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FUEL INJECTOR FOR TWO-STROKE HIGH COMPRESSION MOTORS.
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1,386,832.

Patented Aug. 9, 1921.

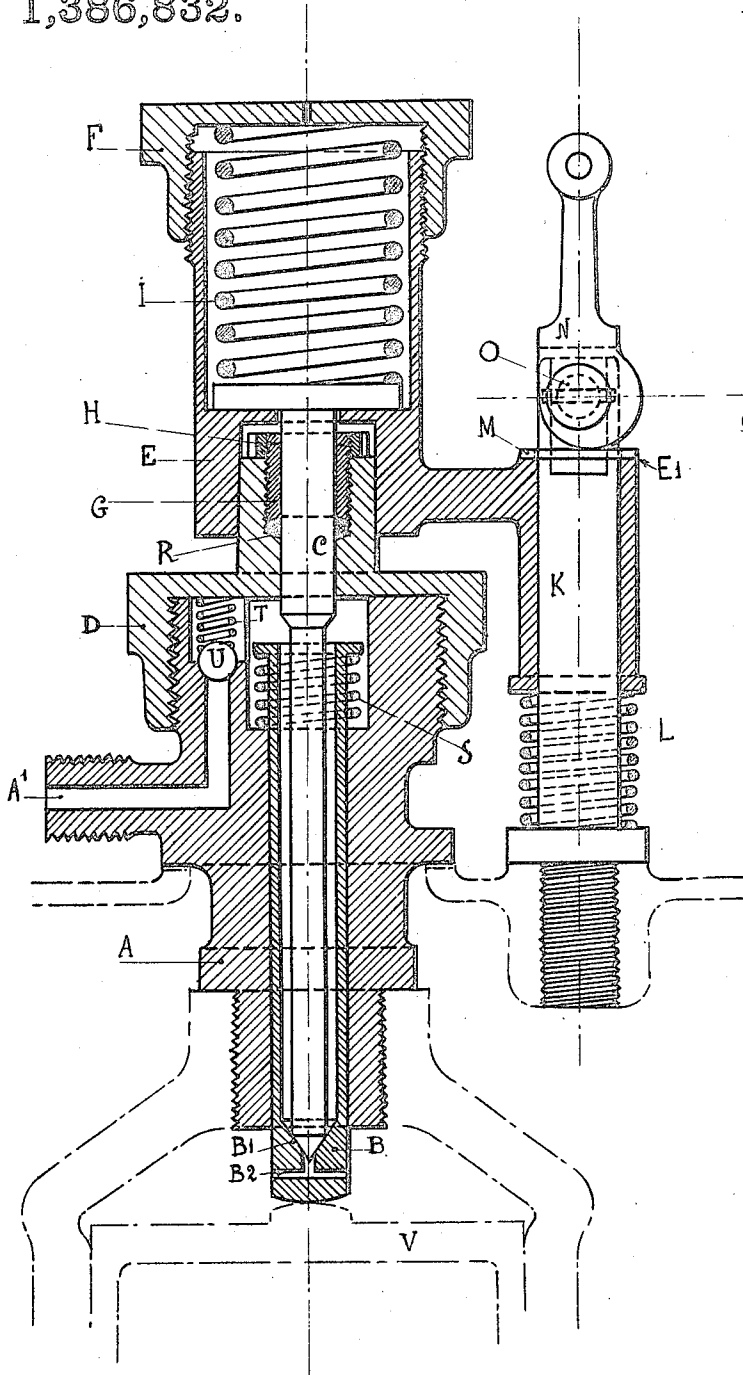


Figure N°1

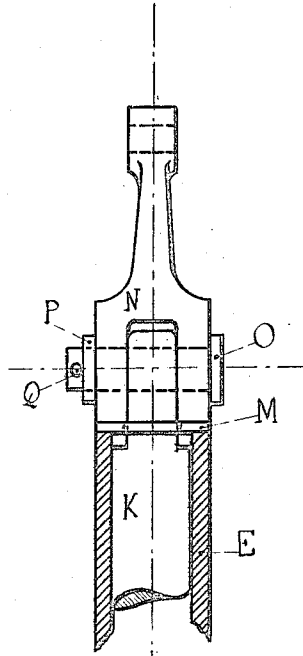


Figure N°2

WITNESS:

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FUEL-INJECTOR FOR TWO-STROKE HIGH-COMPRESSION MOTORS.

1,386,832.

Specification of Letters Patent.

Patented Aug. 9, 1921.

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To all whom it may concern:

Be it known that I, LOUIS BAILLY, a citizen of the French Republic, and resident of Columbus, State of Ohio, have invented certain new and useful Fuel-Injectors for Two-Stroke High-Compression Motors, of which the following is a specification.

My invention relates to a new fuel injector for two stroke high compression motors in which the fuel is fired by its contact with compressed air. The objects of my invention are:—

First: To inject the fuel into the cylinder of the motor when the compression is almost complete, thus avoiding preignition.

Second: To permit an exact adjustment of the quantity of fuel injected according to the power wanted from the motor.

Third: To permit an easy dismounting and easy replacement of the injector, if necessary.

Fourth: To permit an easy adjustment of the velocity of the fuel during injection.

I attain these objects by means of the apparatus shown in the accompanying drawing, which illustrates one of the ways of applying the principle of my discovery.

Figure 1 shows a vertical section of the apparatus as applied to a motor head, showing how the injector may be used on a motor. The motor head is shown in dotted or broken lines.

Fig. 2 shows specially the details of the fuel control through a side view. Similar letters refer to similar parts throughout the two views.

The apparatus is composed as follows:—

The body of the injector (A) is provided with inlet fuel opening at (A¹), which is controlled by the ball valve "U" secured on its seat by the spring "T." Two pistons (B) and (C) work in (A) with a differentiating action. The diameter of (C) is smaller than (B). The spring (S) pushes (B) against (C) on the valve seat (B¹). The nut (D) closes the injector chamber and guides the piston (C) and the part (E). The packing nut (G) locked by the locking nut (H) secures the packing material (R) in place, thus avoiding leakage along (C). The spring (I) placed in (E) pushes (C) down, and the tension of the spring may be adjusted by means of the nut (F). The cam (N) connected with the guide (K) by the spindle (O), which is held in place by

the washer (P) and the pin (Q) allows the part (E) to be raised or lowered. The washer (M) equalizes the pressure of the cam (N) over the top surface of (E) at (E¹). The spring (L) holds the part (E) upward against the washer (M). The guide (K) is screwed into the head of the water jacket of the motor.

The apparatus acts as follows:—

First: The injector is filled with fuel. When the piston of the motor (V) is near the end of its compression stroke it pushes the piston (B), which enters the injector chamber as the piston (C), raised by piston (B), goes out of the injector. The diameter of (C) being smaller than (B) there is compression in the injector (A). The piston (C) is not compensated, and when the pressure in the injector (A) is higher than the pressure of the spring (I) the piston (C) is lifted, allowing the fuel to rush into the cylinder of the motor through the opening (B²) provided at the bottom of the piston (B) as shown in drawing Fig. 1.

When the piston of the engine (V) reaches its upper dead center it ceases to push the piston (B), and the piston needle valve (C) pressed down by the spring (I) sits again in the valve seat (B¹) at the bottom of piston (B), which is compelled to travel downward as soon as the piston (V) begins its working stroke. There is then a compression created in (A) and the ball valve (U) is lifted, allowing the injector chamber to be refilled. The spring (S) is used to maintain the piston (B) against the needle (C) at (B¹) when the injector is not working. To regulate the fuel injection according to the power demanded from the motor, it is necessary to give the piston (B) the right length of stroke by allowing the needle (C) to go down as far as it is necessary. Accordingly the part (E) is actuated by the cam (N) which permits adjustment of the lower point of the stroke of piston (C). The spring (L) presses constantly the part (E) against the washer (M) which equalizes the pressure of the cam (N) on (E). The cam (N) may be adjusted by hand or by an automatic regulator.

I claim as new the following features:—

1. The combination in a fuel injector having an inlet and controlling valve, of a pair of axially alined telescoping pump pistons, one of which is formed as a nozzle injector

and the other as a needle valve controlling said nozzle, said pistons being movable jointly, and means for normally holding said needle valve to its seat in the nozzle injector.

2. The combination in a fuel injector having an inlet and controlling valve, of a hollow nozzle injector, a piston formed with a needle valve controlling said nozzle injector, resilient means for normally holding the needle valve in its nozzle seat, an adjustable box movable relatively to said injector, and a spring within the box bearing on said piston.

3. The combination in a fuel injector with an axially alined hollow nozzle piston and a needle valve piston of less diameter adapted to be jointly lifted by impact from a motor piston, means for lifting said needle valve piston by fluid pressure relative to the nozzle piston to permit inflow of fuel gas,

and means for normally holding said needle valve to its seat in the nozzle injector.

4. The combination in a fuel injector having an inlet and controlling valve, of a hollow nozzle injector and its spring holding it in normal position, a piston formed with a needle valve located in and controlling said nozzle injector, said injector and valve adapted to move jointly, and said needle valve being adapted to move relative to the nozzle injector under fluid pressure, a movable box supported above the piston needle valve and a spring therein bearing on said needle valve, and a cam device for adjusting the position of said box for the purpose described.

Signed at Detroit in the county of Wayne and State of Michigan this 23rd day of February, A. D. 1920.

LOUIS BAILLY.