J. M. HOBE & U. S. TRAUB.

ELECTRICAL PRIMER.

APPLICATION FILED SEPT. 25, 1911.

1,085,425. Patented Jan. 27, 1914.

Fig. 1.

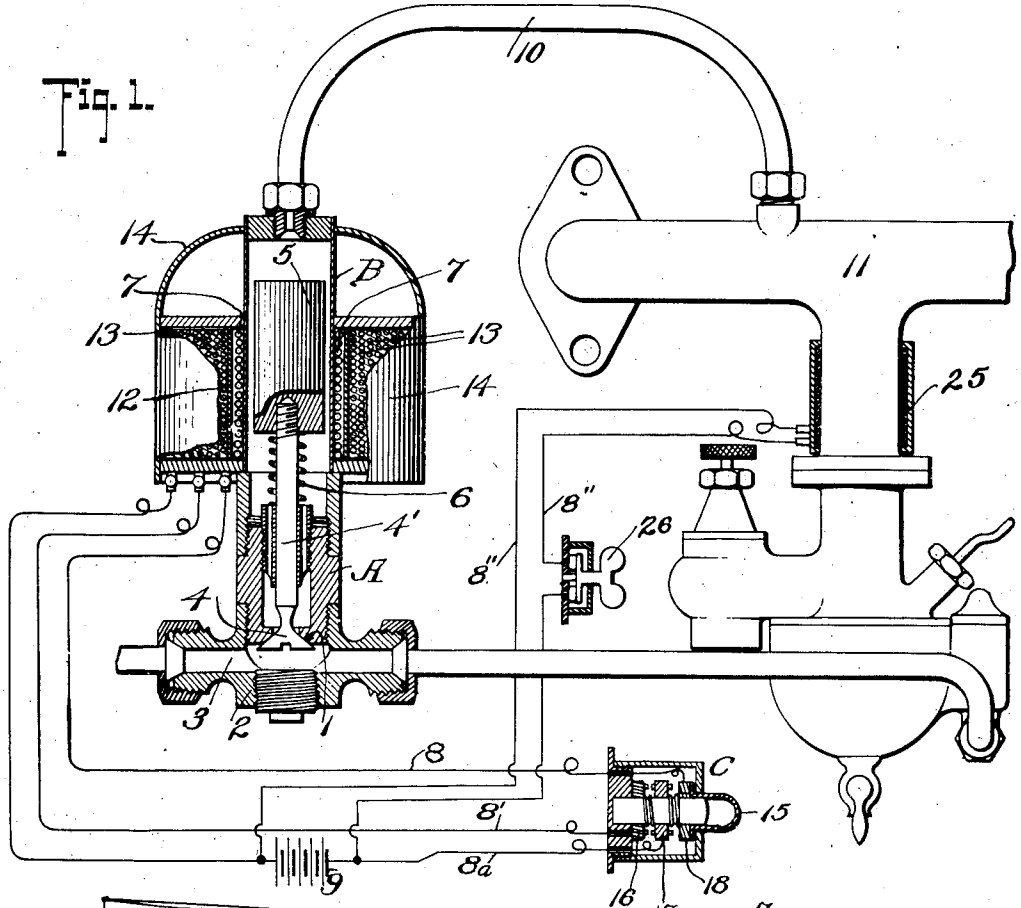


Fig. 3.

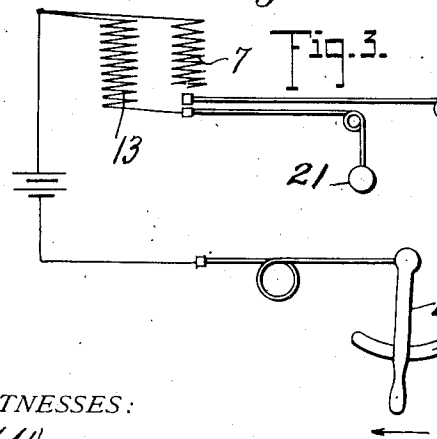
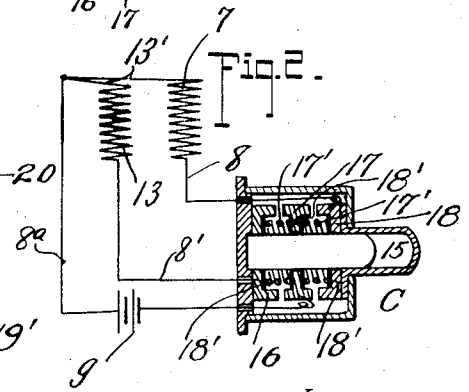


Fig. 2.



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ELECTRICAL PRIMER.

1,085,425. Specification of Letters Patent. Patented Jan. 27, 1914.

Application filed September 25, 1911. Serial No. 651,193.

To all whom it may concern:

Be it known that we, JOHN MORRIS HOBE and URAL STILWELL TRAUB, citizens of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Electrical Primers, of which the following is a specification.

The present invention consists of an improved electrical primer for use in connection with internal combustion engines to facilitate starting of the motor in cold weather especially, or when poor fuel, such as low gravity gasolene is used.

By the employment of the primer of this invention, the gas is introduced into the intake manifold of the cylinder or cylinders of the motor in a condition favorable for an explosion, being heated and partially or wholly vaporized.

The invention consists principally in the special electrical means for heating the fuel, as hereinbefore premised, and the advantages of the invention will appear more fully hereinafter.

For a full understanding of the present invention, reference is to be had to the following description and to the accompanying drawings, in which—

Figure 1 is a view showing a primer comprising the invention connected up with the intake manifold of an explosive engine, the parts of the primer being shown in section and the push-button switch controlling the operation of the primer being also shown in section. Fig. 2 is a diagrammatic view showing more in detail the construction of the push button and circuit connections with the electromagnet and heating coils. Fig. 3 is a diagrammatic view showing a modified form of switch for controlling the operation of the primer.

Describing the invention in detail, A denotes a casing or tubular member of any desired form, having a valve seat 1 at one end, with which end is connected a union 2 having a suitable passage 3 to which the liquid fuel is fed from a suitable tank or other receptacle. A valve 4 is normally seated against the valve seat 1, closing the opening adjacent to said seat, said valve being carried by a stem 4′ having threaded connection at one end with the core 5. A coiled tension spring 6 normally holds the valve 4 in closed position, and connected with the upper portion of the member A is a second casing B in which the core 5 is arranged and adapted to reciprocate. Surrounding the casing B is a coil of resistance wire 7, hereinafter termed a heating coil, said wire being included in an electric circuit comprising the circuit wires 8 and 8ª which lead to a battery or batteries 9 and a switch C. The heating coil 7 is provided for the purpose of heating the casing B and the hydrocarbon which passes through said casing and a pipe 10 to the manifold 11, from which it passes to the cylinder of the motor. Insulation 12 surrounds the heating coil 7 and wound about said insulation is a fine wire 13 providing a magnetizing coil.

Inclosing the several parts B, 7, 12 and 13, is a cap or housing 14. The electrical circuit including the wires 8 and 8ª is connected with the magnetizing coil 13, as shown at 18′, and the electrification of the coils 7 and 13 is controlled by the switch C. The switch C preferably comprises a push-button 15, a stationary contact disk 16, and two movable contact disks designated 17 and 18, said movable disks being connected with the circuit wires 8ª and 8, respectively, as shown in the drawings, in such a manner that initial movement of the push button 15 will cause contact of the disks 17 and 18 and close the circuit including the heating coil 7 whereupon the casing B will be quickly heated. Subsequent movement of the push button 15 will cause contact of the disks 16 and 17 and electrify the coil 13, which coil in connection with the core 5 constitutes the electro-magnet.

As shown most clearly in Fig. 2, the disks 16, 17 and 18 of the switch C are normally held apart by means of interposed springs 17′, which springs preferably bear against washers 18′ of an insulating substance, the several disks therefore being normally not in electrical connection. The circuit wire 8 connects the coil 7 with the outermost disk

of the switch C, the wire 8′ connects the innermost disk of said switch with the coil 13, and the wire 8^a is a return lead common to both coils and including the battery 9. The coöperation of the parts of the switch C will be evident upon reference to Fig. 2 and the previous description.

When the electric current passes through the coil 13, the core 5 is attracted and moved longitudinally in the casing B a sufficient extent to open the valve 4, whereupon the hydrocarbon will pass from the passage 3 through the casings A and B, and the pipe 10 to the intake manifold 11 of the motor. While the push button 15 is maintained depressed to its maximum extent, the casing B is kept heated and heating of the fuel, whereby the latter is vaporized or partially vaporized, is maintained. When pressure on the button 15 is relieved, said button is restored to its original position, rendering the primer inoperative.

A modified form of switch for use in connection with the invention is shown in the diagrammatic view of Fig. 3. In this construction, when the contact lever or arm 19 is connected with the contact 20, the circuit through the heating coil 7 is closed, whereas, when the lever 19 is swung into a position contacting with the contact 21, the magnetizing coil will be electrified. The lever 19 is adapted to make contact with the contacts 20 and 21 by means of a segmental bar 19′ which is attached to the lever. The bar 19′ is of sufficient length to connect the two contacts 20 and 21 together when the lever 19 is in a predetermined position, and when the contacts 20 and 21 are so connected, it will be apparent that the circuits including both the coils 7 and 13 will be closed and the valve 4 maintained in open position as well as while the heating coil is performing its heating functions. Movement of the lever 19 in the direction of the arrow in Fig. 3 causes contact of parts 19′ and 21, whereby the valve 4 will be opened initially, and the further movement of the lever permitting the part 19′ to connect the contacts 20 and 21 accomplishes a subsequent heating of the motive fluid by the coil 7. If the lever 19 is moved in a direction opposite that indicated by said arrow in Fig. 3, the above operation is reversed in that the heating action of coil 7 is started by initial coöperation of parts 19′ and 20, and the valve 4 is subsequently opened when the last described movement of the lever 19 is continued to connect the contacts 20 and 21. Fig. 3 is merely diagrammatic, of course, and the parts 19 and 19′ represent a switch which will establish and maintain connection with the contacts 20 and 21 by friction.

By the arrangement of parts of the switch shown in Fig. 3, the operator may, at will, heat the casing B preliminary to the passage of the hydrocarbon therethrough, or subsequent to said passage.

As shown most clearly in Fig. 1 of the drawings, auxiliary means for heating the fuel may be employed by providing an electric heating device 25 surrounding a portion or branch of the manifold 11, said device 25 including a resistance coil connected by suitable wires 8″ to the circuit wires 8^a. A switch 26 connected with the wires 8′ may be operated to turn the heater 25 on or off as desired. It will be apparent that the heater 25 may be operated with, or independently of the primer, as is described herein.

Having thus described the invention, what we claim as new is:

1. In a primer for explosive engines, in combination, hydrocarbon supply means, a heater, a casing having a passage connecting the supply means with the heater, a valve normally closing said passage, and a common controlling device for the valve and heater and operable to open the valve and to cause heating of the hydrocarbon either before or after the initial charge of hydrocarbon has passed through the heater.

2. In a primer for explosive engines, the combination with a hydrocarbon supply means, a heater, a casing having a passage connecting the hydrocarbon supply with the heater, a valve in said passage normally closing the same, and means common to the heater and valve operable to open the valve, to start the heater either before or after opening of said valve, and to maintain the valve open and the heater in operation.

3. In an electrical primer for explosive engines, the combination with a casing, means for supplying a hydrocarbon to said casing comprising a passage, a valve normally closing said passage, an electromagnet comprising a core movable in the casing and connected with the valve, a heater for said casing comprising a coil, an electric circuit including said electromagnet and heating coil, means for closing a portion of said circuit to render the heating coil operative and for electrifying said magnet to cause movement of the core and the valve connected therewith, and means for supplying hydrocarbon from said casing to a motor.

4. In an electrical primer for explosive engines, the combination with a casing having hydrocarbon supply means comprising a passage, a valve arranged in said passage, a spring coacting with the valve to hold the same in a predetermined position, an electromagnet comprising a coil surrounding said casing, and a core within the casing, a heating coil also surrounding the casing and arranged adjacent to the coil of

the electromagnet, circuit wires connected to said coils, current generating means for the coils, a return lead connected to the coils, and a switch connected with the circuit wires and return lead and operable to close the respective circuits established by the latter for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN MORRIS HOBE.
URAL STILWELL TRAUB.

Witnesses:
JOSEPH SCHOLL,
HARRY E. PURDY.