

(No Model.)

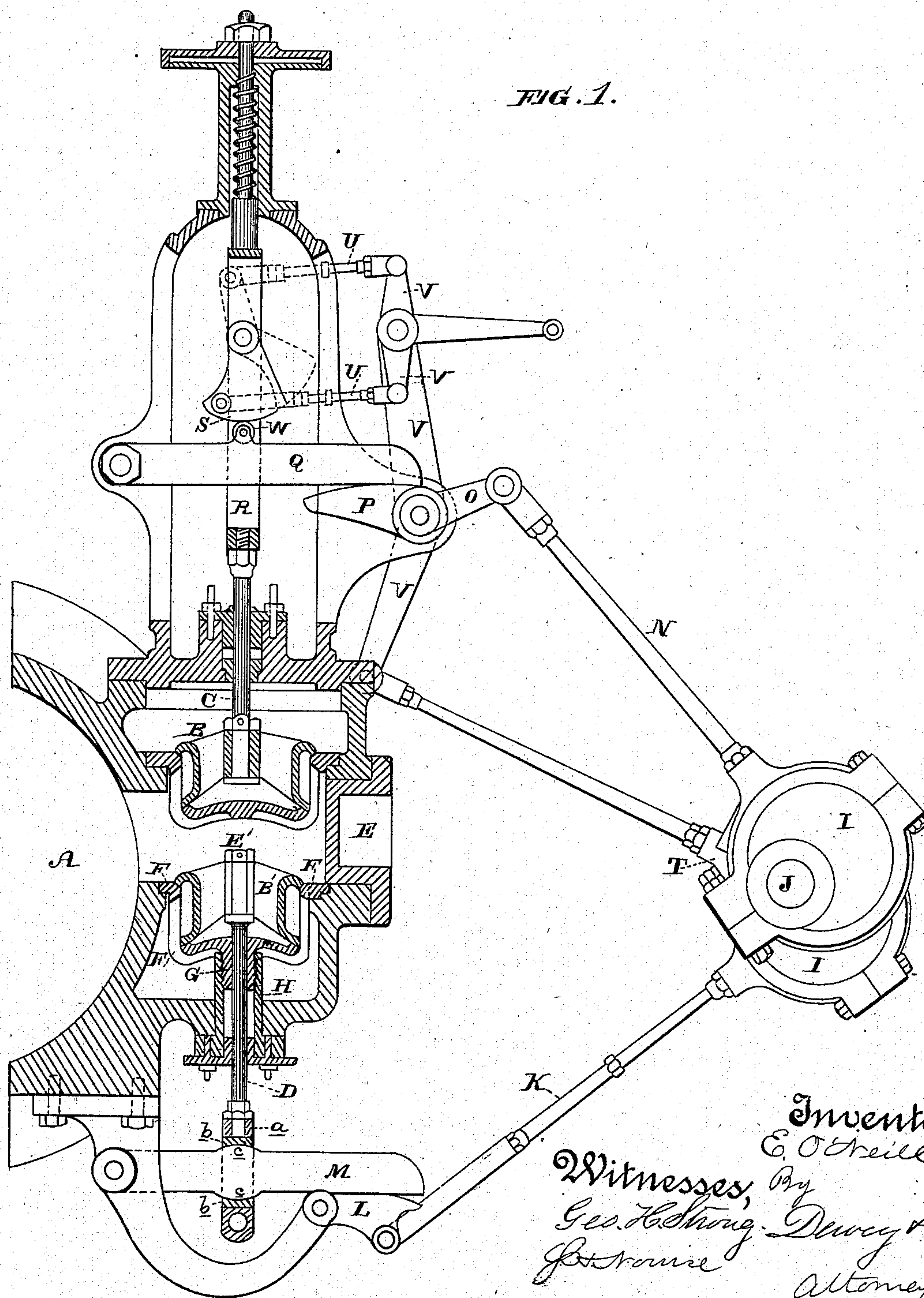
2 Sheets—Sheet 1.

E. O'NEILL.

VALVE GEAR FOR STEAM ENGINES.

No. 278,451.

Patented May 29, 1883.



(No Model.)

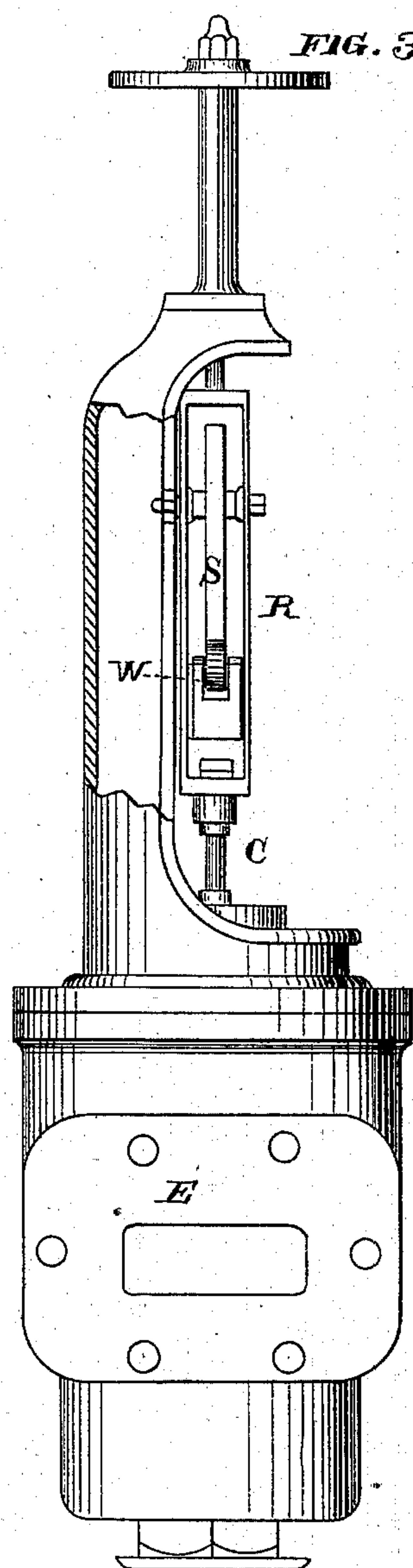
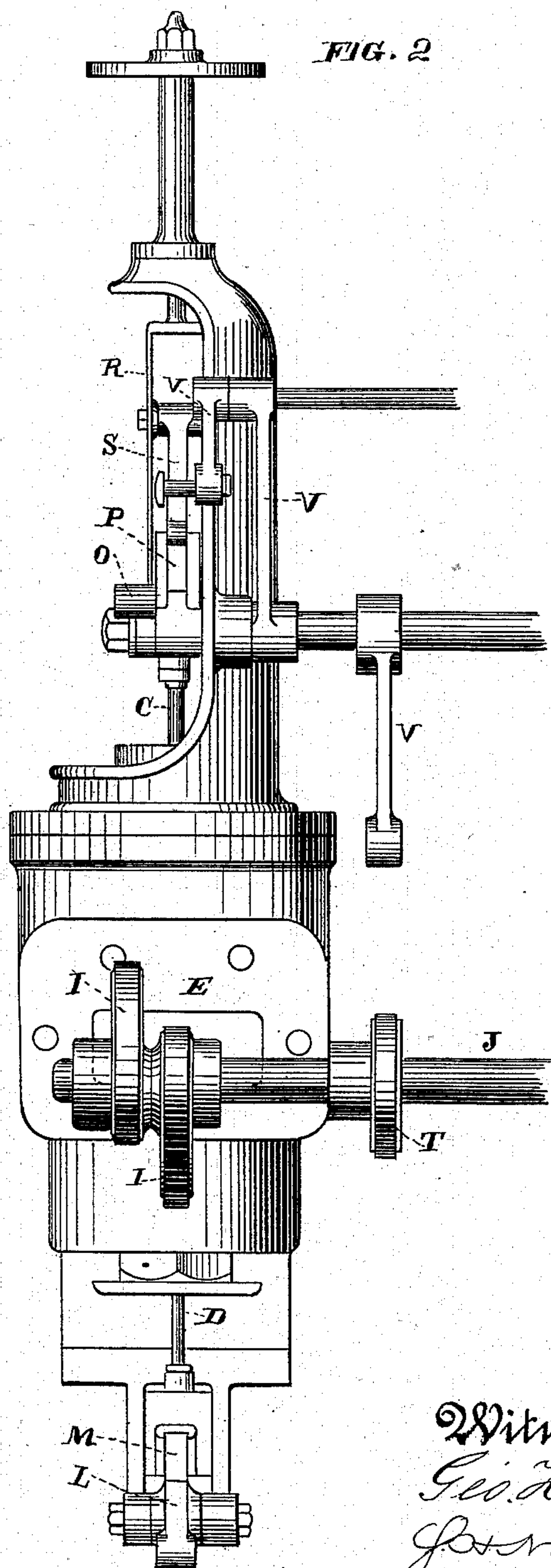
2 Sheets—Sheet 2.

E. O'NEILL.

VALVE GEAR FOR STEAM ENGINES.

No. 278,451.

Patented May 29, 1883.



Witnesses,
Geo. H. Strong, Jr.
for Inventor,
E. O'Neill
Dewey & Co.
Attorneys

UNITED STATES PATENT OFFICE.

EUGENE O'NEILL, OF SAN FRANCISCO, CALIFORNIA.

VALVE-GEAR FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 278,451, dated May 29, 1883.

Application filed February 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, EUGENE O'NEILL, of the city and county of San Francisco, State of California, have invented an Improved Valve-Gear for Engines; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in valve-gear for engines; and it consists, mainly, in a mechanism by which the eccentrics actuate the valves, and in an improved construction of the valves and their seats, and also in a means for connecting the exhaust-valve stems with the actuating-levers, all of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical section. Figs. 2 and 3 are side views.

My invention is shown in the present case as applied to an engine having a horizontal cylinder, A, with steam-valves B and exhaust-valves B', the same being duplicated at the other end of the cylinder.

In my patent of May 25, 1880, the steam and the exhaust valves are both operated from above by suitable stems; but the stems of the exhaust-valves pass up through hollow sleeves, and their seats must be removed through the top, thus requiring considerable work when it is necessary to gain access to the exhaust-valves.

In my present invention each steam-valve B has a stem, C, passing up through the top of the steam-chest and connected with the actuating mechanism, as will be described hereinafter. The exhaust-valves B' have stems D, which pass downward through stuffing-boxes at the bottom, as shown.

E is a plate or cover for the front of the steam-chest E', and the opening caused by its removal is of a size sufficient, after the steam-valve is raised to its highest point, to admit the exhaust-valve and its seat F, which may thus be introduced or removed without interfering with the steam-valves. The exhaust-valve seats F have sleeves or extensions G projecting downward from them and screw-threaded at their lower ends, so that the stuffing-boxes H may be screwed upon them, and thus draw them closely to their places, where

they are firmly held. When they are to be removed it can be done after removing the exhaust-valves and stems. The steam-valves and their seats may be removed through the top.

The valves of my engine are each driven independently by its own eccentric I, these eccentrics being secured to a horizontal shaft, J, which extends from the crank-shaft to a point opposite the cylinder and parallel with it, being driven by gearing from the crank-shaft. The eccentric-rods K connect with the oscillating toes or lifters L, and these lift the levers M, to which the lower ends of the exhaust-valve stems are connected, thus opening and closing the exhaust-valves at the proper time. The eccentric-rods N connect with the rocking arms O, which actuate the lifting-toes P, and these latter raise the levers Q, by which the steam-valves are opened. The steam-valve stems C are connected with the slotted bars or frames R, within which the oscillating tripping-blocks S are hung, and these blocks are actuated by the eccentrics T, and the links U, and rocking arms V, so as to determine the point at which steam shall be cut off. The levers Q have anti-frictional rollers W mounted upon them at the points beneath the blocks S, so that when the levers are lifted by the toes or lifters P these rollers lift the blocks S, and with them the valve-stem C, so as to open the steam-valves and keep them open until the action of the cut-off eccentric and the governor upon the block turns it so that it drops from the roller and allows the valve to close. This cut-off mechanism is fully described in my patent of January 30, 1883, No. 271,352; but my present improvement consists in the employment of the levers Q and the anti-friction rollers W in place of blocks, which were formerly used, and which would be liable to become clogged by dust. By this construction and the employment of independent eccentrics for each valve, with the short eccentric-rods, I am enabled to set each valve exactly without disturbing either of the others, and the short rods being less affected, to lengthen or shorten them by heat and cold, the adjustment of the valves remains correspondingly more perfect.

The levers M and Q by their length and weight insure the prompt closing of the valves

when released, and the rollers W relieve the blocks from danger of breakage. As the point where the valve-stems D connect with the levers M moves slightly in the arc of a circle, I prevent the side movement of the stem as follows: The lower end of the stem is secured to a yoke, *a*, within which the blocks *b* are fitted to slide slightly. These blocks have their inner faces made concave to fit the enlarged circular faces *c* of the lever M, so that as the lever rises and falls about its fulcrum these circular faces will roll slightly within the blocks *b*, and the blocks slide a little within the yoke to compensate for the slight arc of a circle made by the movement of the lever about its fulcrum.

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

1. In an engine having the independent superposed steam and exhaust valves B B', the movable exhaust-valve seat F, with the sleeve or extension G, through which the valve-stem may pass downward from the valve, and the stuffing-box H, screwed upon the extension to hold the valve-seat to its place, substantially as herein described.

2. In an engine having the superposed steam

and exhaust valves B B' within the steam-chest E', the valve-stems C and D, extending out through the top and bottom of the valve-chest from their respective valves, in combination with the levers M and Q, the toes or lifters L and P, and the independent eccentric I for each valve and driving-shaft J, substantially as herein described.

3. The steam-valve rod C, connected with the slotted bar R, and the oscillating tripping-blocks S of the cut-off mechanism, in combination with the lever Q, with the anti-friction roller W, the toe or lifter P, and the eccentric and rocker-arm, substantially as herein described.

4. The lever M, having the enlarged circular faces *c*, and the valve-stem D, with its yoke *a*, in combination with the blocks *b*, fitting the faces *c*, and said lever M adapted to slide within the yoke, so as to prevent side movement of the valve-stem, substantially as herein described.

In witness whereof I hereunto set my hand.

EUGENE O'NEILL.

Witnesses:

JAMES DALY,
J. H. BLOOD.