

(No Model.)

H. BEDDOE.
AUTOMATIC CUT-OFF FOR ENGINES.

No. 436,646.

Patented Sept. 16, 1890.

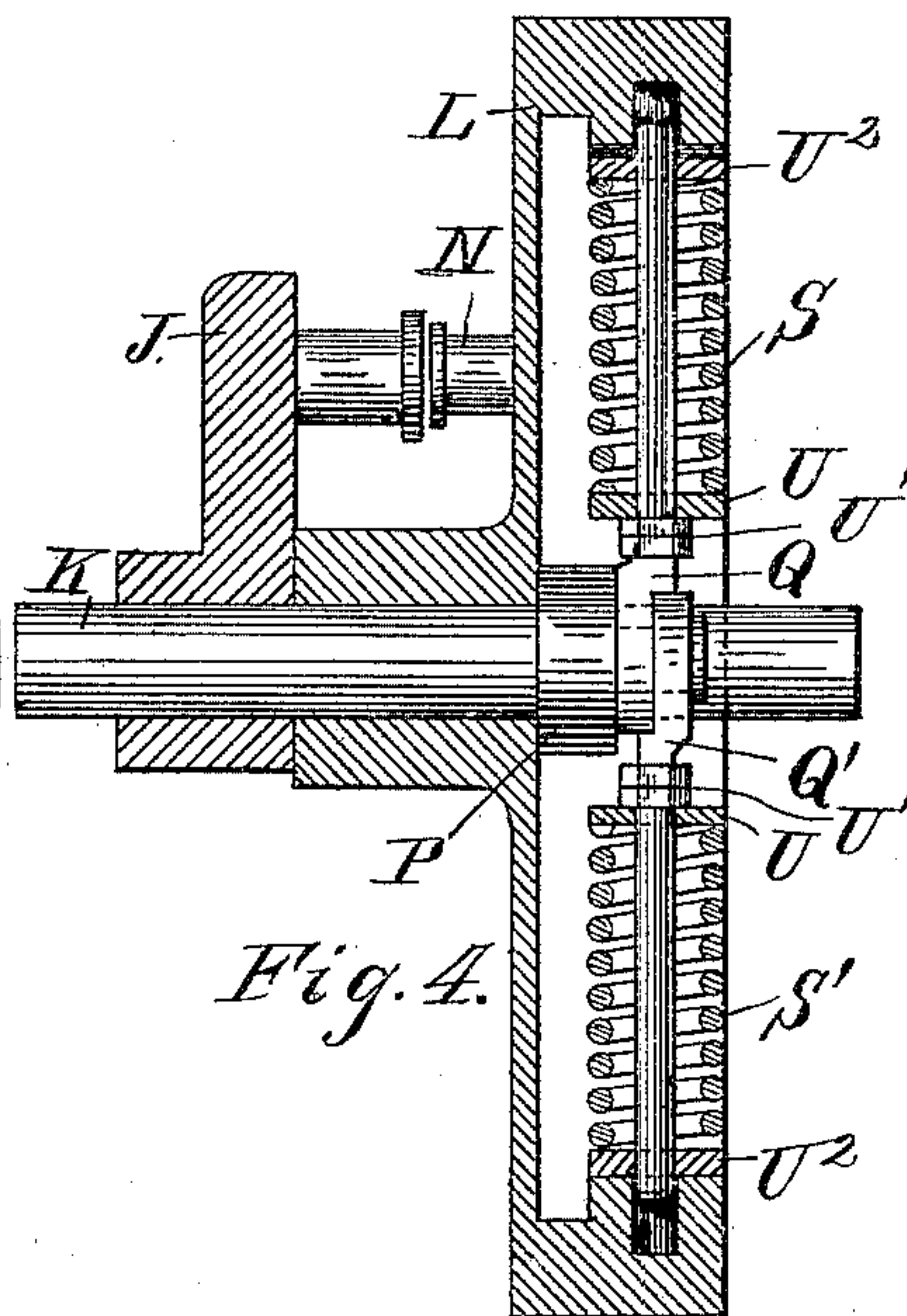
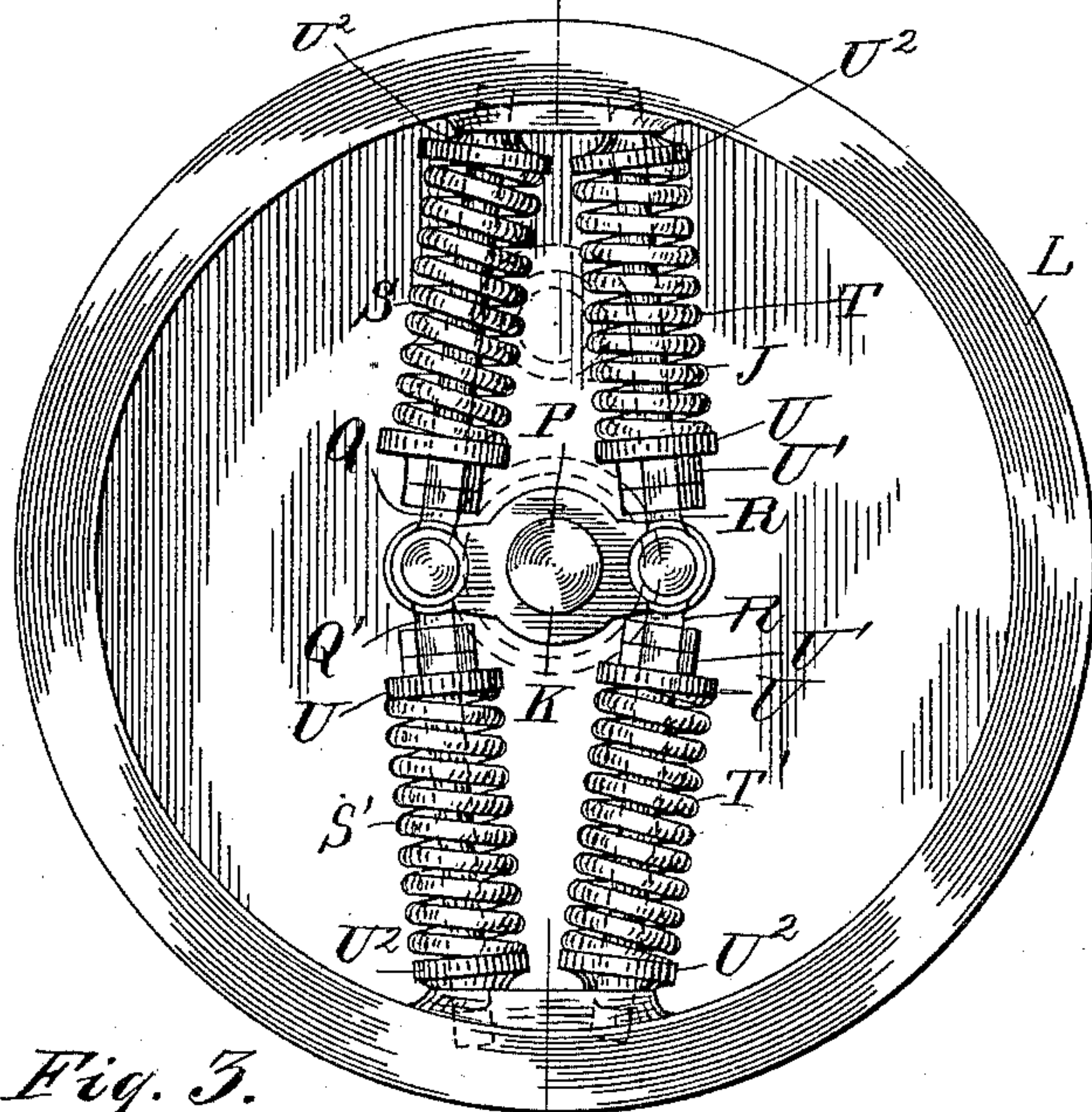
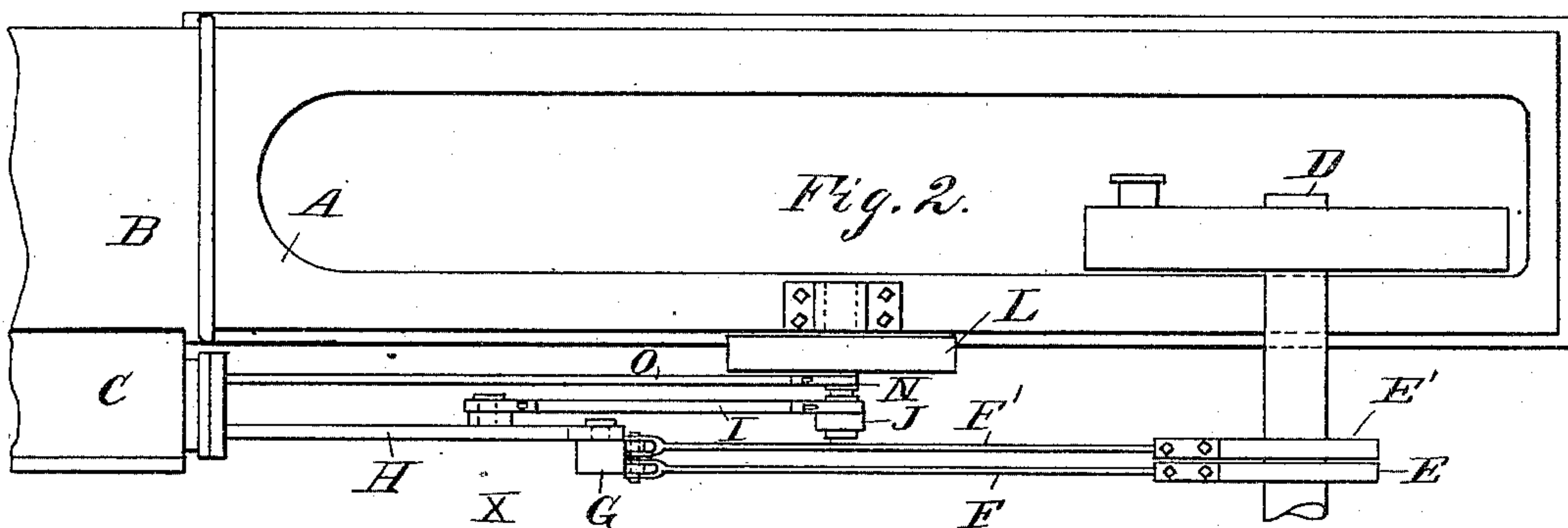
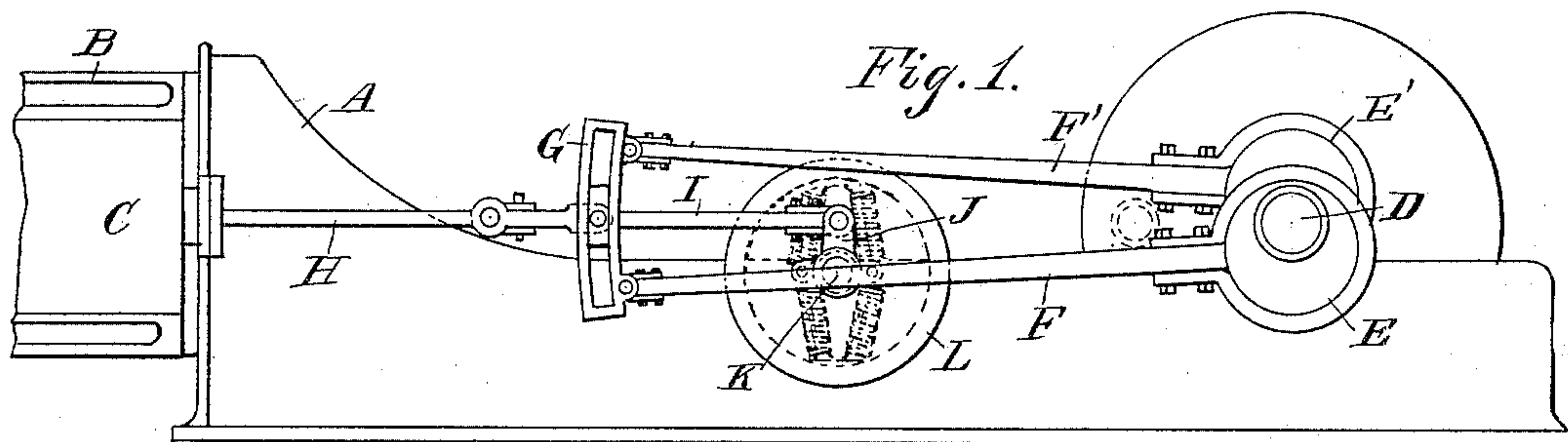


Fig. 3.

WITNESSES:

WITNESSES: X
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HENRY BEDDOE, OF ROLLA, MISSOURI.

AUTOMATIC CUT-OFF FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 436,646, dated September 16, 1890.

Application filed November 20, 1889. Serial No. 330,966. (No model.)

To all whom it may concern:

Be it known that I, HENRY BEDDOE, of Rolla, in the county of Phelps and State of Missouri, have invented a new and Improved Automatic Cut-Off for Steam-Engines, of which the following is a full, clear, and exact description.

The invention relates to valve-gears for steam-engines, and its object is to provide a new and improved automatic cut-off for reversing or non-reversing engines, and which is simple and durable in construction and serves to control the speed of the engine by cutting off the supply of the motive power to the cylinder in proportion to the work required at a given speed.

The invention consists of a spring-pressed wheel mounted to oscillate, and connected with the cut-off valve and controlled from the main valve.

The invention also consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement as applied. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged rear face view of the spring-pressed wheel, and Fig. 4 is a transverse section of the same on the line $x x$ of Fig. 3.

The engine on which the improvement is applied is of any approved construction, and is provided with the usual frame A, on one end of which is mounted the cylinder B for supporting the steam-chest C, in which operates the main valve and a cut-off valve in the usual manner.

The piston of the cylinder B is connected in any suitable manner with the main driving-shaft D, mounted on the frame A, and carrying the eccentrics E and E', connected by the eccentric-rods F and F', respectively, with the link G, connected with the main-valve stem H, connected with the main valve operating in the steam-chest C, as is previously mentioned.

The main-valve stem H is pivotally con-

nected by a link I with a crank-arm J, secured on a short shaft K, mounted to turn in suitable bearings on the frame A of the engine. A wheel L is mounted to turn loosely on the said shaft K, and is provided with a crank-pin N, preferably located directly opposite the crank-pin of the crank-arm J. (See Fig. 4.) The crank-pin N is connected with the valve-stem O, connected with the cut-off valve in the steam-chest C.

The wheel L is provided with a cavity in one face, and an arm P, secured on the shaft K, is held in the said cavity of the wheel L, and is pivotally connected at opposite sides with the rods Q Q' and R R', respectively, of which the rods Q Q' extend in opposite directions and have their outer ends fitted loosely in the rim of the wheel L. The rods R and R' are similarly arranged, as is plainly shown in Fig. 3.

Springs S S' and T T' are coiled around the rods Q Q' R R', respectively, resting with their inner ends on plates U, held adjustably by nuts U', screwing on the respective rods, and the outer ends of the said springs rest on plates U², abutting against the inside of the rim of the wheel L. By adjusting the nuts U' the tension of the springs S S' T T' may be increased or diminished as desired.

The operation is as follows: When the engine is in motion, the main valve is reciprocated from the driving-shaft by the eccentrics E E', the rods F F', the link G, and the valve-rod H in the usual manner. The reciprocating movement of the valve-rod H oscillates the shaft K by the link I and crank-arms J, so that the arm P, secured on the said shaft K and moving with the crank-arm J, imparts a sliding motion to the respective rods Q Q' and R R', so that the respective springs on the said rods are alternately pressed against the rim of the wheel L, mounted to turn loosely on the shaft K, so that the wheel is caused to oscillate somewhat in unison with the movement of the arm P. When the main valve has made its full or part of its stroke, it has led the cut-off valve somewhat by reason of the weight of the wheel L, which is overcome by the springs S S' T T', respectively; but as soon as the resistance of the said wheel L is overcome it will move the

cut-off valve after the main valve with considerable force or speed, which is impelled by the compression of the springs on the present stroke, which was also accumulated
 5 by the momentum of the wheel L during the previous stroke, having partly compressed the springs S S' T T', respectively. By a slight alteration the springs may be made to pull instead of pushing on the wheel L, if de-
 10 sired.

It will be seen that engines having link motion or other device for varying the throw of the main valve and fitted with this improvement will be variable automatic cut-off
 15 engines.

By placing the improvement on engines having but one valve, its eccentric-rod being attached to crank-arm J and its valve-stem attached to crank-pin N, it will operate as a
 20 single-valve automatic cut-off engine and will work well on engines adapted to run alternately forward and backward. In this case the springs must be made lighter in proportion to size of wheel than when it is working
 25 as a double-valve cut-off, as a single valve travels relatively shorter in stroke as the speed increases, while the double-valve cut-off travels longer in proportion to the increase of speed.

The shaft K may be made rigid and the crank-arm J and arm P placed loosely thereon; but the last two must then be rigidly connected with each other.

Having thus fully described my invention,
 35 I claim as new and desire to secure by Letters Patent—

1. In an automatic cut-off, the combination, with a wheel mounted to rock on its axis, and having a crank-pin adapted to be connected
 40 with the valve controlling the supply of motive power to the cylinder, of oppositely-extending springs at opposite sides of the axis of the wheel, the outer ends of the springs engaging the wheel at or near its periphery,
 45 and the inner ends of the springs at the axis of the wheel being controlled from the main driving-shaft.

2. In an automatic cut-off, the combination, with a wheel mounted to rock on its axis, and
 50 having a crank-pin adapted to be connected to a valve, of a rocking arm mounted concentrically with the axis of the wheel, and rocked from the main driving-shaft, two rods pivotally connected at their inner ends with the
 55 said arm at opposite sides of its axis, and

having a sliding connection at their outer ends with the wheel at or near its periphery, two other rods also connected with said rocking arm at their inner ends and having a
 60 sliding connection with the wheel at diametrically-opposite points from the outer ends of the other two rods, and a spring mounted on said rods and rocking the wheel by their alternate compression, substantially
 65 as set forth.

3. In an automatic cut-off, the combination, with a wheel mounted loosely and connected with the valve controlling the supply of motive power to the cylinder, of springs adapted
 70 to press at their outer ends against the said wheel, and an arm having its axis concentric with the axis of the wheel, and adapted to receive a rocking motion from the main drive-shaft, and engaging the inner ends of the
 75 springs to press the said springs outwardly against the said wheel, substantially as shown and described.

4. In an automatic cut-off, the combination, with a wheel mounted loosely and connected with the valve controlling the supply of motive power to the cylinder, of springs adapted
 80 to press at their outer ends against the said wheel, a rocking arm having its axis concentric with the axis of the wheel and engaging the inner ends of the springs to press the
 85 said springs outwardly against the said wheel, and a crank-arm rigidly connected with the said rocking arm and connected with the main driving-shaft or the main valve-stem, substantially as shown and described.
 90

5. In an automatic cut-off, the combination, with a wheel mounted loosely and connected with the valve controlling the supply of motive power to the cylinder, of springs adapted
 95 to press against the said wheel, a rocking arm adapted to press the said springs onto the said wheel, a crank arm rigidly connected with the said rocking arm and connected with the main driving-shaft or the main valve-stem, rods pivotally connected with the said
 100 rocking arm and held to slide in the rim of the said wheel, and adjustable plates held on the said rods and in contact with the said springs coiled on the said rods, substantially as shown and described.

HENRY BEDDOE.

Witnesses:

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 H. DOWD.