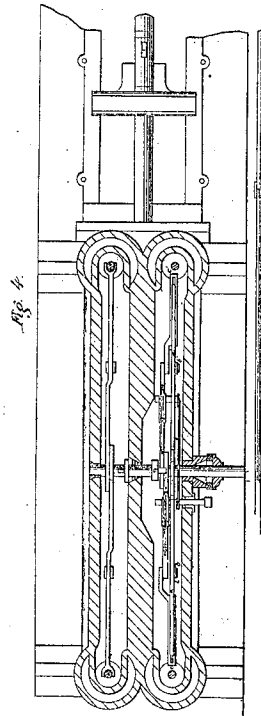
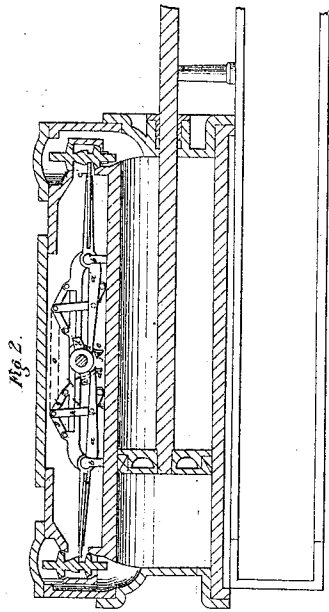
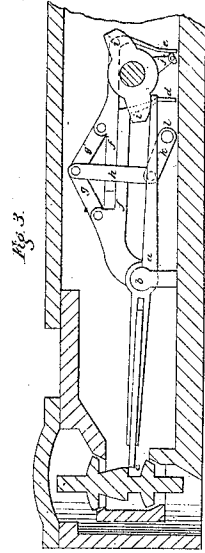
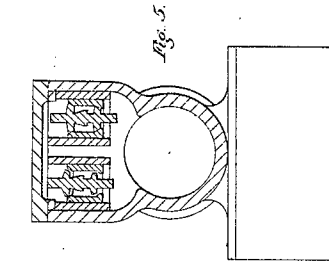
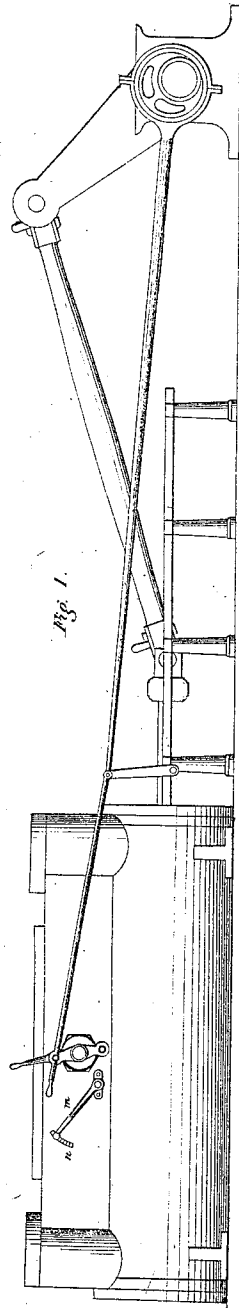


*S. H. Gilman,*

*Steam Cut-Off.*

*No 7,838.*

*Patented Dec. 17, 1850.*



# UNITED STATES PATENT OFFICE.

SAML. H. GILMAN, OF CINCINNATI, OHIO.

## EXPANSION-GEAR FOR HORIZONTAL ENGINES.

Specification of Letters Patent No. 7,838, dated December 17, 1850.

To all whom it may concern:

Be it known that I, SAMUEL H. GILMAN, of Cincinnati, in the county of Hamilton and State of Ohio, have made certain new and useful Improvements in Mechanism for Variable Steam Cut-Offs, of which the following is a full, clear, and exact description, reference being had to the annexed drawings.

The main object of this invention is to provide for a horizontal engine operated by puppet valves—an economical form of cut off movement capable of adjustment to any point of the stroke, the mechanism being of such a structure as to be adjustable either while the engine is in full activity or otherwise.

In the accompanying drawings the same or like parts have the same letters.

Figure 1 is a longitudinal elevation of a steam cylinder on the plan proposed. Fig. 2 is a longitudinal section through the supply valves of the steam chamber. Fig. 3 is an enlarged view of one of the supply valves of the steam chamber with its movements or operative gearing. Fig. 4 is a horizontal section through the valve chambers and through the supply and exhaust chambers. Fig. 5 is a transverse section through one pair of steam and exhaust valve chambers.

In the present illustration, the supply and exhaust passages are with the four valve chambers, cast in one piece with and contiguous to each other and to the cylinder; the supply and exhaust passages being separated from each other by a vertical plate extending lengthwise of the cylinder, and parallel to the outer sides of the passages which with it divide the steam space into two nearly equal compartments. The two supply and two exhaust balance valves being operated entirely within the chamber, are devoid of stuffing joints, and therefore suffer no other impediment to their working than what is due to their inertia.

(a) (a') are the lifting rods or levers vibrating on fixed centers (b) (b'). The portion of the rod which lifts the valve, is a shifting tongue (c or c') capable of being slid to and fro along the rods: This tongue terminates at its rear extremity in a foot or prong (d or d') by which the tongue is at stated intervals brought back to the valve as hereafter explained, another prong or foot (e) being prolonged into a shank (f) is

capable of sliding longitudinally along the shank (f) of the tongue. Both shanks are connected by links (g g') to the upper extremity of a shackle (h) which being elevated draws the prongs together, or being depressed places them farther asunder; (i i') are the rock arms which vibrate the levers. Projecting downward from the rock shaft is an arm, from either side of which projects a tappet pin (j) which during its vibration strikes alternately the two prongs of the yoke. The length of the tongue (c) from the face of the prong (d) to the end which acts on the valve is such that the tappet pin shall exactly place it in contact with the valve spindle at every return of its sweep, and upon the relative distance from the first prong of the second prong (e) depends the period of the stroke at which the tappet pin striking the prong (e) abstracts the tongue from the valve collar, and permits the return of the valve to its seat. The shackle (h) vibrating freely upon its lower pivot permits the free sliding of the prong shanks—while its length is such as not materially to vary the relative distance of the prongs by such vibration.

The elevation and depression of the shackle (h) is effected by a wrist (k) whose shaft (l) passing through a stuffing box in the chest, carries a handle (m) which being provided with a click pin drops into a series of holes (n) concentric with the shaft, and so placed as to answer to the different periods at which it is commonly desired to cut off the steam. This enables the engineer whether the engine be in action or at rest, to work the steam either full or for any portion of the stroke, or to cut it entirely off, the mechanism being so arranged that when the handle is at the lowermost hole, the second prong (e) being placed beyond the range of the tappet, the tongue is not withdrawn at all and when the handle is brought to the uppermost hole, the tappet striking the prong (e) before the rocker acts upon the lever, the latter is prevented from lifting the valve. The summits of the two shackles being connected by a link (o) act thereby in exact concert.

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

Withdrawing the sliding tongue of the lifter of the supply valves of steam cylinders, so as to trip the valves at any desired

point, by an adjustable prong which is made  
to slide upon the arm holding the usual  
fixed prong, by the action of a tappet on the  
rock shaft, when this adjustment is effected  
5 by means of a shackle and links within the  
steam chest, the shackle and links being ele-  
vated or depressed by an index arm with-  
outside the steam chest and the whole be-

ing arranged and operating substantially  
as herein described.

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In testimony whereof, I have hereunto set  
my hand before two subscribing witnesses.

SAMUEL H. GILMAN.

Witnesses:

EDWARD H. KNIGHT,  
GEO. H. KNIGHT.