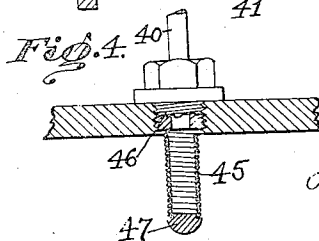
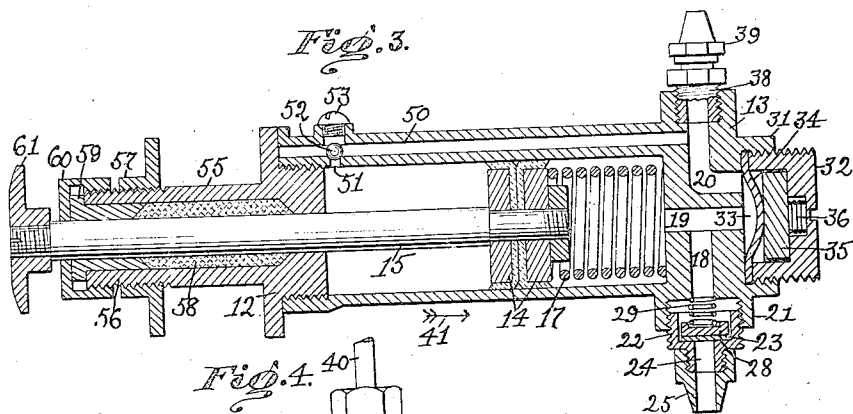
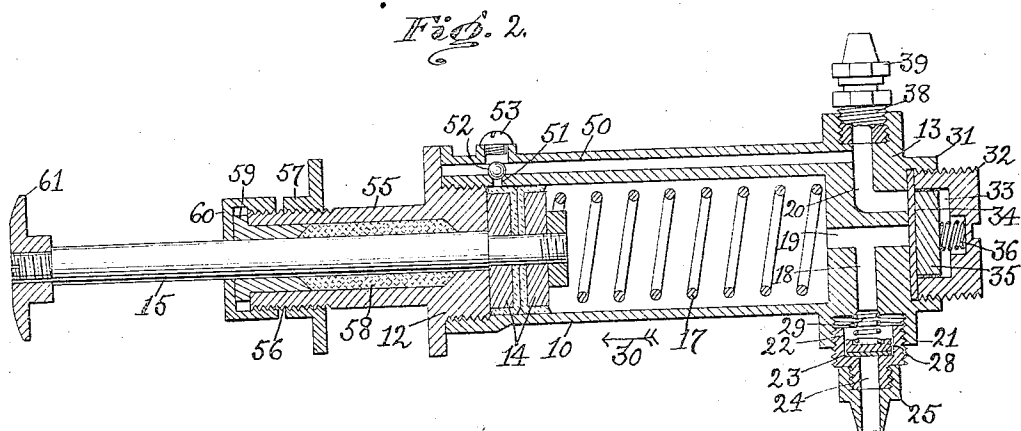
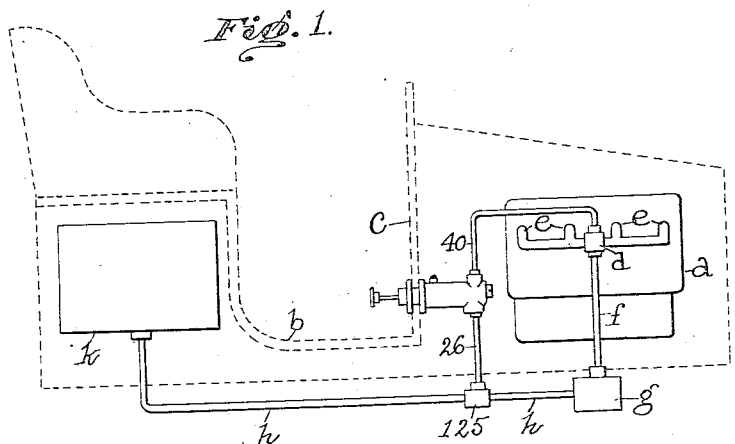


F. O. KILGORE.  
 PRIMING APPARATUS.  
 APPLICATION FILED JAN. 26, 1915.

Patented Feb. 20, 1917.

1,216,460.



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# UNITED STATES PATENT OFFICE.

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## PRIMING APPARATUS.

1,216,460.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, FREDERICK O. KILGORE, a citizen of the United States, residing in Somerville, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Priming Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to an apparatus for priming internal combustion motors, and has for its object to provide a simple, efficient and inexpensive apparatus, which is especially applicable to automobiles, motor cycles, motor boats and the like.

In the present instance, the invention is shown as embodied in an apparatus which is capable of being operated by the foot of the operator of an automobile from the seat of the car, and for this purpose provision is made for attaching the apparatus to the dasher of the car.

The apparatus consists essentially of a pump provided with a cylinder having valves in its head, which control connection of the cylinder with the gasolene supply and with the manifold of the motor. Provision is made for rendering the motor ineffective upon the primer as will be described. Provision is also made for enabling the pump to automatically clear itself of any liquid gasolene which may leak by the piston of the pump, as will be described. Provision is also made for discharging the liquid gasolene into the manifold in the form of a finely divided spray. Provision is also made for having the cylinder loaded with liquid gasolene when not in use. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 represents in elevation a priming apparatus embodying this invention.

Fig. 2, a longitudinal section of the apparatus shown in Fig. 1, showing the pump in non-active condition.

Fig. 3, a like section with the pump piston at the end of its discharging stroke, and

Fig. 4, a detail of the spray device to be referred to.

Referring to the drawing *a* represents the internal combustion motor of an automobile *b*, which may be of usual construction and provided with the dasher *c*.

The motor *a* is represented as provided with a manifold *d* having four intake pipes *e* leading to the four cylinders of the motor *a*. The manifold *d* is connected in the usual manner by the pipe *f* with the carbureter *g*, which is connected by the supply pipe *h* with the tank *k*.

In accordance with this invention, the automobile is provided with apparatus for priming the motor *a*. The priming apparatus herein shown consists of a pump, comprising a cylinder 10 provided with heads 12, 13, and containing a piston 14 provided with a rod 15, which is extended through the head 12.

The cylinder 10 also contains a spring 17, which is located between the piston and the head 13 and serves to move the piston on its suction stroke. In the present instance, the head 13 is shown as integral with the cylinder 10 and is of sufficient thickness to be provided with a plurality of passages for gasolene, and as herein shown, the head 13 is provided with three passages 18, 19, 20, all of which are designed to communicate with the cylinder 10 as will be described.

The cylinder head 13 is provided with a hollow boss 21, which is screw threaded on its interior to receive a hollow casing 22 containing a valve 23, which is designed to close the passage 24 in the casing 22, which latter has secured to it a coupling member 25, which is designed to be connected with a branch pipe 26, leading from a T coupling 125 inserted in the supply pipe *h*.

The valve 23 is shown in the present instance as a disk valve, and is normally seated by a weight 28 in the form of a disk, which is backed up by a light spring 29. The valve 23 constitutes the inlet valve for the pump cylinder 10, and is opened on the suction stroke of the piston 14 in the direction indicated by the arrow 30, Fig. 2.

The cylinder head 13 is provided with a hollow boss 31 in axial alinement with the cylinder 10, and into which is extended a

threaded plug 32, which coöperates with the cylinder head 13 to form a valve chamber 33, in which is located a valve 34, preferably a diaphragm of leather or other flexible material, which is clamped at its circumference between the cylinder head 13 and the plug 32. The diaphragm valve 34 coöperates with the passages 19, 20, and normally disconnects the same as represented in Fig. 2. The diaphragm valve 34 is backed up by a weight or disk 35, and a spring 36, which are located in the chamber 33.

The passage 20 constitutes the outlet passage for the pump, and is provided with a nipple 38 and coupling member 39 for connection with a pipe 40, which leads to and is connected with the manifold *d*.

The piston 14 has its rod 15 extended through the head 12 of the cylinder 10, and normally the piston 14 is in the position represented in Fig. 2, into which it is moved by the spring 17. When the apparatus is not being operated, the parts thereof are in the position shown in Fig. 2, with the inlet and outlet valves 23, 34, in their closed position. When it is desired to prime the motor, the operator pushes the piston 14 in the direction of the arrow 41, Fig. 3, and forces the gasolene or other motive fluid through the passage 19 against the valve 34, which is pushed back into substantially the position shown in Fig. 3, thereby connecting the passage 19 with the passage 20 through the chamber 33, and on further movement of the piston, the gasolene is forced through the pipe 40 into the manifold *d*.

The piston 14 may be moved on its discharging stroke in the direction of the arrow 41 by hand or by the foot of the operator. As soon as the external pressure upon the piston rod 15 is removed, the piston 14 is automatically returned to its starting position shown in Fig. 2, by the spring 17, and on this stroke the piston sucks gasolene from the pipe 26 into the cylinder 10, the valve 23 being automatically lifted from its seat by the suction of the piston, which draws the gasolene through the passages 24, 18, into the cylinder 10. On the suction stroke of the piston 14, the outlet valve 34 is drawn to its seat and closes the passages 19, 20, thereby cutting off the outlet passage 20 from the pump cylinder 10.

The valve 34 is also closed by the spring 36. The charge of gasolene thus drawn into the pump cylinder 10 remains therein ready for priming purposes, and when it is desired to prime the motor, it is only necessary to apply pressure to the piston rod 15 and move the piston on its discharge stroke. It is preferred to provide the end of the pipe 40, which is extended into the manifold *d*, with means for converting the liquid into a fine spray, and in the present instance I have shown one construction of

spraying device which is preferred. The spraying device referred to is shown in Fig. 4, and consists of a closely coiled spring 45, which is secured at one end to a nipple 46, which is in threaded engagement with the manifold *d*, and said spring is closed at its free end by solder 47 or otherwise, so that the liquid gasolene is caused to pass between the convolutions of the coiled spring to get into the manifold, which insures the gasolene being supplied to the cylinders in the form of a finely divided spray.

Provision may also be made for taking care of any gasolene which may leak by the piston, and for this purpose the pump cylinder 10 is provided with a longitudinally extended passage or bore 50, which communicates at one end with the passage 20 and is closed at its other end by the cylinder head 12. The bore or passage 50 near the cylinder head 12 is adapted to communicate with the pump cylinder 10 through a port 51, which is normally closed by a valve 52, herein shown as a ball, which is capable of being lifted from its seat by air or gasolene in the pump cylinder, when the piston 14 is moved on its suction stroke. The valve 52 is retained in its operative relation to the port 51 by a screw 53, which engages a threaded opening in the cylinder wall. On the suction stroke of the piston 14, any air or liquid in the cylinder between the piston and the cylinder head 12 will be forced out of the cylinder, through the port 51 and passage 50 into the outlet passage 20. As a result, the pump is prevented from becoming bound by air or liquid, and the spring 17 is enabled to move the piston rapidly on its suction stroke, which enables the pump to be operated rapidly.

The pump is designed to be attached to the dasher *c* of the automobile, and for this purpose, the cylinder head 12 is provided with a hollow boss 55, which is of sufficient length to extend through the dasher and is provided with screw threads 56 to be engaged by a nut 57, which coöperates with the cylinder head 12 to firmly clamp the pump to the dasher, after the manner represented in Fig. 1. The hollow boss 55 may contain suitable packing material 58, which is retained in place by a sleeve 59 and nut 60, and forms a liquid tight joint with the piston rod. In the present instance the piston rod is provided with a button 61 for the operator to press his foot against when it is desired to prime the motor.

After the primer has been operated, the parts assume the position shown in Fig. 2, and when the motor is running, it will be seen that, with the primer in its non-active condition represented in Fig. 2, the motor is cut off from the cylinder 10 by the outlet valve 34, which is not opened by the suction of the motor, but is closed thereby, and fur-

ther that the suction of the motor can not open the inlet valve 23, as the valve 34 cuts off the inlet passage 18 from the outlet passage 20, consequently liability of the motor drawing gasolene from the cylinder of the primer or from the supply tank through the branch pipes 26, 40 is avoided.

Claims:

1. In an apparatus of the character described, in combination, a pump cylinder provided at one end with a head and with a valve chamber on the opposite side of said head, the latter having a passage leading from the rear face of said head to the outside of said cylinder, means for connecting said chamber with said cylinder, a piston reciprocating in said cylinder, a valve cooperating with the rear face of said head to close and open said passage and movable toward said head on the suction stroke of said piston, and means for positively moving said valve into its closed position on said suction stroke.

2. In an apparatus of the character described, in combination, a pump cylinder provided at its opposite ends with heads, one of which is provided with a liquid inlet and with a liquid outlet for said cylinder, valves for controlling said liquid inlet and outlet, a passage extended longitudinally of said cylinder and connecting said liquid outlet with the cylinder near its opposite end, a piston in said cylinder, and a spring to move said piston in its cylinder.

3. In an apparatus of the character described, in combination, a pump cylinder having heads, one of which is provided with valve containing chambers connected with one end of the said cylinder, valves in said chambers, means for connecting one of said chambers with a supply for liquid gasolene, means for connecting the other of said chambers with a motor to be primed, a passage connecting the valve chamber leading to the motor with the cylinder near the opposite end of the latter, a valve in said passage, a piston in said cylinder having its piston rod extended through the other head of the cylinder, and a spring to move the piston away from the head provided with the valve containing chambers.

4. In an apparatus of the character described, in combination, a pump cylinder provided with a head, a valve chamber attached to said head, a fluid passage extended through said head to connect the said valve chamber with said cylinder, a fluid outlet passage in said head leading from said valve chamber, a valve in said chamber controlling communication between said passages, a fluid inlet passage in said head leading to said cylinder, a valve in said passage, a piston in said cylinder, and a spring to move said piston on its suction stroke.

5. In an apparatus of the character de-

scribed, in combination, a pump cylinder provided with a head, a valve chamber attached to said head, a fluid passage extended through said head to connect the said valve chamber with said cylinder, a fluid outlet passage in said head leading from said valve chamber, a valve in said chamber controlling communication between said passages, a fluid inlet for said cylinder, a valve controlling said fluid inlet, and a piston in said cylinder.

6. In an apparatus of the character described, in combination, a pump cylinder provided at one end with a head having a threaded boss extended from it, a threaded hollow plug engaging said boss to form with said head a valve chamber, a passage extended through said head to connect said valve chamber with said cylinder, an outlet passage in said head leading from said valve chamber, an outlet valve controlling said passages, a fluid inlet passage in said head communicating with said cylinder, a valve controlling said fluid inlet, a piston in said cylinder, and a spring to move said piston away from said head to close said outlet valve and open said inlet valve.

7. In an apparatus of the character described, in combination, a pump cylinder provided at one end with a fluid inlet, and a fluid outlet and with a passage for connecting said fluid outlet with said cylinder, a valve controlling said fluid inlet, and a valve controlling the connection of said passage with said fluid outlet and responsive to suction within the said cylinder and within the fluid outlet to close the latter.

8. In an apparatus of the character described, in combination, a pump cylinder provided with a head having a passage extended through it from its front to its rear face and with a second passage extended from the rear face of said head to the side of the cylinder, a valve cooperating with the rear face of said head to close said passages, a piston in said cylinder, a spring to move said piston on its suction stroke to seat said valve against the rear face of said head and close said passages, a fluid inlet for said cylinder, and a valve controlling said fluid inlet.

9. In an apparatus of the character described, in combination, a pump cylinder provided with a head having a passage extended through it from its rear face and with a second passage extended from the rear face to the outside of the cylinder, a piston reciprocating in said cylinder, and a valve cooperating with the rear face of said head to close said passages on the suction stroke of said piston.

10. In an apparatus of the character described, in combination, a pump cylinder provided with a head and with a valve chamber on the opposite side of said head,

means for connecting the said chamber with  
said cylinder, a passage in said head con-  
necting said chamber with the outside of  
said cylinder, a piston in said cylinder, and  
5 a valve in said chamber cooperating with  
said passage to close the same on the suction  
stroke of said piston.

In testimony whereof, I have signed my  
name to this specification in the presence of  
two subscribing witnesses.

FRÉDERICK O. KILGORE.

Witnesses:

JAS H. CHURCHILL,  
J. MURPHY.