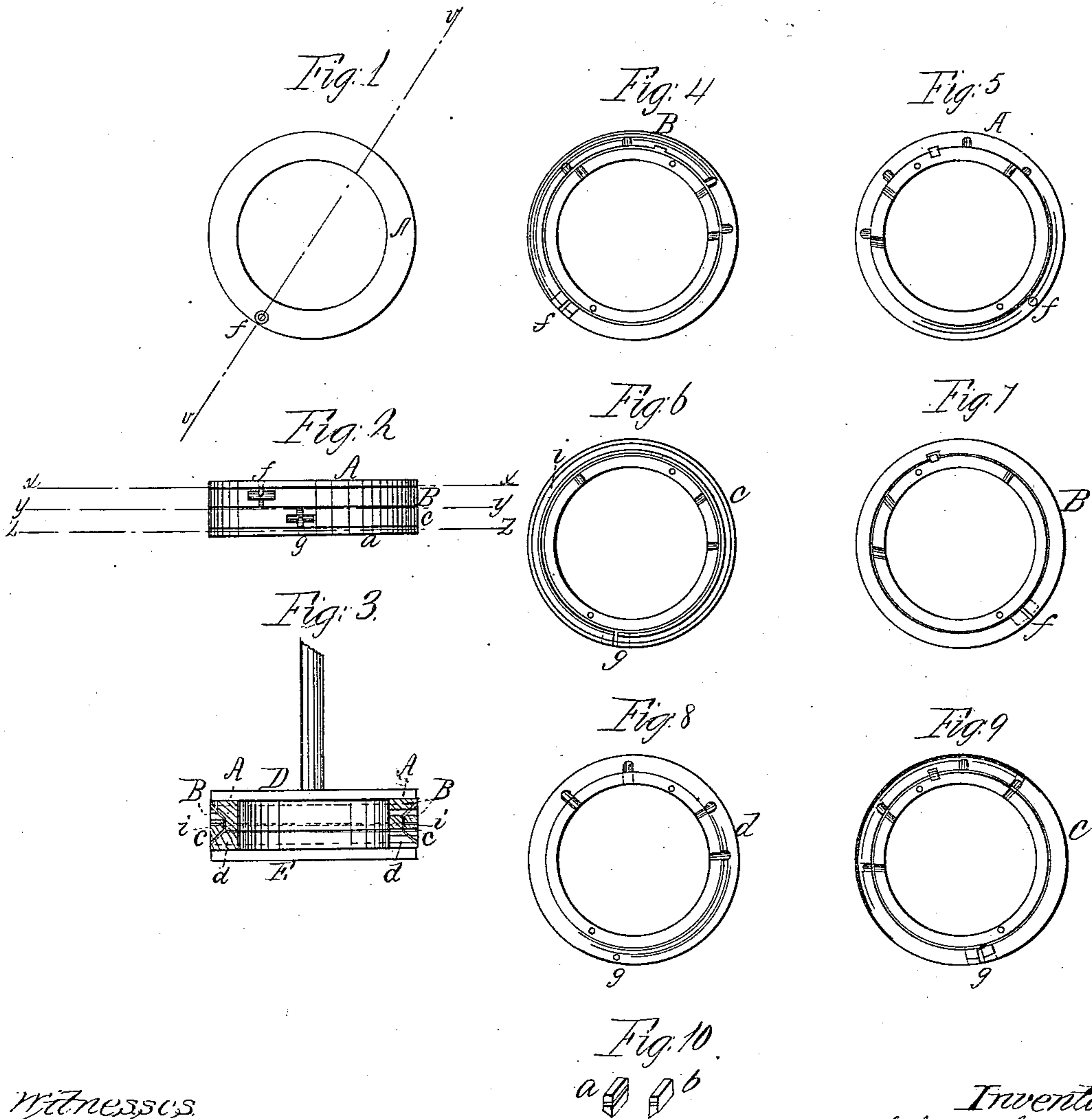


C. H. Clark,
Piston Packing.

No 64,491.

Patented May 7, 1867.



Witnesses

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CHARLES H. CLARK, OF WILMINGTON, DELAWARE.

Letters Patent No. 64,491, dated May 7, 1867.

IMPROVEMENT IN PISTON PACKING.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES H. CLARK, of Wilmington, in the county of New Castle, and State of Delaware, have invented a new and improved Piston-Packing Ring; and I do hereby declare that the following is a full, clear, and exact description thereof.

My object in this invention is to provide a self-adjusting packing for pistons of steam engines, by which the pressure around the cylinder shall be equalized and the piston maintain a central position without undue pressure on the rubbing surfaces; and the invention consists in forming the piston-heads and rings with inclined interior surfaces, and with recesses and apertures in and through them, by which the rings are expanded and the piston made steam-tight in the cylinder, and the weight of the piston sustained by steam pressure; and to enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation, reference being had to the accompanying drawings, forming part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a top view of the ring.

Figure 2 is a side or edge view.

Figure 3 is a vertical section through the line *vv* of fig. 1.

Figures 4 and 5, horizontal section through fig. 2 on the line *xx*.

Figures 6 and 7, horizontal section through *yy* of fig. 2.

Figures 8 and 9, horizontal section through fig. 2 on the line *zz*.

Figure 10 shows the joint-blocks or check-valves.

Similar letters of reference indicate like parts.

The groove which holds the packing-rings is formed around the circumference of the piston-head; it is a cavity having inclined or V-shaped sides, with holes or apertures through its upper and lower as well as through its central or interior surfaces, all of which communicate with the groove before mentioned, and with the packing-rings. The piston-head is formed of two pieces, the inclined surface of each forming the V-shaped groove. *A* represents the upper piece, and *a* the lower piece, which form the head, as seen in fig. 3. The bright yellow indicates *A*, and the pale yellow *a*. *B* and *C* indicate the two packing-rings. *D* and *E*, fig. 3, show the spider and follower, which are bolted together, and which confine the piston-head and make the piston complete. The packing-rings *B* and *C* are wedge shape with flat faces, which faces come together in the middle of the V-shaped groove in the head. One of the points or edges of the wedge-rings turns up and the other turns down from the centre or face, the wedge shape fitting the inclined surfaces of the groove in the head. These rings are sawed once through the section, which allows them to be expanded by the pressure of steam, as seen at *f*, fig. 4, and at *f g*, fig. 2. Where the rings are parted each end has a slot, as seen in figs. 2 and 4. One of the rings *C* has a recess or groove, *i*, in its face, indicated by black marks in figs. 3 and 6. The steam is admitted into this recess *i* through the saw-parting at *f* and *g* of the rings. There are joint-pieces, *a* and *b*, shown in fig. 10, which act as check-valves. They lie in the slots in the parted ends of the rings, and admit or confine the steam as the piston may be moving one way or the other. These joint-pieces or valve-blocks have each a channel on three sides for the steam to pass through, one side of the valve being left smooth, and which closes the aperture when the steam is admitted into the opposite end of the piston. This closing or opening occurs when the piston changes its direction. The steam is admitted through apertures, one at each end of the piston. The steam enters the recess *i* between the rings, and the pressure expands them or throws them apart and on to the inclined surfaces of the head, and against the cylinder. There are holes through the rings which correspond in position with holes through the inclined surfaces of the head or the V-shaped groove, and these holes terminate on the outside of the piston, and against the interior surface of the cylinder. It is proper that I should here state that this arrangement has reference to a horizontal cylinder, and these lateral holes are for the purpose of allowing the pressure of the steam to impinge against the sides of the cylinder from the interior of the piston, and these holes being, as will be observed, on the under side of the piston as it lies in the cylinder, the effect will be that the weight of the piston will be borne up by the pressure, the only friction against the cylinder being the expansive force of the rings. These holes can be multiplied in number to suit the weight of the piston. These lateral holes and the other steam apertures are shown in the horizontal sectional drawings. Figs. 4 and

5 show the piston-head and rings A taken off and B left; figs. 6 and 7 with B taken off and C left, and figs. 8 and 9 with C taken off, leaving *d*. The recess *i* is shown in fig. 6 by the shaded portion. *f* is the aperture to admit steam to the recess on one side of the piston, and *g* on the other side. The small valve-blocks *a* and *b*, fig. 10, are placed in the slots at *f* and *g*. When the piston as it stands in fig. 3 is moving up, the steam pressure being on the bottom of the piston, the steam will lift the little valve-block from the hole *g* in the bottom of the head, and passing round the grooved side of the block, will enter the recess *i* in the ring *c*, from which it has access to the chamber in the interior of the piston. There is now an equilibrium in the pressure in the cylinder below the piston and throughout the interior of the piston, and the pressure forces up the other valve-block, which closes the hole *f* through the upper side, thus confining the steam and preventing its escape to the upper portion of the cylinder.

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

1. The packing-rings B and C, of wedge-shaped form, with the recess *i* between their faces, and with the saw-parted and slotted ends in combination with a piston.
2. The valves *a* and *b*, in combination with the packing-rings and the apertures through the piston-head, substantially as described.

CHARLES H. CLARK.

Witnesses:

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