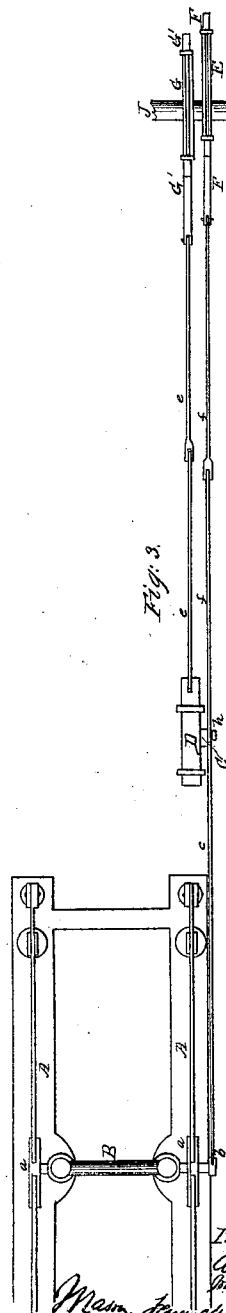
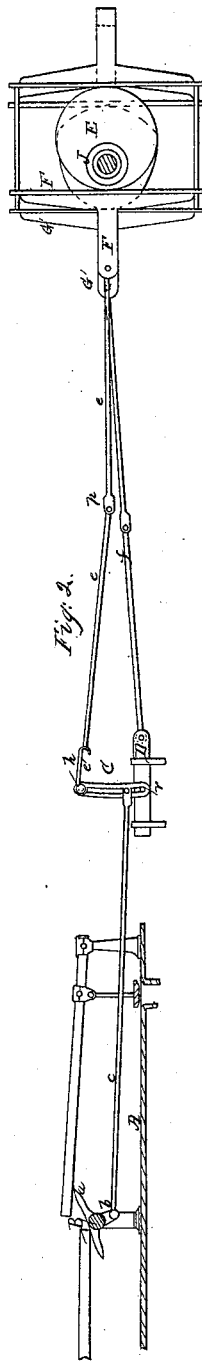
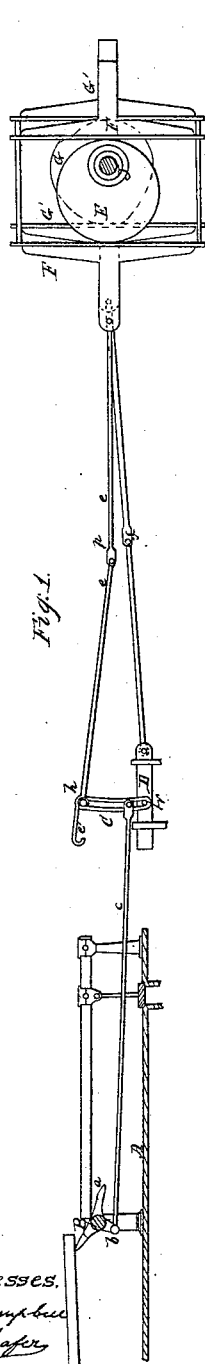


Seely & McCabell,
Steam-Engine Valve-Gear.
N^o 54,026. Patented Apr. 17, 1866.



Witnesses.
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UNITED STATES PATENT OFFICE.

AUSTIN SEELY, OF ALTON, ILLINOIS, AND JOHN M. CABELL, OF KEOKUK,
IOWA.

IMPROVEMENT IN VALVE-GEARS.

Specification forming part of Letters Patent No. 54,026, dated April 17, 1866.

To all whom it may concern:

Be it known that we, AUSTIN SEELY, of Alton, in the county of Madison and State of Illinois, and JOHN M. CABELL, of Keokuk, in the county of Lee and State of Iowa, have invented a new and Improved Variable Cut-Off for Puppet-Valve Steam-Engines; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side view of the improved cut-off motion. Fig. 2 is a similar view, showing the several parts in different positions. Fig. 3 is a top view of the cut-off motion.

Similar letters of reference indicate corresponding parts in the three figures.

This invention relates to a new and improved variable cut-off, which is intended more particularly for engines in which the steam is let into and out of the steam-cylinders by means of puppet-valves, which are operated by levers and lifting-toes. The invention is, however, applicable to slide-valve engines, for letting steam into and out of the chest containing the slide-valve by a puppet-valve, which is seated when the piston has made part of its stroke.

The object of our invention is to so construct a cut-off motion that it can be applied to a common engine with a very trifling change, and can be handled with great facility without stopping the engine.

To enable others skilled in the art to understand our invention, we will describe its construction and operation.

In the accompanying drawings we have represented our improved cut-off applied to a common puppet-valve engine for operating upon the puppet-valves which let steam into and out of the steam-cylinder. Where the improved cut-off is applied to a slide-valve engine the puppet-valves will be arranged so as to let steam into and out of the steam-chest containing the slide-valve, according to any desired lead of this valve.

A represents the steam-chambers, which may be arranged and applied to a steam-cylinder in any suitable manner. B is a rock-shaft carrying two lifters, *a a*, which operate upon the levers of the exhausting and receiving valves; and *b* is a crank which is connected to one end of the rock-shaft B, and which is con-

nected to a vibrating link, C, by means of a rod, *c*, as shown in the drawings. This link C is pivoted to a slide, D, at its lower end, and connected to an eccentric, E, by means of a rod, *e*, and a yoke, F. The slide D receives a reciprocating motion at suitable times from a cam, G, by means of a connecting-rod, *f*, and a yoke, G'. The yokes, and also the connecting-rods and slide, work in suitable guides arranged in any convenient manner.

The link C is slotted to receive an adjustable wrist-pin, *h*, which can be moved nearer to or farther from the point of connection of the link with the slide, according to the amount of cut-off required, and the rod *c*, which connects this link C with the yoke F of the eccentric, has an elongated hook, *e'*, which allows of a slip of rod *c* at certain times in the forward and backward strokes of the slide D. The slip in the hook *e'* equals twice the difference of the eccentricity of the eccentric and full-stroke cam.

It will be seen that the cam and eccentric are applied to their main shaft J in such a manner that they make their throws together. As both the cam and the eccentric impel their yokes forward the slide D will be moved for a short distance until the wrist-pin on the link C is brought against the back of the hook *e'*, as shown in Fig. 1, when the eccentric and cam will both operate to move the link C and lift the receiving-valve. As the eccentric and cam commence the return strokes of the yokes the link C will slip until the forward part of the hook *e'* is brought in contact with the wrist-pin *h*, when the slide and link will both be moved together and the valves will again be lifted, as shown in Fig. 2.

The exhaust-valves are worked by a rod connecting in a suitable manner with the full-stroke cam-yoke, which gives motion to the lower end of the link. The receiving-valves, which are operated as above described, always make the same rise in the same time, the variation being in the time occupied in seating them.

We can use a cam to do the work of the eccentric, but prefer to employ the latter, as it will operate smoother and more positively.

If desirable, the wrist-pin *h*, upon which the hook *e'* works, may be made stationary, and the wrist-pin, upon which the rod *c* works, may be made adjustable, the slot in the link

C being curved in an opposite direction to that shown in the drawings. The amount of lead or cut-off in both cases will be regulated by moving the wrist-pin nearer to or farther from the center of motion of the link.

For an engine that runs but one way—that is to say, an engine that requires no reversing—the full-stroke cam can be dispensed with and the work all done by the eccentric alone. In this case a rod is connected from *p* to *r*, having the same slip or lost motion as described for the rod *e*.

By our invention the variation in the closing of the valves can be made in a moment, and without stopping the engine, and if desirable this variation may be effected automatically by employing a governor for raising and lowering the hooked end of the rod *e*.

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

1. The reciprocating and vibrating link C and adjustable wrist-pin connection *h*, for producing the variation in the closing of the receiving-valves, substantially as described.

2. The hooked rod *e*, in combination with the vibrating link C and reciprocating slide D, the latter being operated by means of a full-stroke cam or eccentric, substantially as described.

AUSTIN SEELY.
JOHN M. CABELL.

Witnesses:

JAMES H. McCORD,
ALEX. C. DURDY.