

No. 675,501.

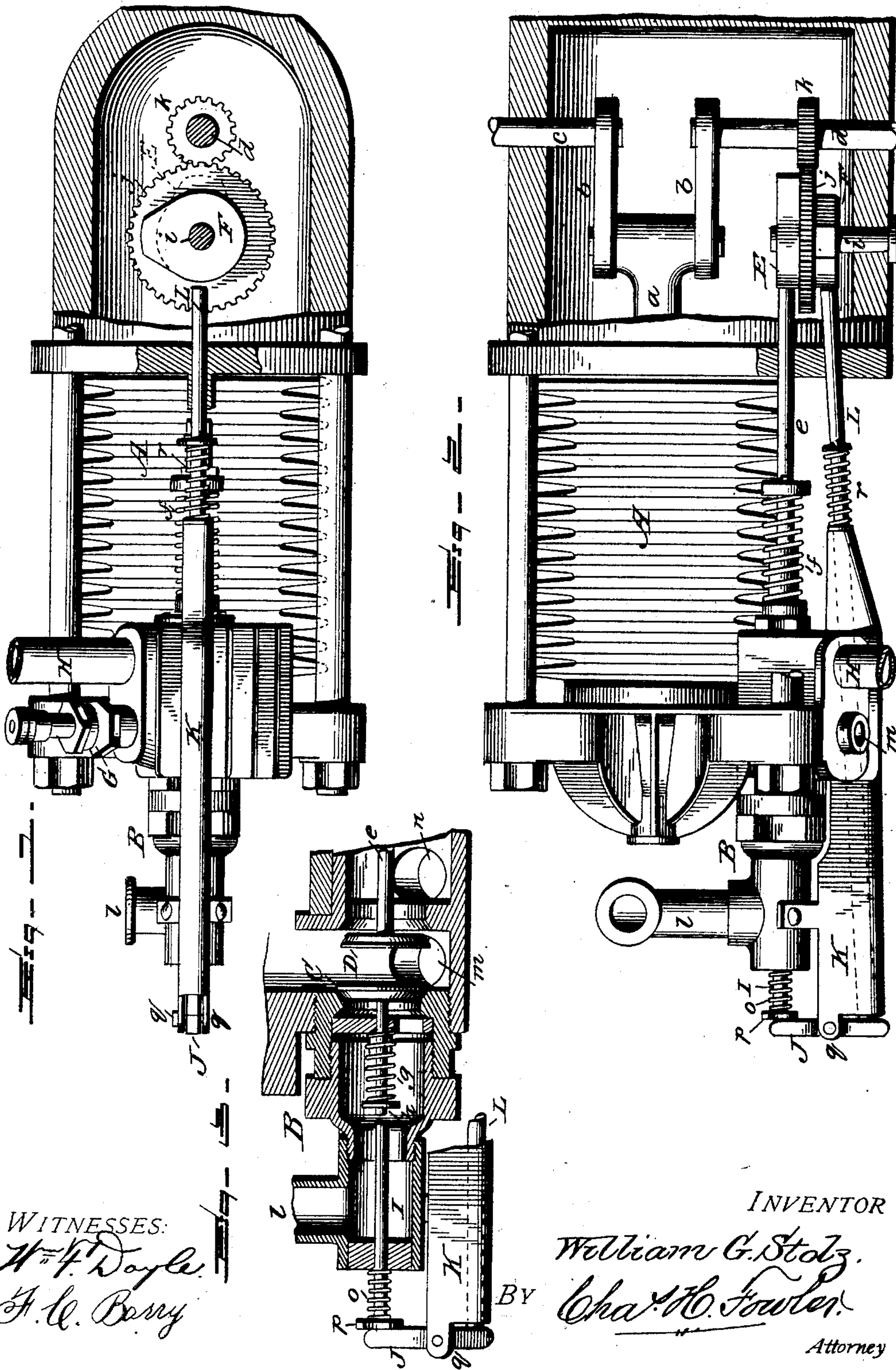
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W. G. STOLZ.

VALVE GEAR FOR EXPLOSIVE ENGINES.

(Application filed Feb. 5, 1901.)

(No Model.)



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

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## VALVE-GEAR FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 675,501, dated June 4, 1901.

Application filed February 5, 1901. Serial No. 46,042. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM G. STOLZ, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Valves for Explosive-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

The present invention has relation to that class of valve-gear for explosive-engines in which the inlet-valve and the outlet-valve are arranged in line with each other. The object thereof is to provide means whereby the inlet-valve may be forced from its seat and opened to supply gas to the engine-cylinder should the valve from any cause fail to act, which object is attained by the mechanism substantially as shown in the drawings and hereinafter described.

Figure 1 of the drawings is a side elevation, partly in section, of an explosive-engine embodying my invention. Fig. 2 is a top plan view, partly in section. Fig. 3 is a detail sectional view showing the inlet-valve and the outlet-valve and the means employed for forcing the inlet-valve from its seat.

In the accompanying drawings, A represents the usual engine-cylinder in which the piston works, the rod *a* thereof being connected to the crank-arms *b*, which in turn are connected to the transverse shaft *c*.

The valve-chest B has the usual inlet-valve C and the outlet-valve D, the latter being operated in the ordinary manner by the cam E, with which the end of the valve-stem *e* engages, said valve being spring-actuated by means of the spring *f*. The valve C is also spring-actuated through the medium of the coiled spring *g*, encircling the valve-stem *h*, so that the valve will be retained closed when in its normal position, as shown in Fig. 3 of the drawings.

The cam E, which may be of the usual construction, is keyed or otherwise secured to a short cam-shaft *i*, which carries a gear-wheel *j* and a second cam F, said gear-wheel meshing with the teeth of a pinion *k* on the shaft *d*.

The valve-chest B communicates with the

supply through the pipe *l*, and the usual igniter G connects with the valve-chest between the valves C D and extends through the opening *m*. The outlet-pipe H connects with the valve-chest through the opening *n* in the exhaust-chamber of the valve-chest.

The several parts and their construction herein described comprise the ordinary form of gas or explosive engine and is simply shown to better illustrate the application of my invention thereto.

The device or mechanism constituting my invention comprises the plunger-rod I, which is spring-actuated by means of the spring *o*, located between the end of the valve-chest B and the bearing-head *p* upon the end of the plunger-rod. A pivoted lever J is brought in contact with the bearing-head *p*, said lever being pivoted to ears *q* upon the end of a guide-casing K, suitably connecting with the valve-chest B. A pitman-rod L operates the pivoted lever J by its outer end striking against said lever and forcing the end thereof against the bearing-head *p* and in turn forcing the end of the plunger-rod I against the end of the valve-stem *h* to open the valve C should the valve stick to its seat and fail to operate in the usual manner. The spring *o* will return the rod I to its normal position and the spring *r* will automatically return the pitman-rod L to its former position necessary to be again operated upon by the cam F, thereby providing a very simple device or attachment that will insure the successful operating of the inlet-valve C at all times.

It frequently happens in explosive-engines that the inlet-valve becomes inactive by reason of said valve sticking to its seat, usually caused by the burned oils and gases which pass in and out of the cylinder and valve-chest and accumulating on the valve-seat in a gummy state and rendering the valve inoperative by suction alone. Therefore it is necessary to bring aid to the valve by a simple automatic means to assist it in its action when the valve resists the usual suction to open it.

The plunger-rod I and the valve-stem *h* are regulated in their length, so that the end of the plunger-rod will not strike the end of the valve-rod unless the inlet-valve fails to operate in its usual manner.

It is evident that many changes or modifi-



cations in the means employed for operating the inlet-valve may be made without departing from the principle of the invention, and any suitable means may be provided for operating the pitman-rod, as circumstances require.

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

10 1. In an explosive-engine, a suction inlet-valve and a supplemental device for operating said valve should it fail to operate by suction, said device comprising a spring-actuated plunger-rod arranged to strike the valve-rod, a pivoted lever arranged to strike the plunger-rod, and suitable means for operating the lever, substantially as and for the purpose set forth.

20 2. In an explosive-engine, a suction inlet-valve and a supplemental device for operating said valve should it fail to operate by suction, said device comprising a spring-actuated plunger-rod arranged to strike the valve-

rod to force open the valve, a pivoted lever arranged to strike the end of the plunger-rod, 25 and a spring-actuated pitman-rod arranged to strike the lever, and suitable means for operating said pitman-rod, substantially as and for the purpose specified.

3. In an explosive-engine, a suction inlet-valve and a supplemental device for operating said valve should it fail to operate by suction, said device comprising a spring-actuated plunger-rod arranged to strike the valve-rod, a pivoted lever arranged to strike the 35 end of the plunger-rod, a spring-actuated pitman-rod arranged to strike the lever, and a rotatable cam for operating the pitman-rod, substantially as and for the purpose described.

In testimony that I claim the above I have 40 hereunto subscribed my name in the presence of two witnesses

WILLIAM G. STOLZ.

Witnesses:

GEORGE M. BOND,  
C. M. FORREST.