

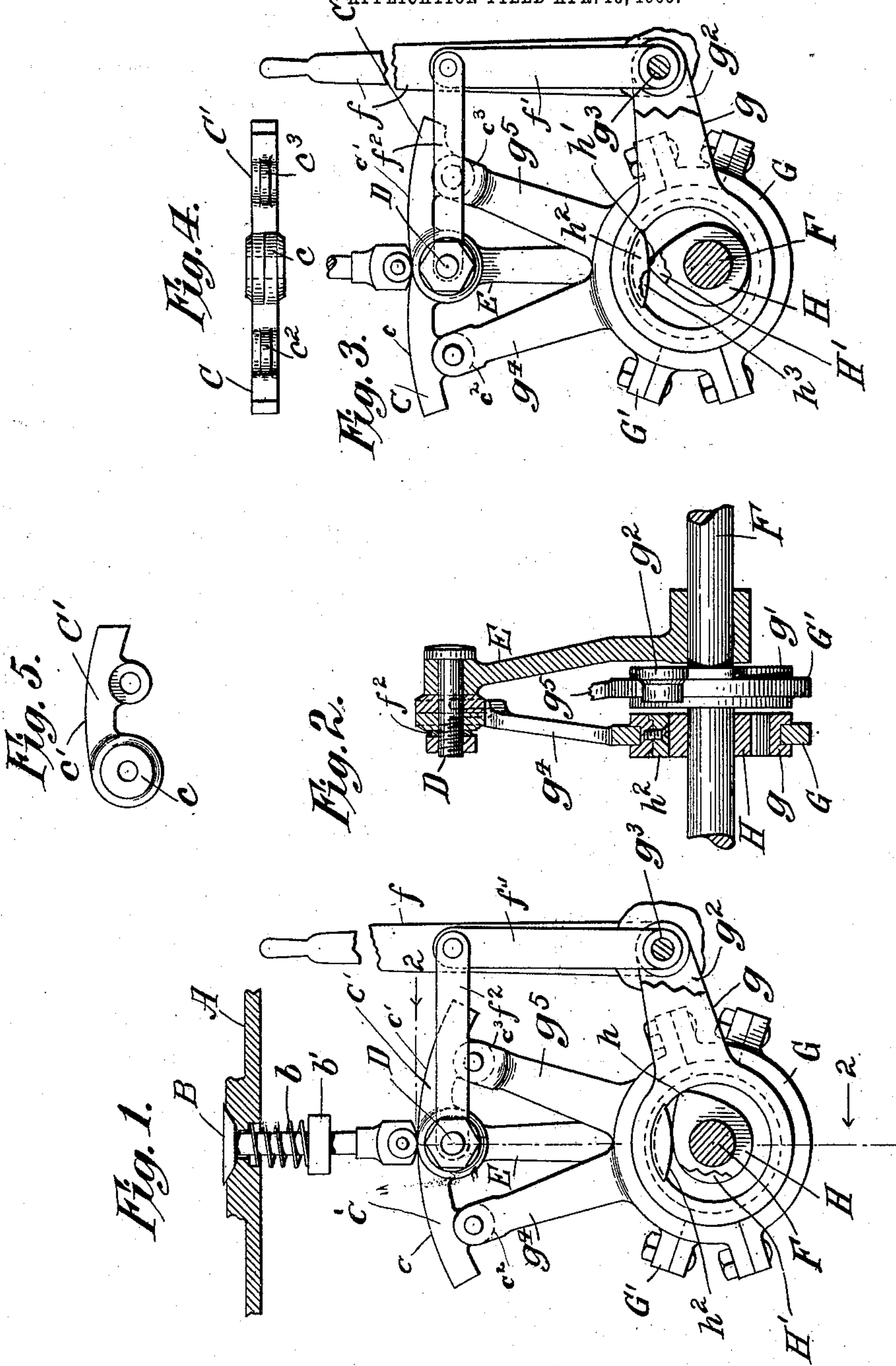
No. 842,817.

PATENTED JAN. 29, 1907.

J. W. SLATER.

VALVE CONTROL AND REVERSE MECHANISM.

APPLICATION FILED APR. 18, 1906.



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# UNITED STATES PATENT OFFICE.

JOHN W. SLATER, OF SLATERSVILLE, RHODE ISLAND.

## VALVE CONTROL AND REVERSE MECHANISM.

No. 842,817.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed April 18, 1906. Serial No. 312,292.

*To all whom it may concern:*

Be it known that I, JOHN W. SLATER, a citizen of the United States of America, and a resident of Slatersville, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Valve Control and Reverse Mechanism, of which the following is a specification.

10 This invention relates to means for regulating and controlling the degree of lift of the valves in a gas-engine, together with means for so timing the actuation of said valves that they will permit the engine to run either  
15 in the forward or reverse direction, as desired.

My improvements comprise certain changes in construction and arrangement of parts differing from my former application, Serial  
20 No. 261,869, (since matured into Patent No. 828,064, dated August 7, 1906.)

In the drawings, Figure 1 is a side elevation of parts embodying my improvements shown in operative relation with a valve of  
25 an internal-combustion engine. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a similar view to that of Fig. 1, showing the actuating parts elevated by the cam. Fig. 4 is a bottom plan view of the bipart pivotal  
30 link, and Fig. 5 is a side view of one part of said pivotal link.

In said figures, A indicates a broken-away portion of a gas-engine cylinder having a valve-opening, and B indicates a valve seated  
35 within said opening and having a spring  $b$  to hold it normally closed. The valve stem or rod passes through a guide, as  $b'$ , which maintains said stem or rod in a true vertical position. The means provided for lifting the  
40 valve through the medium of its stem or rod comprise a link, which may be in two parts  $C C'$ , pivotally united at  $c$  and having an outer curved surface  $c'$ , adapted to form a way or track movable against the end of the  
45 valve stem or rod.

The pivot  $D$ , uniting the link members, is carried by a supporting-arm  $E$ , whose opposite end is mounted on a cam-shaft  $F$ .

$G G'$  indicate, respectively, separate eccentric-straps mounted upon circular supports,  
50 as  $g g'$ , which latter are placed about the cam-shaft, and each has a localizing extension or arm, as  $g^2$ , that is fulcrumed upon a rock-shaft  $g^3$ , which is mounted in a rigid part of  
55 the frame. Secured upon the cam-shaft  $F$  within the circular supports  $g g'$ , respec-

tively, are cams  $H H'$ , whose radial enlargements  $h h'$ , respectively, contact with and are adapted to move against the inner surfaces of said circular supports.

The eccentric-straps  $G G'$  are respectively provided with rods  $g^4 g^5$ , the latter being pivoted, respectively, to lugs  $c^2 c^3$ , depending from the link members  $C C'$ , whereby movement communicated through said eccentric-  
60 strap rods  $g^4 g^5$  rocks said link members  $C C'$  upon their common pivot  $D$ .

Secured against the inner surfaces of the circular supports  $g g'$  are the cam-drops or curved displacing-blocks  $h^2 h^3$ , respectively,  
70 said blocks  $h^2 h^3$  serving to elevate the eccentric-straps and rods through the action of the cams in the rotation of the latter.

It will be noted that the blocks  $h^2 h^3$  are so positioned within the circular supports  $g g'$   
75 as to be in the vertical plane of the valve-stem and the axis of the link members. Thus while the supporting-arm  $E$  holds the pivot  $D$ , which carries the link members, in a set position beneath the valve-stem, thereby  
80 affording a neutral point at which no movement is communicated to the valve with the rotation of the cam-shaft, it is evident that the opposite rocking movement which is communicated to the link members becomes ef-  
85 fective in lifting the valve-stem and valve when the link is moved laterally in either direction. It is further evident that the degree of lift imparted to the valve varies according to the degree to which the link is  
90 moved and presents its upper surface or way toward the valve-stem in different positions having different degrees of vertical movement.

The means for moving the link to vary its  
95 position relatively to the valve-stem may be as follows: A lever  $f$  is secured to the rock-shaft  $g^3$ , to which is also connected a rod or bar  $f'$ , the latter carrying pivotally a rod or bar  $f^2$ , that is freely connected to the pivot  $D$ .  
100 A set of the rods or bars  $f' f^2$  is employed for each link, and all are operated through the medium of the single lever  $f$ , as is obvious. The *modus operandi* with respect to the valve operation to run the engine in the forward or  
105 reverse directions and the means employed for timing the spark with the period of compression correspond with the means referred to in my said former patent application. In fact, the main difference existing between  
110 said former application and the present case resides in the arrangement of the present



hinged link to move laterally under a valve rod or stem that is immovable except vertically, to actuate the valve differently, while in the former application the hinged actuator was immovable laterally and the valve push-rod was movable over the surface of said actuator to accomplish a like result.

The present device is more particularly adapted for use where a short valve stem or rod is used.

I claim—

In an internal-combustion engine having a valve and a valve-stem therefor, a bipart actuator for said stem composed of two hinged members, a cam-shaft having a pair of cams, an actuator-support pivoted to said cam-

shaft and having a pivot uniting said actuator members, a pair of circular supports about said cams, and having localizing extensions, and a fixed cam-displacing block within each support; together with an eccentric-strap mounted upon each circular support, and a rod extending from each strap, said rods being respectively pivoted to the actuator members.

Signed at Kissimmee, Florida, this 13th day of November, 1905.

JOHN W. SLATER.

Witnesses:

J. M. WILLSON, Jr.,

W. B. HINTON.