Nov. 15, 1955 G. E. FRANCK 2,723,624

PRIMER

Filed May 12, 1951

Fig. 1.

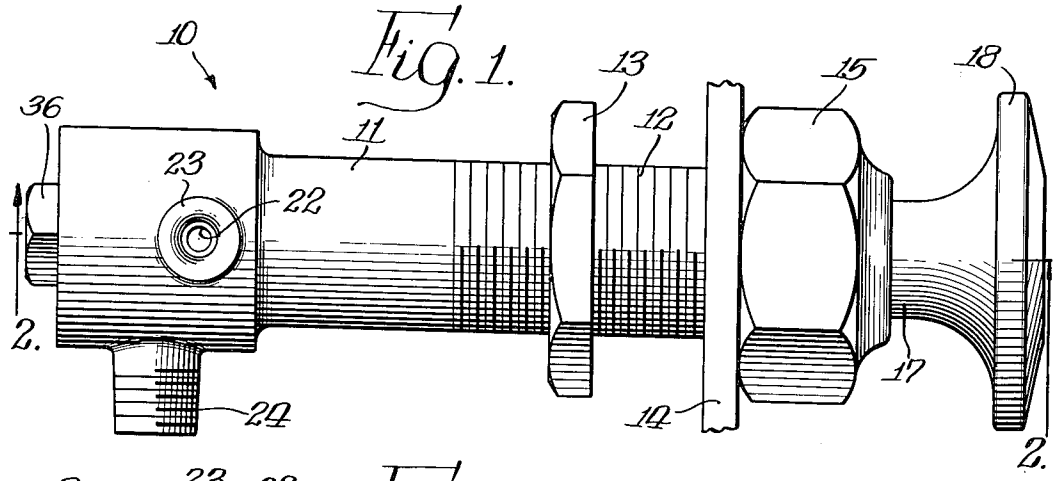


Fig. 2.

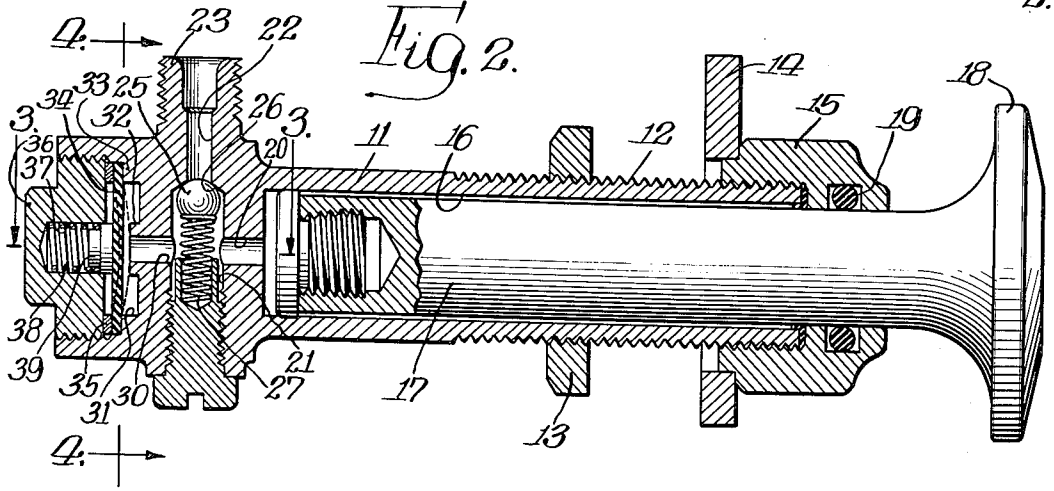


Fig. 3.

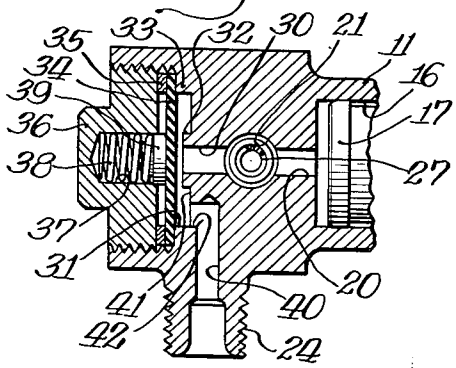
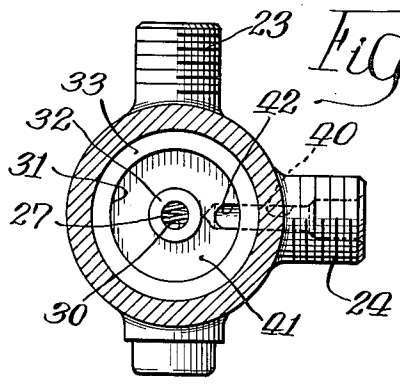


Fig. 4.



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PRIMER

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2 Claims. (Cl. 103—153)

This invention relates to priming means and more particularly to a primer adapted to supply priming fluid to a cylinder or the like.

It is the general object of this invention to produce a new and improved priming means.

It is a more specific object of this invention to produce a priming means of simplified construction which is readily assembled and disassembled and is economical to manufacture.

A further object of the invention is to produce a priming device in which the principal parts lie along a single axis so that the device may be readily assembled and disassembled.

Another object of the invention is to produce a primer having a single valving means and adapted to serve a dual purpose, thus there is provided a valving means which opens when priming fluid under pressure is applied thereto to permit the fluid to enter the device to be primed, the valving means being so constructed and arranged that it closes the passageway connected to the source of priming fluid when suction is applied to the valving means, as for example when the engine has been started and is running.

A further object of the invention is to produce a valving means for a priming device which includes a chamber having a first opening connected to the device to be primed and a second opening connected to the means for supplying priming fluid under pressure to the chamber and to provide in such a chamber a flexible seal adapted to be flexed into sealing engagement with the means connecting the chamber with the supply of priming fluid when the engine is running and hence suction is applied to the chamber and which is adapted to be flexed to a position uncovering the connection to the source of priming fluid when fluid under pressure is supplied to the chamber.

Yet another object of the invention is to produce a priming means of the type described in the preceding paragraph in which the connections between the chamber and the source of priming fluid on the one hand and the device to be primed on the other hand are located in parallel planes which are spaced from each other so that when suction is applied to the chamber the flexible seal therein is moved into sealing engagement with a passageway connected to the source of priming fluid.

Other and further objects of the invention will be readily apparent from the following description and drawings, in which:

Fig. 1 is a side elevational view of a primer embodying the invention;

Fig. 2 is a longitudinal section taken along line 2—2 of Fig. 1;

Fig. 3 is a sectional view of the left-hand portion of Fig. 2 and taken along line 3—3 of Fig. 2; and

Fig. 4 is a section taken along line 4—4 of Fig. 2.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings

and will herein be described in detail one specific embodiment, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

Referring now to the drawings the priming device 10 comprises an elongated casing 11 provided with threads 12 adjacent one end thereof engaged by a nut 13 adapted to be moved into engagement with a portion 14 of a dashboard or other means upon which the primer is to be mounted. A second nut 15 is threaded to the right-hand end (as seen in Figs. 1 and 2) of the casing which is adapted to bear against the other side of the dashboard 14.

The casing is provided with a cylindrical bore 16 extending therethrough in which there is reciprocably mounted a plunger 17 provided with a handle 18 at its outer end so that the same may be moved in the bore. The plunger is sealed to the nut 15 by the O-ring 19 as shown.

Extending axially from the left-hand end of the bore 16 is a first passageway 20 adapted to connect the bore with a supply chamber 21 formed in the enlarged portion of the casing. The supply chamber 21 is adapted to be connected to a source of priming fluid by means of a fluid conduit 22 which extends outwardly through an externally threaded boss 23 formed integral with the casing, the threads being provided so that suitable connections may be made to a supply of priming fluid. A ball check valve 25 is urged into sealing engagement with a valve seat 26 formed on the inner end of the conduit 22 by means of a spring 27 seated in the supply chamber 21.

A second fluid passageway 30 connects the supply chamber with a valving chamber 31 formed in the left-hand end of the casing. The valving chamber 31 is annular in shape and is provided along one end wall with a boss or annular valve seat 32 extending centrally thereinto and through which the second passageway 30 opens into the chamber. A stepped portion 33 is formed along the edges of the chamber 31 against which there is held a flexible disk-like seal 34 by means of a ring 35 and an end closure member 36 which forms the other end wall of the chamber and is threaded into the casing as shown. The end closure 36 is provided with a central opening 37 in which there is located a spring 38 adapted to have one end bear against a thrust washer 39 which contacts the flexible seal to urge the same against the end of the passageway 30.

Referring now to Fig. 3, the casing is provided with a passage 40 which is adapted to be connected to the device to be primed, for example the cylinder of an internal combustion engine. The passage 40 at its upper end connects to the annular portion 41 of the chamber 31 defined between the sides thereof and the central boss or annular valve seat 32.

In operating the priming device of this invention, it will be clear from the foregoing description that retraction of the plunger 17 serves to draw priming fluid from the source through the conduit 22 and check valve 26 into the supply chamber 21 and thence through the passageway 20 into the bore 16, the check valve 26 opening with such motion of the plunger. Reversing the movement of the plunger causes the check valve 26 to close and forces priming fluid through the passageway 20, the supply chamber 21 and the second passageway 30 and against the flexible seal 34 to move the same away from the boss or annular valve seat 32 against the compression of the spring 38 to permit priming fluid to enter the valving chamber 31. From the valving chamber, priming fluid

under pressure is conducted by means of the passage **40** to the cylinder or cylinders of the engine to be primed. When the engine is started, suction is applied to the passage **40** and hence to the chamber **31**. As previously noted, the flexible seal **34** performs a dual function so that it not only opens under the pressure of priming fluid created by inward movement of the plunger **17** to permit priming fluid to pass through the chamber and into the passage **40**, but it also closes the passageway **30** when the engine is running. Thus as suction is applied to the chamber **31**, the flexible seal **34** is drawn toward the annular portion **41** of the chamber and by such suction and in its movement theretoward closes the valving chamber end of the passageway **30**. This position is illustrated in the dotted lines in Fig. 2 which show the position the flexible seal attains when the chamber **31** is under suction. Thus the portion of the boss **32** where it surrounds the valving chamber end of the passage **30** acts in the nature of a valve seat and cooperates with the sealing member effectively to close off the passageway **30** to prevent priming fluid from being drawn into the engine while it is running.

The spring **38** serves not only to close off the passageway **30** when the engine is stopped and no priming operations are being effected but also in some measure to aid in the suction in closing off the passageway **30** when the engine is operating.

It will be noted from the drawings that the passageways **20** and **30** are axially aligned with the cylindrical bore **16** and the chambers **21** and **31** are also aligned therewith so that the parts may be readily assembled and disassembled, the latter operation being necessary from time to time to clean the various parts and passages of the primer.

It will be observed that the passage **40** opens to the annular portion **41** of the valving chamber through an opening **42** which lies in a plane parallel to but spaced from a plane passing through the inner end of the boss **32** and hence across the opening end into the valving chamber of the passageway **30**, the two planes being parallel to each other and perpendicular to the axis of the chamber **31** (and hence perpendicular to the axis of the bore **16**). By so offsetting the two openings suction applied to one serves to draw the flexible seal toward it in which movement the seal moves into sealing engagement with the other.

I claim:

1. A priming device comprising a casing having a cylindrical bore, a plunger reciprocable in the bore, a substantially cylindrical valving chamber in the casing and located axially of the bore, a priming fluid supply chamber in the casing and located axially of the bore intermediate the bore and the valving chamber, check valve means for connecting the fluid supply chamber with a source of priming fluid, a first passageway connecting the supply chamber with the bore, an annular valve seat extending centrally into the valving chamber, a second passageway having one end opening into the valving chamber through the valve seat and having its other end opening into the supply chamber, a third passageway opening to the periphery of the valving chamber and adapted to be connected to a device to be primed, a flexible imperforate seal in the valving chamber and positioned therein to be flexed into engagement with the valve seat to close said second passageway when suction in said third passageway is applied to said other portion of the valving chamber and to be flexed to a position uncovering said second passageway when fluid under pressure is supplied thereto, a rigid element operatively contacting said seal opposite said second passageway, and a spring in the valving chamber acting through said rigid element engaging the seal to bias the same toward sealing engagement with said valve seat, the area of the face of said rigid element contacting said seal being greater than the cross sectional area of said second passageway in said valve seat.

2. In a priming system having means for supplying priming fluid under pressure and a passage for priming fluid adapted to be connected to a device to be primed, valve means comprising a substantially cylindrical chamber, a boss extending centrally into the chamber, a passageway opening through the end of the boss and connected to the supplying means, means connecting the periphery of the chamber with the passage, a flexible disk-like, imperforate seal in the chamber adapted to be flexed by differential pressure into sealing engagement with the end of the boss to close the passageway when suction in the passage is applied to the chamber and adapted to be flexed to a position uncovering said opening when fluid under pressure is supplied to the passageway, a rigid element operatively contacting said seal opposite the opening of said passageway in said boss, and a spring in said chamber acting through said rigid element to bias the seal toward sealing engagement with the end of said boss, the area of the face of said rigid element contacting said seal being greater than the cross sectional area of said passageway opening through the end of said boss.

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