(No Model.)

W. W. ST. JOHN.

CUT-OFF VALVE.

No. 386,365. Patented July 17, 1888.

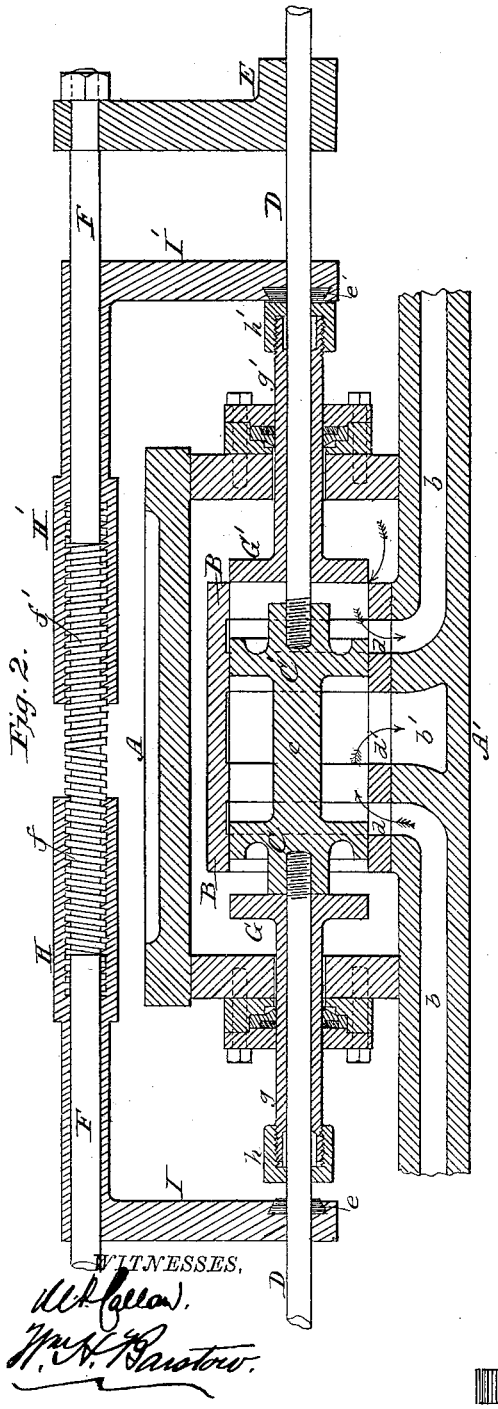

Fig. 2.

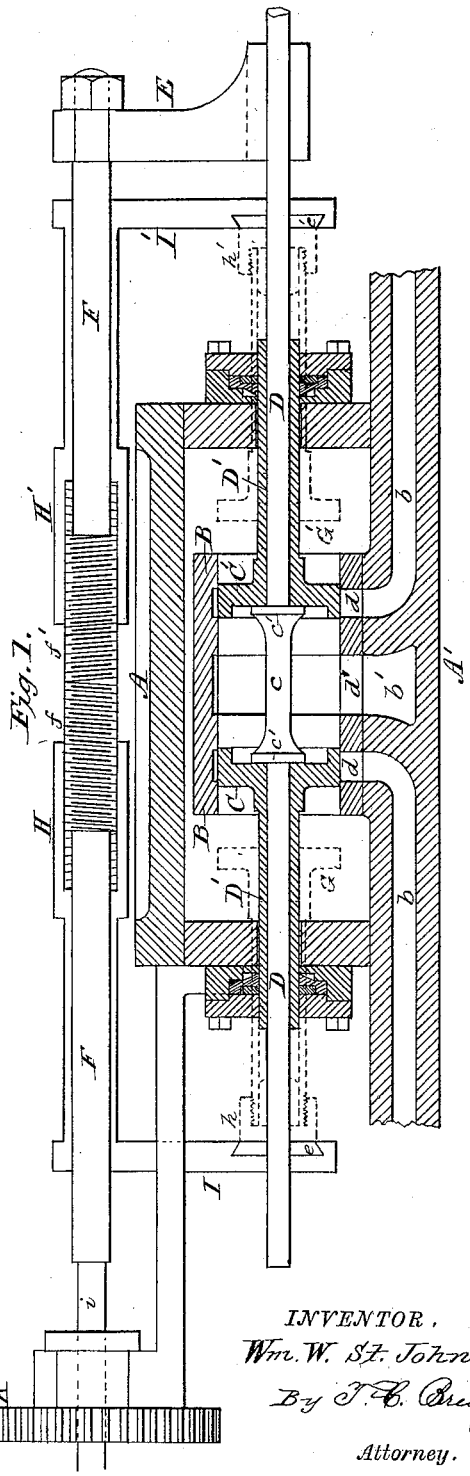

Fig. 1.

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WILLIAM W. ST. JOHN, OF BROOKLYN, NEW YORK.

CUT-OFF VALVE.

SPECIFICATION forming part of Letters Patent No. 386,365, dated July 17, 1888.

Application filed September 12, 1887. Serial No. 249,440. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. ST. JOHN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Cut-Off Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in cut-off valves for locomotive and other engines; and the object of the invention is to produce a piston-valve to be used with or without a cut-off, and which is very simple in its construction, not liable to get out of order, and very economical in its operation as regards wearing of the valve as well as the use of steam; also, that it can be operated direct by the pressure of steam; also, that its operation can be automatically regulated by connection with a governor, or that it can be regulated or adjusted by hand, as desired, so as to cut off the steam sooner or later; furthermore, that it can be easily applied to old as well as new engines, and, finally, that it can be produced at a very small expense and will be very economical in the use of steam, gas, or other motive power.

To this end my invention consists in the construction of certain details and the arrangement of parts, as will be more fully described hereinafter, and specifically pointed out in the claims, reference being had to the accompanying drawings and the letters of reference marked thereon.

Like letters indicate similar parts in the different figures of the drawings, in which—

Figure 1 represents a longitudinal section of my improved piston-valve with the cut-offs shown in dotted lines and arranged in an ordinary steam-chest of a locomotive-engine. Fig. 2 is a modification of the same adapted to a stationary or other engine.

In the drawings, A represents an ordinary steam-chest, secured to the usual cylinder, A′, with its steam-ports *b* and exhaust-port *b′*. To the valve-seat of this cylinder the casing B, having the steam-ports *d* and exhaust-port *d′*, corresponding with ports *b* and *b′*, is bolted. It is bored out for the reception of the piston-valve, consisting of the bisected heads C and C′, loosely placed on the valve-stem D. If desired, the said heads may be provided with suitable packing-rings, although usually not required. The valve-stem D is provided with the central part, *c*, and the collars *c′*, which limit the movement of the heads toward each other. The heads have the hollow valve-stems D′, which pass through suitable stuffing-boxes at each side of the steam-chest.

This valve is especially adapted for locomotives and other quick-running engines, and operates as follows: The steam being admitted to the steam-chest, the two heads are forced against the collars *c c′* by the steam-pressure, when, by the action of the eccentric or other valve-gear to which the valve-stem is connected, the ports are alternately opened and closed, as in an ordinary piston-valve, and the steam is thus admitted and exhausted. When running without steam—as, for instance, down a grade—the valve-stem moves backward and forward, leaving the heads in place, thereby breaking the vacuum in the cylinder by leaving both the ports open, permitting the exhaust-steam to pass from one end of the cylinder to the other end. The wear on the valve-heads is in this instance entirely avoided.

If it is desired to employ cut-off valves, the disks G and G′ (shown in dotted lines in Fig. 1) are applied to the hollow valve-stems D′, which are then extended and stuffing-boxes *h h′* provided at each end. The ends of said stems are then acted on by the tappets I I′, attached to the sleeve-nuts H H′, made adjustable on the rod F by the right and left hand screw-threads *f f′*, so as to cut off the steam sooner or later. If desired, the rod F may be provided with a suitable gear or bevel wheel, K, meshing with intermediate gearing, to be operated automatically by a governor; or a hand-wheel may be used to adjust the tappets by hand. The tappets are provided with buffers *e e′*, made of leather, rubber, or other suitable material, to prevent the noise which would be occasioned by the metals coming in contact with each other. The arm E, secured to the valve-stem D, communicates motion to the rod F in this instance. The end of the rod F is made square, as at *i*, in this case, and prevents the rod from turning.

In the modification shown in Fig. 2 the steam-chest, the casing, and ports are similar to those in Fig. 1. The disks or heads C and C′ are connected by a neck, *c*, and the valve stem D, passing through the hollow stems *g g′* of the cut-offs G G′, is provided with the arm E, connected to rod F, having the right and left hand screws *f f′*, meshing with the sleeve-nuts H H′, provided with the tappets I I′, by which the cut-offs G G′ are operated and adjusted as desired. The steam, being admitted to the steam-chest, passes into the cylinder until the steam-pressure forces the valve G′ toward the main valve, coming in contact with the extended hub thereof and cuts off the steam. The exhaust-steam passes out at the opposite end, as indicated by the arrows. The cut-off and the main valve then move toward the opposite end of the steam-chest, and the above operation is repeated as in the first instance, the difference being that the main valve-heads C C′ are positively moved by the valve-stem D, while in Fig. 1 the valve-heads C C′ are loosely attached to the stem and are moved by the steam-pressure.

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

1. A piston-valve having the bisected heads placed loosely on a valve-stem, having collars for limiting their motion toward each other, and operated as and for the purpose herein specified.

2. A piston-valve provided with heads C C′, arranged in a casing, B, having steam and exhaust ports, and the cut-offs G and G′, in combination with a solid stem, D, and hollow stems and tappets, as and for the purpose specified.

3. A piston-valve provided with heads C C′, attached to a solid stem, D, and arranged in a casing, B, having steam and exhaust ports, in combination with the loose cut-offs G G′, provided with hollow stems and operated by tappets, in the manner shown and set forth.

4. The combination of a piston-valve, arranged in a casing and provided with heads C C′, attached to a solid stem passing through hollow stems of the cut-offs G G′, operated by tappets, with the right and left hand screws and sleeve-nuts, all arranged as shown and specified.

In testimony whereof I hereby affix my signature in presence of two witnesses.

WILLIAM W. ST. JOHN.

Witnesses:

T. C. BRECHT,

M. P. CALLAN.