May 1, 1928. 1,668,209

C. H. JORGENSEN ET AL

PRIMER

Filed March 21, 1923

Fig. 1.

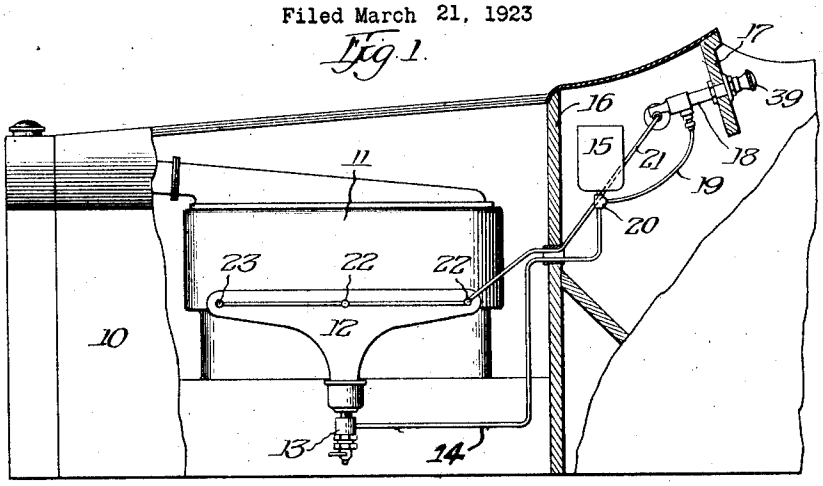


Fig. 2.

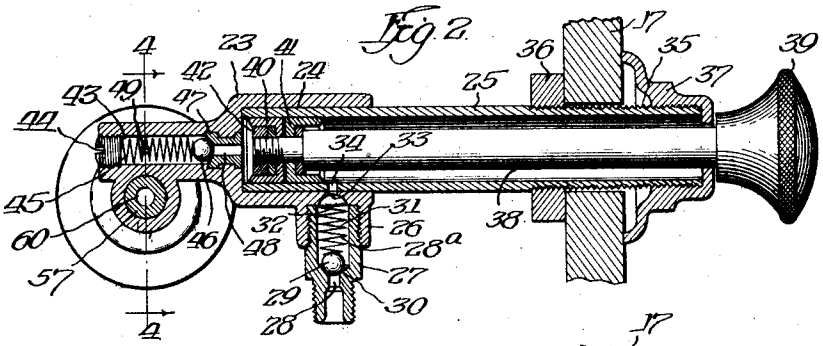


Fig. 3.

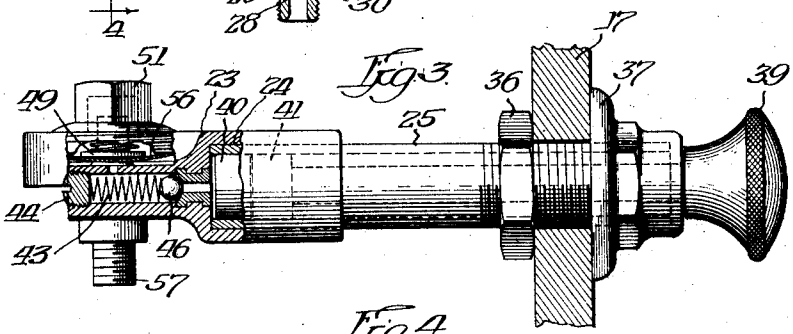
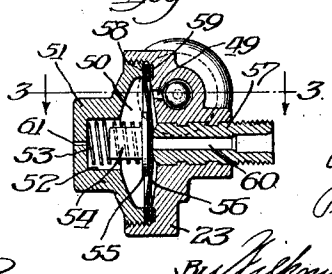


Fig. 4.



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UNITED STATES PATENT OFFICE.

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PRIMER.

Application filed March 21, 1923. Serial No. 626,508.

Our invention relates to primers and has particular reference to a manually operated priming device for use in internal combustion engines into which gasoline or other liquid fuel is injected in spray formation into the manifold intake of an internal combustion engine so that the starting thereof is accomplished easily and quickly.

A further object of our invention is the provision of a primer having its parts so arranged that there is no possibility of gasoline or air being drawn into the cylinders by the suction created by the pistons in the cylinders, which has been a common objection to devices of this character heretofore employed. It has heretofore been impossible to secure tight fitting parts so that the fuel oil is drawn directly into the engine cylinders and leaks downwardly past the piston rings into the lubricating oil, destroying its value for lubricating purposes and resulting in unnecessary wear of the piston rings, the scoring of the cylinders and the like, with the consequent loss of power.

It has heretofore been impossible to prevent, because of improperly fitted parts, or because of the lack of proper operation on the part of the operator, the fuel oil being drawn directly into the engine cylinders and leaking downwardly past the piston rings into the lubricating oil, destroying its value for lubricating purposes and resulting in unnecesary wear of the pistons and piston rings, and the like. Another serious result of an uncontrollable by-passing of gasoline through a priming device is an unnecessary wastage of fuel, as the leakage is not uniform because of the vast differences in the manifold vacuums with open and closed throttles, therefore making it impossible to maintain an efficient as well as a perfect carburetor adjustment at all engine speeds.

These and other objects of our invention will be more fully and better understood by reference to the accompanying sheet of drawings, and in which—

Figure 1 is an elevational view of an automobile engine and the forward end of the automobile chassis showing our improved invention in position;

Figure 2 is a vertical sectional view through the body of the priming device;

Figure 3 is a side elevational view with a partial sectional view on lines 3—3 of Figure 4; and

Figure 4 is a sectional view on lines 4—4 of Figure 2.

Referring now specifically to the drawings, and in which like reference characters refer to like parts throughout, an automobile body 10 is shown having an engine 11 mounted therein having the usual intake 12 secured thereto, a carburetor 13 at the lower portion thereof, the carburetor 13 having a feed pipe 14 leading thereto from a vacuum tank 15 secured to a dividing wall 16, the said vacuum tank 15 receiving its supply of fuel from the supply tank at the rear of the automobile in the usual manner. An instrument board 17 is provided upon which the primer 18 is positioned, having an intake pipe 19 secured thereto and leading to a T 20 at the lower end of the tank 15 and through which fuel is supplied to the primer 18. A discharge pipe 21 secured to the primer 18 is provided which leads to connections 22 on the intake 12 and through which fuel is forced into the intake and thence into the cylinders for priming purposes.

The primer consists of a body member 23 preferably formed by a die casting of brass or other suitable material, and having a cylindrical chamber 24 in one side thereof with a barrel 25 positioned therein open to the atmosphere at its outer end, the member 23 having an internally threaded projection 26 at its lower side within which a screw threaded nipple 27 is positioned and which is connected to the supply pipe 19, the nipple having a conduit 28 extending therethrough with an enlarged chamber 28^a in the upper portion thereof, with a ball 29 positioned upon a seat 30 in said nipple and held in position by a spring 31 in the chamber 28^a and supported at its upper end by a perforate member 32 so that the ball 29 forms a valve which prevents a return of fuel through the supply pipe 19 from the cylinder 25 by the operation of the device. A port 33 is provided at the bottom of the chamber 28^a which is in register with a second port 34 formed in the barrel 25 of the device, through which the priming fluid enters the barrel 25. The outer end 35 of the barrel 25 is threaded and has a check nut 36 positioned thereon with a threaded member 37 on the outer end thereof which abuts against the instrument board 17 and serves to hold the priming device 18 in position on the instrument board. A stem 38 is posi-

tioned in the barrel 25 having a knob 39 thereon and having a piston head on its inner end composed of a pair of oppositely disposed members 40 and 41 held in position by a nut 42 screw threaded on the inner end of the stem 38. A longitudinally extending chamber 43 is provided in said member 23 which is internally threaded at its outer end and closed by a screw 44 positioned therein with a spring 45 pressing against a ball 46 in engagement with a member 47 having a conduit 48 therethrough, the conduit 48 and chamber 43 being in alignment with the member 25 and forming an exit passage for said priming fluid as it is forced by the piston out of the barrel 25. A port 49 connects the chamber 43 and the lower portion of a second chamber 50 in said body member 23, a threaded cap 51 being secured to the body member 23 and having a chamber 52 formed therein with a spring 53 seated in said chamber 52 and extending around a stud member 54 having a flattened base 55 which is in engagement with the upper side of a spring diaphragm 56 extending across the chamber 50 and dividing the chamber into upper and lower portions and which is held in normal seated engagement against the inner end of a bushing 57 inserted in the body member 23 and which is screw threaded at its outer end, to which the discharge pipe 21 is secured. The diaphragm 56 has a washer 58 extending circumferentially around its marginal edges at its upper side with a second washer 59 on the under side thereof, the said diaphragm 56 forming a closure member for an exit port 60 extending longitudinally of the member 57 so that the possibility of the engine drawing gasoline or air into the cylinders is prevented first by the position of the head 41 being normally positioned between the intake opening 34 and the discharge chamber 43, and secondly by the position of the diaphragm over the conduit 60, the said diaphragm being slightly curved so as to obtain proper flexure of the diaphragm. A port 61 is provided in the upper portion of the member 51 which leads to the atmosphere and it will be noted that the suction of the engine serves to draw the diaphragm into tight engagement with the end of the member 57 which projects outwardly a slight distance from the floor of the chamber 50, so that the greater the suction in the engine the greater is the effective force with which the diaphragm is held in position and preventing any possibility of leakage of either fuel or air into the manifold.

In the operation of the device, when it is desired to start the engine, particularly in cold weather, the operator grasps the handle 39 and pulls the stem 38 out, which causes a supply of fuel to flow through the intake conduit 34 into the barrel 25 of the primer. Thereupon the piston is pushed forward by the operator, the ball 29 is forced against the seat 30, the priming fluid being forced outward through the member 47 into the chamber 43 and through the port 49 underneath the diaphragm 56, the priming fluid spreading out underneath the diaphragm 56 has the effect of hydraulic action thereon and forces the diaphragm 56 away from the member 57 against the suction of the engine and the spring 53, and forces the priming fluid outward through the pipe 21 and into the manifold of the engine. It will thus be understood that the forcing of the liquid into the lower portion of the chamber 50 underneath the diaphragm 56 unseats the diaphragm and allows the fluid to pass through the primer into the engine and thereafter the diaphragm is seated by the action of the spring 53 and also by the suction of the engine, so that there is no possibility of fuel or air entering the engine. This is in addition to the positioning of the piston head between the intake port and the discharge port in the cylindrical member 25 which also acts to prevent the withdrawal of gasoline from the vacuum tank 15 into the engine, and because of the outer end of the member 25 being open to the atmosphere as shown in Fig. 2. If there should be a leakage through the piston and valves, air will be drawn into the engine intake instead of creating a vacuum in the tube 25 which might cause gasoline to fill the said tube and prevent proper functioning of the engine.

While we have described more or less precisely the details of construction, we do not wish to be understood as limiting ourselves thereto, as we contemplate changes in form and the proportion of parts and the substitution of equivalents, as circumstances may suggest or render expedient without departing from the spirit or scope of our invention.

We claim:

1. A primer comprising in combination a body member having an intake port and a discharge opening, a valve controlling said intake port and a movably mounted piston in said body member, the head of the piston being positioned between the intake port and the discharge opening in the normal closed position of the primer and the body member being free to admit air at its end opposite the discharge opening.

2. A primer comprising in combination a body member having an intake port and a discharge opening, a valve controlling said intake port, a movably mounted piston normally positioned between said ports and a diaphragm in said body member controlling said discharge opening, the said diaphragm being adapted to be seated tightly by the suction of the motor.

3. A primer comprising a body member, a cylindrical member secured thereto, a piston in said cylindrical member, said body member having an intake port and a discharge opening, the said piston being positioned between said openings in normal closed operation of the device, a spring pressed diaphragm adapted to normally close said discharge opening and held in such position by the suction of the motor.

4. A primer comprising in combination a body member having a passage therethrough, and a chamber therein, a cylindrical member secured thereto and a movably mounted piston in said cylindrical member, the said body member having an intake port and a discharge conduit leading from said chamber, plus a spring pressed diaphagm in the chamber of the said body member adapted to control the passage of a fluid through said body member.

5. A primer comprising in combination a body member having a passage therethrough and an enlarged chamber therein, a discharge pipe leading from said chamber, a diaphragm in normal engagement with the end of said discharge pipe, a cylinder member, a piston in said cylinder, the said cylindrical member having an intake port and a discharge port terminating in said chamber, the intake port being located in the side of the cylinder and free of the said piston when the said piston is in normal closed position.

6. A primer comprising in combination a body member having a passage therethrough and an enlarged chamber therein, a discharge pipe leading from said chamber, a diaphragm in normal engagement with the end of said discharge pipe, a cylinder member, a piston in said cylinder, the said cylindrical member having an intake port and a discharge port terminating in said chamber, the said piston being positioned between said intake ports and discharge ports in normal closed position, and clear of said intake port whereby the said intake port is in free communication with the said cylinder when the piston is in normal closed position, the said cylinder being open at one of its ends, whereby air may enter said cylinder.

7. A primer for internal combustion engines comprising in combination, a body member having an inlet port and a discharge port, a diaphragm normally closing said discharge port and adapted to be forced away from said discharge port by fluid forced into the body member, a cylindrical member secured to said body member having an inlet port and an outlet port, and a movably mounted piston in said cylindrical member.

8. A primer comprising in combination a body member having a chamber therein, a discharge pipe leading from said chamber, a diaphragm in normal engagement with the end of said discharge pipe, a cylindrical member, a piston in said cylindrical member, the said cylindrical member having an intake port and a valve controlling said intake port, the said body member having a passage therethrough leading from said cylindrical member into said chamber at one side thereof whereby the pressure of liquid entering said chamber raises the said diaphragm and is forced out through said discharge opening.

9. A primer comprising in combination a cylinder, an intake pipe secured to said cylinder intermediate its ends, a discharge pipe leading therefrom, and a movably mounted piston in said cylinder, the head on said piston being solid and positioned between the intake pipe and discharge pipe in normal closed position of said piston, and free from said inlet port.

10. A primer comprising in combination a cylinder open to atmospheric pressure at its rear end, an intake pipe secured to said cylinder intermediate its ends, a discharge pipe leading therefrom, and a movably mounted piston in said cylinder, the head on said piston being between the intake pipe and discharge pipe in normal closed position of said piston, and free from said intake pipe.

11. A primer comprising in combination a body member, a valve in said body member, connecting means leading to the intake of an internal combustion engine, the said valve being opened by the pressure built up in the said body member and closed by the suction created by the engine.

Signed at Chicago, Illinois, this 12th day of March, 1923.

PETER J. JORGENSEN.
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