

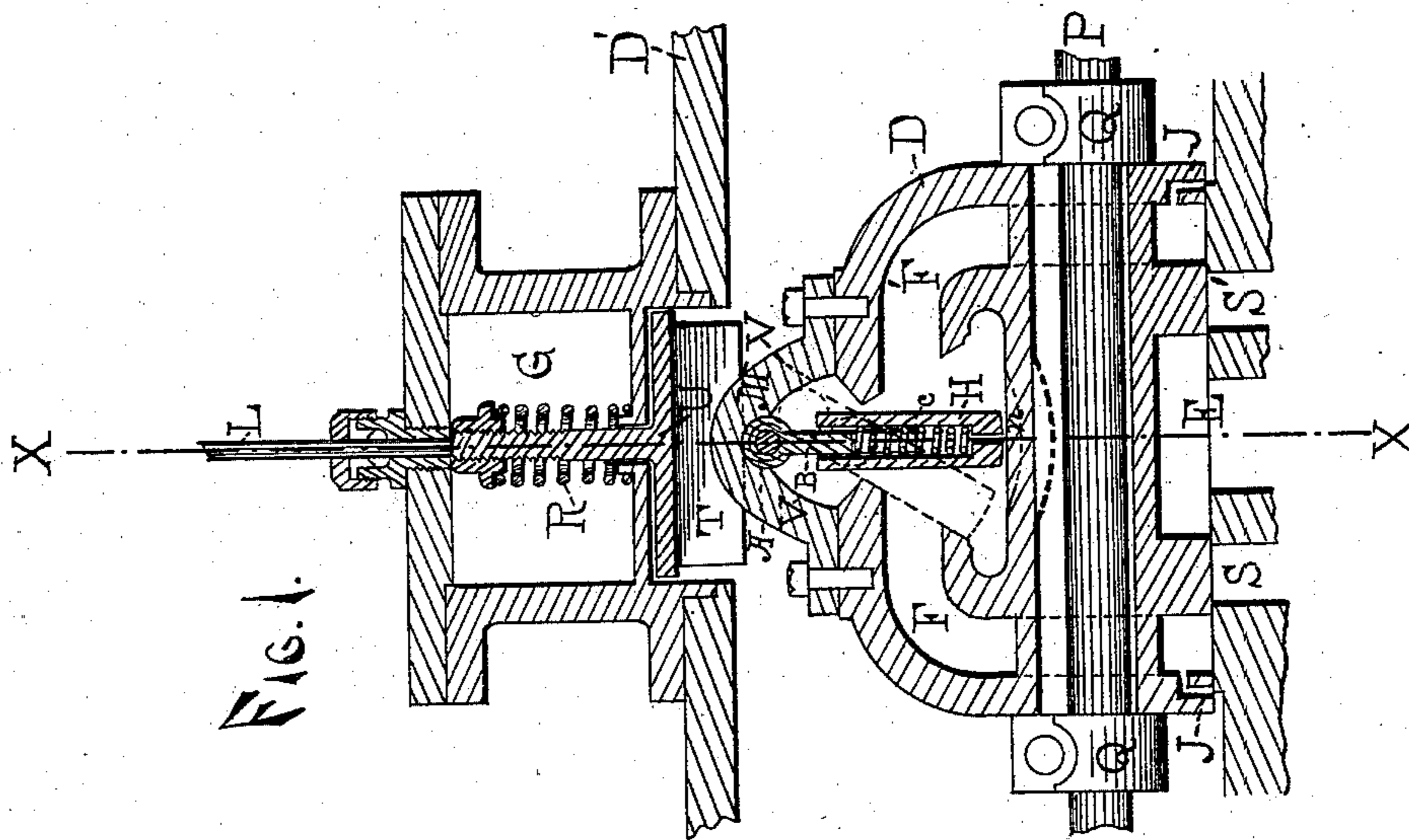
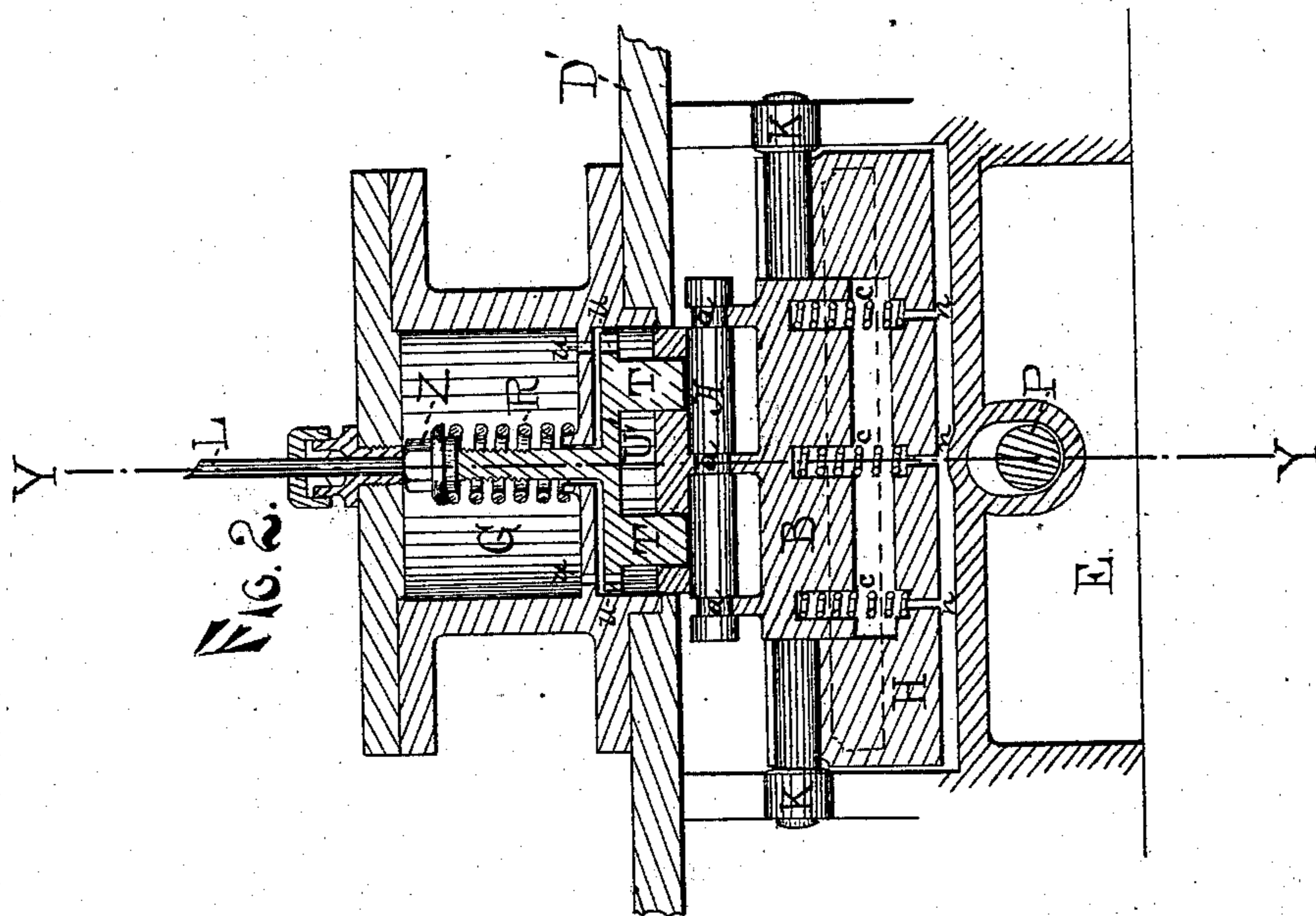
(No Model.)

B. F. OLMSTED.

CUT-OFF VALVE.

No. 284,472.

Patented Sept. 4, 1883.



WITNESSES:

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BENJAMIN F. OLMSTED, OF GRAND RAPIDS, MICHIGAN.

CUT-OFF VALVE.

SPECIFICATION forming part of Letters Patent No. 284,472, dated September 4, 1883.

Application filed June 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. OLMSTED, a citizen of the United States, residing at the city of Grand Rapids, in the county of Kent and State of Michigan, have invented a new and useful Automatic Cut-Off Valve for Steam-Engines, of which the following is a specification.

My invention relates to improvements in cut-off valves for steam-engines; and the object is to cut off steam at different travels of the main piston in the cylinder, according to the different labors on the engine on each half-stroke, respectively. I attain this object by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view of my invention (with such other parts of an engine as are attached to the part by me invented) on line *y y* of Fig. 2. Fig. 2 is also a vertical sectional view of the same on line *x x* of Fig. 1.

Similar letters refer to similar parts throughout the several views.

In the drawings, L is the compression-rod, operated by the governor, which governor is not shown in the drawings, as it is no part of my invention.

R is a spring designed to counteract the pressure from the governor.

U is a piston, so placed that it is depressed by the action of the rod L, and depresses the parallel planes T T, which planes are placed above the roller A A and in contact with it, as shown in Fig. 2, and the roller A A, with the blades B, journaled thereto, is also depressed, through the piston U and planes T T, by the action of the rod L. The journals are shown by *a a a*, there being two or more of these journals.

H is a cut-off valve, so constructed that it receives the sliding blade B and swings on journals or pivots, and springs *c c c* are placed in openings in the valve H, beneath the edge of the blade, so as to press outwardly on the blade and to press the roller A into the arc or socket M, and when the engine is not in motion to hold it there, being the position shown in Fig. 1. The roller A is so constructed that it rolls or turns in journals in the blade, and the upper arc or socket, M, is much smaller than the depressed arcs V V, and as the spring

presses outwardly on the blade the tendency of the spring is to continually press the roller toward the upper part of the smaller arc M at all times.

n n n are vents in valve H to allow the steam to enter and surround the blade and hold it in equilibrium.

D is an ordinary D-valve.

S and S' are steam-ports which receive the steam from the steam-passages F F' and convey it to the cylinder, thereby creating a current of steam alternately through the passages F and F', which steam-current acts alternately first on one side of valve H and then upon the other.

J J are steam-vents for the purpose of equalizing the steam-pressure under the valve H, allowing the spring to bring the valve to its normal position when the pressure is equalized.

E is an exhaust for main D-valve.

Q is a grip-collar on the main valve-stem P.

G is the governor steam-chest, resting on the top D' of the main steam-chest. *u u u u* are vent-holes extending through piston U and the base of the governor steam-chest, in order to equalize the steam-pressure in the governor steam-chest G, as also over and around the governor-piston. The counter-spring R is regulated by the nut Z, so that its counteracting stress on rod L may be increased or decreased at pleasure.

K K are journals on which the valve H turns or swings. The socket M may or may not be the arc of a circle, and the same is true of arcs V V; but the arcs are so placed that as the roller passes from the arc M to arc V it passes over an angle or obstacle.

The operation of my invention is as follows: When the engine is set in motion, as the speed increases, the governor-rod L depresses the piston U, planes T T, and roller A until the steam, entering the cylinder through port S, causes a current in F, which carries the valve H to the valve-seat, cutting off the steam from passage F; and, as the main D-valve reverses its motion, the steam, prior to the opening of port S', passes by means of vent J into passage F, when the spring instantly brings H to its normal position, (shown in Fig. 1,) and when port S' is opened a reverse current is created and valve H is carried to the reverse

seat on F', and the operation is thus continued and the steam is alternately cut off from passages F and F'. If the engine is running rapidly, the depression of the planes T T is such that roller A cannot pass into socket M but a short distance, and the valve passes to its seat much more quickly and readily than it will do with a slower motion, as the angle or obstacle between arc M and arc V but slightly retards the roller, and a strong current will force the valve to its seat much more quickly than a weak or slow current, so that the cut-off may be at any part of the stroke, and the engine is perfectly regulated and the steam most economically used.

I am aware that automatic cut-off valves are not new, and that there are many in use, and I do not broadly claim to have invented the same; but I am not aware that an oscillating valve adjusted by means of sliding blades and springs, so as to regulate the resistance required to force it to its seat, has ever been used.

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

1. In an automatic cut off valve, the oscil-

lating valve H, in combination with the sliding blade B, spring *c c c*, roller A, and arcs M and V, all constructed substantially as described. 30

2. The combination of the spring R, piston U, rod L, planes T T, roller A, arcs M and V, blade B, and valve H, all constructed and operated substantially as described. 35

3. In an automatic cut-off valve, the oscillating valve H, in combination with the steam-passages F and F' and vents J J, as described.

4. In an automatic cut-off valve, the oscillating valve H, in combination with the blade B, spring *c c c*, and vents *a a a*, for the purpose described. 40

5. The following parts in combination, viz: rod L, spring R, piston U, provided with vents *u u u u*, planes T T, roller A, arcs M V V, blade B, valve H, provided with vent *n* and journals K K, steam-passages F and F', main D-valve D, and vents J J, all constructed as described. 45

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Witnesses:

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