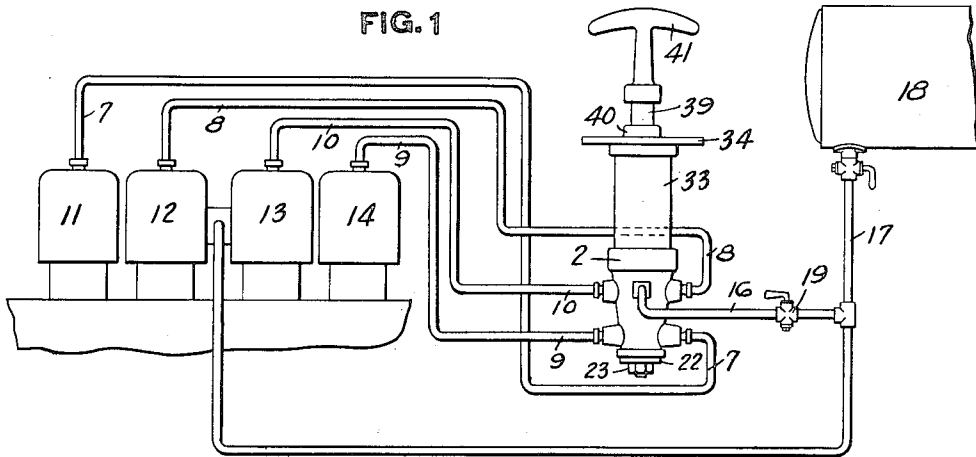
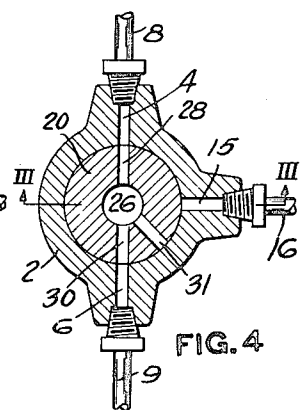
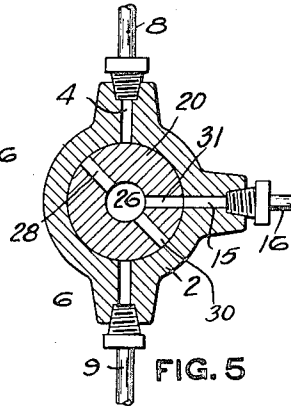
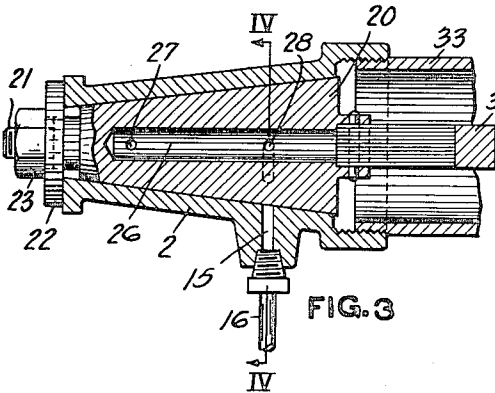
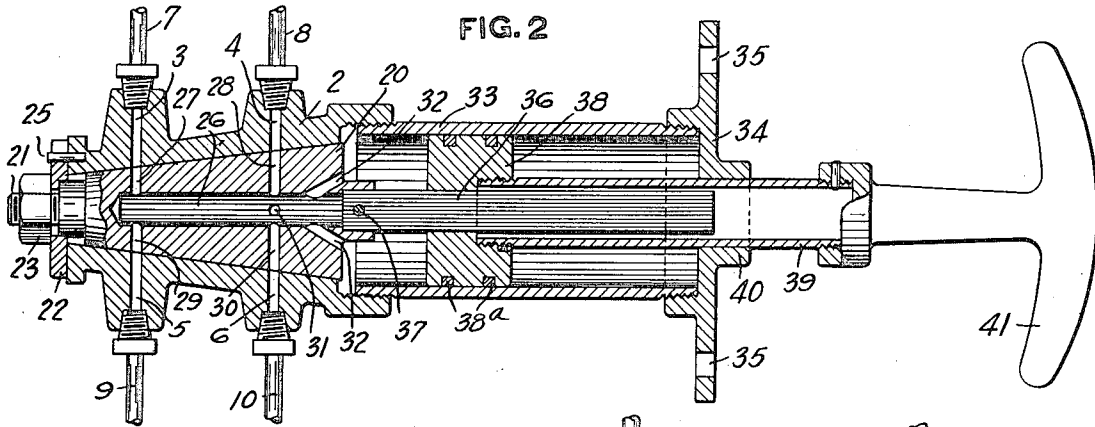


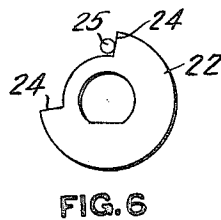
M. B. SCHMELTZ.
PRIMER FOR EXPLOSIVE ENGINES.
APPLICATION FILED MAY 13, 1916.

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Patented Jan. 23, 1917.



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MARCUS B. SCHMELTZ, OF PITTSBURGH, PENNSYLVANIA.

PRIMER FOR EXPLOSIVE-ENGINES.

1,213,693.

Specification of Letters Patent. Patented Jan. 23, 1917.

Application filed May 13, 1916. Serial No. 97,253.

To all whom it may concern:

Be it known that I, MARCUS B. SCHMELTZ, a citizen of the United States, and resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Primers for Explosive-Engines, of which the following is a specification.

My invention relates to the construction and arrangement of priming apparatus for supplying raw gas or explosive fluid to the cylinders of an explosive engine preparatory to starting the engine.

One object of the invention is to provide a primer of improved construction having novel means whereby gasoline or other explosive fluid is withdrawn in measured quantities from the storage vessel and is discharged into the cylinders of multi-cylinder explosive engines.

Another object of my invention is to provide a primer having novel means whereby the gasoline is simultaneously discharged into each of a plurality of engine cylinders.

Another object of this invention is to provide a primer having improved means whereby the primer is connected to and disconnected from the engine cylinders and is simultaneously disconnected from and connected to the gasoline or other liquid supply tank.

A further object of my invention is to provide an explosive engine primer of improved construction and having novel means whereby the inlet and outlet openings are opened or closed at any point in the stroke of the piston forming part of my improved primer.

A still further object of my invention is the provision of a primer for gasoline engines having the novel constructions and arrangements of parts shown in the drawings, covered by the appended claims, and hereinafter fully described in detail.

Referring now to the drawings forming part of this specification, Figure 1 is a side elevation showing one embodiment of my invention, as applied for use on a four-cylinder explosive or internal combustion engine. Fig. 2 is a longitudinal section, on a larger scale, showing in detail the construction of the primer forming this invention. Fig. 3 is a longitudinal section similar to Fig. 2, taken on the line III—III of Fig. 4, or at right angles to the section of Fig. 2. Fig. 4 is a sectional end elevation on the line

IV—IV of Fig. 3, showing the arrangement and relative location of valve ports when positioned to expel the gasoline or explosive fluid from the primer into the engine cylinders. Fig. 5 is a similar sectional end elevation showing the arrangement and relative location of the port openings of my improved primer when drawing a charge of explosive fluid into the primer. Fig. 6 is an elevation showing the washer and pin on one end of the primer of Figs. 2 to 5.

In the accompanying drawings, the numeral 2 designates a body or casing having a series of transverse holes or ports 3, 4, 5 and 6, forming outlets to which one end of the pipes or tubes 7, 8, 9 and 10 are connected, the other ends of these tubes leading one to each of the engine cylinders 11, 12, 13 and 14. The casing 2 also is provided with a hole or port 15 forming an inlet which is connected by the tube 16 to the pipe or feed line 17 leading from the gasoline tank 18 to the engine carbureter.

A valve 19 is provided to shut off the tube 16 from the tank 18 when desirable or necessary.

A tapering plug 20 is positioned to rotate within the correspondingly tapered opening in the casing 2, the screw-threaded end 21 of this plug extending through one end of the casing. A washer 22, secured on the end 21 to rotate with the plug, and a nut 23, are employed to maintain the plug in rotative position within the casing. The washer 22 is provided with a peripheral notch, the ends 24, 24, of the notch being adapted to engage with a pin 25 fastened in the end of the casing 2 to limit the rotative movement of the plug within the casing. The plug 20 has a longitudinal recess 26 therein which connects with one end of the series of transverse openings 27, 28, 29, 30 and 31 in the plug 20, these transverse openings being arranged to register with the outlet openings or ports 3, 4, 5 and 6, and inlet port 15, in the casing 2. The plug 20 is provided at its large end with one or more angularly extending holes 32 which open at one end into the longitudinally extending recess 26 in the plug.

One (the counterbored) end of the casing 2 is provided with internal threads into which one externally threaded end of the primer cylinder 33 is screwed. The other end of the cylinder, which is also threaded, is screwed into a flange 34, this flange or cap

having holes 35 therein for attaching the primer to a stationary object such as the floor or dash of an automobile.

Secured by one end to the large end of the plug 20 is a shaft 36 which is rectangular in cross section, a pin 37 being employed to fasten the shaft in place on the end of the plug 20.

Positioned within the cylinder 33 is a piston 38 having packing or piston rings 38^a on the periphery thereof which may be spring rings of the usual construction or may be formed of leather or other compressible material as is desired.

The piston 38 has an axial opening therein which is of the same rectangular cross section as the shaft 36 on the end of the plug 20. The shaft 36 projects through the opening in the piston 38 so as to extend upwardly within the hollow piston rod 39. The hollow piston rod 39 extends through the opening in the boss 40 on the flange 34 secured to one end of the cylinder 33 and the end of the piston rod on the exterior of the cylinder 33 is provided with a handle 41 by which it is reciprocated and is rotated to turn the plug 20 in the casing 2 in using my improved primer, this construction enabling the piston 38 to be reciprocated within the cylinder 33 without lengthwise movement of the shaft 36 and plug 20, and enabling the plug 20 to be rotated or turned through the medium of the piston 38, piston rod 39 and handle 41 on the outer end of the piston rod.

In the operation of my improved primer the outlet ports 3, 4, 5, 6, will be connected by the tubes 7, 8, 9 and 10 to the engine cylinders 11, 12, 13 and 14 and the inlet port 15 connected by the tube 16 to the feed line 17 leading from the gasoline tank 18 to the carbureter for the engine. When it is desired to prime the engine cylinders the primer handle 41 will be turned axially to locate the plug 20 in the position shown in Fig. 5. The piston 38 being positioned at the bottom or plug end of the cylinder 33 is then pulled outwardly and the suction of the piston draws a measured charge of raw explosive fluid unmixed with air into the cylinder 33. When the piston reaches the outer end of the primer cylinder 33 the handle 41 is then turned to rotate the plug 20 until the outlet ports 27, 28, 29 and 30 are in register with the transverse openings or ports 3, 4, 5, 6 in the casing 2 or into the position shown in Figs. 2 and 4. The piston 38 is then pushed forwardly in the cylinder 33 so as to expel the raw gas from the cylinder 33 through the openings 3, 4, 5, 6, into the tubes 7, 8, 9 and 10, and from these tubes into each of the engine cylinders 11, 12, 13 and 14, sufficient fluid being expelled from the primer cylinder to prime each of the engine cylinders. The handle 41 is then turned to move the plug 20 into the position shown in

Fig. 5 to close the outlet ports 3, 4, 5 and 6. The engine is then started in the usual known manner, this being readily accomplished by reason of the gas necessary to prime the engine cylinders having been introduced into the engine cylinders direct by the above described operations.

Should the engine fail to start after being primed as has been described, the above described operations are repeated to supply a fresh amount of explosive fluid into each engine cylinder, but ordinarily one charge of explosive fluid from the primer to the cylinders will be sufficient.

The above described operations are then repeated whenever it is found necessary to prime the engine.

The advantages of my invention will be appreciated by those skilled in the art. The apparatus is extremely simple, the number of moving parts is reduced to a minimum, and a primer is provided which is operative at all times and all positions of the pistons within the engine cylinders.

Modifications in the details of the construction shown may be made without departing from my invention as defined in the appended claims.

I claim:—

1. A primer for explosive engines comprising a casing having an inlet and outlets, a rotatable plug in said casing having a longitudinal recess therein with transverse holes connected to said recess and arranged to register with the inlet and outlets in the casing, a cylinder on one end of the casing connected to the recess in said plug, a reciprocating piston within the cylinder having a piston rod extending to the exterior of the cylinder, a handle on the one end of the piston rod, and means connecting the piston rod and plug and arranged to rotate the plug when the piston rod is turned axially and to reciprocate the piston without movement of said plug.

2. A primer for explosive engines comprising a casing having ports for connecting the casing with the engine cylinders and fuel tank, a rotatable plug in the casing having a longitudinal recess therein, said plug having transverse openings arranged to register with and connect said ports with the recess in said plug, a cylinder on one end of said casing into which said recess opens, a reciprocating piston in the cylinder, a piston rod on the piston having a handle on the exterior of the cylinder, and a sliding connection between the piston rod and plug whereby the piston is reciprocated without movement of the plug and whereby the plug is rotated when the piston rod is turned axially at all points in the reciprocating movement of the piston.

3. A primer for explosive engines comprising a casing having ports for connect-

ing the casing with the engine cylinders and fuel tank, a rotatable plug in the casing having a longitudinal recess therein, said plug having transverse openings arranged to register with and connect said ports with the recess in said plug, a cylinder on one end of said casing into which said recess opens, a reciprocating piston in said cylinder, a hollow piston rod on the piston having a handle extending to the exterior of the cylinder, and a stem fastened to said plug and projecting through the piston into the hollow piston rod, said piston and stem having contacting surfaces adapted to rotate the plug when the piston rod is turned axially and arranged to permit the piston being reciprocated without movement of the plug.

4. A primer for explosive engines comprising a casing having an inlet and outlets, a rotatable plug in said casing having a longitudinal recess therein with transverse holes connected to said recess and arranged to register with the inlet and outlets in the casing, a cylinder on one end of the casing connected to the recess in said plug, a reciprocating piston within the cylinder having a piston rod extending to the exterior of the cylinder, a handle on the one end of the piston rod, means connecting the piston rod and plug and arranged to rotate the plug

when the piston rod is turned axially and to reciprocate the piston without movement of said plug, and coacting means on said casing and plug whereby the extent of turning movement of the plug is limited.

5. A primer for explosive engines comprising a casing having ports for connecting the casing with the engine cylinders and fuel tank, a rotatable plug in the casing having a longitudinal recess therein, said plug having transverse openings arranged to register with and connect said ports with the recess in said plug, a cylinder on one end of said casing into which said recess opens, a reciprocating piston in said cylinder, a hollow piston rod on the piston having a handle extending to the exterior of the cylinder, a stem fastened to said plug and projecting through the piston into the hollow piston rod, said piston and stem having contacting surfaces adapted to rotate the plug when the piston rod is turned axially and arranged to permit the piston being reciprocated without movement of the plug, and coacting means on said casing and plug whereby the extent of turning movement of the plug is limited.

In testimony whereof I have hereunto set my hand.

MARCUS B. SCHMELTZ.