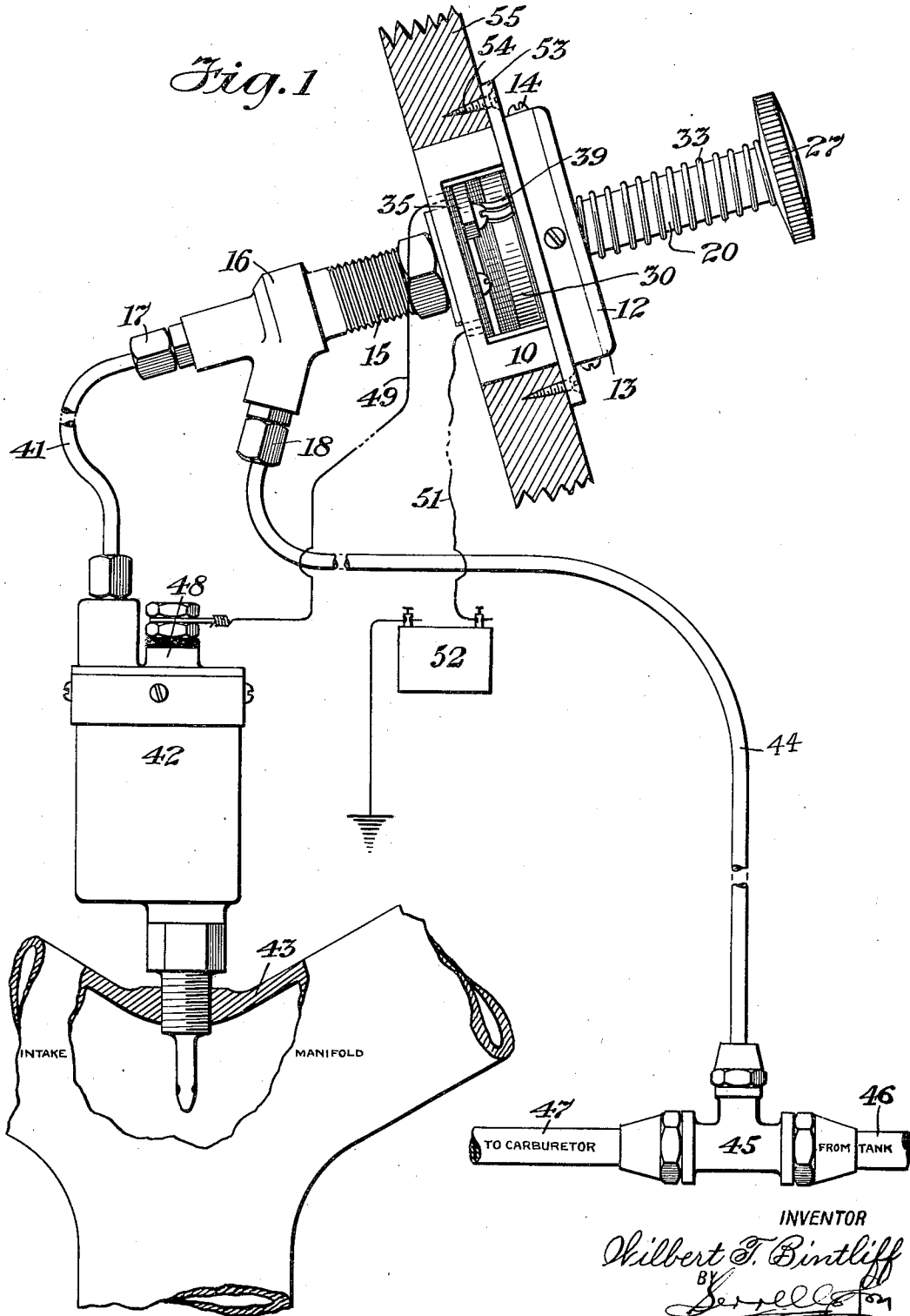


W. T. BINTLIFF.
 PRIMING APPARATUS FOR INTERNAL COMBUSTION ENGINES.
 APPLICATION FILED JAN. 6, 1920.

1,369,608.

Patented Feb. 22, 1921.

2 SHEETS—SHEET 1.

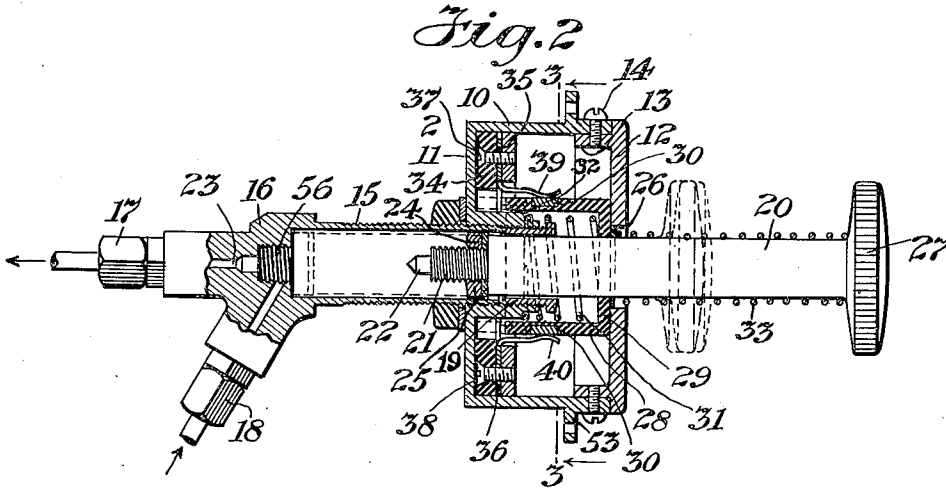
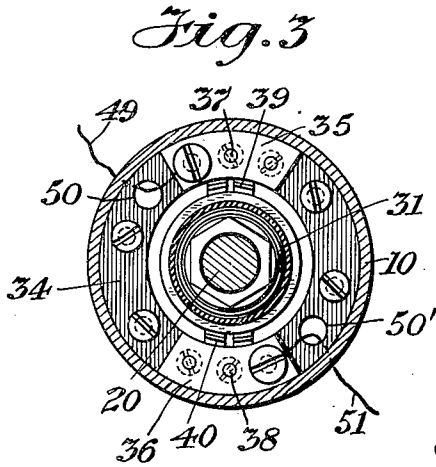
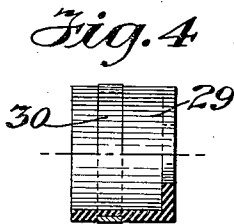
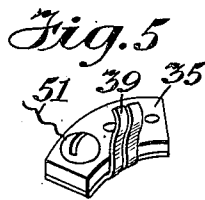
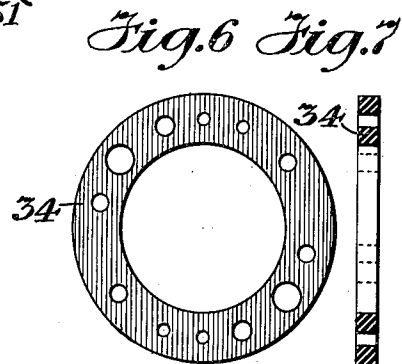


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INVENTOR
Gilbert T. Bintliff
BY
S. J. Bintliff
HIS ATTORNEYS

UNITED STATES PATENT OFFICE.

WILBERT T. BINTLIFF, OF PLAINFIELD, NEW JERSEY, ASSIGNOR OF ONE-HALF TO
ALLEN B. LAING, OF PLAINFIELD, NEW JERSEY.

PRIMING APPARATUS FOR INTERNAL-COMBUSTION ENGINES.

1,369,608.

Specification of Letters Patent.

Patented Feb. 22, 1921.

Application filed January 6, 1920. Serial No. 349,805.

To all whom it may concern:

Be it known that I, WILBERT T. BINTLIFF, a citizen of the United States, residing at Plainfield, in the county of Union, State of New Jersey, have invented an Improvement in Priming Apparatus for Internal-Combustion Engines, of which the following is a specification.

Heretofore, in conjunction with an internal combustion engine, various forms of primers have been employed for initially vaporizing the fuel for starting the engine particularly adapted for use in cold weather, when, due to the low temperature, it is difficult, if not impossible, to vaporize the fuel and consequently troublesome to start the motor. The present invention relates to an apparatus for forcing liquid fuel to a heating unit and simultaneously and automatically causing the heating unit to be sufficiently heated to vaporize the fuel supplied thereto.

I am aware that heretofore in electric primers, various forms of switches have been employed for closing an electric circuit to the coil of the heater, and also heretofore, various forms of devices have been employed for supplying or forcing the liquid fuel to the heater to be vaporized. In all instances, however, so far as I am aware, these devices have been so made as to be separately operated, and in operating these devices separately, much inconvenience and often difficulty is experienced. The object of the present invention, therefore, is to overcome these difficulties and to so construct an apparatus for priming gas engines so as to simultaneously force or supply the liquid fuel to a heating unit and close an electric circuit to the coil thereof, which apparatus may be attached to the dash board of the motor car in which the gas engine is employed, as will be hereinafter more particularly described.

In the drawing:

Figure 1 is a diagrammatic elevation and partial cross section illustrating the construction and use of my present invention.

Fig. 2 is a central longitudinal section of the primer actuating device to which the invention more particularly relates.

Fig. 3 is a cross section on line 3—3, Fig. 2.

Fig. 4 is a sectional elevation of the switch drum.

Fig. 5 is a perspective view of one of the terminal and contact members employed.

Fig. 6 is a plan of the insulating ring, and

Fig. 7 is a cross section thereof.

In carrying out the invention, as will be seen by reference to the drawing, the primer actuating device to which the invention particularly relates, comprises a body member 10 which may be made of metal or any suitable material and is preferably cylindrical in form, and provided with a base 11 which closes one end of the cylinder. At the other end of the cylinder, the same is provided with a cover 12 having a flange 13 adapted to fit within the open end of the cylinder and by which, through means of screws 14 or otherwise, the cover may be secured in position in the cylinder. The base 11 is provided centrally with a tubular flange extending into the body member 10 and adapted to receive a shank 15 of a two way connection 16, the shank 15, as illustrated, being screw threaded to turn down into the bore of the tubular extension of the base 11, it being understood, however, that these parts may be otherwise connected without departing from the nature and spirit of this invention. The two way connection 16 is provided with stop valves 17 and 18, the former of which permits the passage of the gasoline or other liquid fuel in the direction of the arrow, while the latter also permits the passage of the liquid fuel in the direction of the arrow associated therewith, both stop valves preventing the flow of the liquid fuel in the directions opposed to the arrows. Also fixed in the tubular extension of the base 11, is a bearing 19. As illustrated, this bearing 19 is screw threaded and turned down into the tubular extension from the inner side of the body member, but the connection may be made otherwise and in any suitable manner without departing from my invention. The bearing 19 is adapted to receive a plunger 20 which, at the inner end thereof, is provided with a reduced extension 21 fitted at its extremity with a valve 22. This valve 22 which is of the needle valve type is adapted to bear against a valve seat 23 in the passage in the

two way connection 16 leading to the stop valve 17 when the plunger 20 is in the dotted line position as indicated in Fig. 2 of the drawing. The reduced end 21 of the plunger 20 is screw threaded and fitted with a piston washer 24 which is maintained in position thereon by lock nuts 25 or otherwise. The piston washer is adapted to fit the bore in the shank 15 which thereby becomes a pump cylinder for drawing the liquid fuel from the source of supply and forcing the same to the primer as hereinafter described.

The cover 12 is provided with an opening 26 through which the plunger 20 also passes, the plunger being provided at its outer extremity with a head or handle 27. Mounted on the plunger 20 within the body member 10, is a cylindrical block 28. This block is provided with a head 29 having an aperture therein through which the plunger 20 also passes, and in the outer wall of the cylindrical block 28, there is fixed a contact ring 30, the cylindrical block, as will be understood, being made of any suitable insulating material. The cylindrical block 28 in the operative positions of the parts of the apparatus is normally maintained in the full line position as shown in Fig. 2 with the head end of the block in contact with the inner surface of the cover 12 of the body member. This is accomplished by means of a spring 31 surrounding the plunger 20 and extending between a shoulder 32 at the inner end of the tubular extension of the base 11 and the inner surface of the end 29 of the cylindrical block. A spring 33 also surrounds the plunger 20 and extends from the head 27 thereof through the opening 26 in the cover 12 to the outer face of the end 29 of the cylindrical block. When the parts of the apparatus are in their operative positions as shown in Fig. 2 the tensions of the springs 31 and 33 are such that the action of the spring 33 will not overcome the action of the spring 31, whereas, when the parts are in their inoperative positions or that shown in dotted lines in Fig. 2, the tension of the spring 33 is sufficient to overcome the tension of the spring 31, thereby forcing the cylindrical block 28 away from the cover 12 of the body member to break the circuit to the heating unit as hereinafter described.

Within the body member 10 and fitted to the base thereof, I employ a ring 34 made of any suitable insulating material. Secured to this ring 34, preferably in oppositely disposed positions, there are terminals 35 and 36, these terminals being secured in position respectively by means of screws 37 and 38 or otherwise, the heads of which are preferably covered with insulating washers. The terminal 35 is provided with contacts 39 and the terminal 36 with contacts 40, the contacts 39 and 40 being adapted to bear against the

ring contact 30 in the cylindrical block when the same is in its outermost position or with the head thereof in contact with the cover of the body member so that in this position, the circuit is closed through these contacts and the ring in the cylindrical block, and when the cylindrical block is in its other position, the circuit is broken by the ring moving away from the contacts.

The stop valve 17 is connected by a pipe 41 to the inlet end of an electric heater or heating unit 42. This electric heater may be made in any suitable manner and preferably to contain a heat coil by means of which the liquid fuel supplied to the heater is vaporized before passing to the manifold of the engine. As illustrated in Fig. 1, the heater 42 is connected at its discharge end to the intake manifold 43 of a motor. A pipe 44 leads from the stop valve 18 to a three way connection 45. One end of the three way connection 45 is connected by a pipe 46 leading from the supply tank for the liquid fuel, and the opposite end of the three way connection 45 is connected by a pipe 47 to the inlet end of the carbureter employed with the motor.

One end of the heat coil employed in the heater is connected to a terminal 48 situated on the exterior of the heater while the other end of the heat coil is suitably grounded in the apparatus. A lead wire 49 extends through the base and through a hole 50 in the ring 34 and terminal 48 to the terminal 35. A lead wire 51 extends through a hole 50' in the ring 34 and also through the base 11 and connects the terminal 36 to one terminal of a battery 52, the other terminal of which is suitably grounded in the apparatus. The body member 10 is provided with a flange 53 by means of which and screws 54 it may be secured in place in the dash board 55 of a car or in any other place.

The two way connection 16 is provided with a screw threaded socket 56 adapted to receive the reduced screw threaded end 21 of the plunger 20 so as to maintain the plunger in its inoperative or dotted line position shown in Fig. 2, and at the same time to cause the valve 22 to bear against the valve seat 23, in which position, as hereinbefore stated, the spring 33 counteracts the tension of the spring 31 and forces and maintains the cylindrical block in the position in which the circuit is broken at its contacts 39 and 40. Now in operating the device, the plunger is unscrewed so that the reduced end of the plunger is removed from the socket 56 and the plunger withdrawn and reciprocated. In withdrawing the plunger, the action of the spring 31 forces the cylindrical block to its operative position, thereby closing the circuit through the contacts 39 and 40 and the contact ring 30 to the heater coil thereby heating the same, and by reciprocating the

plunger, moving the same back and forth, the piston washer 24 acting in the bore of the shank 15 draws the gasoline or other liquid fuel through the pipe 44 and valve 18 into the chamber in the shank 15 when the plunger is moved outwardly, and when moving the plunger in the opposite direction, the piston washer forces the liquid fuel thus drawn into the cylinder through the valve 17 and the pipe 41 to the interior of the heater where it is vaporized before passing to the manifold of the motor.

I claim as my invention:

1. An apparatus for priming internal combustion engines, comprising a heater, a plunger device for supplying fuel to the heater, and means released by the plunger device and operative continuously while the plunger device is operative for energizing the heater and thereby causing the volatilization of the fuel supplied thereto.

2. An apparatus for priming internal combustion engines comprising a heater, a plunger device normally in an inoperative position and adapted to force fuel to the heater, and means automatically operative upon the release of the plunger for operating the heater and thereby causing the volatilization of the fuel forced thereto.

3. An apparatus for priming internal combustion engines, comprising an electrical heater, a plunger device for forcing fuel to the heater, and means automatically released upon the release of the plunger device and operative continuously while the plunger device is operative for closing an electric circuit to the heater and thereby causing the volatilization of the fuel supplied thereto.

4. An apparatus for priming internal combustion engines comprising an electrical heater, a plunger device for forcing liquid fuel to the heater, means for normally maintaining the plunger device in an inoperative position, and devices automatically operative upon the release of the plunger device for closing a circuit to the heater thereby causing the same to volatilize the liquid fuel forced thereto by the plunger device.

5. An apparatus for priming internal combustion engines comprising an electric heating unit having a heat coil therein, a plunger adapted to be operated to supply liquid fuel to the heating unit, means for normally maintaining the plunger in an inoperative position, means operative when the plunger is released for automatically closing an electric circuit to a heat coil in the heating unit, and means when the plunger is returned to its inoperative position for automatically opening the electric circuit to the heat coil in the heating unit.

6. An apparatus for priming internal combustion engines comprising an electric heating unit having a heat coil therein, a casing, a plunger mounted to reciprocate

therein to supply liquid fuel to the heating unit, means for normally maintaining the plunger in an inoperative position, a switch device, means for automatically operating the switch device to close an electric circuit to the heat coil in the heating unit when the plunger is released, and means for automatically opening the switch device to open the circuit to the heat coil in the heating unit when the plunger is returned to its inoperative position.

7. An apparatus for priming internal combustion engines comprising an electric heating unit having a heat coil therein, a casing, a plunger mounted to reciprocate in the casing, a cylindrical block mounted on the plunger within the casing, a contact ring fixed in the said cylindrical block, contacts also secured within the said casing, electrical connections making a circuit between said contacts and heat coil in said heating unit, means for normally maintaining the plunger in an inoperative position in which the circuit is broken at the said contact ring and contacts, means for automatically moving the said cylindrical block when the plunger is released to close a circuit between the said contact ring and contacts, and means for automatically moving the said cylindrical block in the opposite direction to open the circuit to the said contact ring and contacts when the plunger is returned to its inoperative position.

8. An apparatus for priming internal combustion engines comprising an electric heating unit having a heat coil therein, a casing, a plunger mounted to reciprocate in the casing, a cylindrical block mounted on the plunger within the casing, a contact ring fixed in the said cylindrical block, contacts also secured within the said casing, electrical connections making a circuit between said contacts and heat coil in said heating unit, means for normally maintaining the plunger in an inoperative position in which the circuit is broken at the said contact ring and contacts, a spring within the said cylindrical block for moving the same on the said plunger when the plunger is released in order to close the circuit at the said contact ring and contacts, and means counteracting the effect of said spring when the plunger is returned to its inoperative position to automatically open the circuit at the said contact ring and contacts.

9. An apparatus for priming internal combustion engines comprising an electric heating unit, having a heat coil therein, a casing, a plunger mounted to reciprocate in the casing, a cylindrical block mounted on the plunger within the casing, a contact ring fixed in the said cylindrical block, contacts also secured within the said casing, electrical connections making a circuit between said contacts and heat coil in said heating unit,

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ger when the plunger is released in order to
close the circuit at the said contact ring and
contacts, and a spring surrounding the said

plunger and counteracting the effect of the
aforesaid spring when the plunger is re- 10
turned to its inoperative position to auto-
matically move the said cylindrical block
and thereby open the circuit at the contact
ring and contacts.

Signed by me this 24th day of Dec., 1919.
WILBERT T. BINTLIFE.