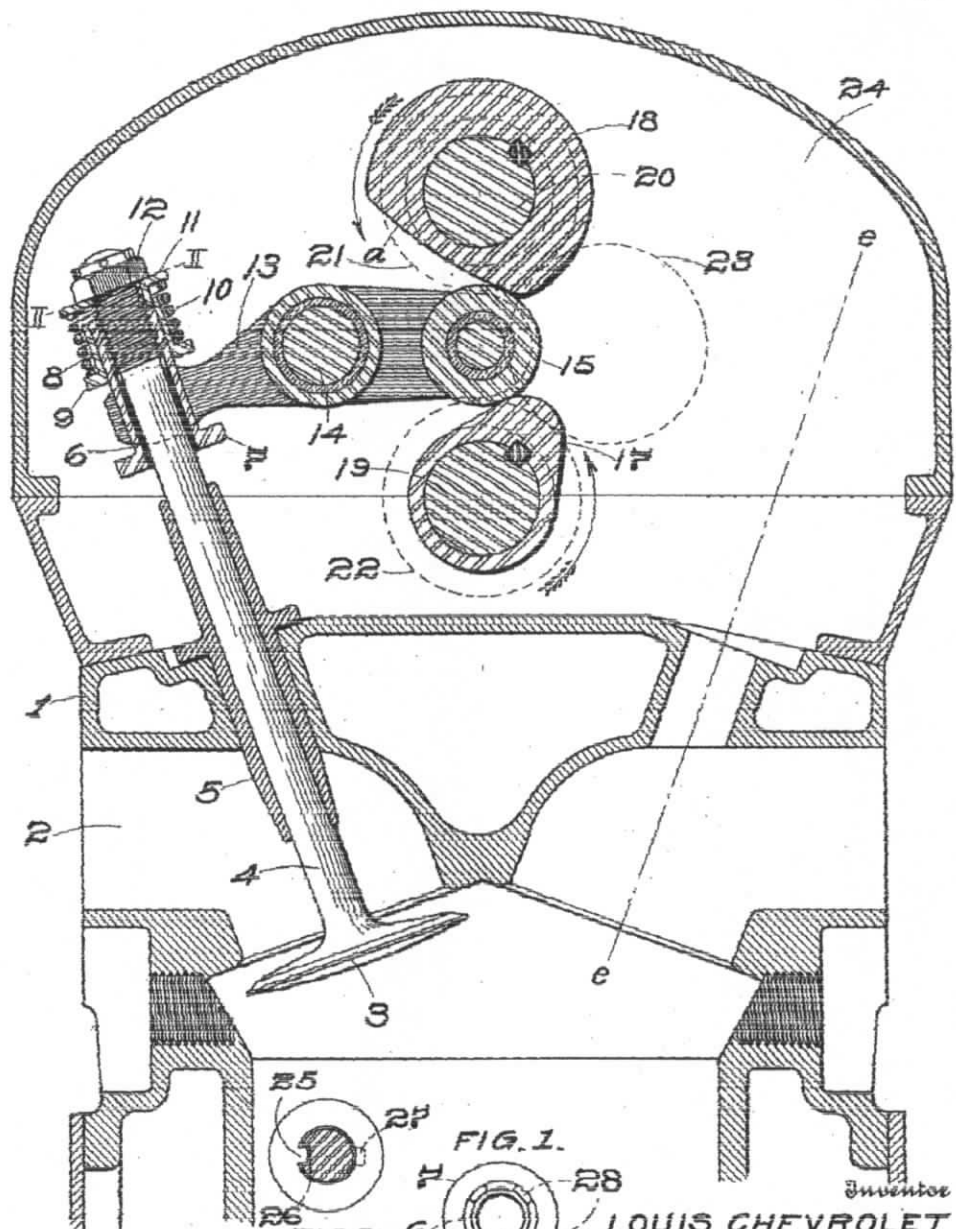


L. CHEVROLET.
 VALVE MECHANISM.
 APPLICATION FILED NOV. 8, 1916.

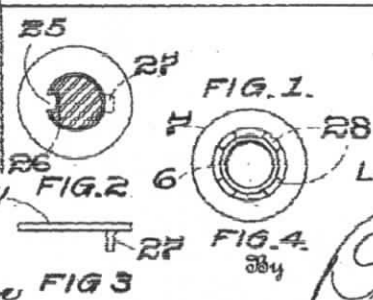
1,238,263.

Patented Aug. 28, 1917.



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VALVE MECHANISM.

1,238,263.

Specification of Letters Patent. Patented Aug. 28, 1917.

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To all whom it may concern:

Be it known that I, LOUIS CHEVROLET, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Valve Mechanism, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a valve gear for positively actuating valves of the puppet type for internal combustion motors.

To those who are familiar with the construction of internal combustion motors it is a well-known fact that puppet valves are usually actuated in their opening movement by means of a lever or cam, but are returned to their closed position by means of a spring; it is also a necessity and a common practice to provide a guide of considerable length through which the stem of the valve reciprocates.

In a construction of this kind it sometimes occurs, in case said stem and its guide become over-heated, that the movement of the valve presents an abnormal resistance to the action of said spring and the closing movement will then become sluggish, and said resistance may become sufficient to cause the stem to stick in the guide; in either event the efficiency of the motor is reduced and it may be wholly interfered with. Furthermore with the excessively high rate of speed at which motors are now operated, the matters of momentum and inertia must be carefully considered and properly disposed of; because of this, when spring actuation is employed the spring must be sufficiently stiff that it will arrest the momentum of the opening movement of the valve and not permit it to over-carry the positive actuation of the lever or other actuating element and this consideration requires a spring of such a degree of stiffness that the overcoming of its resistance not only consumes an appreciable amount of the power of the motor but in addition thereto the wear upon the valve gear is rapid, and necessitates frequent inspection, overhauling and repairs.

It is therefore, the object of this invention to provide a valve gearing from which the above objections or defects are eliminated and the requirements stated properly provided for.

The construction of my improved valve gear is clearly shown in the accompanying drawing.

Figure 1 is a vertical section through the head of a motor and the adjacent portion of the cylinder, showing the same equipped with my improved valve gear;

Fig. 2 is a section on line II—II of Fig. 1, and

Figs. 3 and 4 are details.

The construction here shown is substantially as follows.

Within the head 1 of the motor and in proper relation to a valve port 2 thereof, is mounted a puppet valve 3 the stem 4 of which passes through a guide 5 which is suitably inserted within the surrounding structure of the head; said guide 5 is preferably inclined somewhat so that the axis of the valve stem forms an angle with the longitudinal center line of the cylinder.

Over the upper screwthreaded end of said stem 4 is screwed a sleeve 6 which is formed at the lower end into an annular flange or collar 7; an additional or spring sleeve 8 is placed over the upper end of the sleeve 6 and said sleeve 8 is provided at its lower end with an annular flange or collar 9; a cylindrical spring 10 surrounds said sleeve 8 with its lower end bearing against the upper face of said flange 9 at the upper end of said spring is placed a washer 11. All of said elements 6, 8 and 11 are locked upon said stem 4 by means of a castle nut 12, which employs the usual pin or cotter to secure said nut in position.

For the purpose of more effectively locking the sleeve 6 against any accidental displacement from its properly adjusted position, the washer 11 is formed as shown in Fig. 2 with a tongue 25 which projects into a corresponding seat 26 of the valve stem 4; said washer is also provided with a downwardly projecting keeper or detent 27 as shown in Figs. 2 and 3. In the upper end of said sleeve 6 are formed a number of notches 28 in much the same manner that a castle nut is formed, and said keeper 27 is caused to occupy one of said notches thus positively locking said sleeve in its proper position.

Between the adjacent faces of the flanges 7 and 9 is formed an annular groove for the reception of the engaging or actuating ends of

a lever 13. Said lever is pivotally mounted upon a shaft 14 and in the outer end thereof is mounted a roller 15 which is adapted to be acted upon by the cams 17 and 18. Cam 17 5 actuates said lever 13 in the direction which opens said valve 3; said cam 17 is of a form commonly employed in motor construction. The action of said cam 16 is to return said 10 valve to the seat and to retain the same in its seated position during the interim of the actuations of cam 17. It will be noted that cam 18 is nearly cylindrical in outline and is cut away at *a* to permit the free 15 movement of the roller during the actuations of cam 17.

For the purpose of adjustment and for preventing a rigid and unyielding action of said lever 13 when closing said valve, and in retaining same in its closed position, said 20 spring 10 is provided. Said spring-sleeve 8 is free to move longitudinally upon sleeve 6 and is yieldably pressed against the upper face of lever 13 by said spring; said sleeve 8 is so adjusted that after the valve becomes 25 seated said spring 10 will be compressed somewhat and this provision not only suitably modifies and softens the valve closing action of the gearing but it also provides an automatic take-up for the wear of parts, and 30 permits a latitude in original adjustments that insures an efficient and properly seated valve even when the gearing is adjusted by unskilled labor.

Said cams 17 and 18 are operably mounted 35 upon the shafts 19 and 20 respectively, each of which is provided with a gear 21 and 22. An intermediate gear 23 is provided to cause said cams to revolve in the directions indi-

cated by the arrows, and any one of said gears may be used as the driving gear. 40

It will be readily understood that the gearing shown is or may be duplicated for the purpose of actuating the other valve of the motor which would be mounted upon the center line indicated at *e-e*. 45

The gearing is all inclosed in a chamber 24 which may be filled with a suitable lubricating material that will serve to keep all moving parts properly lubricated.

What I claim is:— 50

A valve gear for puppet valves comprising in combination a puppet valve, a suitable mounting structure arranged to carry said valve, a non-yieldable, longitudinally-adjustable annular flange carried by the stem of 55 said valve, a yieldable longitudinally adjustable flange carried by the stem of said valve, the juxtaposed faces of said flanges being adapted to bear against the opposite faces of an actuating lever for said valve, a lever pivoted intermediate its ends and adapted at 60 one of its ends to extend between said juxtaposed faces of said collars and to be in contact therewith, the other end of said lever being adapted to be cam-actuated and a revolvable cam positioned upon either side of said last-mentioned end of said lever, said cams being adapted to cooperatively actuate said lever in the respective movements for the 65 actuation of said valve. 70

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

LOUIS CHEVROLET.

Witnesses:

ANNA M. DORR,
LEWIS E. FLANDERS.