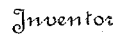


1,380,771.

2 SHEETS—SHEET 1.



Dodge and Sons,

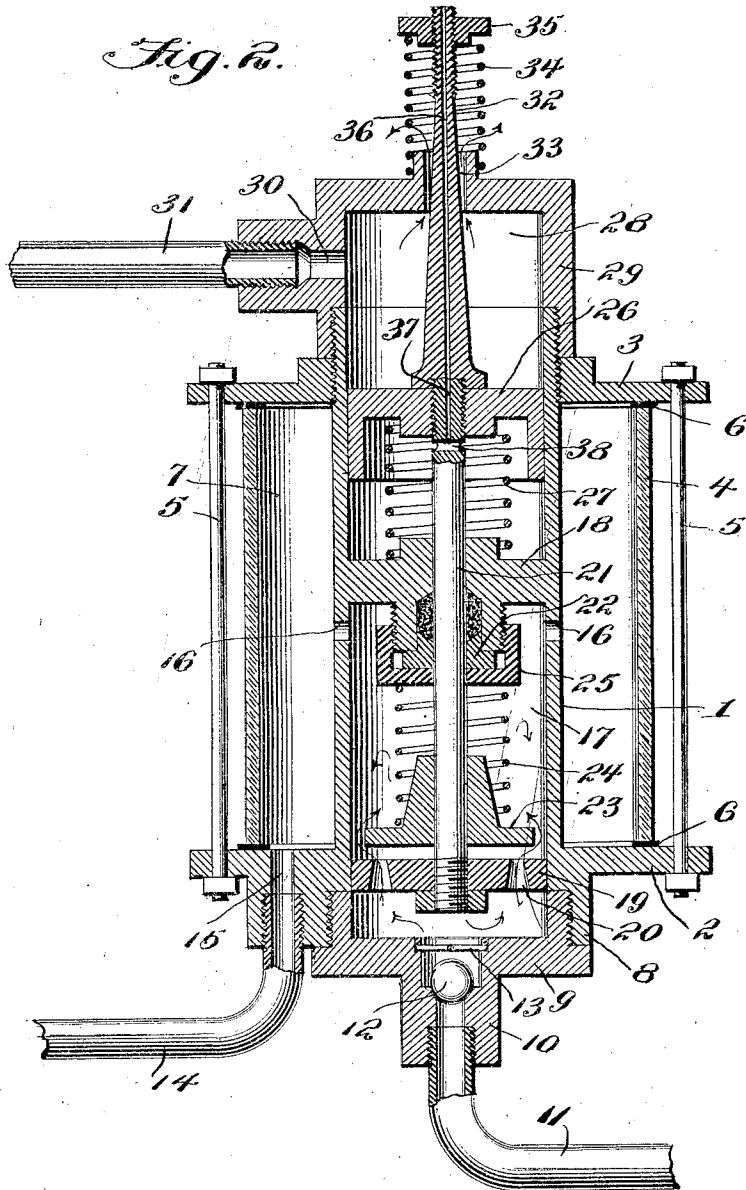
Attorneys

D. J. CARTWRIGHT.
FUEL FEEDING PUMP.
APPLICATION FILED SEPT. 2, 1919.

1,380,771.

Patented June 7, 1921.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

DAVID J. CARTWRIGHT, OF NEW YORK, N. Y.

FUEL-FEEDING PUMP.

1,380,771.

Specification of Letters Patent.

Patented June 7, 1921.

Application filed September 2, 1919. Serial No. 321,239.

To all whom it may concern:

Be it known that I, DAVID J. CARTWRIGHT, a citizen of the United States, residing at New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Fuel-Feeding Pumps, of which the following is a specification.

This invention pertains to an improved pump designed more particularly for feeding fuel to internal combustion engines.

The main object of the invention is to provide a pump which, actuated by a suitable source of power, preferably by pressure derived from the operation of the engine, will draw the liquid fuel from a supply tank, and force the same in determinate regulable quantities to the carbureter.

A further object resides in so constructing the pump that the feeding action is at all times visible so that one may know that the apparatus is functioning properly.

One embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a vertical sectional view of the pump, the parts being in that position where a charge of fuel is being forced to the carbureter and a new charge or supply drawn in; and

Fig. 2 is a similar view showing the parts as moving downward, or in a direction the reverse of that in Fig. 1.

In the drawings, 1 denotes a cylindrical-like body member having an outwardly extending flange 2 formed adjacent its lower end. The upper end of said member 1 is externally threaded and a second flange 3 is screwed thereon. A glass cylinder 4 is clamped between said flanges by stud bolts 5, suitable packing as 6 being interposed between the parts to effect a tight joint and to prevent breakage of the glass. As will be seen, the glass cylinder is spaced away from the member 1, thereby forming a sight feed chamber 7 between said elements. A hub 8 formed on the flange 2 is internally threaded and a cap 9 is screwed therein, said cap being provided with a nipple 10 to which is connected a pipe 11 leading from the source of fuel supply, as a tank, not shown.

A check valve 12 is mounted in the cap 9 in line with the bore in nipple 10, the valve seating downwardly and being limited in its upward movement by an overlying guard

13. A pipe 14 leading to the carbureter is threaded into the hub 8 and is in communication with chamber 7 through a bore 15. Said chamber 7 is, through ports 16, in direct communication with the upper end of the cylinder above the piston of the lower pump cylinder or chamber designated by 17, said cylinder being formed in the lower portion of the member 1 and defined, as to length, by the cap or plug 9 and a cross partition 18 shown formed as an integral portion of said member 1.

A piston 19 having ports 20 extending therethrough is mounted in the lower cylinder, and a piston rod 21 is connected to the piston. Said rod extends through the head or cross partition 18, a suitable packing gland as 22 being employed to effect a tight joint about the rod. A valve 23 is seated upon the upper face of piston 19 and is normally held thereagainst to close ports 20 by a spring 24 which bears, at one end, against the valve and at its opposite end against the nut 25 which holds the gland 22 in place. The upper end of the rod 21 terminates within the upper portion of member 1, and attached thereto is a second piston 26, a spring 27 being interposed between said piston and the head or partition 18. This spring 27 is somewhat stronger than spring 24, and tends to move the rod 21 and the two attached pistons 19 and 26 upwardly.

A pressure chamber 28 is formed above the piston 26 by a hollow cap piece 29 which is screwed onto the upper end of member 1. A port 30 extends from said chamber and is in communication with the engine or motor through a pipe 31, so that a portion of the exploding or expanding gases may pass therefrom and into the chamber above the piston 26. Such chamber and piston may be termed a motor. A tapered rod or stem 32 is connected to the upper end of the piston rod, and extends outwardly through a vent port or opening 33 formed in the upper face of the cap 29. A spring 34 encircles the upper exposed end of the stem, and a nut 35 is threaded for adjustment on the stem. By adjustment of said nut the spring may be placed under a greater or less degree of compression. This spring 34 co-acts with spring 27 to move the piston 19 and the piston 26 upwardly against the action of spring 24 which they overbalance.

Stem 32 is provided with a longitudinal bore 36 which opens at its lower end into a

similar bore 37, which terminates in a cross bore 38. A vent passage is thus provided to the atmosphere for the space between the partition or head 18 and the under face of the piston 26, so that the piston and the cylindrical member 1 below the piston cannot act as a dash pot.

In operation, upon pressure being exerted in the motor chamber 28, the piston 26 will be forced downwardly causing the piston 19 to descend. Assuming that fuel is in the lower portion of pump cylinder 17, valve 23 will be lifted and ports 20 opened, permitting the fuel to pass therethrough and into the cylinder above the piston. At the same time owing to the inward movement of stem 32, the chamber 28 will be vented as the piston 26 moves downwardly, the venting area increasing as the ports approach their limit of downward movement. During such downward movement springs 27 and 34 are placed under compression, and immediately the pressure in chamber 28 falls below that exerted by said springs the springs 27 and 34 will move the rod 21 and its connected parts upward, valve 23 closing. As a result the fuel above the piston 19 will be carried upwardly and discharged through ports 16 into the sight feed chamber 7, whence it passes through pipe 14 to the charge-forming device or other point of consumption.

By adjusting the nut 35 and consequently the initial degree of compression of spring 34, the amount of fuel fed at each stroke and the degree of pressure at which it is ejected may be determined and regulated. If the power stroke alone of the engine is utilized to produce the necessary pressure in chamber 28, a check valve as 39 may be placed in the line or pipe 31, said valve closing on the suction stroke of the engine.

Having thus described my invention what I claim is:—

1. In an apparatus for supplying liquid fuel to an engine, the combination of a pump including a piston, said pump having an inlet port connected to a source of fuel supply and an exhaust port leading to the fuel line of the engine; a pressure cylinder; a trunk type piston mounted therein and connected to the pump piston; a spring serving to move the trunk piston in one direction; means connecting one end of the pressure cylinder to the explosion pressure space of the engine being supplied with fuel whereby pressure will be applied to the trunk piston acting in opposition to the spring; and an automatically controlled vent in the pressure cylinder.

2. In an apparatus for supplying liquid fuel to an engine, the combination of a pump for the fuel; a motor for actuating the pump, comprising a pressure chamber and a piston, the latter being connected to

the pump; means connecting the chamber above the pressure piston with the explosion pressure space of the engine; a spring assisted by the suction stroke of the engine acting on the piston in opposition to the pressure derived from the engine; and a relief port for the pressure chamber controlled by the movement of the piston.

3. In an apparatus for supplying liquid fuel to an engine, the combination of a pump for the fuel; a motor for actuating the pump, comprising a cylinder and a piston, the latter being connected to the pump; means for delivering fluid under pressure from the engine to the cylinder above the piston; a tapering stem movable with the piston and passing outwardly through a relief port formed in the motor cylinder; and a spring acting to move the piston in opposition to the pressure derived from the engine.

4. In an apparatus for supplying liquid fuel to an engine, the combination of a pump having an inlet port connected to the source of fuel supply and an exhaust port leading to the fuel line of the engine; a motor cylinder; a piston mounted therein and connected to the pump piston; a spring serving to move the motor piston in one direction; means connecting one end of the motor cylinder to the fluid pressure space of the engine being supplied with fuel; a tapering stem movable with said motor piston and passing outwardly through a relief port formed in the motor cylinder; a spring acting to move the piston in opposition to the pressure derived from the engine; and means for adjusting the initial compression of said spring.

5. In an apparatus for supplying liquid fuel to an engine, the combination of a pump for the fuel; a motor connected to the pump and actuated in one direction by pressure impulse derived from the engine; a spring which stores energy by said power impulse to operate the piston in the opposite direction; and a sight feed chamber surrounding the pump and into which it discharges, said chamber being connected to the fuel line of the engine carbureter.

6. In an apparatus for supplying liquid fuel to an engine, the combination of a pump; a motor connected to the pump for operating the same, said motor being actuated in one direction by a pressure impulse and in the opposite direction by the suction derived from the engine; vented means for regulating the actuation of said motor; and a sight feed chamber surrounding the pump and into which it discharges, and connected to the fuel line leading to the engine carbureter.

7. In an apparatus for supplying liquid fuel to an engine, the combination of a pump having an inlet port connected to the

source of fuel supply; a glass shell or cylinder surrounding the pump and spaced away therefrom, and forming a sight feed chamber, said chamber being in communication with the pump through its discharge ports and likewise in communication with the fuel line leading to the engine through a discharge port; a motor connected to the pump piston adapted to be operated in one direction by a pressure impulse derived from the engine; a tapered stem extending upwardly from the piston of said motor, said stem extending outwardly through a port or opening formed in the wall of the motor; a spring encircling said stem; and a nut threaded upon the outer end of the stem and contracting the spring.

8. In an apparatus for supplying liquid fuel to an engine, the combination of a pump having an inlet port connected to the source of fuel supply; a glass shell or cylinder surrounding the pump and spaced away therefrom, and forming a sight feed chamber, said chamber being in communication with the pump through its discharge ports and likewise in communication with the fuel line leading to the engine through a discharge port; a motor connected to the pump piston adapted to be operated in one direction by a pressure impulse derived from the engine; a tapered stem extending upwardly from the piston of said motor, said stem extending outwardly through a port or opening formed in the wall of the motor, and having a port or passage extending therethrough and communicating with the space beneath the piston to vent the chamber below the piston; a spring encircling said stem; and a nut threaded upon the outer end of the stem and contracting the spring.

9. In an apparatus for supplying liquid fuel to an engine, the combination of a cylindrical-like member provided with a cross partition; a cap closing the lower end of said member; a pump piston mounted within the lower portion of the cylindrical member between said partition and cap, said piston being provided with through ports; a valve resting upon the piston; a spring serving normally to hold the valve to its seat to close the ports; a piston rod extending upwardly from the piston through the partition; a second piston secured to the upper end of the rod and working within the upper portion of the cylindrical member; a cap closing the upper end of said cylindrical member and forming a chamber above the last-named piston, said chamber being in communication with the fluid pressure space of the engine being supplied with fuel; a hollow tapered stem extending upwardly from said last-named piston, said stem extending outwardly through a port formed in the cap; a spring surrounding the outer end of the stem; a nut threaded upon the stem and bearing upon the spring; a spring located between the partition and an under face of the last-named piston, and serving to move said piston upwardly; and a glass cylinder surrounding the cylindrical member and spaced away therefrom, and thereby forming a sight feed opening which is in communication with the pump cylinder through ports formed in the wall thereof, said sight feed chamber likewise being in communication with a discharge port leading to the fuel line of the engine.

In testimony whereof I have signed my name to this specification.

DAVID J. CARTWRIGHT.