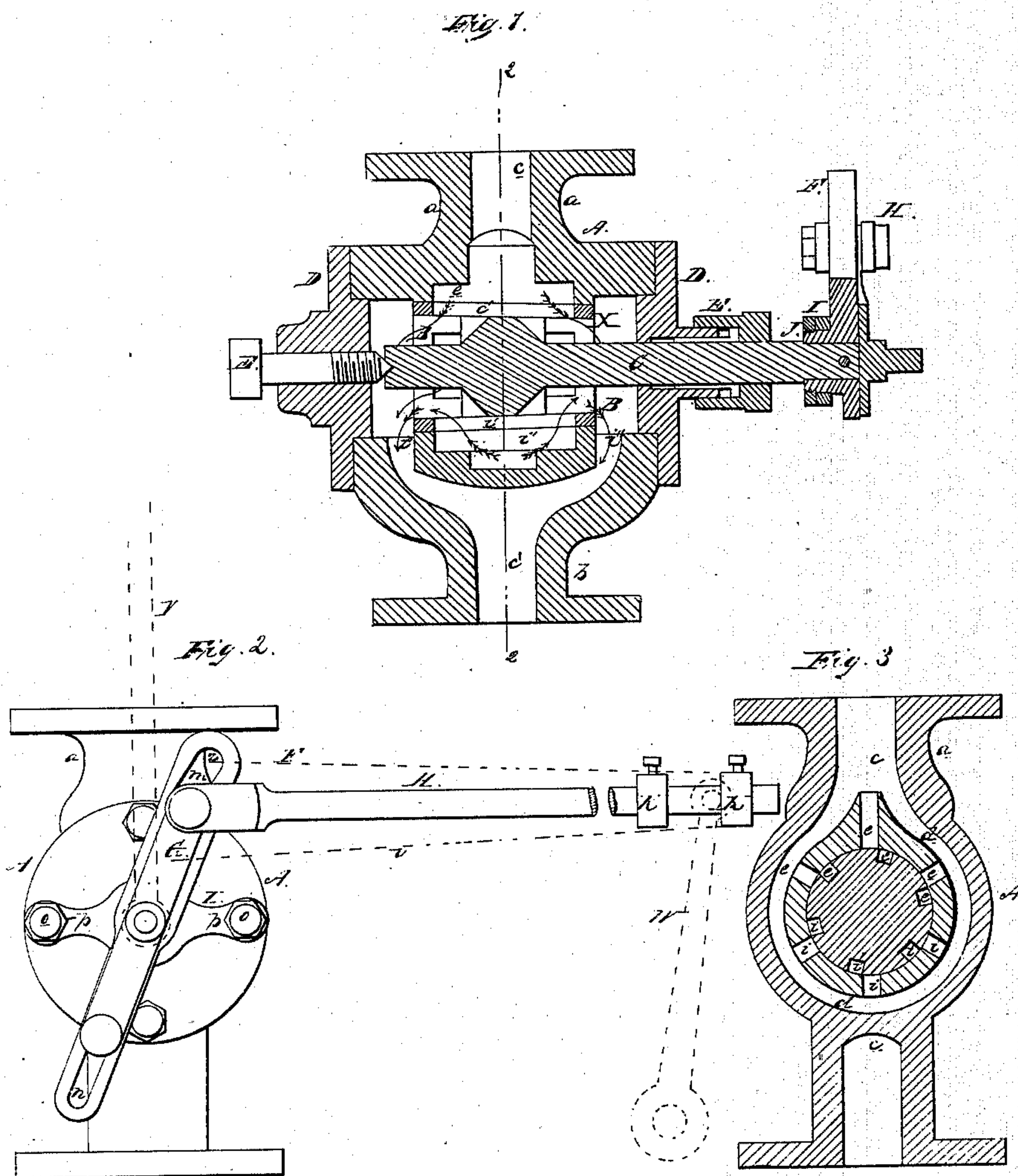


*K. H. Loomis,*  
*Rotary Steam Valve.*

*No. 49,284.*

*Patented Aug. 8, 1865.*



*Witnesses.*

*Charles O. Smith*  
*John Parker*

*Inventor.*

*K. H. Loomis*



# UNITED STATES PATENT OFFICE.

K. H. LOOMIS, OF BALTIMORE, MARYLAND.

## IMPROVEMENT IN CUT-OFF-VALVE GEAR.

Specification forming part of Letters Patent No. 49,284, dated August 8, 1865.

*To all whom it may concern:*

Be it known that I, K. H. LOOMIS, of Baltimore, Maryland, have invented an Improvement in Cut-Off Valves for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to improvements in cut-off valves for which Letters Patent were granted to me on the 23d day of August, 1864; and my invention consists of devices, fully described hereinafter, by which the construction and operation of the mechanism for cutting off the steam previous to its admission into the valve-chest of an engine may be greatly simplified.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form part of this specification, Figure 1 is a longitudinal sectional elevation of a cut-off valve with my improvements; Fig. 2, an end view looking in the direction of the arrow, Fig. 1, and Fig. 3 a section on the line 12, Fig. 1.

Similar letters refer to similar parts throughout the several views.

A is the valve-chest, within which is a chamber, X, the latter being contracted at the center, where there is a seat for the tapering valve B, which is secured to the valve-spindle *c*. Through the head D of the chest passes a set-screw, E, the conical point of which projects into a corresponding recess in the end of the valve-spindle, the opposite head, D', having an opening for the passage of the valve-spindle, and being provided with the usual packing-box, E'.

From the head D' project two rods, *o o*, on the outer ends of which is a yoke, I, the latter being adjusted to or from the head by nuts *p p* on the ends of the rods, and against this yoke bears a collar, J, on the end of the spindle C.

In the inlet branch *a* of the chest is an opening, *e*, which communicates through narrow longitudinal openings *e e e i i i* with the chamber X, and in the exit branch *l*, which is bolted to the steam-chest of an engine, is an opening, *e'*,

which communicates with the said valve-chest, and also with the chamber X through openings *i''* and *i''*.

In the valve B are openings *e' e' e'* and *i' i'*, which correspond in shape and size to the openings *e* and *i* in the valve-chest.

To the outer end of the valve-spindle C is secured a lever, F, in the upper end of which is a curved slot, *m*, and in the lower end a straight slot, *n*, and in the slots slide pins projecting from a plate, G', to the center of which is jointed loosely the lower end of the governor-rod Y, so that when the speed at which the governor revolves is diminished the plate G will be raised toward the upper end of the lever F.

To the upper end of the plate G is jointed one end of a rod, H, on which are two adjustable blocks, *k k*, and at one side of this rod vibrates a lever, W, which is operated from any suitable moving portion of the engine, a pin at the side of the lever being brought alternately against each of the blocks *k k*, so as to impart an intermittent reciprocating motion to the rod.

It will be apparent that as the rod H slides back and forth the valve B will be caused to rotate first in one direction and then in the other, the ports or openings in the valve being brought opposite to and carried beyond those in the steam-chest. When the speed of the engine is suddenly diminished, so that the action of the governor raises the plate G toward the upper end of the lever F, (the rod H coinciding with the line *z*, Fig. 2,) the valve B will revolve more slowly than when the plate and rod are depressed to the position shown by the line *y*, Fig. 2. The openings in the valve therefore coincide for a greater length of time with the openings in the chest, and a proportionately greater amount of steam is admitted into the cylinder. The reverse of this is the case when the speed of the engine is accelerated, the plate and rod being then lowered so that the openings in the valve are carried rapidly across the openings in the chest, the steam being therefore quickly cut off from the cylinder.

It is important that the slot *m* should be curved to correspond with the arc of a circle of which the center is the pin to which the opposite end of the lever H is hung, as otherwise an equal reciprocating motion imparted to the



lever after the plate G had been moved from its first position would turn the valve to a greater extent in one direction than in the other.

When the valve becomes worn it will be apparent that it may be moved close to its seat by adjusting the yoke I to a greater distance from the plate D' and by bringing the set-screw E firmly up to the rear end of the valve-spindle after adjustment, the collar J preventing the valve from being wedged too tightly into its seat.

In ordinary engines provided with cut-off valves the latter are operated by an additional eccentric, as it is necessary that the steam should be admitted to the cylinder for only a short time after the usual valve has opened the port.

In my improvement I am enabled to dispense with the supplementary eccentric by the use of the lugs *k k*, in combination with an arm which alternately shuts the same, this arm being driven by any moving part of the machinery.

It will be apparent that by imparting to the arm W a uniform motion, and by adjusting the lugs *k k* to a greater or less distance apart the arm will be brought in contact with the lugs and will move the rod H of the valve at such time as may be required in order to admit or cut off the steam at any desired point of the stroke.

It will be evident without further description that by the above-described devices the

admission of the steam into the cylinder will be regulated with that nicety which is so essential in order to maintain the engine at a uniform speed, when the amount of labor which it has to perform is frequently and suddenly increased or diminished.

It will also be apparent that the device is simple in construction and operation, not liable to get out of order, and may be readily applied at comparatively small expense to the ordinary engines now in use.

Without confining myself to the exact construction and arrangement of the parts herein described,

I claim as my invention and desire to secure by Letters Patent—

1. The plate G, sliding in the lever F, attached to the valve-spindle and jointed to and operated by the governor-rod Y, and sliding-rod H, or its equivalent, all substantially as and for the purpose specified.

2. The rod H, with its adjustable lugs *k k*, connected to the plate G, and operating by the vibrating lever W or its equivalent, substantially as and for the purpose set forth.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

K. H. LOOMIS.

Witnesses:

CHARLES E. FOSTER,  
JOHN WHITE.