June 9, 1953 I. LEVINE 2,641,240

PRIMING DEVICE FOR STARTING ENGINES

Filed March 20, 1952

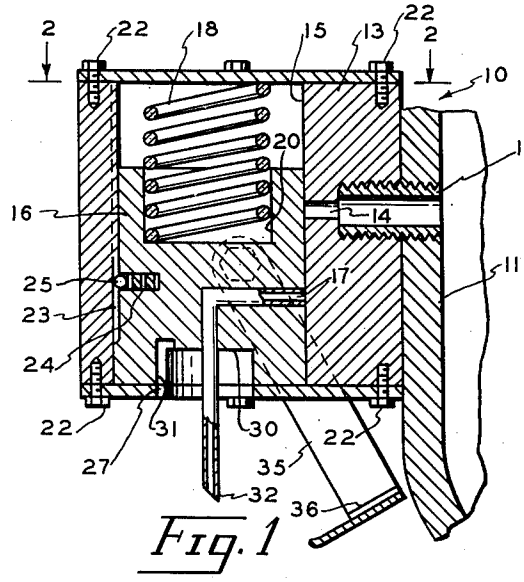


FIG. 1

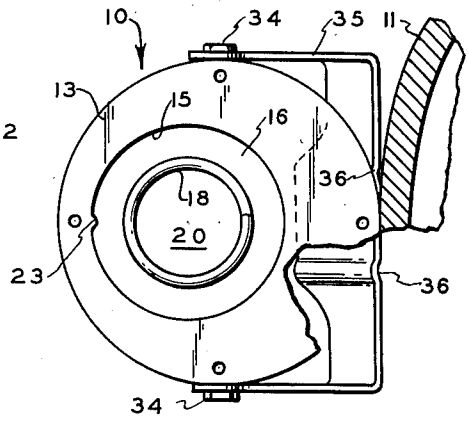


FIG. 2

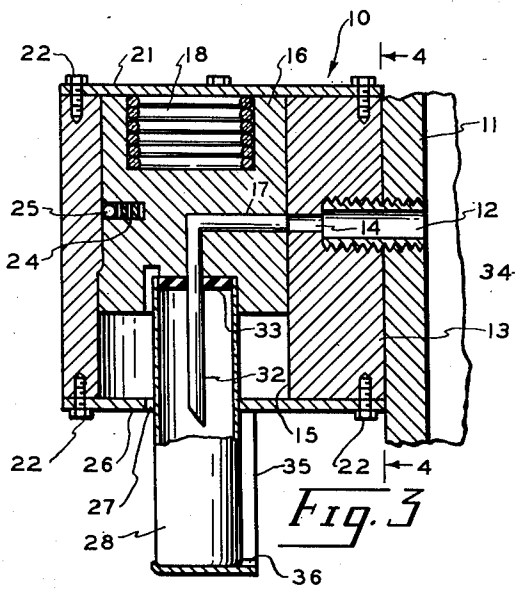


FIG. 3

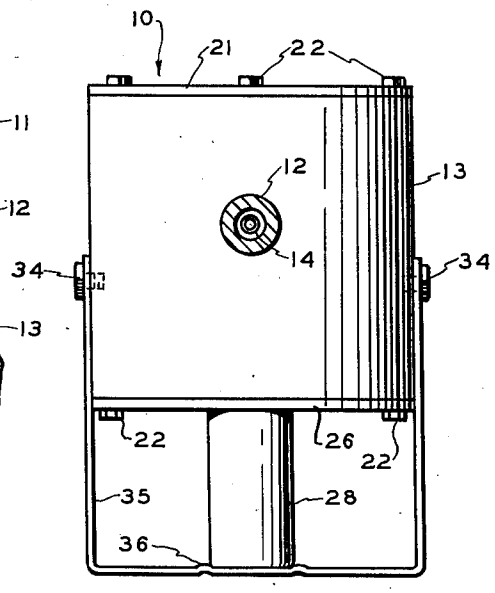


FIG. 4

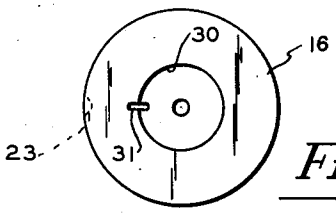


FIG. 5

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Patented June 9, 1953

2,641,240

UNITED STATES PATENT OFFICE

2,641,240

PRIMING DEVICE FOR STARTING ENGINES

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Application March 20, 1952, Serial No. 277,629

4 Claims. (Cl. 123—187.5)

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This invention relates to a priming device for starting engines and has for an object to provide an improved means of priming an engine such as the internal combustion engine of a vehicle or otherwise by making it possible for the engine as the starting is commenced to draw in a supply of a highly volatile and explosive fluid which has been kept in a sealed vial until just when the engine is ready to be started.

A further object of this invention is to provide a mechanism arranged to be permanently attached and connected to the combustion space of the engine as by being connected to the intake manifold, either of the air or of the fuel supply whereby a sealed vial may be attached thereto and have its seal penetrated and be automatically connected to a passageway to the engine space by the very act of placing the sealed vial in the mechanism, whereupon as soon as the engine is turned over to start it, it will draw in the highly volatile exposive fluid from the sealed vial and thus prime its starting.

A further object of this invention is to provide a priming mechanism which may be readily and permanently attached and connected to any internal combustion engine ready to receive a sealed vial of priming fluid whenever desired, and which, has a port connecting to the engine while the vial is in place, which port is automatically closed off by the act of removing the exhausted vial from the mechanism.

A further object of this invention is to provide a priming device for starting engines which consists of a means for holding a previously sealed vial connected to a port leading therefrom to the engine combustion space which port will connect only from the inside of the vial to the engine space, and which port will be sealed off by the act of removing the vial from its position.

A further object of this invention is to provide a priming device for starting engines which is simplier and much more efficient than that shown in previous U. S. Patents 1,446,850; 1,526,838; and 2,485,423; in that a charge of priming fluid sufficient for priming the engine is kept in a sealed vial until ready for use, as a result of which the priming fluid is not apt to go stale through premature evaporation of the more highly volatile parts thereof.

Still a further object of this invention is to provide a priming device for automobile engines which cooperates with a sealed vial of priming fluid, as a result of which, a supply of sealed vials of priming fluid may be kept about the engine until needed for use with the assurance that

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the priming fluid within the sealed vial will not become stale before it is ready for use.

With the foregoing and other objects in view, this invention comprises the combination, construction and arrangement of parts hereinafter set forth, claimed and disclosed in the accompanying drawings, wherein:

Fig. 1 is a sectional view through the priming device of this invention when in operative position.

Fig. 2 is a top plan view of Fig. 1 partly broken away, being in line 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view similar to Fig. 1 but showing a vial in operative position.

Fig. 4 is a view on line 4—4 of Fig. 3.

Fig. 5 is a bottom plan view of the reciprocable piston.

There is shown at 10 the priming device of this invention arranged for connecting to the intake manifold or engine part 11 which is connected to the engine combustion space. A nipple 12 threaded into the priming device body part 13 at one end and into the engine part 11 at the other end serves to secure priming device in operative position and also to connect an outlet port 14 leading through the nipple 12 at one end and terminating in a piston passageway 15 at its other end.

Reciprocably movable within this passageway 15 is a piston 16 having a fluid port 17 extending therethrough and aligning with the body outlet port 14 when the piston 16 is at one end of its passageway 15. When at the end of the passageway 15, the movement of the piston 16 is yieldably resisted by means of a coil spring 18 one end of which is countersunk within a well 20 formed in the end of the piston 16 and the other end of the spring 18 bears against a plate 21 secured by studs 22 to the end of the body part 13 and providing a stop limiting the movement of the piston 16 in this direction. To assure that the piston port 17 will align with the body outlet port 14, the piston 16 is held non-rotatably within its piston passageway 15 as by means of a cooperating integrally formed spline and keyway 23 formed on the piston 16 and piston passageway 15.

To also assure that the piston 16 will pass its port side having the fluid port 17 against the body outlet port 14 and thus act as a cut-off sealed valve when the parts are not in alignment, a spring 24 and ball 25 are countersunk within the side of the piston 16 opposite from its port side thus yieldably urging the piston toward its port side. A plate 26 secured to the bottom of the body part 13 by similar studs 22 limits the down-

ward movement of the piston 16. This plate 26 is provided with an aperture 27 through which a sealed vial 28 may be inserted, and the bottom of the piston 16 is provided with a small well 30 of a size to receive the top end of the fluid vial 28 therein. A small air lock releasing groove 31 along one edge of the well 30 to its upper end as shown provides for easy insertion and removal of the top of the vial 28. Connected to the fluid port 17 and extending through the center of the well 30 in the bottom of piston 16 is a sharpened hollow needle 32 similar to a hypodermic needle and arranged to penetrate sealed top 33 of the vial 28 when the vial 28 is pressed thereagainst. Pivotally supported on opposite sides of the body part 13 as by studs 34 is a U-shaped stirrup 35 provided with a vial end cooperating ribs 36 so that when the vial 28 has had its top 33 pressed over the needle 32 and then pushed inwardly so as to push the piston 16 against its spring 18 to its limit against the stopping plate 21, the stirrup 35 may be pivoted under the vial 28 and hold the vial 28 in position.

With the vial 28 held in this position, the fluid passage 17 from the hollow needle 32 is in alignment with the body outlet port 14 leading through the nipple 12 to the engine combustion space connected to the engine part 11.

Then, as soon as the engine is turned over by means of an engine starter or crank as conventional, suction in the engine will then draw out the highly volatile priming fluid such as ether, high octane gasoline, or the like, which has been kept fresh and sealed within the vial 28 until the vial 28 has been placed in cooperative position in the priming device of this invention. The engine will then usually start very readily with this highly exposive fluid therein at its first few revolutions and the fluid from the vial 28 being limited in amount will be quickly exhausted and the engine may then continue running thereafter.

The empty vial 28 may be left in position without interfering with the operation of the engine until some convenient time, possibly until the engine has been stopped, whereupon the vial may be removed, if desired, or may be left in place. If the vial is removed, the spring 18 moves the piston 16 back to its bottom position sealing off the body outlet port 14, which sealing action is assisted by the presence of the spring 24, and ball 25 at its opposite side. Then, when it is necessary to start the cold engine again, the new vial 28 may be put in position and the process repeated.

Obviously, with the highly volatile priming fluid kept sealed in a series of vials 28, the fluid will always remain fresh and not deteriorate through loss of its most highly volatile and evaporative portions as is customary with other types of priming devices wherein the fluid is stored in containers wherein only a part of the stored fluid is used for each priming or starting action.

With this invention, a fresh supply of sealed priming fluid is used every time, thus insuring the successful operation thereof.

While the device has been shown and the structure described in detail, it is obvious that this invention is not to be considered as being limited to the exact form disclosed, and that changes in detail and construction may be made therein within the scope of what is claimed, without departing from the spirit of this invention.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. A priming device for starting an engine comprising in combination a body part, an outlet port, means for connecting said outlet port to the combustion space of the engine, a piston passageway within said body part connected to said outlet port, a piston reciprocably and non-rotatably movable within said piston passageway, means at each end of said passageway limiting the movement of said reciprocable piston, means yieldably resisting the approach of said piston to one end of said passageway, a fluid port extending through said piston, one end of said fluid port being aligned with said body outlet port when said piston is at said end of its passage against said yieldably resisting means, means urging said piston against the piston passageway side through which the outlet port extends, a vial penetrating hollow needle connected to the other end of said piston fluid port at the end of said piston opposite from the yieldably resisted end, a vial receiving opening through the adjacent piston movement limiting means, an air-lock releasing groove in one side of said vial end receiving depression in said piston end, and a vial supporting stirrup pivoted to said body part over said vial receiving end, whereby a sealed vial of priming fluid may be pressed over said needle end to move said piston against its opposite end and align its fluid port with said port outlet, and then be held in such position by pivoting said supporting stirrup thereunder, whereby the priming fluid in the vial may be drawn therefrom into the engine as the engine is started.

2. A priming device for starting an engine comprising in combination a body part, an outlet port, means for connecting said outlet port to the combustion space of the engine, a piston passageway within said body part connected to said outlet port, a piston reciprocably and non-rotatably movable within said piston passageway, means at each end of said passageway limiting the movement of said reciprocable piston, means yieldably resisting the approach of said piston to one end of said passageway, a fluid port extending through said piston, one end of said fluid port being aligned with said body outlet port when said piston is at said end of its passage against said yieldably resisting means, means urging said piston against the piston passageway side through which the outlet port extends, a vital penetrating hollow needle connected to the other end of said piston fluid port at the end of said piston opposite from the yieldably resisted end, a vial receiving opening through the adjacent piston movement limiting means, and a vial supporting stirrup pivoted to said body part over said vial receiving end, whereby a sealed vial of priming fluid may be pressed over said needle end to move said piston against its opposite end and align its fluid port with said port outlet, and then be held in such position by pivoting said supporting stirrup thereunder, whereby the priming fluid in the vial may be drawn therefrom into the engine as the engine is started.

3. A primary device for starting an engine comprising in combination a body part, an outlet port, means for connecting said outlet port to the combustion space of the engine, a piston passageway within said body part connected to said outlet port, a piston reciprocably and non-rotatably movable within said piston passageway, means at each end of said passageway limiting the movement of said reciprocable piston, means yieldably resisting the approach of said piston to one end of said passageway, a fluid port extending through said piston, one end of said fluid

port being aligned with said body outlet port when said piston is at said end of its passage against said yieldably resisting means, a vial penetrating hollow needle connected to the other end of said piston fluid port at the end of said piston opposite from the yieldably resisted end, a vial end receiving depression in said piston end about said port needle, a vial receiving opening through the adjacent piston movement limiting means, an air-lock releasing groove in one side of said vial end receiving depression in said piston end, and a vial supporting stirrup pivoted to said body part over said vial receiving end, whereby a sealed vial of priming fluid may be pressed over said needle end to move said piston against its opposite end and align its fluid port with said port outlet, and then be held in such position by pivoting said supporting stirrup thereunder, whereby the priming fluid in the vial may be drawn therefrom into the engine as the engine is started.

4. A priming device for starting an engine comprising in combination a body part, an outlet port, means for connecting said outlet port to the combustion space of the engine, a piston passageway within said body part connected to said outlet port, a piston reciprocably and nonrotatably movable within said piston passageway, means at each end of said passageway limiting the movement of said reciprocable piston, means yieldably resisting the approach of said piston to one end of said passageway, a fluid port extending through said piston, one end of said fluid port being aligned with said body outlet port when said piston is at said end of its

passage against said yieldably resisting means, means urging said piston against the piston passageway side through which the outlet port extends, a vial penetrating hollow needle connected to the other end of said piston fluid port at the end of said piston opposite from the yieldably resisted end, a vial end receiving depression in said piston end about said port needle, a vial receiving opening through the adjacent piston movement limiting means, an air-lock releasing groove in one side of said vial end receiving depression in said piston end, and a vial supporting stirrup pivoted to said body part over said vial receiving end, whereby a sealed vial of priming fluid may be pressed over said needle end to move said piston against its opposite end and align its fluid port with said port outlet, and then be held in such position by pivoting said supporting stirrup thereunder, whereby the priming fluid in the vial may be drawn therefrom into the engine as the engine is started.

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