

Dec. 7, 1926.

1,609,686

J. E. BLANDING

FUEL FEED DEVICE

Filed Feb. 17, 1925

2 Sheets-Sheet 1

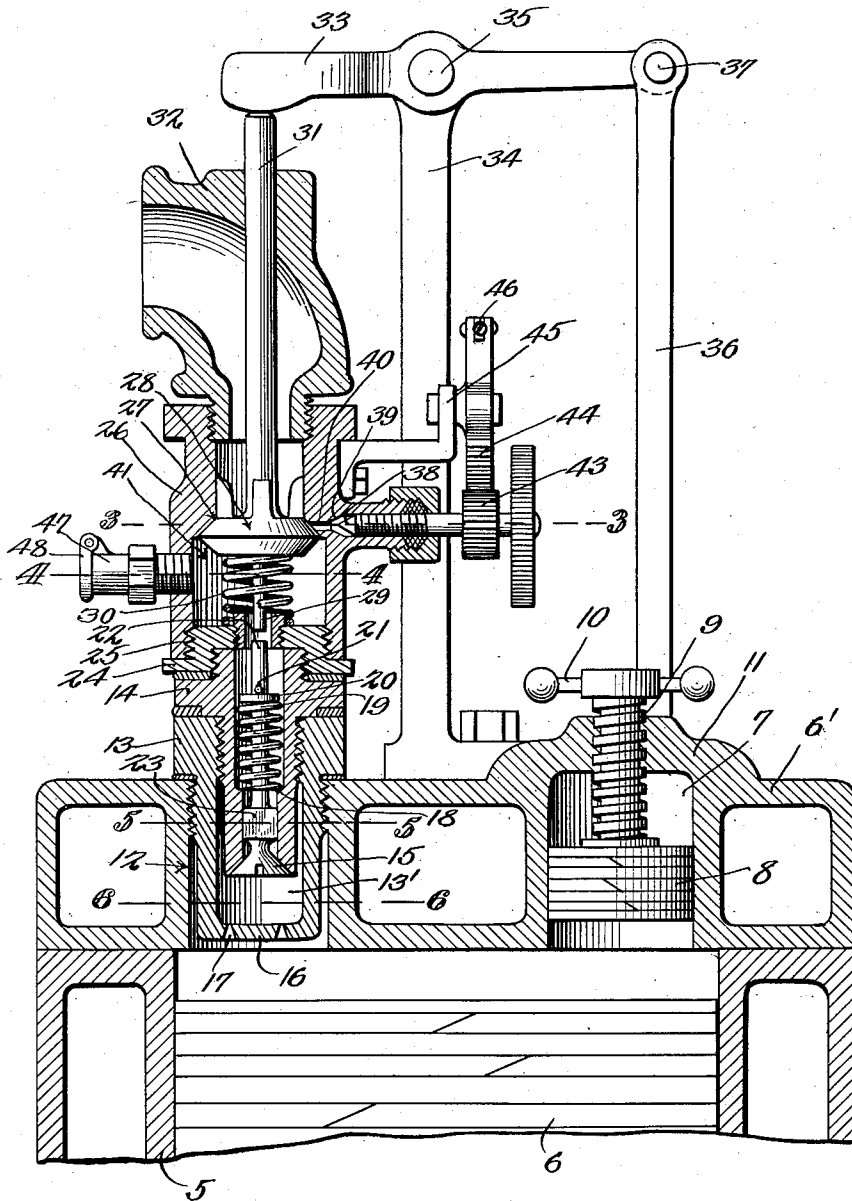


Fig. 1.

Inventor

J. E. Blanding

By *CA Snow & Co.*
Attorneys

Attorneys,

Dec. 7, 1926.

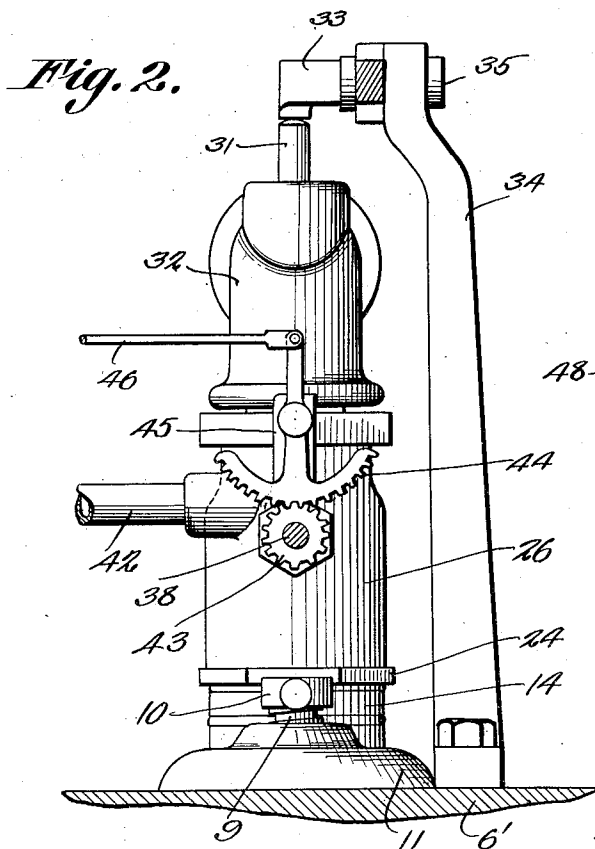
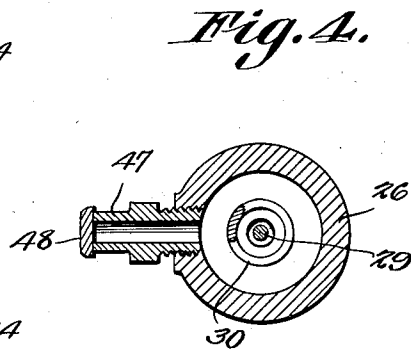
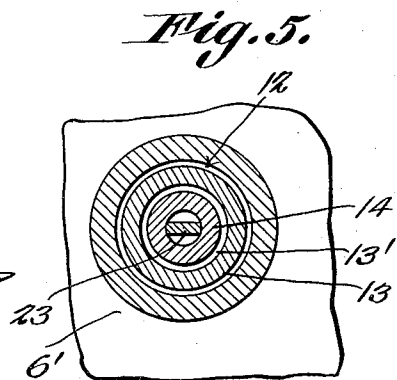
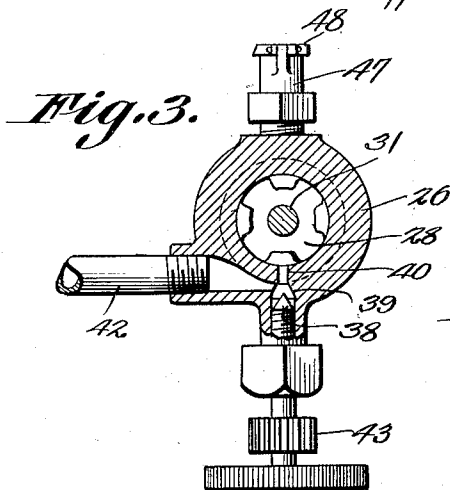
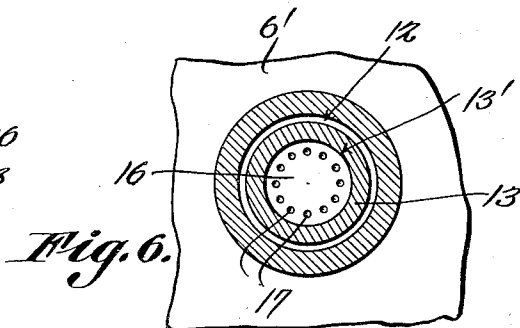
1,609,686

J. E. BLANDING

FUEL FEED DEVICE

Filed Feb. 17, 1925

2 Sheets-Sheet 2



Inventor

J. E. Blanding

By *CA Snow & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH E. BLANDING, OF NEW LONDON, CONNECTICUT.

FUEL-FEED DEVICE.

Application filed February 17, 1925. Serial No. 9,818.

This invention relates to internal combustion engines and aims to improve the construction as illustrated in my co-pending application filed January 10, 1923, and bearing Serial Number 611,753.

An object of the invention is to provide a needle valve control or governor operating in conjunction with a spring-pressed valve to normally hold the intake port to the combustion chamber forming a part of the apparatus, closed, thereby insuring against loss of compression, by foreign matter collecting under the compression valve or spring-pressed valve.

Another important object of the invention is the provision of means to vary the area of the compression chamber to increase or diminish the compression within the cylinder to increase the efficiency of the engine.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

Referring to the drawings:

Figure 1 is a fragmental sectional view through the upper portion of an internal combustion engine constructed in accordance with the invention.

Figure 2 is a side elevational view of the upper portion of the engine construction.

Figure 3 is a sectional view taken on line 3-3 of Figure 1.

Figure 4 is a sectional view taken on line 4-4 of Figure 1.

Figure 5 is a sectional view taken on line 5-5 of Figure 1.

Figure 6 is a sectional view taken on line 6-6 of Figure 1.

Referring to the drawings in detail, the reference character 5 indicates an engine cylinder in which the piston 6 operates.

The reference character 6' indicates the cylinder head which is of the usual construction, and preferably removable on the cylinder block 5 in order that repairs to the piston and cylinder may be made with facility. The head 6' is formed with an opening 7 in which the piston 8 is positioned, the piston 8 being mounted on the lower end of

the screw 9 which is provided with a head 10 whereby the screw may be rotated to move the piston 8 within the opening 7, to vary the distance between the lower end of the piston 8 and upper end of piston 6, whereby the area of the compression space may be regulated at the will of the operator, to increase or diminish the compression.

The screw 9 operates through a suitable threaded opening in the threaded member 11 which is secured to the cylinder head 6 in any usual and well known manner. Formed in the cylinder head 6 is an opening 12 in which is positioned the threaded plug 13 that is hollow to accommodate the removable member 14 that is provided with an inclined lower end portion providing a valve seat for the valve member 15, which is spaced from the lower end 16 of the plug 13 providing a chamber 13'. The lower end of the plug 16 is formed with a plurality of openings 17 establishing communication between the engine cylinder and chamber 13' below the valve member 15 so that fuel entering the chamber 13' may be inhaled into the engine cylinder through the openings 17, in a fine spray.

The member 14 is formed with a shoulder 18 providing a seat for the valve spring 19, the upper end of the valve spring operating against the washer 20 that engages the pin 21 carried by the valve stem 22, the valve stem being held in alignment with the opening through which it moves by means of the guide member 23 that is formed integral with the valve stem 22.

Removably supported on the upper end of the member 14 is a cap 24 that is provided with external threads 25 to accommodate the removable valve housing 26 which is threaded at its lower end. Formed within the valve housing is a valve seat 27 against which the valve 28 moves for normally holding the air intake opening closed.

As shown, the valve member 28 is provided with a depending stem 29 around which the coiled spring 30 is positioned, the coiled spring having its upper end contacting with the valve 28 and its lower end mounted on the cap 24 to normally urge the valve member 28 to its closed position.

Formed on the valve member 28 and extending upwardly therefrom, is a valve rod indicated at 31 that extends upwardly through an opening formed in the air intake

pipe 32 where it is engaged by the rocker arm 33 supported at the upper end of the arm 34, as at 35.

The reference character 36 indicates a push rod which has pivotal connection with the rocker arm 33 at 37, the lower end of the push rod 36 being arranged adjacent to a suitable cam, whereby the rod 36 may be moved upwardly at predetermined intervals to operate the valve 28 and control the incoming charge.

The needle or throttle valve is indicated by the reference character 38 and is adapted to seat at 39, the valve 38 being designed to control the passage of liquid to the port 40 that communicates with the mixing chamber 41 to supply fuel thereto.

Communicating with the port 40, is a supply pipe 42 which is in communication with a suitable supply tank not shown. Mounted on the valve stem 38 is a pinion 43, the teeth of which being in mesh with the teeth of the segmental gear 44 mounted on the arm 45 that is disposed directly thereabove, so that upon movement of the segmental gear 44, a corresponding rotary movement will be imparted to the valve 38 to move the same towards or away from the valve seat 39 to vary the quantity of fuel passing to the mixing chamber.

The throttle rod is indicated at 46 and may be operated by the person in charge of the engine to control the operation of the engine. Communicating with the mixing chamber 41 is a pipe 47 which carries a flap valve 48 at its outer end, which flap valve will relieve the compression chamber 41 and valve member operating therein of excessive pressure, should an explosion occur in the mixing chamber. It will be obvious that should an explosion occur in the mixing chamber, the valve 48 will be unseated and the products of combustion passed outwardly through the pipe 47.

From the foregoing it will be obvious that due to this construction, liquid fuel is drawn into the mixing chamber 41 through the opening 40, the valve member 28 being moved downwardly or unseated, by the

action of the rocker arm 33, whereupon air is drawn into the mixing chamber, through the pipe 32 where the air and liquid fuel are mixed.

Upon the downstroke of the piston 6, it will be obvious that the charge is drawn into the chamber 13', where it is passed into the engine cylinder, through the openings 17.

Should it be desired to increase the compression within the cylinder, it is obvious that by rotating the screw 9 to move the piston 8 towards the piston 6, the compression chamber within the cylinder will be reduced to increase the efficiency of the engine under certain conditions.

I claim:—

1. An internal combustion engine including a cylinder, said cylinder having a fuel inlet opening, a hollow plug mounted in the opening, a valve supporting member disposed above the plug and extending into the plug, a valve housing mounted above the valve supporting member, and having an enlarged portion providing a mixing chamber, a valve member within the mixing chamber, the valve member being of a diameter less than the mixing chamber to permit fuel to pass between the edge of the valve and wall of the mixing chamber, means for operating the valve, and means for controlling the passage of fuel through the valve chamber.

2. An internal combustion engine including a cylinder, said cylinder having a fuel inlet opening, a hollow plug positioned in the opening, a valve supporting member extending into the hollow plug, a valve housing disposed above the valve member, said valve housing including a mixing chamber, a valve member operating in the mixing chamber for controlling the passage of air to the mixing chamber, a fuel pipe communicating with the valve chamber, and a needle valve for controlling the passage of fuel to the valve chamber.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

JOSEPH E. BLANDING.