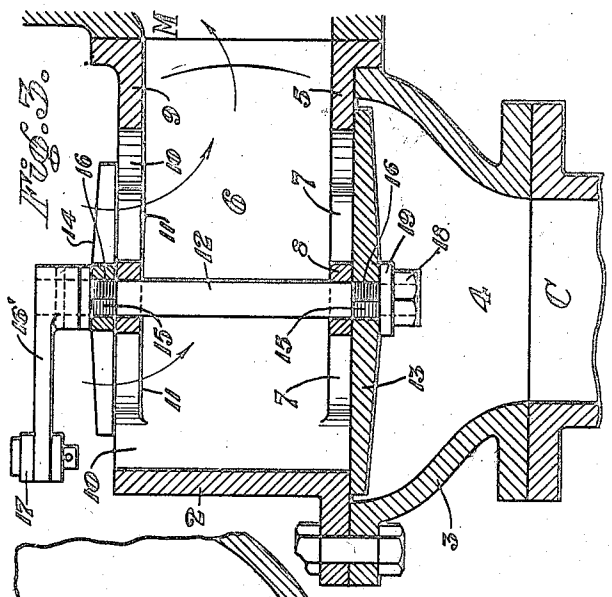
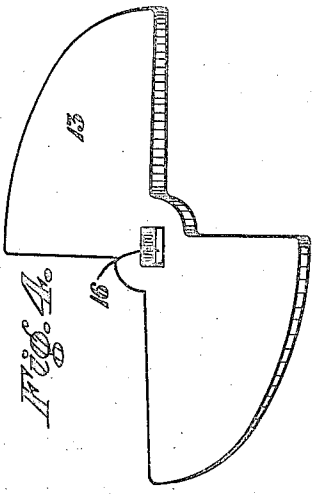
Mar. 20, 1923. 1,449,074.

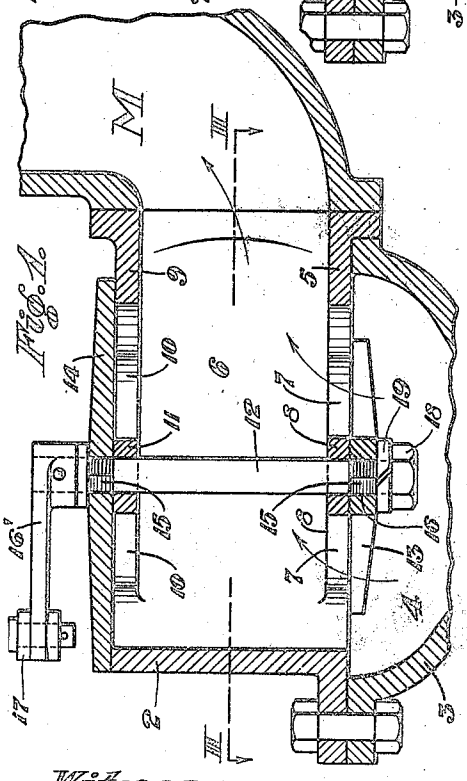
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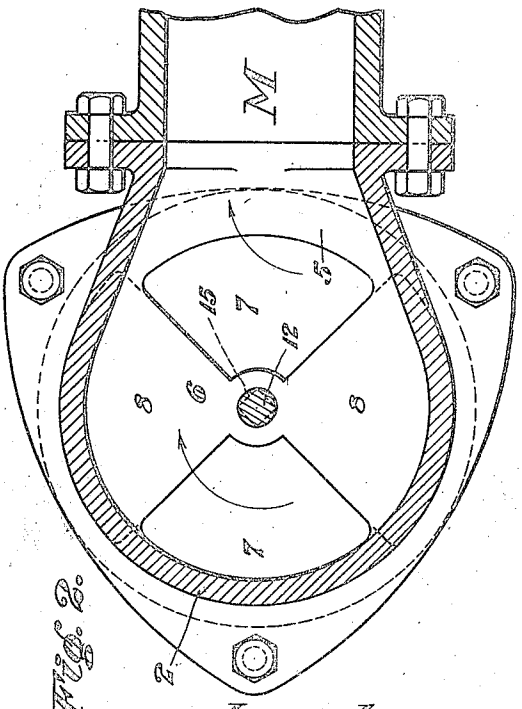
FUEL CONTROL MECHANISM FOR INTERNAL COMBUSTION ENGINES.

FILED MAY 6, 1920.









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UNITED STATES PATENT OFFICE.

HARRY L. TYGARD, OF PITTSBURGH, AND GEORGE M. HAMILTON, OF OAKMONT, PENNSYLVANIA.

FUEL-CONTROL MECHANISM FOR INTERNAL-COMBUSTION ENGINES.

Application filed May 6, 1920. Serial No. 379,415.

To all whom it may concern:

Be it known that we, HARRY L. TYGARD and GEORGE M. HAMILTON, citizens of the United States, residing at Pittsburgh and Oakmont, respectively, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Fuel-Control Mechanism for Internal-Combustion Engines, of which the following is a specification.

Our invention is an improvement in internal combustion engines, and particularly in the motors of this type as used on automobiles or similar self-propelled vehicles.

It has in view to provide means for cutting off the fuel supply to the explosion chamber or chambers of the engine at times when the car is running upon its own momentum, as in coasting, and for simultaneously reducing the vacuum of the cylinders, and increasing the compression.

Primarily, it has in view to effect a corresponding economy in the use of the explosive fuel at such times as the engine is operating by motion transmitted to it from the connected gearing.

Ordinarily, in such cases, the conduit between the fuel supply, as a carbureter, and the explosion chambers of the cylinder or cylinders is normally open, so that when the engine is itself being operated by the turning over of the crank shaft and corresponding actuation of the plungers, there is an undesired suction of the fuel and a wasting thereof through the ordinary exhaust passages, whether the explosive mixture be ignited or not.

Our invention has in view to provide means for cutting off the communication between the fuel supply and the explosive chamber or chambers at such times as propelling power of the engine is not needed, and at the same time opening communication from the cylinder or cylinders to the atmosphere, so as to ensure ample supply of air with resulting higher compression and lower vacuum in the cylinders. Our invention contemplates the simultaneous closing of the fuel supply, and opening of the circulation to the atmosphere, and vice versa.

The present invention is similar in purpose and operation to that disclosed in our prior application filed November 3, 1919, Serial No. 335,502. It has for its object to provide a construction in which a common chamber, open to the manifold, is placed in communication with the carbureter or with the atmosphere alternately by the opening and closing of a pair of chamber plates coacting with communicating passageways.

In the drawings which illustrate one preferred embodiment of the invention:

Fig. 1 is a vertical sectional view through a valve mechanism interposed between the fuel supply and the air supply and a manifold leading to the engine and adapted to establish circulation therewith.

Fig. 2 is a horizontal sectional view on the line II—II of Fig. 1.

Fig. 3 is a vertical sectional view similar to Fig. 1 showing the manifold communicating with the atmosphere and closed to the carbureter.

Fig. 4 is a perspective detail view of one of the damper valves detached.

In the drawings, in which the invention is illustrated somewhat diagrammatically, C represents the upper portion of a carbureter or other fuel supply device of any well known construction. A manifold M, also of an ordinary type, leads to the explosion chamber or chambers of one or more cylinders communicating therewith by the usual lateral ports. Between the carbureter and the manifold is inserted our improved controlling device which consists of a suitable casing 2 of any convenient form having direct connection with the carbureter C by an intervening conduit 3 providing an intervening circulation chamber 4. Casing 3 is connected with casing 2 and carbureter C respectively by suitable abutting flanges and bolts or otherwise as may be desired. The partition wall 5 of casing 2, between its interior 6 and chamber 4 is provided with one or more segmental shaped openings 7 and intervening closing wall portions 8, one side of which is on a continuous common plane. The opposite wall 9 of casing 2 is similarly provided with one or more segmental openings 10, and intervening solid portions 11, adapted to provide circulation between chamber 6 and the exterior of the casing for inflow of atmospheric air. The central portion of each wall 5 and 9 respectively provides a journal bearing 11 for a central stem 12, and upon which are mounted the damper valves 13 and 14 respectively. The stem 12 may be squared as indicated at 15 or otherwise suitably shaped to fit the opening

16 in each damper valve, so that rotation of the stem will also rotate the valves together. At the upper side stem 12 is provided with an operating lever 16 connected at its outer end with a terminal 17 of a pitman, crank or other suitable actuating device. Such device may be provided with any convenient operating terminal mounted upon the dash board, steering controls or elsewhere, capable of being easily thrown by the operator to one side or the other of a dead center, or otherwise, whereby to open and normally retain open or closed respectively valves 13 and 14 and the manifold with communication to the atmosphere closed or vice versa. The valves 13 and 14 are retained in position on stem 12 and in sufficiently tight face engagement with the partitions 5 and 9, by any suitable means as a terminal nut 18 and a spring washer 19.

As thus constructed, between the carbureter and manifold, valve 14 is in closed position over the atmosphere parts 10 as in Fig. 1, and when the stem 12 is rotated and quarter turn of more or less, parts 7 are closed cutting off the fuel supply and parts 10 are correspondingly open to the atmosphere as in Fig. 3.

The construction and arrangement of the invention as to its particular design, proportions or other details may be variously changed or modified by the skilled mechanic, in its application to any particular type or form of carbureter, manifold, or other conditions incident to the type of engine with which it is used. For instance the circulation control mechanism instead of being separately connected with the carbureter or manifold may be made as an integral or incorporated member of it and will operate in the same way as above described. We do not therefore wish to be limited to the exact construction shown.

What we claim is:

A valve casing having a middle cylindrical chamber and a delivery opening for direct communication with the manifold of an internal combustion engine and provided with opposite flat walls having alternating segmental shaped openings and closed portions, an operating stem journalled in the middle of each of said walls, a damper valve having segmental wings secured to each end of said stem and in face engagement with said walls, and a nut and spring washer adapted to maintain the damper valves in position.

In testimony whereof we hereunto affix our signatures.

HARRY L. TYGARD.
GEORGE M. HAMILTON.