

WILLIAM B. KENNEDY.

Improvement in Oscillating Valves for Steam-Engines.

No. 127,069.

Patented May 21, 1872.

fig 1

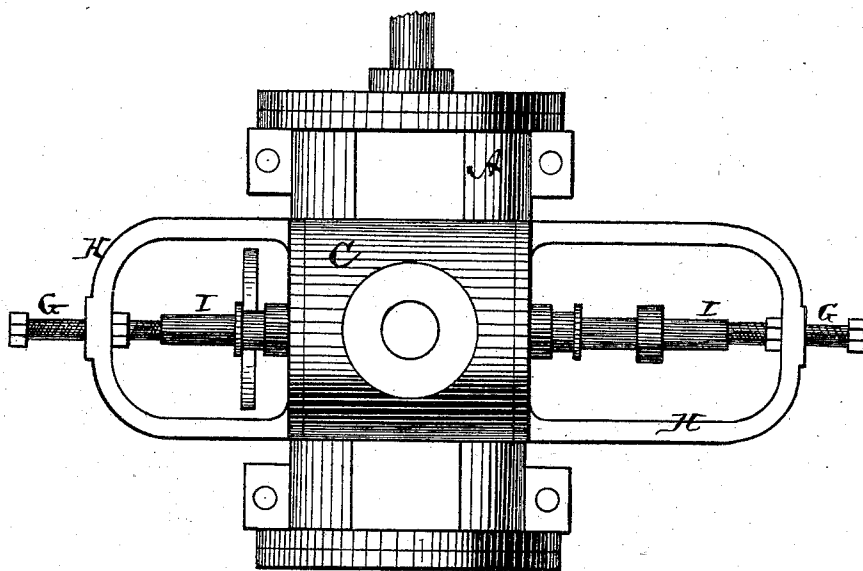
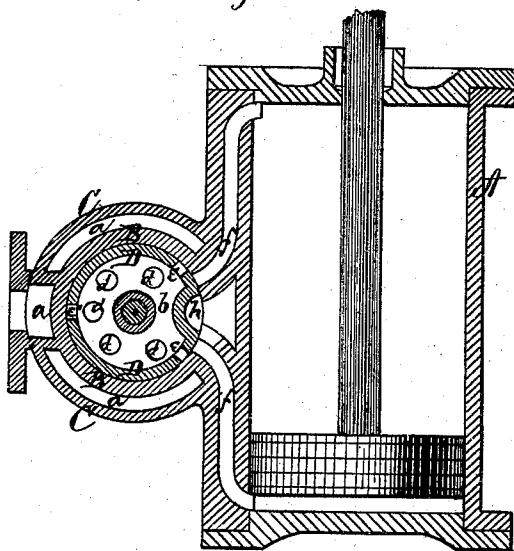


fig 2



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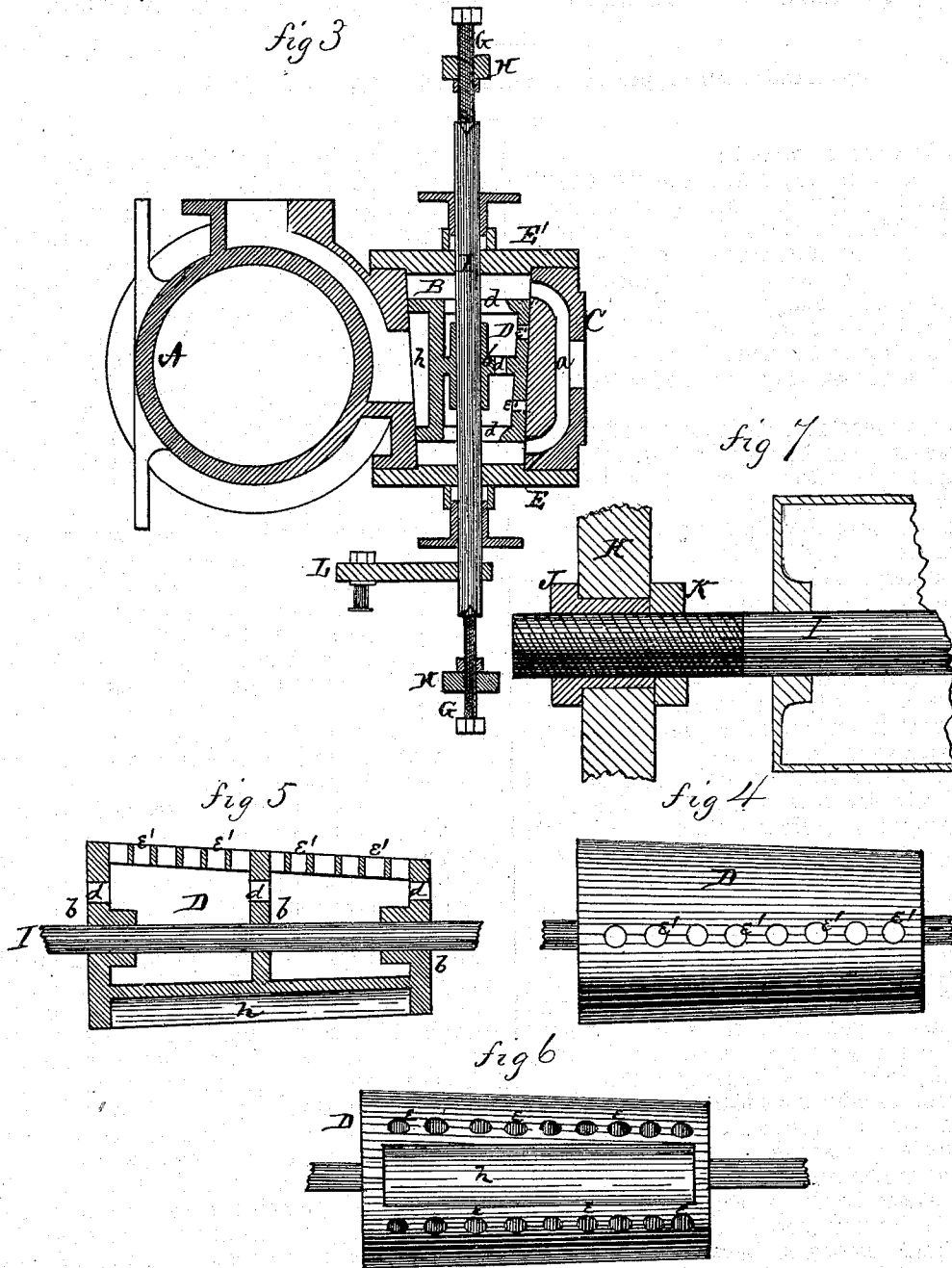
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UNITED STATES PATENT OFFICE.

WILLIAM BROSTER KENNEDY, OF LOUISVILLE, KENTUCKY.

IMPROVEMENT IN OSCILLATING VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 127,069, dated May 21, 1872.

To all whom it may concern:

Be it known that I, WM. BROSTER KENNEDY, of Louisville, in the county of Jefferson and in the State of Kentucky, have invented certain new and useful Improvements in Steam-Engines; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon making a part of this specification.

My invention relates particularly to that class of steam-engines having oscillating valves working in a cylindrical steam-chest, the axis of which is at a right angle to the axis of the cylinder proper of the engine; and the nature of my invention consists in the construction and arrangement of the oscillating valve and steam-chest, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a side view of the cylinder and steam-chest; Fig. 2 is a longitudinal section of the cylinder with cross-section of the chest; Fig. 3 is a cross-section of the cylinder with longitudinal section of the chest; Figs. 4, 5, and 6 are enlarged views of the oscillating valve; and Fig. 7 shows a modification of the means for adjusting the valve.

A represents the cylinder proper of the steam-engine, which varies in no essential feature from those in general use. B is the steam-chest, which may be cast on or bolted to the cylinder A, and is bored larger at one end than at the other, forming a conical opening or bore. This steam-chest is provided with a casing, C, leaving a steam-passage, *a*, between them, allowing the steam to envelop the steam-chest B. The steam in the passage *a* being direct from the boiler prevents, in a great measure, any unequal expansion between the steam-chest B and the valve D. The valve D is made cylindrical and in conical form, with one or more heads or diaphragms, *b*, which are perforated with any suitable number of holes or openings, *d d*, to admit the steam at both or either ends of the valve, and thus preserve the equilibrium. The ports *e e* in the valve

are made by drilling a series of holes to correspond with the ports *f f* in the steam-chest. The exhaust-port *h* is cast in the valve, with the supply-ports *e e* on each side thereof. Drilling these supply-ports in the valve is for the purpose of retaining some metal in the continuation of the cylindrical form, to protect the valve from expanding otherwise than cylindrical, and strengthen it at the same time.

To insure as nearly a practically balanced valve as can be obtained, a series of holes, *e'*, may be drilled in the upper portion of the valve to compensate for the ports *e e*, the number of which holes *e'* will have to be determined by practice.

When the engine is new the largest end of the valve D would be close to or near the head E' at the largest end of the steam-chest; and should the valve wear so as to permit steam to pass between the outer surface of the valve and the inner surface of the steam-chest, set-screws G G are provided to adjust the valve in the proper place in the steam-chest, so that any variation in the expansion of the valve and that of the steam-chest can be adjusted to a nicety in practice.

The heads E E' of the steam-chest have each an arch, H, cast upon it, through which arches the set-screws G G pass, a thread being cut in the arches to correspond with the thread of the screws, or in any other manner to produce the same effect mechanically.

In Fig. 7 I have shown a device as a substitute for the set-screws G G. I represents the valve-spindle, which, in this case, is made long enough to reach through the arches or outer bearings of the steam-chest covers far enough to receive the sleeve-nut J, and enough longer to move in the direction of its axis to either end of the steam-chest. The sleeve-nut J has a thread cut inside to correspond with a thread cut on the spindle of the valve, and the nut is turned outside a sufficient portion of its length to pass through a hole in the center of the arch, and a fraction longer than the distance through the arch. A nut, K, is screwed onto the valve-spindle inside the arch. The sleeve-nut J is screwed on the valve-spindle until its (the nut's) hexagon collar comes against the outer face of the arch. The nut K is then screwed up hard against the inner end of the sleeve J, thereby binding the two nuts tightly

together, and yet leaving the valve and nuts free to revolve in the arch of the steam-chest head; or, in other words, the sleeve-nut forms a good substantial journal instead of the point of the set-screw in the end of the spindle, as above described. L represents the ordinary lever for operating oscillating valves.

The steam-cylinder, steam-chest, and casing, with the steam passage around the chest, may all be cast at once.

When the valve covers either of the ends of the steam-passage *a*, Fig. 3, the steam passes into the end of the valve through the openings *d d* in one or the other end of the valve, keeping the pressure always inside the cylinder of the valve, and acting radially on the same, and not in a direction of the ports in the cylinder proper.

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

1. In an oscillating cylindrical valve, D, a series of holes, *e' e'*, made in the side opposite

to the steam-ports *e e*, substantially as and for the purposes herein set forth.

2. The cylindrical conical-shaped valve D, provided with one or more perforated diaphragms, *b*, and ports *ee*, *e'*, and *h*, the ports *ee* and *e'* each consisting of a series of drilled holes, all substantially as and for the purposes herein set forth.

3. The combination of the steam-chest B, casing C, steam-passage *a*, valve D, with diaphragms *b* and ports *e e' h*, arches H, valve-spindle I, and nuts J K or their equivalents, all constructed and arranged to operate substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 9th day of March, 1872.

WM. BROSTER KENNEDY.

Witnesses:

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