H. O. Perry,

Steam-Engine Valve-Gear.

No. 46,932. Patented Mar. 21, 1865.

Fig. 1

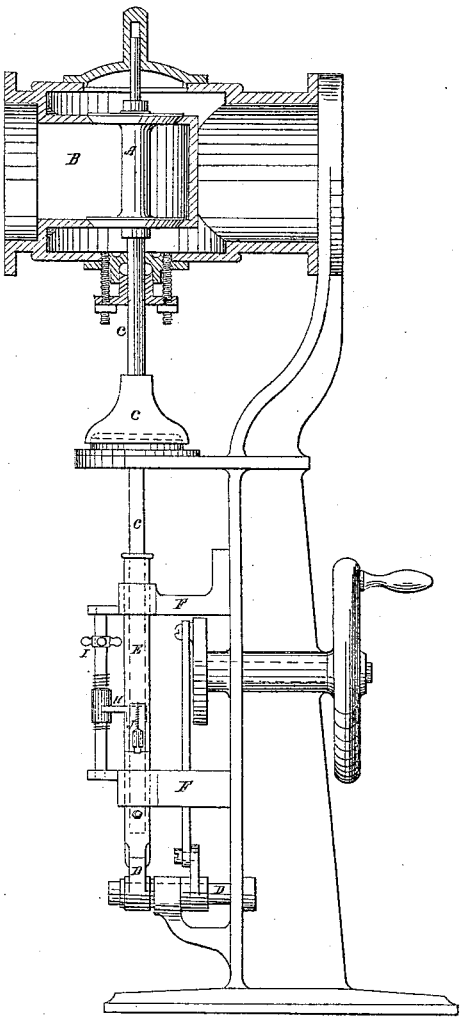
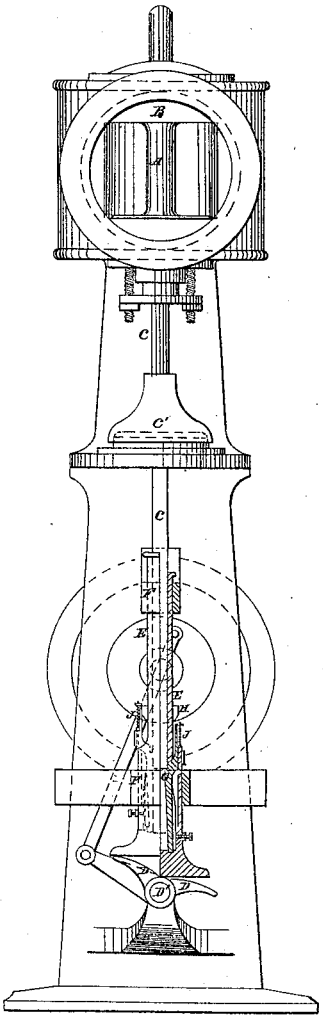


Fig. 2.



Witnesses

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IMPROVEMENT IN VARIABLE CUT-OFF VALVE-GEAR FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **46,932**, dated March 21, 1865.

To all whom it may concern:

Be it known that I, HORATIO O. PERRY, of the city of Buffalo, county of Erie, and State of New York, have invented a certain new and Improved Variable Cut-Off Gear for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure I is a side elevation of cut-off gear and section of valve and chest, and Fig. II is a sectional front elevation of same.

The nature of this invention consists in making the lifting-toes by which the cut-off valve is raised in two parts independent of each other, so that in their movement by the rocking steam-toes one is free to descend while the other is ascending, thus allowing each lifting-toe to remain in constant contact with its steam-toe, so that the valve will be opened instantly after a change of motion of the steam-toes, (the steam-toes having a motion coincident with, but slightly leading that of the piston,) and kept open through any required part of the ensuing stroke of the piston, or until closed by the operation of an appropriate tripping device; second, in the combination, with the independent lifting-toes, of an adjustable tripping device, by which the action of the lifting-toes in raising the valve may be broken and the valve allowed to close and the steam be cut off at any part of the stroke, (less the lead given the valve).

Letters of like name and kind refer to like parts in each of the figures.

A represents the cut-off valve of the double-puppet construction operating within the valve-chest B.

C represents the valve-stem, upon which the lifting-toes act to give motion to the valve.

C′ represents an air-dash pot of ordinary construction, by which the slamming of the valve is prevented.

D represent the steam-toes on the rock-shaft D′, which is given a motion coincident with but slightly leading that of the piston by any convenient means.

E represents a lifter-rod divided longitudinally into two halves, each half having a lifting-toe formed at its lower end.

The lifter-rod is supported and guided in its movement by the brackets F, bolted to the engine-frame. The two halves of the rod are grooved out, forming a sleeve, through which the valve-stem works.

Motion being given to the rock-shaft and steam-toes D, it is evident that the rising toe will carry with it the corresponding half of the lifter, while the other half of the lifter will follow the descending toe.

Each lifter is provided with a spring-catch, G, which catches under the end of the valve-stem as the lifter rises, thus causing the lifter and valve-stem to move together and the valve to open. The catch is thrown out and its hold on the valve-stem released and the valve consequently allowed to close, by striking the wedge or cam H, the relative position of which with regard to the motion of the lifter (which is coincident with that of the piston) governs the time the valve is allowed to remain open, and consequently the part of the stroke at which the steam is cut off. By varying this position, which is done by the adjusting-screw I, the point of cutting off is varied in a corresponding degree; and since the motion of the rock-shaft and steam-toes is coincident with that of the piston—that is to say, they rock in one direction during the same time that the piston is moving in one direction, and change their motion and rock in the opposite direction, when the piston changes its motion, (except that they are given a slight "lead,") it is evident that the rising motion of the lifters will coincide with, or nearly so, the motion of the piston, so that, unless sooner tripped by the cams H the valve will be kept open through the whole stroke of the piston. It will thus be seen that this cut off is momentarily adjustable and capable of cutting off at any part of the stroke.

The spring-catch G is held out during the downward movements of the lifter by a spring-bolt, J, which as the lifter completes its downward motion is made to release its hold and allow the catch to spring in again ready to take a new hold of the valve-stem by striking the bracket F or other properly-arranged stop. By this means the catch of the descending lifter is prevented from interfering with the dropping of the valve-stem when the same is tripped at less than full-stroke.

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

1. The combination, with the rocking steam-toes having a motion coincident, or nearly so, with the piston, of two independent steam lifting-toes acting upon one valve-stem in such manner that as one ascends the other will descend, by which construction and the operation of an appropriate adjustable tripping device the steam may be cut off at any required part of the stroke.

2. In the combination, with the independent steam lifting-toes E′, of the spring-catches G, and spring-bolt J and adjustable tripping-cams H, operating for the purpose and substantially as described.

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