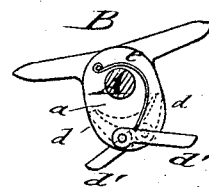
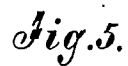
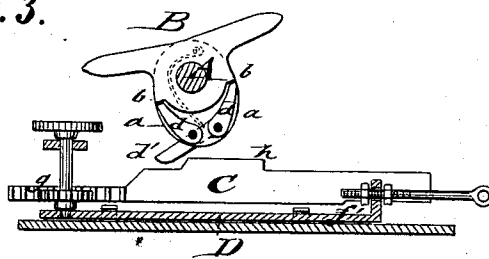
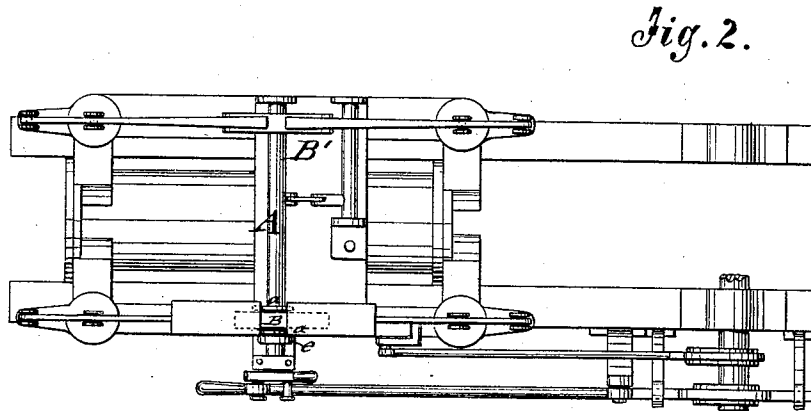
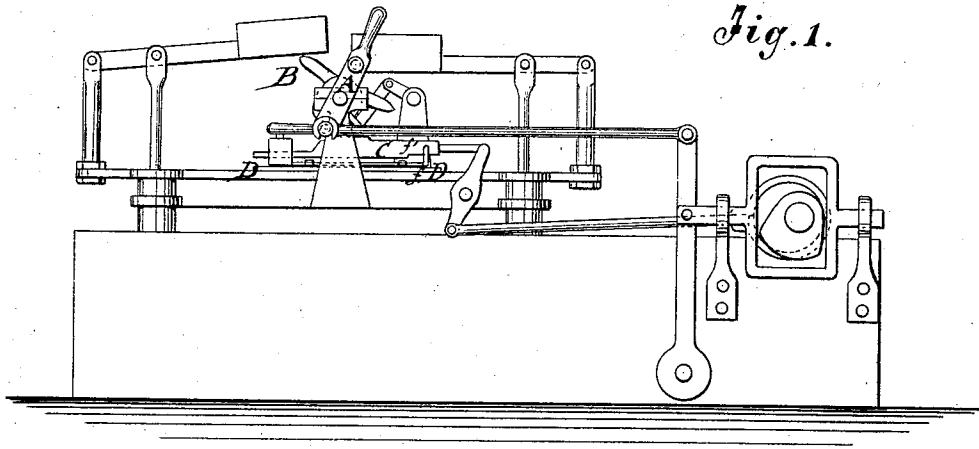


Adjustable Cut-Off for Steam-Engines.

Patented Jan. 26, 1875.



WITNESSES:

A Bennekenhof
A. F. Terry

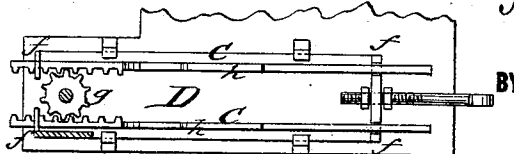


Fig. 4. INVENTOR:

H. Webster
Munroe
attys

UNITED STATES PATENT OFFICE.

HENRY WEBSTER, OF CASSVILLE, WISCONSIN.

IMPROVEMENT IN ADJUSTABLE CUT-OFFS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **159,130**, dated January 26, 1875; application filed October 24, 1874.

To all whom it may concern:

Be it known that I, HENRY WEBSTER, of Cassville, in the county of Grant and State of Wisconsin, have invented a new and Improved Adjustable Cut-Off, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a side elevation of a lever-engine with my improved adjustable cut-off; Fig. 2, a top view of the same. Figs. 3 and 4 are, respectively, a vertical longitudinal section and top view of the adjustable sliding rack-pieces, with oscillating toe-pieces; and Fig. 5, a detail side view of oscillating top piece.

Similar letters of reference indicate corresponding parts.

The invention will first be fully described, and then pointed out in the claim.

In the drawing, A represents the rock-shaft of the engine, which engages, by oscillating and stationary toe-pieces B B', the weighted levers of the steam induction and eduction valves of the cylinder. The oscillating toe-piece B moves freely between stationary guide-plates *a* of rock-shaft A, and is provided, at its lower circular part, with shoulders *b*, which are engaged by symmetrically-arranged pawls or arms *d*, pivoted to the guide-plates *a*. To the pivots of arms *d* are keyed, at the outer side of guide-plates *a*, extension-arms *d'*, of suitable inclination, which are acted upon by strong band-springs *e*, so as to cause the firm pressure of the pawls on the shoulders of the toe-piece, and retain, thereby, the same, when both shoulders are engaged, in rigid position on the rock-shaft, in the manner of a stationary toe-piece. The projecting toes raise and lower in this condition, alternately, the weighted lever-arms of the induction-valves, for admitting and cutting off the steam, and require, for the purpose of changing the speed of the engine, to be brought, by their arms *d'*, in connection with the adjustable rack-pieces C, which are guided on a reciprocating sliding plate, D, connected, by fulcrumed levers and

connecting-rod, with an eccentric of the crank-shaft. The main parts of the rack-pieces C slide vertically in suitable guides *f* of plate D, the racks at their ends being engaged, by a pinion, *g*, with operating hand-lever or wheel, and set in either direction, according as the pinion is turned, the extreme position of the sliding pieces C being defined by bottom shoulders *f'*, in connection with the guides *f*. An elevated top rail, *h*, with inclined ends, is applied to the upper part of each rack-piece C, being of sufficient height to be brought in contact with the ends of the pivoted arms *d'* of the oscillating toe-piece when the rack-pieces are set into the required position.

The toe-piece B works in the regular manner when the rack-pieces C do not touch the raised top rails *h*, but as soon as the top rails are set to engage them the pawls are instantly released thereby from the shoulders of the toe-piece, and produce, by the weight of the levers thereon, the dropping of the respective toe and lever, and the cutting off of the steam. The nearer the top rails of the rack-pieces are placed to the pivoted arms of the toe-piece the shorter will be the cutting-off action, and the quicker the speed of the engine.

The action of the rack-pieces on the toe-piece in both directions produces the cutting off in forward and backward direction, and produces thus a very effective and readily-adjusted cut-off construction.

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

The oscillating toe-piece B, having shoulders *b b*, and the rock-shafts having pawls *d d* and arms *d' d'*, combined with the slide C D, having top rail *h*, as and for the purpose specified.

HENRY WEBSTER.

Witnesses:

ALOYS GRIMM,
SAMUEL BIRCH.