(No Model.)

J. HAMILTON.

PISTON VALVE.

No. 476,228. Patented May 31, 1892.

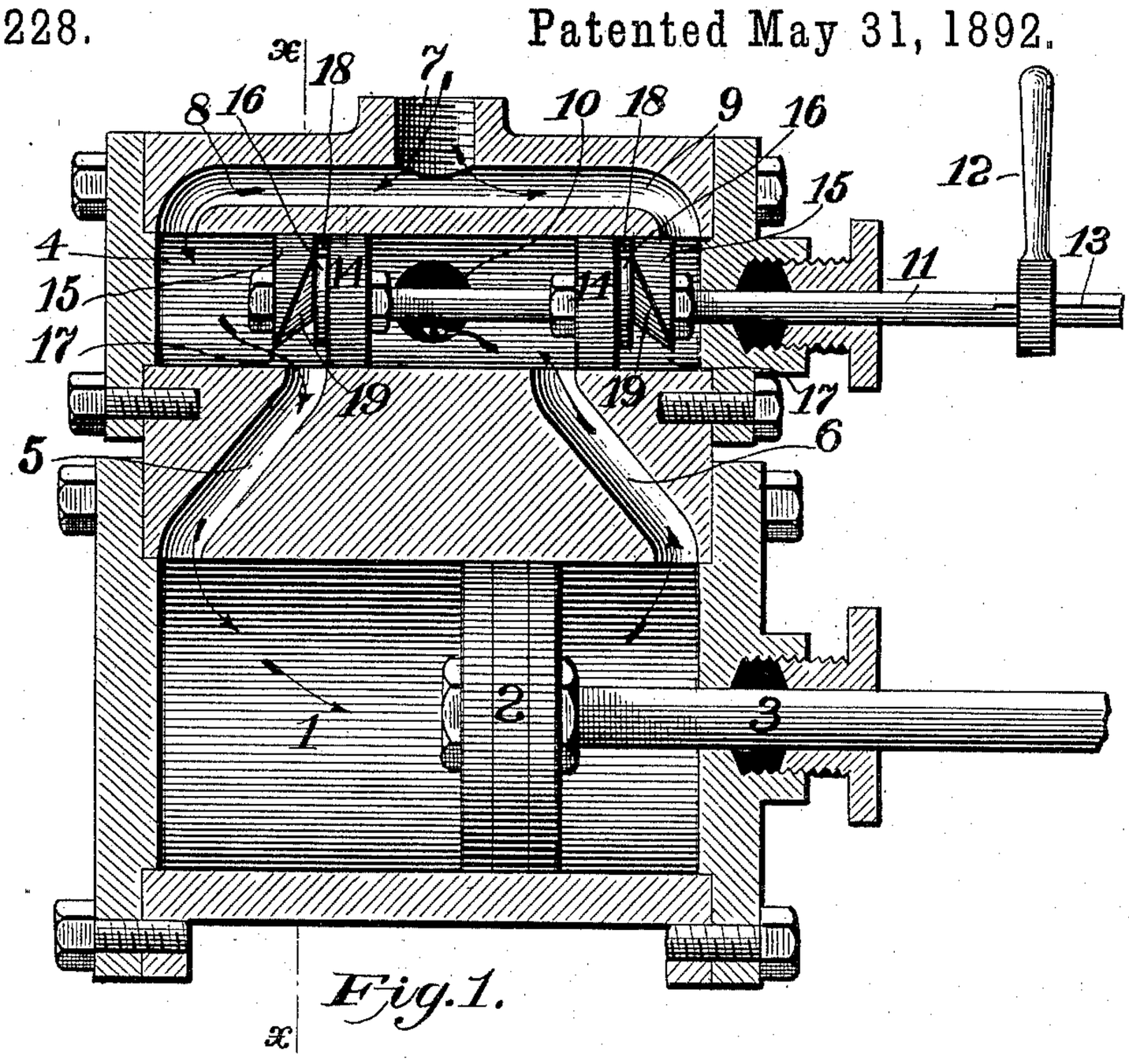

Fig. 1.

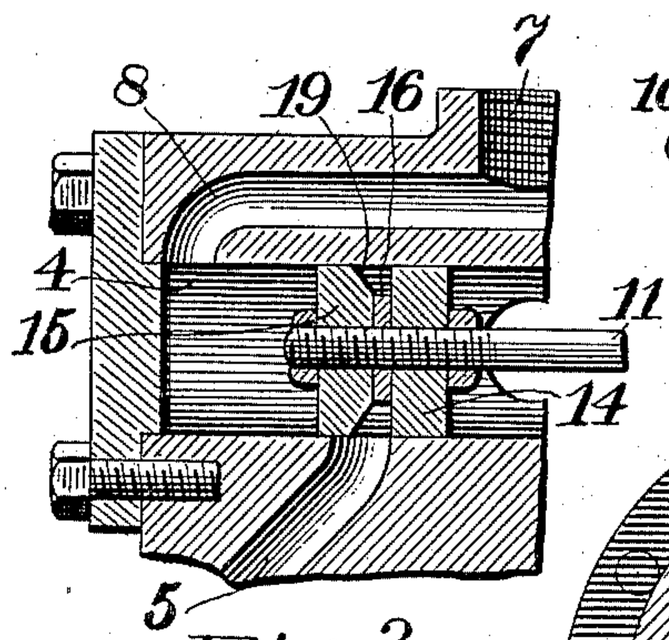

Fig. 3.

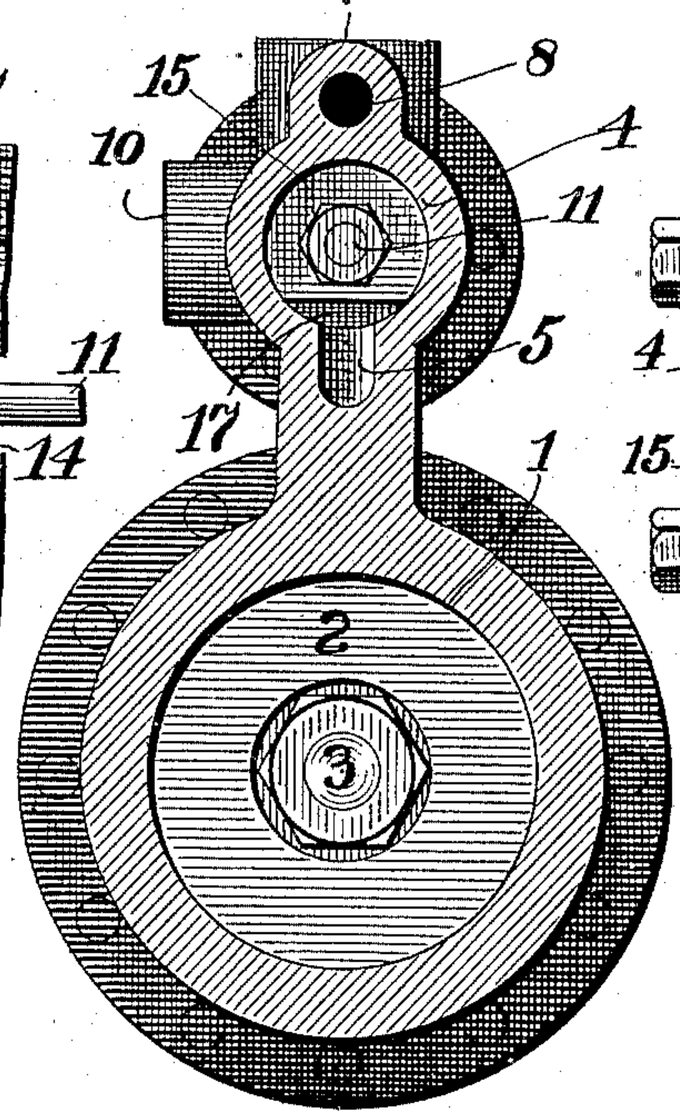

Fig. 2.

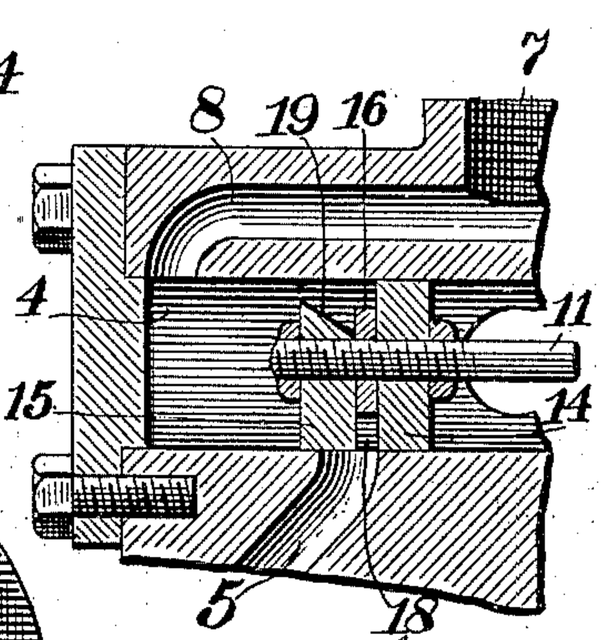

Fig. 4.

WITNESSES:

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JAMES HAMILTON, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO HUNTER, PATCHEN & HAVENS, OF SAME PLACE.

PISTON-VALVE.

SPECIFICATION forming part of Letters Patent No. 476,228, dated May 31, 1892.

Application filed August 31, 1891. Serial No. 404,329. (No model.)

To all whom it may concern:

Be it known that I, JAMES HAMILTON, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Piston-Valves for Steam-Engines; 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.

My invention relates to certain new and useful improvements in the construction of piston-valves for steam-engines, and has for its object to regulate the throttling of the steam-inlet ports without cutting off the exhaust in the slightest degree; and, furthermore, to provide a valve which shall be capable of adjustment to vary the normal throttling of the steam-inlet ports without changing the stroke of the valve.

With these ends in view my invention consists in certain details of construction and combination of parts, such as will be fully hereinafter set forth, and then specifically be designated by the claims.

In order that those skilled in the art to which my invention appertains may more fully understand its construction and operation, I will proceed to describe the same, referring by letter to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a sectional elevation of a steam-cylinder and valve-chest equipped with my improvement; Fig. 2, a section at the line *x x* of Fig. 1, and Figs. 3 and 4 are detail broken sections illustrating the adjustment of the valve.

Similar numbers of reference denote like parts in the several figures of the drawings.

1 is the steam-cylinder; 2, the piston therein; 3, the piston-rod; 4, the valve-chest cylindrical in shape; 5 6, the ports leading from the valve-chest into the steam-cylinder; 7, the steam-inlet having ducts 8 9, which lead into the valve-chest, and 10 the exhaust leading from the valve-chest, all constructed in the ordinary manner.

11 is the valve-stem, adapted to be operated from any suitable valve-gear, (not shown,) it being merely necessary to provide any ordinary swivel connection for said stem, whereby the latter may be capable of an axial rotary movement and a reciprocatory movement. 12 is a hand-pin secured on said stem by spline 13. On the stem are two valves, one for each port 5 6, each of said valves comprising disks 14 15 and an intervening collar 16, said disks and collar being secured together as if made in a single piece. The disks 14 fit within the valve-chest snugly throughout their entire circumference, while the disks 15 have steam-inlets 17 cut therein, as will be presently set forth. With the exception of these cut-away portions said disks 15 are snugly conformed to the valve-chest. The diameter of the collars is less than that of the disks, so that between the latter there will be a narrow annular space 18. From the inlets 17 the disks 15 are beveled inward toward their axes, as seen at 19, whereby the space between the disks 14 15 at that point is gradually widened, while at the same time the width of the edge of the disks 15 is gradually increased from the point 17 upward. It will therefore be readily understood that when the disks 15 are in the position shown at Figs. 1 and 2 the inlets to the ports 5 6 will be the freest. On the other hand, if the valve-stem were turned, so as to reverse the position of the inlets 17, as shown at Fig. 4, the greatest width of the disks 15 would be brought into play, thereby greatly throttling the ports 5 6 and permitting steam to enter therein only through the annular space 18. If the stem be turned, so as to bring the inlets 17 to a position at right angles to that shown at Figs. 1 and 2, the ports 5 6 will be moderately choked and steam will enter said ports through the widened space between the disks 14 15. From the foregoing it will be readily understood that when the stem is turned the disks 15 will present their varying widths to the ports 5 6, thereby normally choking the latter to a greater or lesser degree, as the case may be. It will also be understood that the beveling of the disks 15 from the steam-inlet point 17 affords a space between the disks 14 15 of varying widths, and that the wider such space immediately over the ports 5 6 the more freely is the steam admitted within said ports. In Fig. 1 the port

6, through which the steam is exhausted, is not choked in the slightest degree, and when the valve-stem has been reciprocated to a position opposite to that shown, the same will be true of the port 5. The disks 14 serve as absolute cut-offs between the ports 5 6, while the disks 15 regulate the admission of steam within said ports to the steam-cylinder. The inlets 17 may be formed by boring holes through the disks 15, the shape and precise location of such inlets being immaterial.

I claim—

1. A piston-valve for steam-engines, comprising the usual disks for admission and exhaust of steam to the cylinder, and additional disks beveled on one side and located on the valve-stem in close proximity to the first-mentioned disks, whereby an annular space is formed, said beveled disks being provided with steam-inlets, substantially as set forth.

2. In a slide-valve for steam-engines, the combination, with the ports which lead from the valve-chest within the steam-cylinder, of the reciprocatory and rotatory valve which controls the admission of steam to said ports, each end of the valve comprising two disks, with a narrow annular space between them, one of said disks serving as a cut-off between the ports and having a normal position beyond the latter, the other disk having a steam-inlet and beveled inward from said inlet, whereby the width of the edge of said disk is varied, substantially as shown and described.

3. The herein-described slide-valve for steam-engines, comprising a disk which cuts off steam between the ports, a disk having a steam-inlet and the width of whose edge is varied, there being a space between said disks, which varies in width inversely to the width of said edge, said space converging into a narrow annular recess between the disks at a point opposite to said inlet, said disks being mounted on a reciprocatory and rotatory stem, the rotation of the stem affording a means for adjusting the normal positions of the disks around their axes, whereby the varying widths of the inlet disk are brought into position to normally throttle the parts to a greater or lesser degree, as the case may be, substantially as shown and described.

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

JAMES HAMILTON.

Witnesses:

F. W. SMITH, Jr.,

J. S. FINCH.