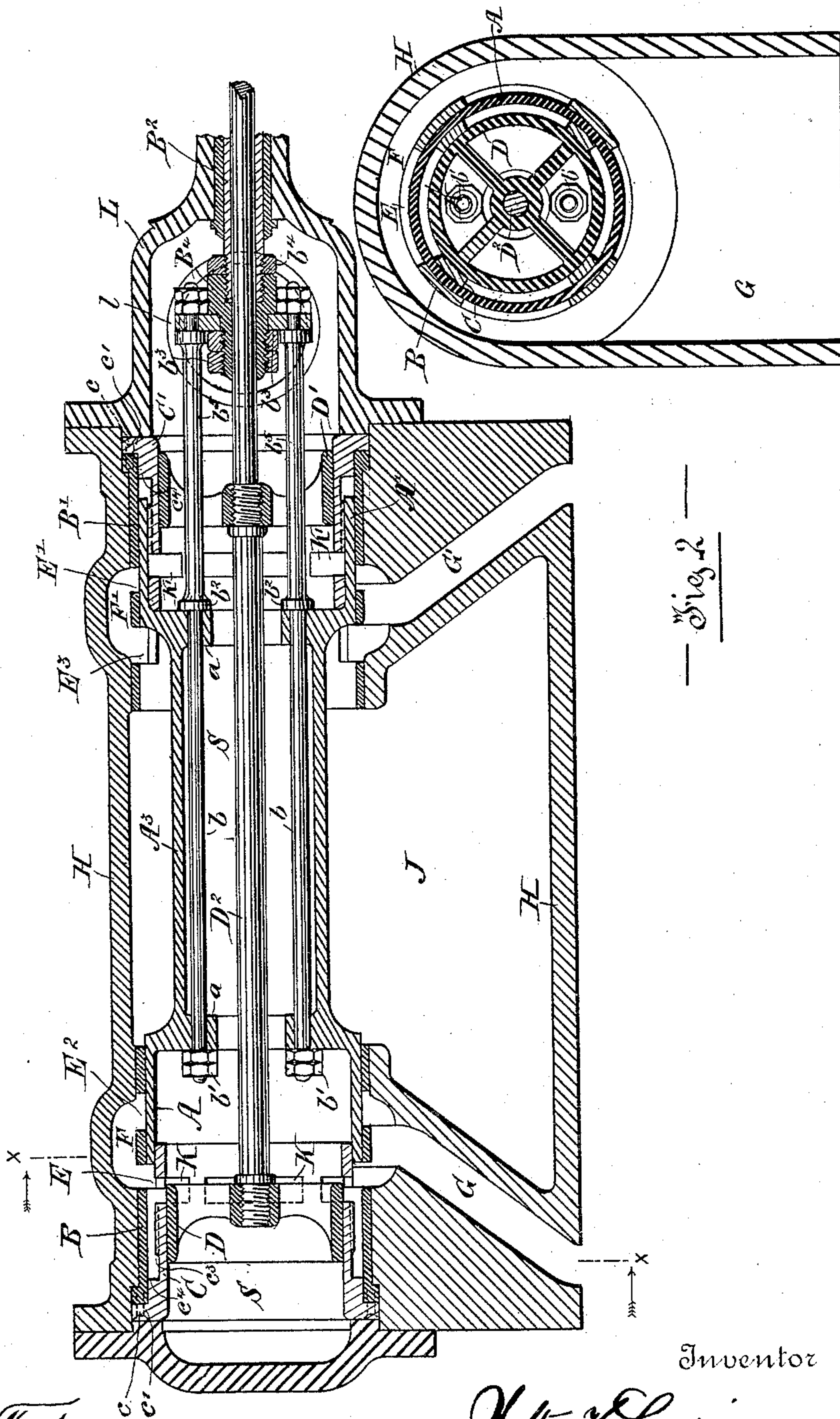


(No Model.)

W. H. LAURIE.
CUT-OFF VALVE.

No. 452,978.

Patented May 26, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

WALTER H. LAURIE, OF MONTREAL, CANADA.

CUT-OFF VALVE.

SPECIFICATION forming part of Letters Patent No. 452,978, dated May 26, 1891.

Application filed August 8, 1890. Serial No. 361,498. (No model.)

To all whom it may concern:

Be it known that I, WALTER HUNTER LAURIE, of the city of Montreal, in the District of Montreal and Province of Quebec, Canada, have invented certain new and useful Improvements in Cut-Off Valves; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to cut-off piston-valves, and has for its object to provide an automatic cut-off which will secure a sharp cut-off, avoid excessive cushion and friction of the steam in its passage to the cylinder, thus guarding against wire-drawing, and to secure a longer stroke, thereby obtaining a high rate of piston speed without excessively high rotative speed, and, further, to obtain full boiler-pressure to point of cut-off, so as to derive the highest efficiency from the steam used.

The invention consists in the interposition between the main valve and the auxiliary valve of a stationary auxiliary bushing having a single port, in contradistinction to the movable auxiliary many-ported bushings at present in use, as such movable bushings do not allow of a cut-off at every point of the whole stroke of the main valve, notwithstanding the numerous ports in them, and, furthermore, that so many ports serve to materially increase wire-drawing of the steam. For full comprehension, however, of the invention, reference must be had to the annexed drawings, forming part of this specification, in which like symbols indicate corresponding parts, and wherein—

Figure 1 is a longitudinal vertical section of the steam-valve engine provided with my cut-off; and Fig. 2, a transverse section of same on line X X, Fig. 1, looking in the direction indicated.

A A' are the end sections of the main valve, their outer surfaces being fitted to main bushings B B', as usual, and having their inner surfaces bored to fit outside of stationary auxiliary bushings C C', secured in place, preferably, by screws *c* passing through flanges *c'* *c'* on their ends into the ends of the main bushings B B'.

D D' are the cut-off valves fitted to the in-

ner surfaces of the auxiliary bushings C C' and secured on the spindle D², passing through the center of the main valve-spindle B², which is hollowed to receive same. The stem or central section A³ of the main valve is hollow to allow of communication with each end of the chest, and has inwardly-projecting flanges *a a* cast at each end and bored for the passage of rods *b b*, which are rigidly held to the main valve by jam-nuts *b' b'* and shoulders *b²* in contact with the flanges *a a*, and project, as at *b⁵*, to connect the main valve with its spindle B² through a cross-head or plate B³, fitted on a cap B⁴, screwed on the end of the spindle, both being secured in place, respectively, by jam-nuts *b³ b³* and *b⁴*.

E E' are the steam-ports, and E² E³ the exhaust-ports, in the main bushings B B', which communicate with the circular ways F F', connected with the cylinder by channels G G' in the chest H, J being the exhaust-space in same.

K K and K' K' are ports in the stationary auxiliary bushings C C', not quite in line with the ports E E', but sufficiently near for instant communication.

Steam enters the central space S S S, inclosed by the bushings and valves at *l*, from a pipe let into the bonnet L, (or at the opposite cover,) arranged at the forward end of the chest, as usual, and through which the valve-spindles pass.

The main valve and the auxiliary or governor valve are both set to cut off at about the same point, and when the main-valve section A uncovers the steam-port E the steam passes through the port K in the auxiliary bushing C to such port E, the exhaust-port E² and steam-port E' being closed and the exhaust-port E³ open. On the return-stroke this order is reversed, the exhaust-port E² being opened to allow the steam to pass from the cylinder into the exhaust-chamber J.

When the engine gets up to speed, the cut-off or governor valves D D' move up and cut off the steam from the auxiliary ports K K' at the desired point of stroke necessary to maintain speed.

The stationary auxiliary bushings C C' are provided on the outside with grooves or pas-

sages c^3 from their ports to the shoulders c^4 to prevent cushion when the main valves move into the space between the two bushings.

5 It will be seen that the stationary port to be operated upon by the cut-off valve allows the cut-off to be made perfectly sharp and uniform throughout the whole stroke of the main valve.

10 What I claim is as follows:

1. In a piston-valve engine, the combination, with the main valve and bushing, of an auxiliary valve and bushing, the latter having a single port, and connections with the
15 governor or other device for operating said auxiliary valve.

2. In a piston-valve engine, the combination, with the main valve and bushing, of an auxiliary valve and stationary ported bush-
20 ing located within the annulus of said main

valve, and connections with the governor or other device for operating said auxiliary valve.

3. In a piston-valve automatic engine, the combination, with the main valve and its
25 ported bushing, of an auxiliary valve and stationary ported bushing located within the annulus of said main valve, an operating-spindle for such auxiliary valve, passing through the main-valve spindle, hollowed to
30 receive it, and rod and cross-head connections between the main valve and its said spindle to allow of the passage of the said auxiliary-valve spindle to and through such main-valve spindle, as shown and described.

WALTER H. LAURIE.

Witnesses:

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