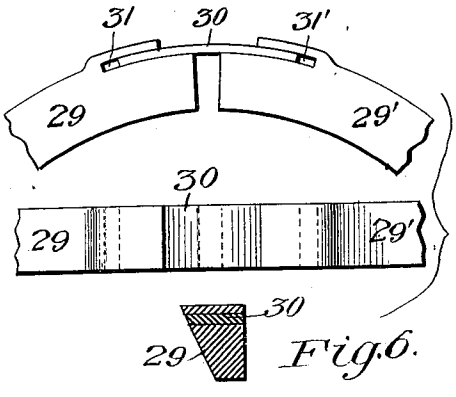


Fig. 6.

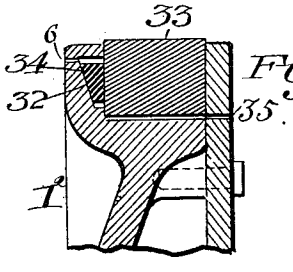


Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN T. WILSON, OF JERSEY SHORE, PENNSYLVANIA.

PISTON-PACKING.

SPECIFICATION forming part of Letters Patent No. 654,211, dated July 24, 1900.

Application filed November 9, 1899. Serial No. 736,302. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. WILSON, a citizen of the United States, residing at Jersey Shore, in the county of Lycoming and State of Pennsylvania, have invented a certain new and useful Piston-Packing, of which the following is a specification.

The object of my invention is the production of a piston-packing for engines which shall be rendered practically solid and rigid when the engine is working steam, which shall be adapted to automatically adjust itself to the cylinder when steam is shut off, so as to compensate for wear, which shall be so arranged relative to the piston that steam will be excluded from the interior or under surface thereof, and which shall possess many other desirable features and characteristics especially adapting it to perform its proper functions.

With these main ends in view my invention consists of a piston having a packing-ring and a wedge-ring.

It further consists in a piston having a packing-ring and a wedge-ring so arranged as to exclude steam from the under side of the packing-ring.

It further consists of a piston having a packing-ring and a wedge-ring, the said packing-ring adapted to be held rigid when steam is on and to automatically adjust itself when steam is shut off.

Finally, it consists in certain novelties of construction and combinations of parts hereinafter set forth and claimed.

The accompanying drawings illustrate three pictured examples of the physical embodiment of my invention constructed according to the best modes or methods I have so far devised for the application of the principle.

Figure 1 is a sectional elevation view of one of the examples, showing a piston, a packing-ring in position, and two wedge-rings, one on each side of the packing-ring. Fig. 2 shows the constructive details of the packing-ring lap-joint illustrated in Fig. 1. Fig. 3 shows the lap-joint of the wedge-ring illustrated in Fig. 1. Fig. 4 is a sectional elevation view of a second example, showing a piston, two packing-rings, and two wedge-rings. Fig. 5 illustrates the constructive details of the packing-ring lap-joint shown in Fig. 4. Fig. 6 illustrates the construction of the wedge-ring lap-joint shown in Fig. 4. Fig. 7 is a fragmentary sectional view of a third example, showing a piston, a packing-ring, and a single wedge-ring.

Referring to the first example, as illustrated in Figs. 1, 2, and 3, the numeral 1 designates an engine-piston. 2 is a groove extending entirely around the circumference of the piston. 3 3 designate walls of the groove; 4 4, beveled sides of the walls; 5 5, flanges of the shape shown; 6 6, holes made through the walls of the groove. 7 is a packing-ring made of any suitable material, size, and shape. 8 8′ are the free ends of the packing-ring. 9 is a plate. 10 10′ are seats made in the ends of the ring to receive the plate. 11 is a tongue. 12 12′ are slots made in the ring to receive the tongue. 13 13 are rivets which unite the plate 9 and tongue 11 to one end of the ring only. 14 14 are wedge-rings located on opposite sides of the packing-ring and fitting against the beveled surfaces of the walls. 15 15′ designate the two parts which constitute the ring. 16 16 are rivets which hold the two parts in their relative positions each side of their free ends. As shown in Fig. 3, the wedge-ring is composed of two complete rings 15 15′, united to form a composite ring. The top ring 15′ is rectangular or L-shaped in cross-section, and the bottom ring 15 is so fashioned as to form a seat for the top ring, as clearly shown by the small sectional view in Fig. 3. A small open space is left between the free ends of each ring 15 15′, so that a free end of each can move upon the other and allow the composite ring to expand and contract.

Referring to the second example, as illustrated in Figs. 4, 5, and 6, the numeral 1′ designates a piston. 17 17′ are grooves in the circumference thereof; 18 18, the beveled walls of the grooves. 19 is a circumferential partition which may be integral with the piston or a removable ring. 20 20 are flanges; 21 21, packing-rings, one in each groove and separated by the partition 19, as shown; 22 22′, the free ends of one of the packing-rings. 23 is a plate L-shaped in cross-section, as shown in Fig. 4. 24 25 are seats made in the bottom and one side of each of the free ends of

the packing-ring to receive the L-shaped plate. 26 26 are rivets which unite the plate to one end only of the packing-ring. 27 is an opened space adjacent the free end of the plate 23, formed when the packing-ring is slightly expanded. 28 28 are the wedge-rings, each of the construction shown in Fig. 6. 29 29′ are the free ends of the ring. 30 is a plate. 31 31′ are seats or grooves within which the ends of the plate are frictionally held, as indicated.

Referring to the third example, as illustrated in Fig. 7, the numeral 1² designates a piston. 32 is the beveled wall of one side of the groove, which extends entirely around the circumference of the piston. 33 is a packing-ring located in the groove. 34 is a wedge-ring, and 35 is a hole drilled through the wall of the piston.

The general relative arrangement of the packing-rings and wedge-rings in the grooves of the pistons is obvious from the illustrations. The lap-joint of a packing-ring and the lap-joint of a wedge-ring should of course occupy different positions within the circumference of the groove, and the wedge-ring should be so disposed that it will lap the line X where the free end of the plate lies in frictional contact with its seats in the packing-ring, as shown in Fig. 5. Thus arranged the rings will form a tight joint and exclude steam from the space beneath the packing-ring. Any suitable means may be employed to hold the rings in their relative positions within the groove.

In Fig. 1 a single packing-ring is shown with a wedge-ring on each side. In Fig. 4 are two parallel grooves, with a packing-ring and a wedge-ring in each groove. In Fig. 7 a single packing-ring is used, with a wedge-ring on one side only.

The mode of operation of the packing in each of the three examples is substantially the same. Steam being admitted to the cylinder will pass by way of the holes 6 to the top surface of the wedge-ring and force it downwardly, which action will compress the packing-ring against the opposite wall of the groove, or, where two wedge-rings are used, as in Fig. 1, the packing-ring will be compressed between the two wedge-rings or against the one wedge-ring and the flange 5 when such flange is used. This compression of the packing-ring renders it very solid and rigid and holds it against the interior surface of the cylinder under a substantially constant frictional pressure. When steam is shut off, the packing-ring can automatically adjust itself to the interior of the cylinder and take up wear, a feature of great importance. Inasmuch as the wedge-ring and the packing-ring form a tight joint, steam cannot find its way to the under side of the packing-ring and force it with too great pressure against the surface of the cylinder, so as to inordinately increase the friction of the parts.

To allow any steam to escape which may by accident find its way under the packing-ring, I in some cases may drill a hole through the wall, as at 35 in Fig. 7, especially where steam is applied to one side of the piston only. In Fig. 4 the space 24 in the packing-ring would allow the steam to escape. However, any suitable means may be employed for the purpose.

From the foregoing description it will be obvious that I have produced a piston-packing which fulfils all the conditions set forth as the object or end of my invention and which constitutes a superior means for performing the desired functions.

While I have illustrated and described only three examples of the physical embodiment of my generic invention, embracing two specific constructions of packing-rings and two specific constructions of wedge-rings, I do not thereby intend to limit the scope of the same to such examples, inasmuch as they only disclose certain modes of the application of the principle which can be applied by an indefinite number of other specific modes. Any type of piston can be selected for receiving my packing—one having a single or a plurality of grooves, with or without the flanges 5 or 20, and adapted for use in connection with any type of fluid-pressure engine. Any style of packing-ring and any style of wedge-ring may be substituted for those shown and having similar or dissimilar lap-joints. The shape of the rings is also unimportant, provided they perform the required functions. The shape of the wedge-ring especially may be changed when a less or greater degree of pressure is to be imparted to the packing-ring and its rigidity increased or diminished. Regarding my invention as generic, I do not wish or intend to restrict its scope to any specific mode of applying the principle.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a piston, of a packing-ring, and a wedge-ring said rings being arranged in parallel planes and adjacent within a groove formed in the circumference of the piston, and each of said rings having a lap-joint, and said lap-joints being located in different arcs of the circumference of the piston, whereby steam is normally excluded from the under side of the packing-ring, the said wedge-ring being adapted to receive steam-pressure upon its circumferential surface; substantially as set forth.

2. The combination with a piston, of a packing-ring, and a wedge-ring; the said rings being arranged side by side in parallel planes within a groove made in the circumference of the piston and so disposed as to form a tight joint and exclude steam from the under side of the packing-ring but admit it to the top of the wedge-ring; in substance as set forth.

3. The combination with a piston, of a packing-ring, and a wedge-ring; said rings being arranged in parallel planes within a groove formed in the circumference of a piston and

so united as to normally exclude steam from the under side of the packing-ring, but admit it to the wedge-ring, and the said packing-ring adapted to be held rigid or solid by the wedge-ring when steam is on, and to automatically adjust itself to the cylinder when steam is shut off; in substance as set forth.

4. The combination with a piston, of a packing-ring, and a wedge-ring; the said wedge-ring being located between a packing-ring and the wall of a groove, and both rings so relatively disposed as to normally exclude steam from the under side of the packing-ring.

5. The combination with a piston, of a packing-ring, and a wedge-ring arranged side by side in parallel planes within a groove formed in the circumference of the piston; the said packing-ring having a lap-joint comprising the free ends of the ring, the plate 9, and the tongue 11; in substance as set forth.

6. The combination with a piston, of a packing-ring, and a wedge-ring arranged in parallel planes within a groove formed in the circumference of the piston; the said wedge-ring comprising the two parts 15 and 15′ united to form a composite ring; in substance as set forth.

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

JOHN T. WILSON.

Witnesses:
FRANK TRUMP,
WM. R. PEOPLES.