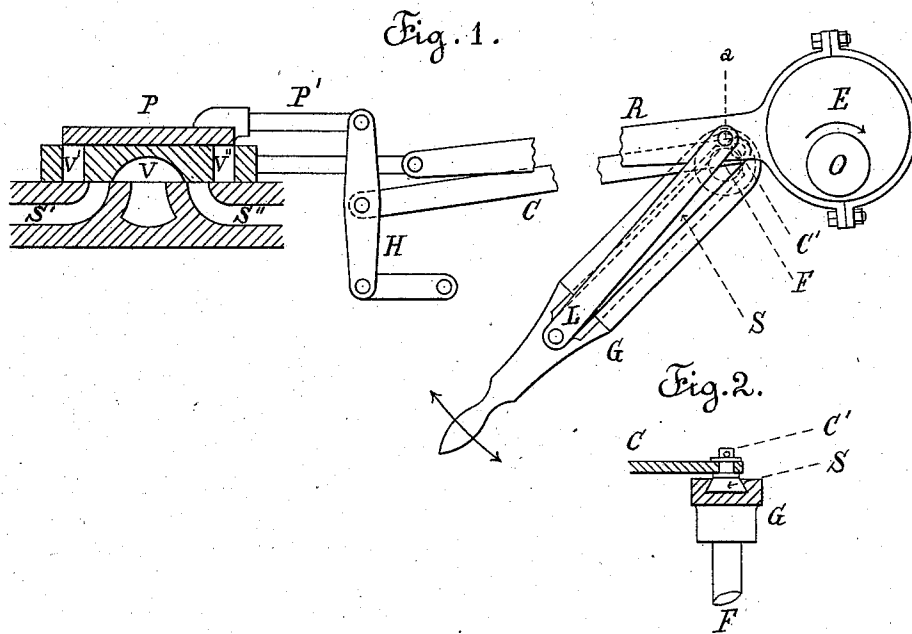


H. BILGRAM.
Cut-Off Valve-Gears.

No. 158,669.

Patented Jan. 12, 1875.



Witnesses:
M. F. Johnson
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by his atty
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UNITED STATES PATENT OFFICE.

HUGO BILGRAM, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN CUT-OFF VALVE-GEARS.

Specification forming part of Letters Patent No. 158,669, dated January 12, 1875; application filed April 23, 1874.

To all whom it may concern:

Be it known that I, HUGO BILGRAM, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Mechanism for Operating the Valves of Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing and letters of reference marked thereon.

The nature of my invention consists in a device for procuring a secondary motion from the eccentric which operates the principal steam and exhaust valve, or from an eccentric or crank having a motion coincident therewith, which, by means of slides or equivalent mechanism, converts such motion into a reciprocating rectilinear motion of variable and adjustable direction, from which a motion of variable extent is produced, and applied to a valve-stem or other valve-moving mechanism.

I will now proceed to particularly describe the mode of making and using this invention, referring to Figure 1, which shows an elevation of the valve-operating mechanism, and a section of the cut-off valve and steam and exhaust valves of a steam-engine. Fig. 2 shows a section of the variable oblique slide.

The same letters apply to the same parts in the several figures.

O represents the main shaft of an engine, to which the eccentric E is keyed. The eccentric rod R is connected, in the usual manner, to the principal steam and exhaust valve V, having passages or ports V' and V'', of the construction generally used with sliding cut-off valves. The link L connects the eccentric rod R, at a, with a slide, S, which is held by a guide, G. The angular position of this guide can be varied and adjusted upon its fulcrum F, by which it is attached to the steam-engine bed or frame. The end C' of the slide S gears through a connecting-rod,

C, to a lever, H, by which the cut-off valve P is moved by its stem P'.

The operation of this invention is as follows: When the shaft O is rotated in the direction indicated by the arrow, the valve V will be moved as in an ordinary slide-valve engine. At the same time the point a of the eccentric rod will move in a circular, or nearly circular, curve, and thereby, through the link L, will transmit a reciprocating motion to the slide S. This reciprocating motion is changed in direction, and transmitted and varied in extent, according to position of the guide G to the cut-off plate P, by the combined action of the connecting-rod C and lever H.

The principal steam-admission valve V distributes steam in the same manner as a slide-valve does in an ordinary slide-valve engine. The cut-off plate P, however, effects a closing of either of the steam-passages V' or V'', and interrupts the admission of steam. This interruption takes place at a later or earlier period of each semi-rotation of the crank-shaft, in proportion as the guide G is more or less inclined or moved in either direction of the double-headed arrow marked thereon. The amount of steam admitted during any one stroke of the piston can be thus regulated and controlled.

This invention may be applied to steam-valves working upon fixed seats, instead of on the exhaust and steam-valve.

What I claim as my invention is—

The combination of the angularly-adjustable guide G, slide S, link L, and rod R, operated by an eccentric with a rod conveying motion to the cut-off valve of a steam-engine, substantially as shown.

HUGO BILGRAM.

Witnesses:

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