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H. J. PODLEŠÁK.  
VALVE CONTROLLING MECHANISM FOR GAS ENGINES.

APPLICATION FILED OCT. 22, 1904.

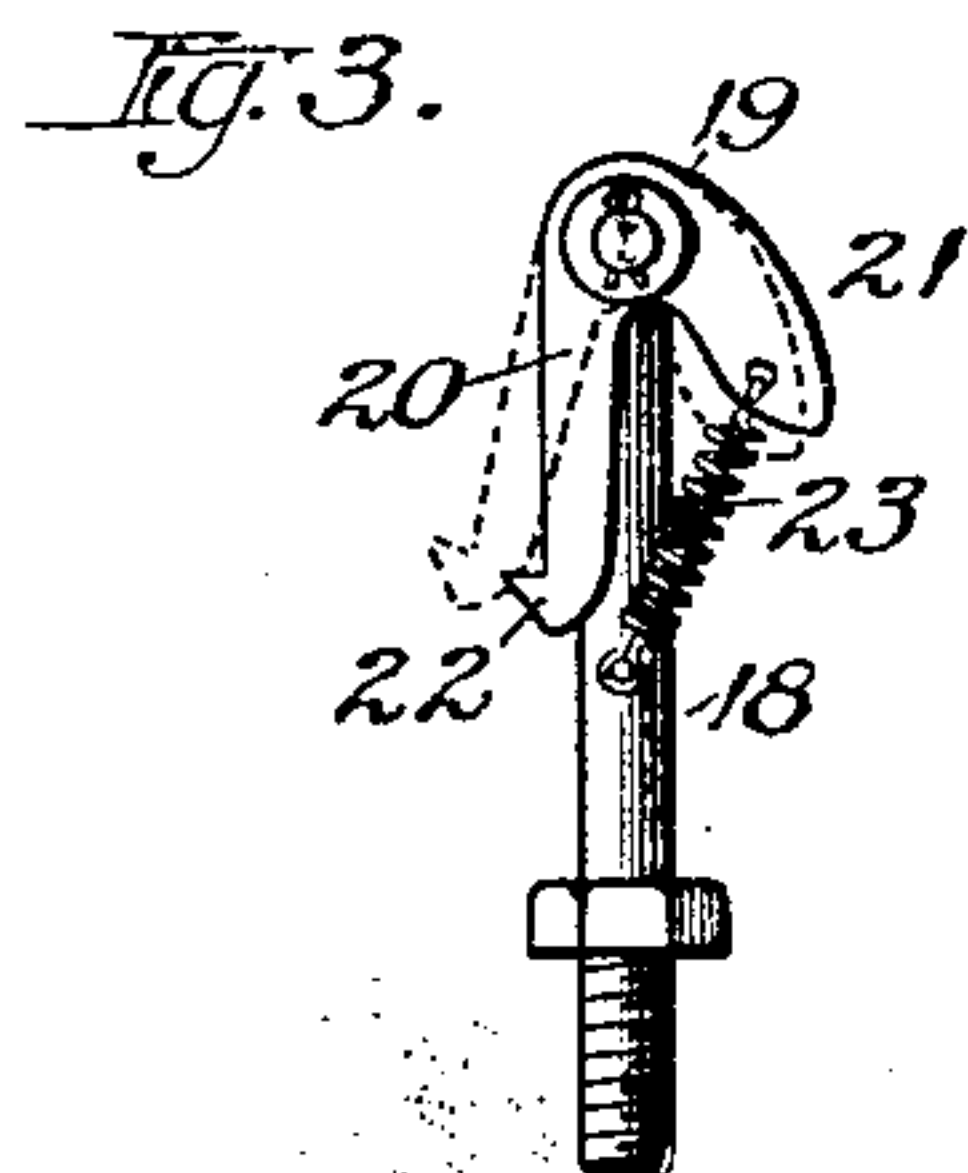
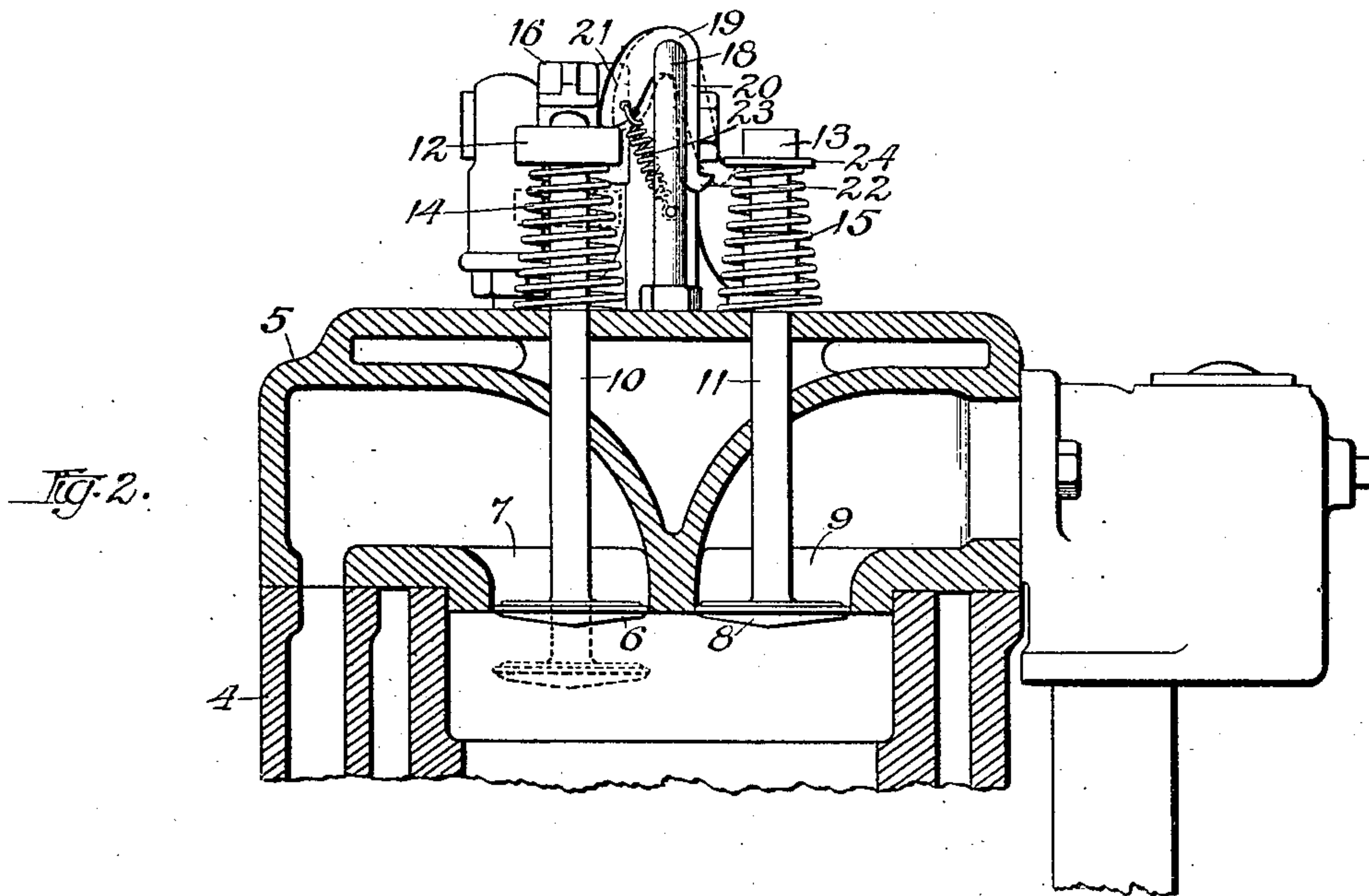
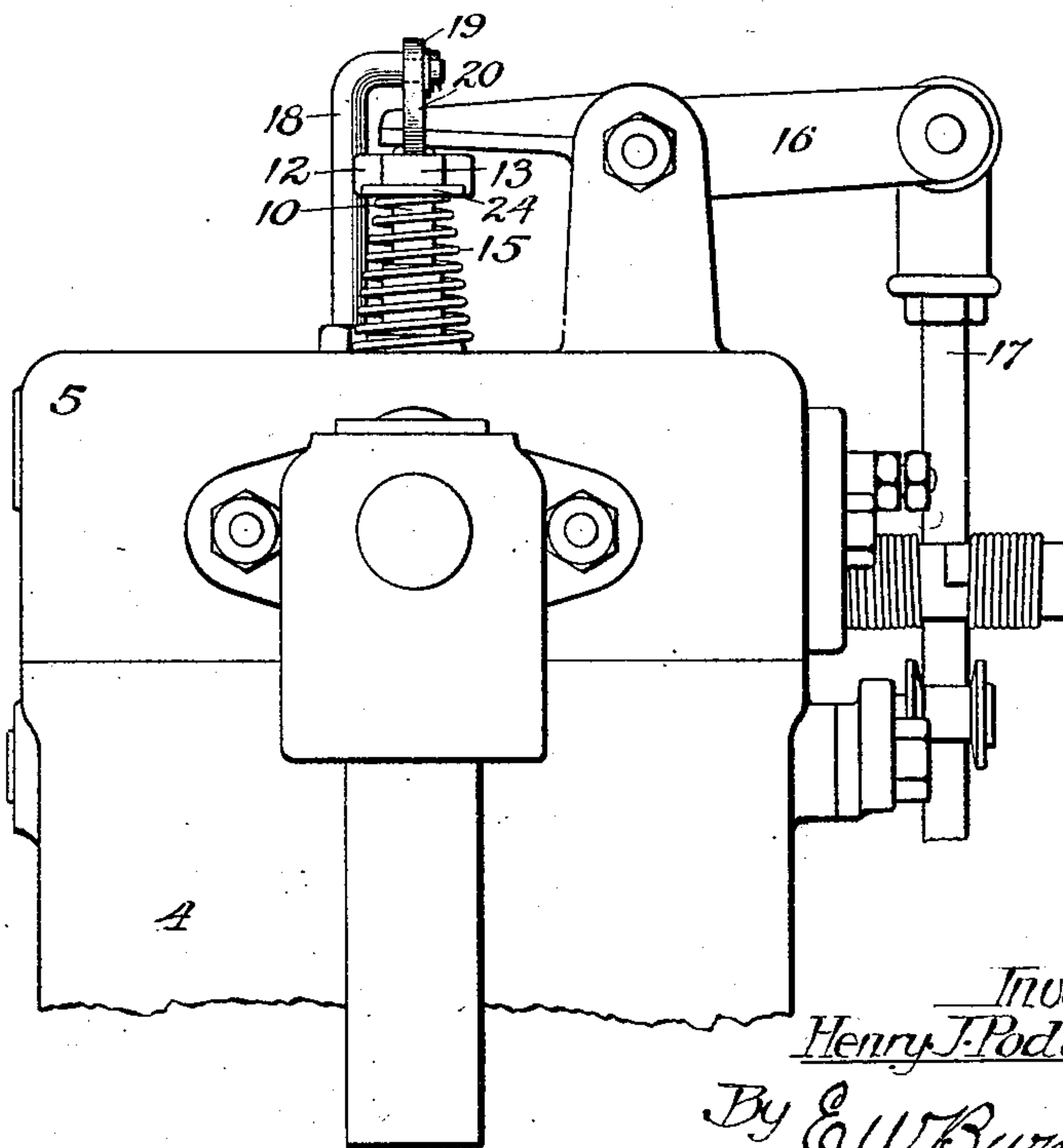


Fig. 1.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## VALVE-CONTROLLING MECHANISM FOR GAS-ENGINES.

No. 816,817.

Specification of Letters Patent.

Patented April 3, 1906.

Application filed October 22, 1904. Serial No. 229,518.

*To all whom it may concern:*

Be it known that I, HENRY JOSEPH PODLEŠÁK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valve-Controlling Mechanism for Gas-Engines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to gas-engines, belonging to that class commonly called "four-cycle," wherein a rearward movement of the piston operates to draw in a charge of the explosive mixture through the inlet-valve which is compressed by the return movement of said piston and ignited at the second rearward movement of the same and the exhaust-valve opened during its second forward movement.

The object of the invention is to provide means for preventing the opening of the inlet-valve during a portion of the time when the exhaust-valve is open.

In the operation of the above class of engines it has been found that in the absence of mechanism for performing the above-noted function when the explosion takes place and the piston is moved thereby to a predetermined position and the exhaust-valve is opened to permit the discharge of the spent gases the force of the exhaust will produce a partial vacuum in the cylinder sufficient to cause the inlet-valve to open and admit explosive material which is thereby wasted, and the purpose of my invention is to cure that evil.

The construction and operation of the invention will be more clearly described in the specification and illustrated by the drawings accompanying this application.

Figure 1 is a side view of so much of a gas-engine thought to be sufficient to illustrate my invention. Fig. 2 is a sectional elevation of a part of Fig. 1, and Fig. 3 is a detail of the locking-lever.

Like reference-numerals represent like parts throughout the various views.

4 represents the engine-cylinder, and 5 the cylinder-head secured thereto.

6 is the exhaust-valve, operating to open or close the port 7.

8 is the inlet-valve, operating to open or close the port 9.

10 is the stem of the exhaust-valve, 11 is the stem of the inlet-valve, each being mounted in the cylinder-head and adapted to slide relative thereto. Said valve-stems project outside the cylinder and have collars 12 and 13 secured thereto, respectively, and coiled springs 14 and 15 operate between the collars 12 and 13 and the surface of the head to keep the valves normally closed.

Upon the cylinder-head 5 is mounted a rocking lever 16, having one end resting against the end of the stem 10 of the exhaust-valve and its opposite end pivotally connected with one end of a reciprocating rod 17, as shown in Fig. 1. The rod 17 is caused to reciprocate by means of suitable connections with a movable part of the engine and is governed in its movements by any of the usual forms of mechanism for the purpose of moving it at predetermined intervals. When the lever 16 is rocked upon its pivot in one direction, it forces the stem 10 of the exhaust-valve inward and opens the exhaust-port for the emission of the spent gases.

Mounted upon the cylinder-head between the valve-stem is a stud 18, and pivoted at the outer end of the said stud is a rocking lever 19, having the two arms 20 and 21. The arm 20 is provided with a hooked end 22, and the arm 21 is connected to the stud 18 by the coiled spring 23, the function of the spring being to draw the arm 21 toward the stud and cause the arm 20 to swing away therefrom.

Referring to Fig. 2, when the exhaust-valve is closed the collar 12 bears against the arm 21 and holds the arm 20 inward toward the stud 18 away from the washer 24, that is interposed between the coiled spring and the collar upon the stem of the inlet-valve; but when the exhaust-valve is opened the reaction of the spring 23 causes the lever 19 to rock on its pivot, as shown by dotted lines in Fig. 2, and swing the hook portion of the arm 20 under the washer 24, and thereby lock the valve-stem of the inlet-valve against inward movement, and consequently prevent said inlet-valve from opening until the exhaust-valve in its closing movement releases said lever from contact with the stem of the inlet-



valve. The inlet-valve is thus closed during nearly the whole closing movement of the exhaust-valve.

What I claim, and desire to secure by Letters Patent, is—

1. In a gas-engine, the combination of inlet and exhaust ports and valves operating to open and close said ports alternately, means for operating said exhaust-port valve, means  
10 unconnected with said valve-operating means for holding the inlet-valve positively closed, said means adapted to engage with and be directly controlled by the exhaust-valve in moving toward its seat.

2. In a gas-engine, the combination of a cylinder, inlet and exhaust ports and valves operating to open and close said ports alternately, means for operating said exhaust-port valve, said valves having projecting  
20 stems outside said cylinder, springs surrounding said stems and operative to hold said valves against their seats, a two-armed lever mounted to vibrate between said valve-stems, independent of said valve-operating means, one arm of said lever engaging the inlet-valve to hold it positively closed when the exhaust-valve is open, and the other arm of the lever being engaged with the stem of the exhaust-valve so as to release said inlet-valve when  
30 the exhaust-valve is moving toward its seat.

3. In a gas-engine, the combination of a cylinder, inlet and exhaust ports and valves operating to open and close said ports alternately, means for operating said exhaust-  
35 port valve, said valves having projecting

stems outside said cylinder, springs surrounding said stems and operative to hold said valves against their seats, a stud between said stems, a two-armed lever pivoted on the stud, one arm of said lever engaging the inlet-valve to hold it positively closed when the exhaust-valve is open, and the other arm of said lever being engaged with the stem of the exhaust-valve so as to release the inlet-valve when the exhaust-valve is moving toward its seat.

4. In a valve mechanism for gas-engines, the combination of a cylinder, inlet and exhaust ports communicating therewith, valves operating to open and close said ports alternately, means for operating said exhaust-port valve, said valves having projecting stems outside said cylinder, springs surrounding said stems and operative to hold said valves against their seats, a stud between  
55 said stems, a two-armed lever pivoted on the stud, one arm of said lever engaging the inlet-valve to hold it positively closed when the exhaust-valve is open, a spring operative to hold said arm in contact with said stem, and the other arm of the lever engaging with the stem of the exhaust-valve so as to release the inlet-valve when the exhaust-valve is moving toward its seat.

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

HENRY JOSEPH PODLEŠÁK.

Witnesses:

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CHAS. N. CHAMBERS.