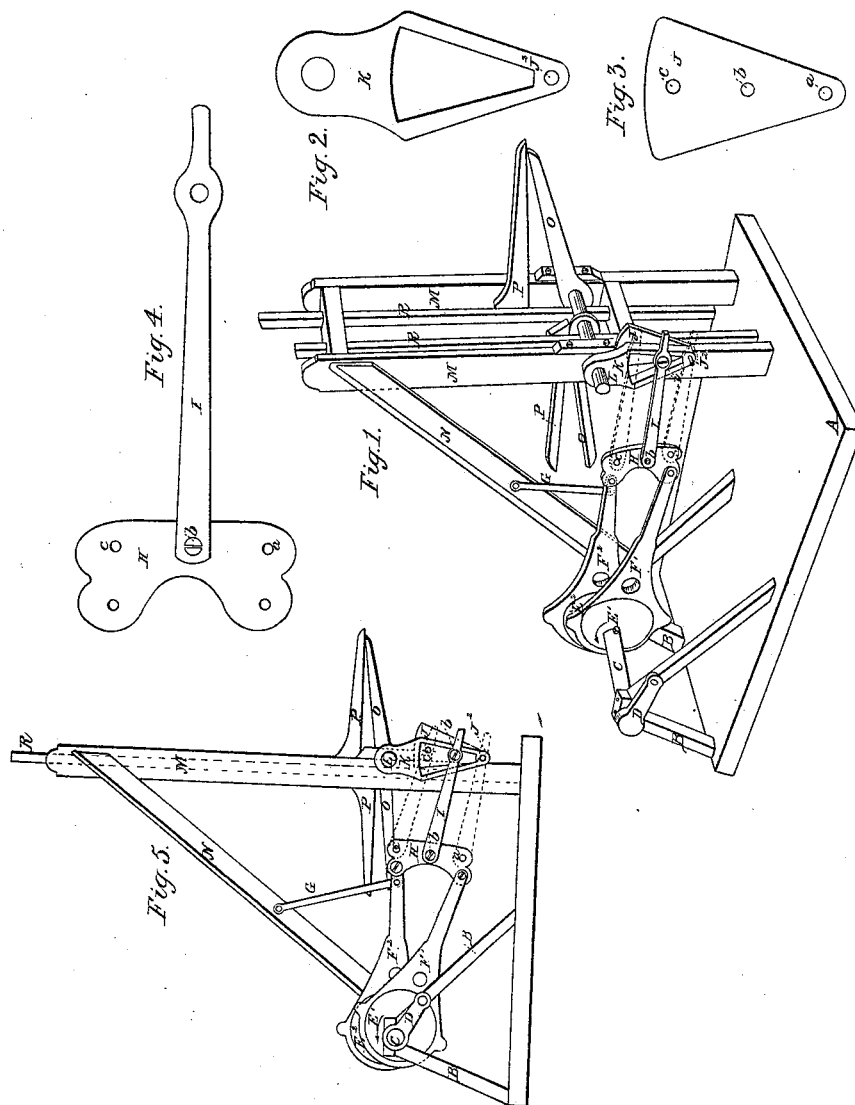


T. McLaughlin,
Steam-Engine Valve-Gear.
N^o 7,056. Patented Jan. 29, 1850.



UNITED STATES PATENT OFFICE.

THOMAS McLAUGHLIN, OF NEW YORK, N. Y.

EXPANSION-GEAR FOR PUPPET-VALVES.

Specification of Letters Patent No. 7,056, dated January 29, 1850.

To all whom it may concern:

Be it known that I, THOMAS McLAUGHLIN, of the city, county, and State of New York, have invented a new and Improved
5 Cut-Off for Steam-Engines; and I do hereby declare that the following is a full and exact description of the same.

The nature of my invention consists in the producing of a more easy and safe cutoff for
10 steam, by the combination and attachment to the end of the rock shaft, of an arm or lever having an angular quadrant shaped opening in it of about 90 degrees (more or
15 less), and attached to the back of it, by means of a pin or bolt, through its lower end, a quadrant shaped plate, which has three holes pierced through it, (a greater or lesser number may be used if required) for the purpose of proportioning the half, three
20 quarter, or full supply of steam. Into either of these holes, and through the angular opening in the arm, is attached one end of a connecting rod, the other being bolted to a reciprocating plate connecting the ends of
25 the two eccentric rods on the main shaft. But to describe my invention more particularly I will refer to the accompanying drawings, the same letters of reference in the several drawings referring to the same parts
30 wherever they occur.

Figure 1, a perspective view; Fig. 2, a rock shaft arm or lever; Fig. 3, a back or quadrant shaped plate of the rock shaft
35 arms; Fig. 4, reciprocating plate and connecting rod; Fig. 5, a side elevation.

Letter A, flooring. B, frame, for supporting the main shaft. C, main shaft. D, crank on the end of it. E', E², two eccentrics on the main shaft. These eccentrics are
40 keyed on the main shaft so as to make a difference of lead or drawing of the rods of about an eighth of their circumference, (that is, of the eccentrics) and are so relatively placed, for the purpose of obtaining the
45 necessary motion to graduate the cutting off of the steam at the time required. F', F², two eccentric rods. G, support for holding up the ends of the eccentric rods, attached to a brace or side of the engine room. H, reciprocating plate, attached by bolts, through
50 its upper and lower left hand corners, to the ends of the two eccentric rods, for the purpose of reciprocating the opposite motions of the two eccentrics. In the back of this plate are three holes *a*, *b*, *c*, (a greater
55 or lesser number may be used if required)

into which is attached by a bolt one end of the connecting rod I, the other end being secured at a corresponding hole (by a bolt *i*) in the quadrant shaped plate J at the back
60 of the lever or arm K, and through the angular opening of which, the bolt (*i*) passes. This plate J is secured at its lower ends by a center pin (J²) to the lower end of the arm K, for the purpose of vibrating or al-
65 lowing play to the motion of the eccentrics, while the steam is shut off, and the piston completing its stroke. By this time the eccentrics have carried the bolt or pin (*i*) across the angular opening in the arm K,
70 and is ready to act upon the inner side of the opening, for opening the valve again for another stroke. In the middle of the plate J are three holes corresponding with the holes in the back of the reciprocating plate.
75 When the connecting rod I is attached to the reciprocating and quadrant plates at the points *a*, *a*, the steam would then be on throughout the entire stroke; if attached at *b*, *b*, it would be cut off at half stroke, and
80 if at *c*, *c*, at quarter stroke. This arrangement of attaching the connecting rod to the reciprocating plate and quadrant plate respectively, by pins or bolts, may be varied
85 so as to use adjusting screws into rods on which the connecting rod may be raised or lowered without the necessity of disconnecting it from the reciprocating and quadrant
plates and which in practical operations, is intended as a part of the invention. L, rock
90 shaft. M, frame supporting rock shaft. N, brace for steadying rock shaft frame. O, O, toes on rock shaft. P, P, lifters on valve rods R, R.

The operation of these several parts are
95 that when the two eccentrics are keyed on the main shaft so as to make a difference in their lead or drawing of about one eighth of their circumference, and the crank is on its lower center, the valves are down, and
100 if the connecting rod I be now attached to the reciprocating plate and quadrant plate, respectively, at the holes *b*, *b*, and the engine started in the direction of the arrow, the steam will be cut off at half stroke; that is,
105 the eccentric E' throws forward the lower end of the reciprocating plate, while for a time the eccentric E² lifts and holds the upper end of it nearly perpendicular so as to allow the eccentric E' to cause the project-
110 ing forward of the connecting rod, and pressing of the pin *i*, against the inner side

of the angular opening in the lever K, to rock or move the shaft for lifting the valves. When at half stroke the eccentric E² commences to draw on the upper end of the reciprocating plate and the eccentric E' to hold the lower end of it stationary or nearly so, for the drawing back of the connecting rod. This action releases the pressure on the arm, and further admission of steam is cut off. While the other half of the stroke is being performed the pin (i) plays or passes through the open space in the arm till it comes in contact with the opposite side of the opening, when it opens the valve again for the next stroke. In changing the point of attachment to a, a, or c, c, or other points when used the same operation is performed, the only change required to vary the

cut off being in the attaching of the connecting rod.

Having now described my invention I will state what I claim and desire to secure by Letters Patent.

What I claim therefore is—

The use and employment of the connecting rod I, acted upon by two eccentrics, in combination with the reciprocating plate H, and arm K having an angular opening in it, and quadrant shaped plate J or its mechanical equivalent attached thereto, for the purpose of working puppet valves, in form and manner substantially as herein set forth.

THOMAS McLAUGHLIN.

Witnesses:

CHARLES L. BARRITT,
JOHN ADAMS.