D. J. MILLER & J. M. AUSTIN.

VALVE GEAR.

APPLICATION FILED MAY 2, 1917.

1,239,933.

Patented Sept. 11, 1917.

Fig. 1.

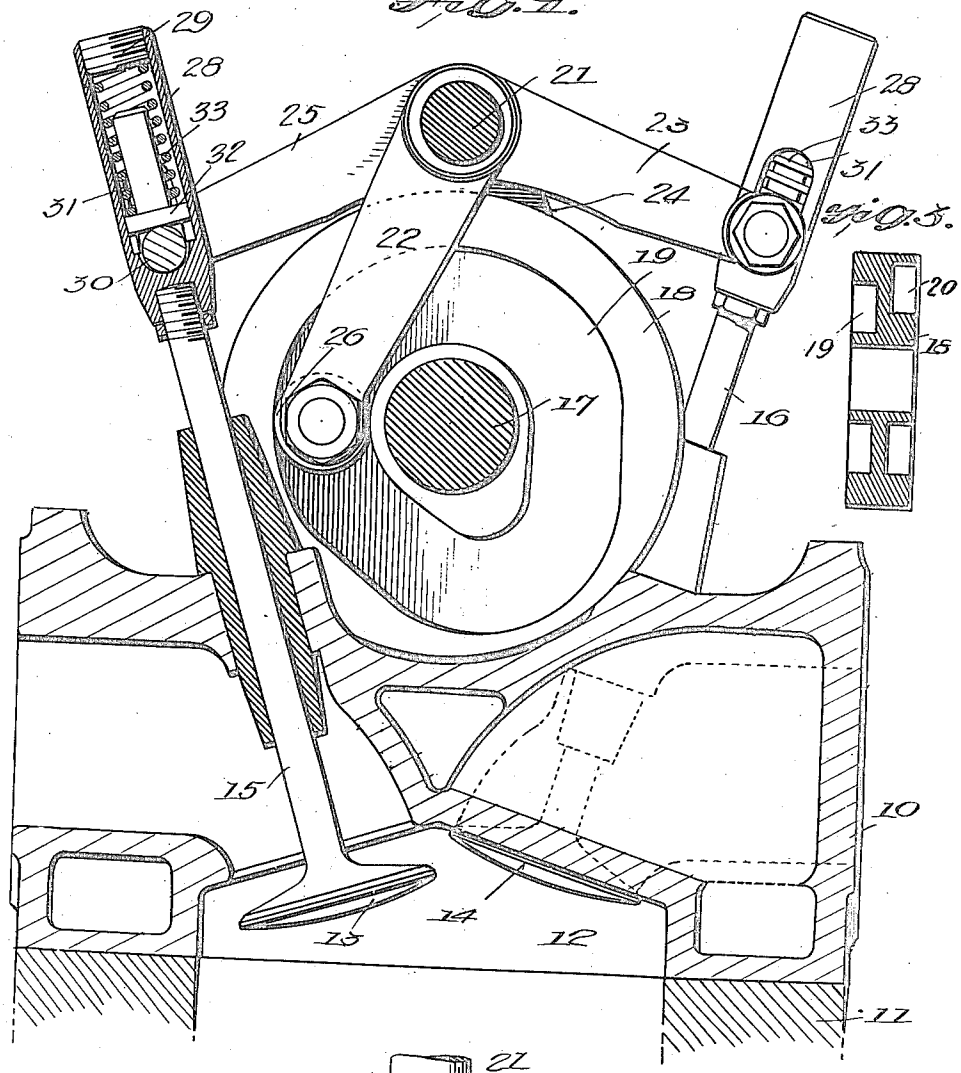
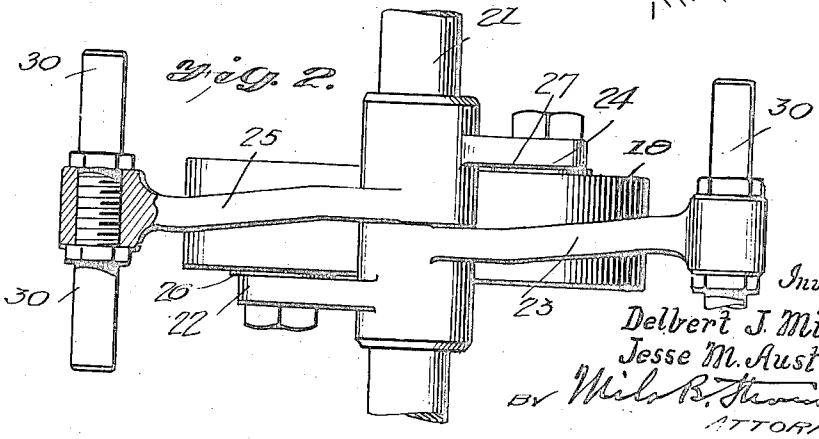


Fig. 3.

Fig. 2.



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VALVE-GEAR.

1,239,933. Specification of Letters Patent. Patented Sept. 11, 1917.

Application filed May 2, 1917. Serial No. 165,996.

To all whom it may concern:

Be it known that we, DELBERT J. MILLER and JESSE M. AUSTIN, citizens of the United States, residing at Green Bay, Brown county, Wisconsin, and Chicago, in the county of Cook and State of Illinois, respectively, have invented new and useful Improvements in Valve-Gears, of which the following is a specification.

The valve gear which is the subject matter of the present application for patent is designed more particularly for internal-combustion engines, although it is not, necessarily, limited to that class of engines.

The invention has for its object to provide a novel and improved cam-actuated valve mechanism which is simple in construction, and efficient and reliable in operation.

The object stated is attained by means of a combination and arrangement of parts to be hereinafter described and claimed, and in order that the same may be better understood, reference is had to the accompanying drawing forming a part of this specification.

In the drawing

Figure 1 is an elevation of the invention showing the application thereof, with parts in section;

Fig. 2 is a plan view of the valve operating mechanism partly in section; and

Fig. 3 is a cross-section of a cam member.

Referring specifically to the drawing, 10 denotes the head of an engine cylinder 11 having a combustion chamber 12 and provided with inlet and exhaust ports which are controlled by valves, the inlet valve being shown at 13 and the exhaust valve at 14. These valves are ordinarily puppet valves opening inwardly and having a stem which projects from the cylinder head so that the valve actuating means may be connected to the outer ends. The stem of the valve 13 is shown at 15 and the stem of the valve 14 at 16. The inlet and exhaust ports are located on opposite sides of the center of the cylinder head, and the valve stems extend divergingly therefrom.

On the outside of the cylinder head 10, between the projecting ends of the valve stems 15 and 16 is located a shaft 17 obtaining motion from the engine shaft through any suitable gearing which has not been illustrated as it forms no part of the present invention. This shaft carries a double cam in the form of a disk 18 having in one side or face, a cam groove 19 and in its other side or face a cam groove 20.

Above the shaft 17, and extending parallel thereto, is a stationary shaft 21 on which is fulcrumed an angle lever, the two arms of which are shown at 22 and 23 respectively. A second angle lever, having arms 24 and 25, is also fulcrumed on the shaft 21. The lever arm 22 carries a roller 26 at its outer end which seats in the cam groove 19, and a roller 27 carried by the outer end of the lever arm 24, seats in the cam groove 20. It will therefore be seen that the two angle levers are rocked when the cam disk 18 is turning. The outer end of the lever arm 25 is connected to the valve stem 15, and the outer end of the lever arm 23 is connected to the valve stem 16.

The connection between the lever arms 23 and 25, and the valve stems 16 and 15 is made as follows: To the outer end of the valve stem is secured a sleeve 28 closed at its outer end by a plug 29. The outer end of the lever arm carries a side pin 30 which passes into the sleeve through a slot 31 in the side thereof. In the sleeve is mounted a spring-pressed plunger 32 on which the side pin bears, the spring 33 being interposed between the plunger and the plug 29. Through this spring-pressed plunger and the sleeve, the motion of the lever arm is yieldingly transmitted to the valve stem. Both valve stems are connected in this manner to the respective lever arms.

The pins 30 may extend from both sides of the lever arms as shown, to operate two inlet (or outlet) valves simultaneously whereby our invention is applied to a cylinder fitted with four valves.

The cam grooves 19 and 20 will be designed to effect the opening and closing of the valves 13 and 14 at the proper time during the cycle of engine operation.

In operation, the internal edge of the cam grooves coming in contact with the rollers of the angle levers, said levers are forced outward until the highest point of the cam is reached, the valve being fully open at this point, after which the external surface of the cam bearing on the rollers draws the angle levers back to close the valves, they remaining closed until the first mentioned cam surface again comes into action. The spring 33 is compressed when the valve is closing, which insures a perfect seating re-

gardless of expansion of the valve from the heat of the engine. The valve action is absolutely positive, and valve lag at high engine speed is entirely eliminated. The spring also cushions the closing stroke of the valve and relieves the same of binding in the event of hard particles lodging between the valve and its seat.

We claim.

A valve operating mechanism comprising in combination with the stem of a valve, a sleeve carried by the outer end of the valve stem and having a side opening, a spring pressed plunger seating in the sleeve, a lever having a side pin extending into the sleeve through the side opening and engaging the plunger, and actuating means for the lever, the plunger being moved to compress its spring when the lever swings to close the valve.

In testimony whereof we affix our signatures.

DELBERT J. MILLER.
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