

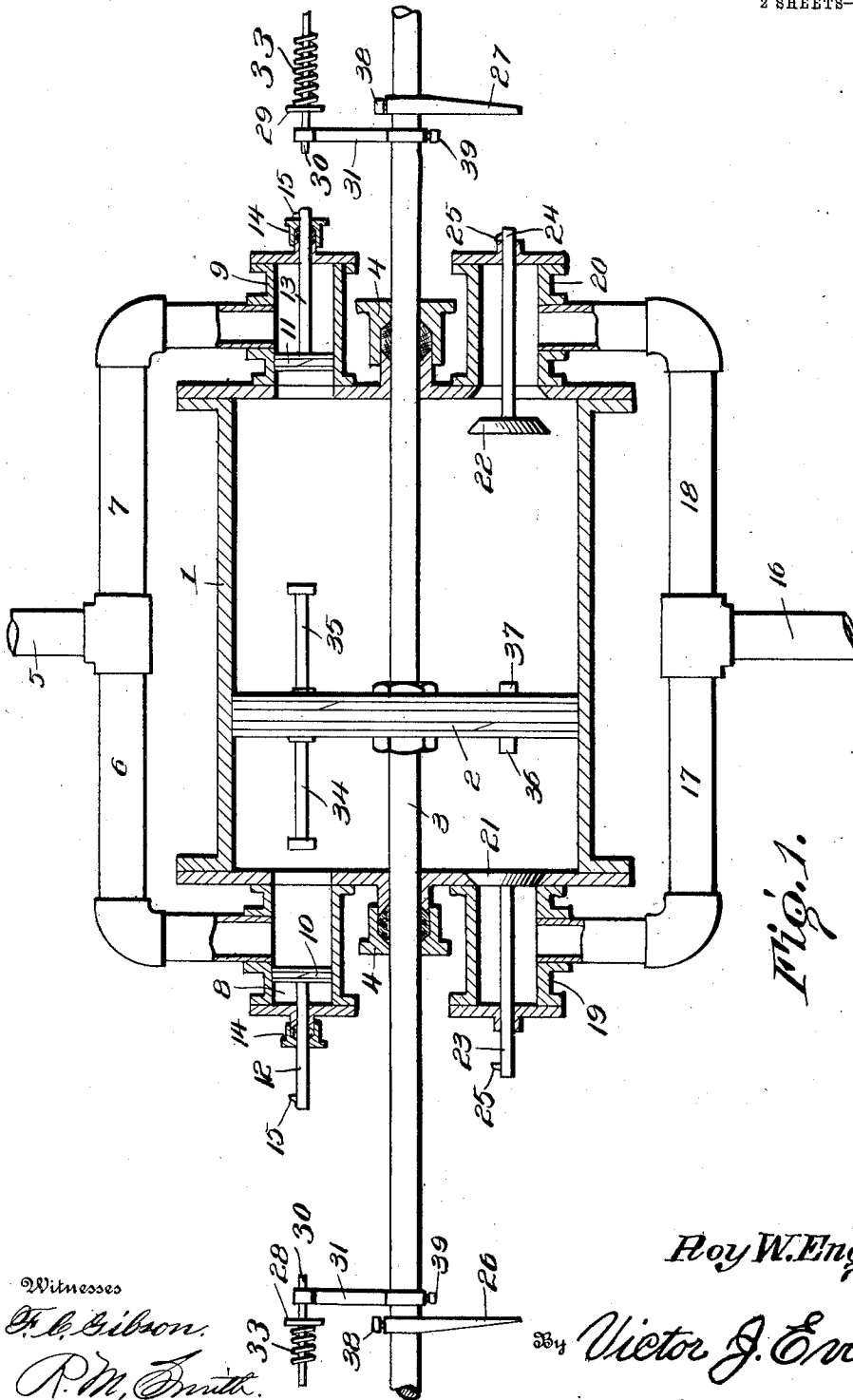
R. W. ENGLISH.
ENGINE.

APPLICATION FILED AUG. 18, 1909. RENEWED JUNE 2, 1911.

1,003,348.

Patented Sept. 12, 1911.

2 SHEETS—SHEET 1.



Witnesses

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Fig. 2.

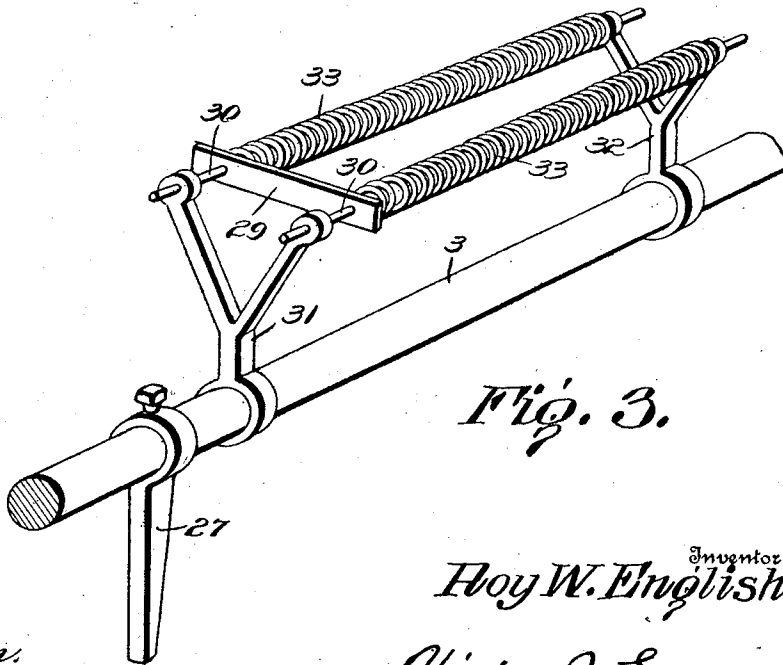
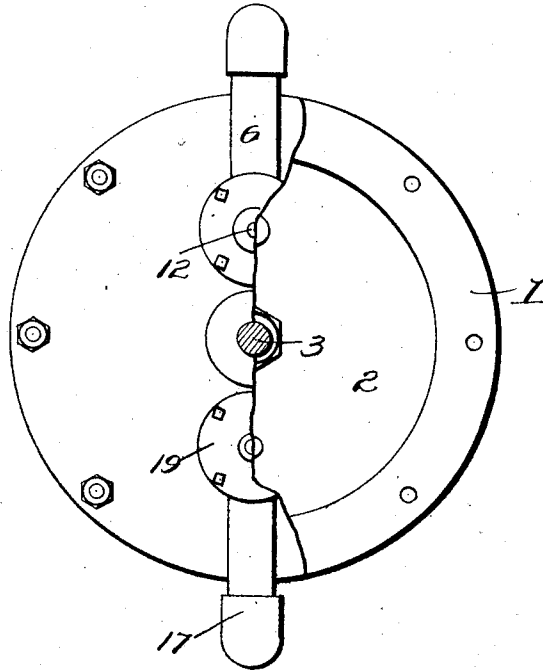


Fig. 3.

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UNITED STATES PATENT OFFICE.

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ENGINE.

1,003,348.

Specification of Letters Patent.

Patented Sept. 12, 1911.

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To all whom it may concern:

Be it known that I, ROY W. ENGLISH, a citizen of the United States, residing at Renfrow, in the county of Grant and State of Oklahoma, have invented new and useful Improvements in Engines, of which the following is a specification.

This invention relates to engines of the expansion type, the object of the invention being to provide simple valve mechanism for alternately cutting on and off the steam at opposite sides of the piston, the valve being actuated by means carried by the piston and piston rod without the intervention of the usual cam or eccentric mechanism now commonly employed for the purpose.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination and arrangement of parts as herein fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a longitudinal section through the cylinder and valve mechanism of an engine embodying the present invention. Fig. 2 is an end view of the cylinder, showing the piston rod in cross section. Fig. 3 is an enlarged perspective view of a section of the piston rod, showing a portion of the inlet and exhaust valve operating mechanism.

In the drawings, 1 designates the cylinder of the engine and 2 a reciprocating piston working therein and having connected thereto a piston rod 3 extending in both directions from the piston head and working through stuffing boxes 4 arranged at opposite ends of the cylinder.

5 designates the steam inlet or supply pipe having branches 6 and 7 leading to inlet valve casings 8 and 9 at opposite ends and in communication with the cylinder 1. Within the valve casings 8 and 9 are mounted sliding piston valves 10 and 11, the stems 12 and 13 of which extend through stuffing boxes 14 at the outer ends of the valve casings, the said stems being provided adjacent their outer extremities with stop shoulders 15.

16 designates the exhaust pipe provided with branches 17 and 18 leading respectively to exhaust valve casings 19 and 20 located at opposite ends of the cylinder and communicating with the interior thereof through the cylinder heads as shown in Fig. 1. Within said valve casings are mounted

exhaust valves 21 and 22 provided with stems 23 and 24 and having at their outer extremities stop shoulders 25. The piston rod 3 has mounted on the opposite end portions thereof striker rods 26 and 27 adapted to operate respectively against the extremities of the stems 23 and 24 of the exhaust valves for unseating said valves. The piston rod 3 also has mounted on the opposite end portions thereof, striker bars 28 and 29 mounted to slide on parallel guide rods 30 carried by bifurcated brackets 32 and 32 mounted fast on the piston rod 3. The bar 29 is yieldingly held toward the cylinder 1 by means of coiled springs 33 encircling the guide rods 30 and interposed between one of the brackets 32 and said striker bar 29 as clearly illustrated in the detail view Fig. 3. The bars 28 and 29 are adapted to cooperate with the extremities of the respective inlet valve stems 12 and 13 for the purpose of shifting the said inlet valves 10 and 11. The piston head 2 is provided with oppositely extending striker rods 34 and 35 adapted to cooperate with the inlet valves 10 and 11 for the purpose of moving said valves outward to admit steam to the cylinder and said piston head is further provided with striker lugs or pins 36 and 37 which cooperate with exhaust valves 21 and 22 to close the same at the proper time in the reciprocating movements of the piston head.

The operation of the mechanism hereinabove described is as follows:—Steam admitted through the pipe 5 passes through the branch 6 into the casing 8 and into the adjacent end of the cylinder 1 thereby causing the piston head 2 to travel toward the opposite end of the casing. Just before reaching the opposite end of the casing, the striker bar 28 acts on the stem 12 to close the inlet 10 while the striker rod 35 operates to open the inlet valve 11. Simultaneously therewith, the striker lug 37 closes the exhaust valve 22 and the striker arm 26 opens the exhaust valve 21. Steam now enters through the branch 7 of the steam inlet pipe 5 and drives the piston back in which movement, the striker bar 29 closes the inlet valve 7, the striker rod 34 opens the inlet valve 10, the striker lug 36 closes the exhaust valve 21 and the striker arm 27 opens the exhaust valve 22. The striker arms 27 are adjustable on the piston rod by means of set screws

38 and the brackets 31 and 32 are also adjustable on said piston rod by means of set screws 39 thereby enabling the movement of the inlet and exhaust valves to be properly timed and adjusted.

I claim:—

1. A valve-operating means for engines comprising a reciprocatory element, fixed members mounted thereon and spaced apart, rods extending from one member to the other and supported thereby, a device movably mounted on the rods to impart movement to the valve, and cushioning means supported by the rods and disposed behind the said device.

2. A valve-operating means for engines comprising a reciprocatory element, spaced members mounted thereon, rods extending from one member to the other and supported thereby, helical compression springs supported by the rods, and a valve-moving device slidably mounted on the rods and cushioned by the springs.

3. The combination of a cylinder, a piston

therein, a valve mounted in one head of the cylinder to move in a direction parallel with the piston, a rod connected with the piston and extending out of the cylinder, means movable with the piston for moving the valve in one direction, and a device disposed outside of the cylinder for moving the valve in the opposite direction, said device consisting of spaced arms rigidly secured to the piston rod, rods mounted on the arms and disposed parallel with the piston rod, helical compression springs mounted on the last mentioned rods, and a member slidably mounted on the arm supported rods and arranged to be cushioned by the springs when the said device moves the said valve.

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

ROY W. ENGLISH.

Witnesses:

B. G. DVORAK,
JOSEPH DVORAK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."