W. J. THOMAS.

PRIMER.

APPLICATION FILED AUG. 5, 1920.

1,437,622. Patented Dec. 5, 1922.

Fig. 1.

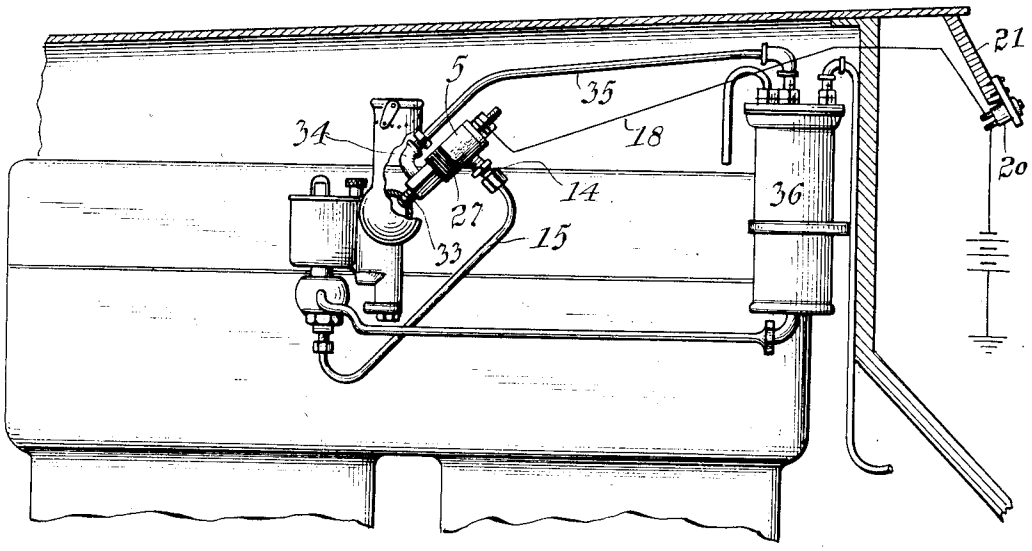
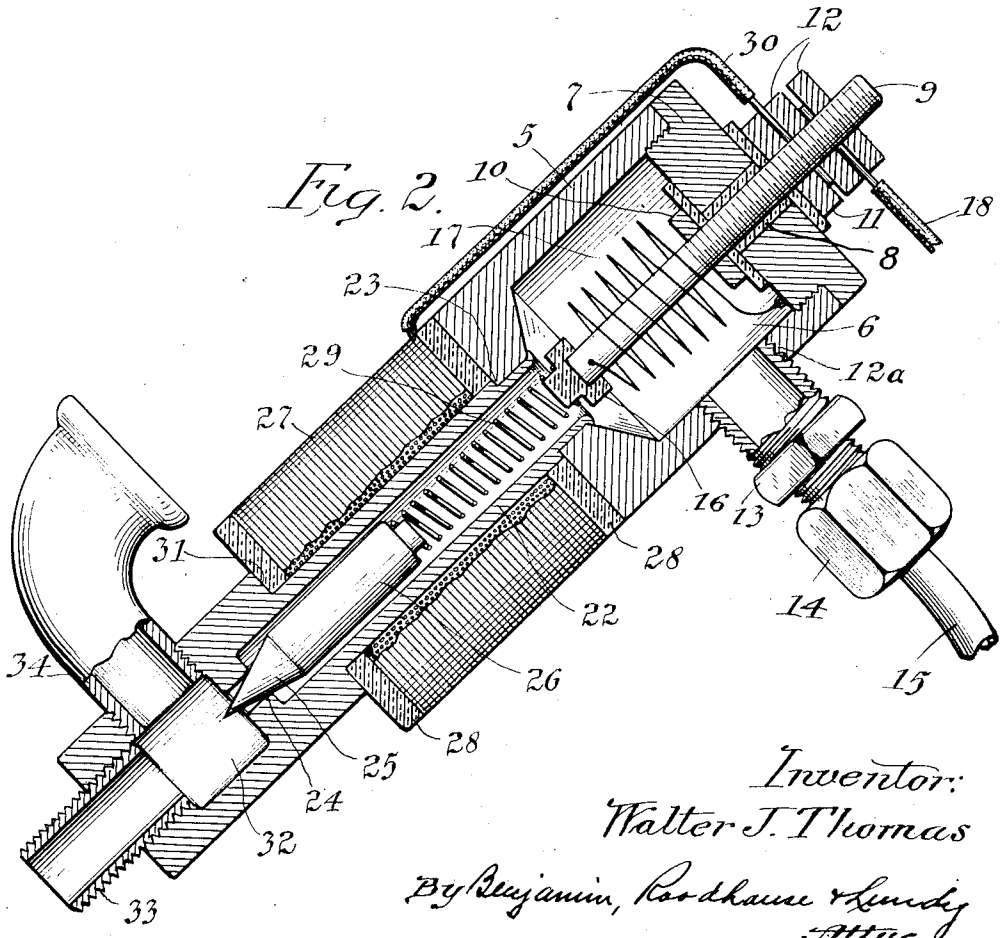



Fig. 2.




Inventor:
Walter J. Thomas
By Benjamin, Rochaun & Lundy
Attys.

Patented Dec. 5, 1922. 1,437,622

# UNITED STATES PATENT OFFICE.

WALTER J. THOMAS, OF CHICAGO, ILLINOIS.

## PRIMER.

Application filed August 5, 1920. Serial No. 401,433.

*To all whom it may concern:*

Be it known that I, WALTER J. THOMAS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in a Primer, of which the following is a specification.

My invention relates to primers for internal combustion engines, and is designed for special use in connection with engines employing one of the forms of vacuum tank fuel feed although it may also be employed with a pressure fuel feed by tapping into the fuel manifold.

One of the objects of my invention is the provision of a priming device that is capable of being installed upon engines in motor driven vehicles of the types now generally upon the market without requiring any alteration to the stock parts of the motor or vehicle and with a minimum of labor. Another object of my invention is the provision of a primer that is adapted to deliver to the motor a quantity of fuel heated so as to render it capable of ready ignition and combustion within the cylinder of the engine. A still further object of my invention is the provision of a primer that is instantaneous in operation and therefore will be of easier and more frequent use. Other objects of my invention are the provision of a primer that is unitary in character, compact in construction, easy to operate and install, and dependable in performing the divers function for which it is designed.

I prefer to accomplish the objects of my invention in substantially the manner hereinafter fully described and as more particularly pointed out in the claims. Reference will now be made to the accompanying drawings that form a part of this specification, and which are in a sense merely diagrammatic for the purpose of illustrating the principles involved.

In the drawings—

Figure 1 is a schematic view illustrating a fragment of an internal combustion engine and a portion of the vehicle showing a manner of installing my improved priming device.

Figure 2 is a vertical axial section of the priming device detached from the motor and drawn to an enlarged scale.

In the drawings I have employed similar reference numerals to designate the same parts throughout the several views, and by referring to Figure 2 it will be seen my priming device preferably comprises a tubular housing or casing 5 the interior whereof provides a fuel heating chamber 6. The upper end of the casing 5 is open and is closed by a flanged plug or cap 7 that is centrally bored to receive an insulating bushing 8 through which an electric terminal or stem 9 extends. A shoulder or collar 10 is provided upon the inner portion of the stem 9 that engages the inner edge of the bushing 8 and a lock nut or washer 11 is screwed upon the outer extended portion of the stem to securely hold the latter in position centrally of the chamber 6 as seen. Binding nuts 12 are also screwed upon this outer extended portion of the stem for connecting the stem with an electric conductor as will hereinafter more fully appear. A suitable threaded opening $12^a$ is made in the cylindrical wall of the casing about midway its height to receive a threaded nipple 13 that is screwed therein, and a coupling sleeve 14 is carried by said nipple that connects a relatively small tubing 15 therewith. The opposite end of said tubing 15 is connected with any source of fuel supply such as the drain cock of the carbureter as shown so as to deliver the desired quantity of fuel to the primer.

The inner or lower end of the stem 9 is provided with a suitably shaped head 16 of insulating material and electrically connected with and surrounding the stem between said head and the closure cap 7 for the chamber is a coil of wire 17 of material that is capable of being heated by the passage of an electric current. One end of the wire coil 17 is connected to and grounded on the cap 7 and the coil receives its electric energy through the stem 9 and a conductor 18 leading from the outer portion of the stem to the usual battery employed in motor vehicles. A switch 20 of any desirable type is interposed in the conductor 18 and is positioned upon the cowl or instrument board 21 within convenient reach of the driver of the vehicle, so that upon the opening of said switch the coil 17 receives the current and instantly heats the motor fuel passing through the chamber 6.

The bottom of the chamber 6 is tapered and is provided with a central opening to receive the upper portion of a discharge

tube 22. This tube has a shoulder 23 adjacent its upper end and the portion above the shoulder is slightly tapered to permit of a drive-fit in the discharge opening and after being thus fitted the upper edge of the tube is swaged or turned over against the adjacent portion of the casing 5. The bore of the tube 22 is interrupted in its lower portion by reducing the bore slightly to provide a seat 24 for a needle valve 25 having an elongated spindlue 26 that reciprocates during the operation of the primer within the bore of the tube. This spindle 26 and the needle valve 25 are reciprocated through the magnetic action of a solenoid coil 27 surrounding the tube 22 between the insulating washers 28, and a light coiled spring 29 retains the valve 25 normally upon its seat 24. As seen in the drawing this spring has its lower end engaging the upper end of the valve spindle 26 and its upper end engaging the insulating head 16 on the lower end of the stem 9, and the solenoid receives current from the conductor 18 through a short piece of conductor 30 extending from the outer portion of the stem to the winding of the solenoid, the other end of the solenoid being grounded with tube 22.

Just above the seat 24 for the valve the tube is provided with the exterior shoulder 31 against which one of the disks 28 rests and the exterior surface of the tube below shoulder 31 is formed hexagonal or other angular shape in cross-section to permit the use of a wrench or other tool thereon. Below the seat 24 the bore of the tube is widened as at 32 and the outer portion is threaded to receive a nipple 33, while a lateral opening is made in the tube just above the inner end of the nipple to receive an elbow or other coupling 34.

In mounting the priming device the vacuum pipe 35, leading from the upper portion of the vacuum tank 36 to the intake manifold, is disconnected at its outer end and connected with the elbow 34, and the nipple 33 screwed into the place formerly occupied by the end of pipe 35. The coupling 14 and stub 12 are connected to the small pipe 15 leading to the drain cock of the carbureter or other source to receive its supply of fuel and the electrical connection is made through the instrumentalities heretobefore described.

What I claim is:—

1. A priming device comprising a casing having an interior chamber, a fuel inlet conduit leading into said chamber, a discharge tube leading from said chamber, a valve controlling the passage of fuel through said discharge tube, and electrical devices for increasing the temperature within said chamber and for unseating said valve.

2. A priming device comprising a casing having an interior chamber, a fuel inlet conduit leading into said chamber, a discharge tube leading from said chamber, a valve normally seated in said tube, a magnetic coil surrounding said tube adjacent said valve, a resistance coil within said chamber, and conductors suitably connected to said electrical elements whereby said resistance coil is heated and said magnetic coil is energized to unseat said valve.

3. A primary device comprising a casing having an interior chamber, a feed pipe leading thereto, a discharge tube axially alining with the axis of said chamber, a magnetic coil surrounding said tube, a valve normally seated in said tube within the magnetic field of said coil, a heating unit within said chamber, and conductors suitably connected to said coil and unit whereby the energizing of said coil unseats said valve and said unit is adapted to be heated.

4. A priming device comprising a casing having an interior chamber, means feeding fuel to and discharging it from said chamber, an electrically operated valve coacting with said means, and a heating unit coacting with said chamber and electrified simultaneously with the operation of said valve.

5. A priming device comprising a casing having an interior chamber, a terminal extended into said chamber, a heating coil connected to said terminal, a discharge tube leading from said chamber and alining with said terminal, a solenoid surrounding said tube and connected to said terminal, a valve seated in said tube, a spring interposed between said valve and said stem, and an electric conductor connected to said terminal whereby said coil and solenoid are energized.

6. A priming device comprising a hollow casing adapted to receive a quantity of fuel, a valve controlled chamber communicating with said casing, a solenoid surrounding said chamber whereby said valve is unseated and a heat unit in said casing electrically connected in multiple with said solenoid.

7. A primer comprising a casing providing a compartment, a valve-controlled conduit leading from said compartment, a heater within said compartment, and electric elements suitably connected to said device whereby said heater and valve are simultaneously operated.

8. A priming device comprising a casing having an interior chamber, an inlet port communicating with said chamber, a discharge port leading from said chamber, a valve controlling said discharge port, and electrical devices for unseating said valve.

9. A priming device comprising a casing having an interior chamber, an inlet port communicating with said chamber, a discharge port leading from said chamber, a valve of magnetically responsive metal, a spring for yieldingly holding said valve

closed, a solenoid surrounding said valve and adapted when energized to retract the same from its seat.

10. A priming device comprising a casing having an interior chamber, an inlet port communicating with said chamber, a discharge port leading from said chamber, a valve of magnetically responsive metal for controlling said discharge port, and a solenoid adapted when energized to move said valve.

Signed at Chicago, county of Cook and State of Illinois, this 31st day of July, 1920.

WALTER J. THOMAS.