J. GILLIES.

STEAM SLIDE-VALVES.

No. 189,723. Patented April 17, 1877.

Fig. 1.

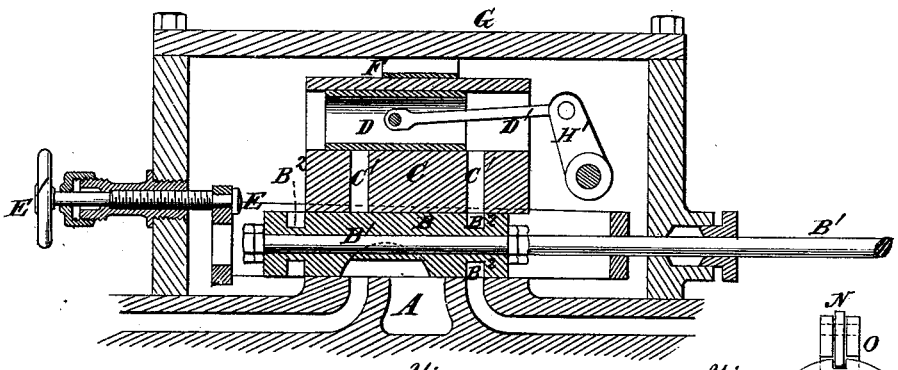


Fig. 2.

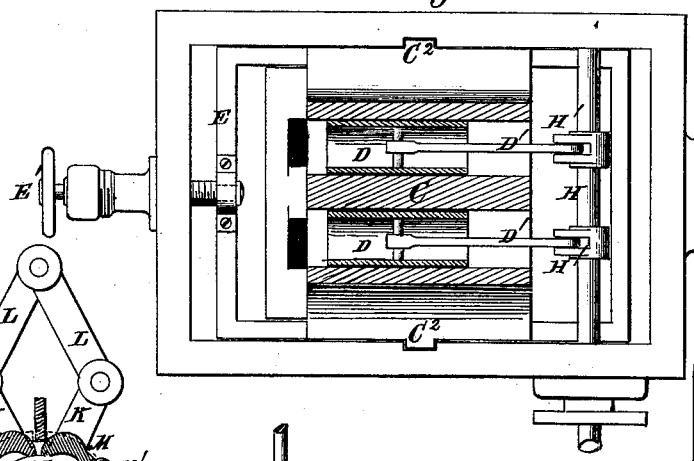


Fig. 5.

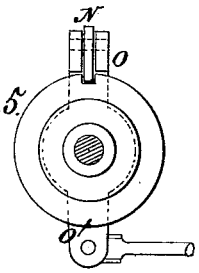


Fig. 6.

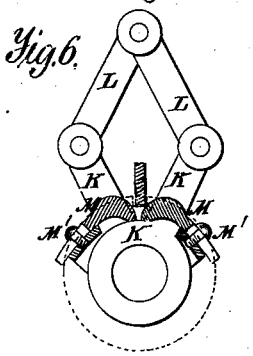


Fig. 4.

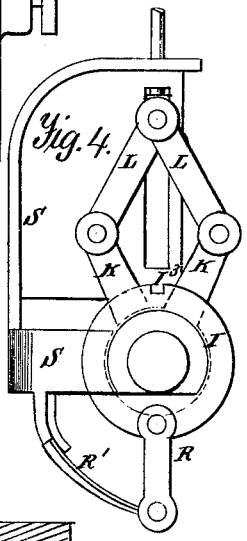


Fig. 7.

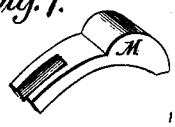
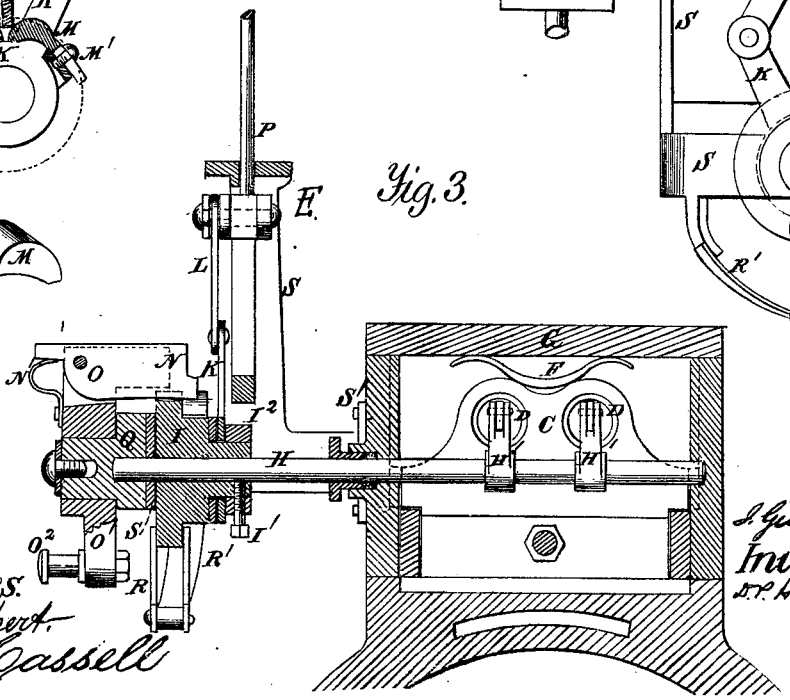


Fig. 3.



Witnesses.
A. Ruppert.
A. C. Cassell

J. Gillies
Inventor.
by Holloway & Co.
Atty.

UNITED STATES PATENT OFFICE.

JOHN GILLIES, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN STEAM SLIDE-VALVES.

Specification forming part of Letters Patent No. **189,723**, dated April 17, 1877; application filed May 13, 1876.

To all whom it may concern:

Be it known that I, JOHN GILLIES, of St. Louis, in the county of St. Louis and State of Missouri, have invented a new and useful Improvement in Valves for Steam-Engines, of which the following is a specification:

My improvements relate to slide-valves with cut-off attachment; and consists in peculiarities of construction and arrangement, which will hereinafter be described and specifically indicated, whereby the proper working of the valves is provided for.

In the annexed drawings, making part of this specification, Figure 1 is a central longitudinal section of the valve-chest and valves. Fig. 2 is a plan of the interior of the valve-chest, the cut-off valves being shown in section. Fig. 3 is a transverse section, showing the valves and mechanism by which the governor acts on the cut-off. Fig. 4 is an end elevation of said mechanism. Fig. 5 is a sectional elevation, showing part of said mechanism. Fig. 6 is a similar elevation, showing another part of the mechanism. Fig. 7 is a perspective view of one of the latches which regulates the cut-off.

The same letters are employed in all the figures in the indication of identical parts.

A is the ordinary valve-seat for a slide-valve, B, which is actuated by the rod B^1. It has ports B^2 and on its upper face is a stationary cap, C, with corresponding ports C^1 C^1. The cap C has in the top two round chambers, communicating with the ports C^1, and containing the tubular cut-off valves D, which, when moved, open communication for the steam in the valve-chest, through the induction-ports, to the cylinder. On sides of the cap are projections C^2, which fit into channels in the inner faces of the sides of the valve-chest to prevent the longitudinal movement of the cap. The cap rests on the edge of the wedge-frame E, which is actuated by the set-screw E′, and, being inclined on its face, raises or lowers the cap. Over the cap is a spring, F, which being confined by the cover G of the valve-chest presses the cap down upon its seat.

H is the rocking-shaft which forms the communication between the governor stem and the sliding cut-off valves D, with which the shaft is connected by the arms H′ and rods D′. The mechanism through which the governor acts on the valves D is as follows: The cone I is fastened to shaft H, by means of a set-screw, I^1, confining also the ring I^2, which confines the eyes of the lower arms K of a double toggle, K L, connected by a sliding stud, L′, with the governor-stem P. On the respective arms K K, where they surround the shaft, are adjustably secured cams M, by means of set-screws M′, passing through slots in the stem of the cams. The function of the cams is to detach the latch N from the notch I^3, in the upper edge of the base of the cone I, and as the position of the cams depends upon that of the arms K K of the toggles, it follows that, as the latter are raised or lowered by governor-balls, the latch will be thrown out of gear with the cone I sooner or later, and that consequently the shaft H will have a shorter or longer vibration, and the action of the cut-off be correspondingly increased or diminished.

The latch N is pivoted to the double arm O, and held down by the spring N′. The lower end of the arm O^1 carries a stud-pin, O^2, which is connected to the rod of an eccentric on the main driving-shaft of the engine. The double arm oscillates upon the hub Q, which is fastened to the bracket S, which is bolted by its flange S′ to the valve-chest, and supports the driving mechanism, and the stud connecting the toggles with the governor-stem P. On the lower edge of the cone I opposite the notch I^3 are placed the links R connected with a spring, R′, fastened to the bracket T, the object of which is to bring back the notch I^3 after the latch has been disengaged far enough from the surface of the cam to permit the latch to fall into the notch with the return-stroke.

The operation of the valves is as follows: The reciprocating motion of the eccentric rod communicates a constant oscillation to the double arm O O^1 and latch N, which engages the notch I^3 on the rim of the cone I, and with it oscillating the shaft H, and actuating the cut-off valves D. The extent of the movement of the latter depends, therefore, upon the distance over which the latch causes the cone to turn; and this is governed by the position of the cams M, which are brought nearer by

the rising of the governor-stem, and thereby sooner disengaging the latch shortens the stroke of the cut-off valves. When the latch has freed the cone, it is immediately drawn partly back by the spring R′ so that it will be engaged by the latch on the return-stroke. Should the speed increase, so as to raise the stem of the governor to its greatest upward range the cam will exclude the latch from the notch entirely, and so close the valves entirely. There may be one, two, or more cut-off valves as preferred.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with the slide-valve, the cap C, formed with ports and tubular valve-seats, and the balanced tubular valve D, substantially as set forth.

2. In combination with the cap C, inclosing the cut-off valves, the wedge-frame E for regulating the seat of the cup, so as to control the relation of the cup to the slide-valve without disturbing its relation to the cut-off valve.

3. In combination with the slide-valve, the adjustable cap C, containing the tubular cut-off valve D, the oscillating shaft, and governor, substantially as set forth.

4. The combination of the cap, having ports through it, the adjustable wedge-frame, and the spring F, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN GILLIES.

Witnesses:
F. A. LEBAURIN,
CHAS. L. MOSS.