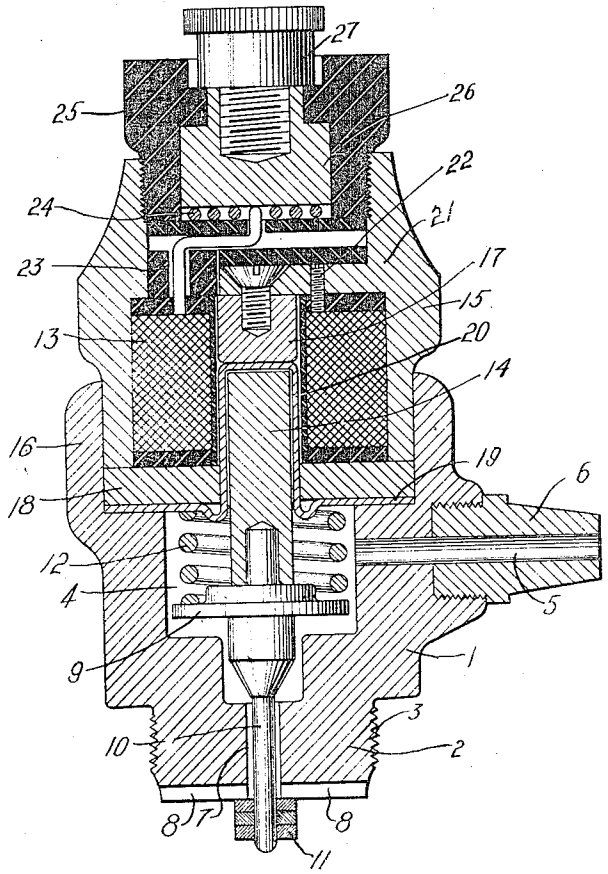
F. CONRAD.

PRIMING DEVICE FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED NOV. 5, 1913.

1,271,670.

Patented July 9, 1918.



WITNESSES:

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PRIMING DEVICE FOR INTERNAL-COMBUSTION ENGINES.

1,271,670. Specification of Letters Patent. Patented July 9, 1918.

Application filed November 5, 1913. Serial No. 799,256.

To all whom it may concern:

Be it known that I, FRANK CONRAD, a citizen of the United States, and a resident of Swissvale, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Priming Devices for Internal-Combustion Engines, of which the following is a specification.

My invention relates to priming devices for internal combustion engines, and it has for its object to provide a means whereby a rich combustible mixture may be readily and conveniently supplied to the cylinders of such engines.

In carrying out my invention, I employ a valve actuated by an electromagnet for controlling the flow of liquid fuel from a suitable source to the intake manifold of a gas engine. The windings of the magnet are protected by a metallic structure which is not affected by the liquid fuel, thus providing an arrangement which is substantial and permanent.

In the accompanying drawing, the single figure is a view in longitudinal section of a priming device constructed in accordance with my invention.

The priming device comprises a cylindrical shell or casing member 1, of phosphor bronze or similar material having a reduced portion 2 that is threaded at 3 for connection to the intake manifold or other suitable part of a gas engine (not shown). The casing 1 is provided with a central bore 4 to form a chamber or reservoir for a small quantity of liquid fuel. An opening 5 connects the chamber 4 with a nipple 6 that is adapted for connection to a suitable source of fuel, such as gasolene or other suitable liquid hydrocarbon. An outlet for the chamber 4 is provided by an axial opening 7 that is connected, at its lower end, to radial grooves 8 which serve to distribute or spray the priming liquid.

The opening 7 is controlled by a valve 9 having a guide rod 10 that is provided with lock nuts 11 which serve both to limit the upward movement of the valve 9 and to deflect the liquid fuel along the grooves 8 as it emerges from the opening 7. A spring 12 normally holds the valve 9 in its lower or closed position. The valve 9 is controlled by an electromagnet comprising a coil 13 and a movable core member 14 that is connected at its lower end to the valve 9. The coil 13 is inclosed in a cylindrical bushing 15 that has a driving fit with a flange portion 16 of the casing 1. The coil 13 is separated from the chamber 4 by an iron disk 18 and a brass lining 19. The lining 19 is provided with a cylindrical portion 20 which extends axially into the coil 13 and provides a means for guiding and limiting the movement of the core member 14. The lining 19 serves as a gasket to prevent the leakage of the liquid fuel from the chamber 4 into the structure of the coil 13.

The magnet is provided with a pole piece 17 that is attached to a member 21 which is integral with the bushing 15. The magnetic circuit of the coil 13 comprises the pole piece 17, member 21, bushing 15, iron disk 18 and movable core member 14. One terminal of the coil 13 is grounded by a threaded conductor 22 to the bushing 15. The other terminal of the coil extends through an insulated opening 23 in the member 21 and ends in a coil 24. A bushing 25 has a threaded engagement with the upper end of the bushing 15 and carries with it a conductor 26 to engage the terminal coil 24 of the coil 13. A binding screw 27 forms the outer terminal for the magnet winding 13.

It may be assumed that the priming device is connected to any suitable source of fuel. When it is desired to prime the engine, the circuit of the magnet coil 13 is closed by means of any suitable electrical connections and the movable core member 14 is drawn upwardly within the tubular portion 20 of the lining 19. If the fuel is under pressure, it will be forced through the nipple 6, opening 5, chamber 4, opening 7 and grooves 8 into a part of a gas engine closely related to the inlet valves, such as the intake manifold. The air drawn in by the engine pistons will then take up the vaporized fuel to form a rich mixture. If the fuel is not under pressure, the valve 9 will be held open during the rotation of the engine shaft in starting and the suction produced by the engine pistons will cause the fuel to flow in the same manner. While the priming device may be operated by independent means, it is preferably arranged to operate automatically in conjunction with a starting motor as shown and described in my copending application Serial No. 804,646, filed Dec. 4, 1913.

It will be noted that I have provided an

electrically operated priming device of simple construction in which the magnet windings are protected without the use of packing material of any description.

I claim as my invention:

1. In a priming device, the combination with a valve and a core member connected thereto, of a coil for actuating said core member, a casing for said coil, a spring between said valve and said casing, a second casing member having a passage therethrough controlled by said valve and a member for inclosing said core member and for forming a gasket for connecting said casing members.

2. In a priming device, the combination with a casing member having a chamber and an outlet for said chamber, and a valve for controlling said outlet, of a coil above said chamber, a member of non-magnetic material between said coil and said chamber and having a portion projecting within said coil, a second casing member for inclosing said coil separated from the other casing member by the member of non-magnetic material to constitute a gasket therebetween, and a movable core member within said projecting portion and attached to said valve.

3. In a priming device, the combination with a plurality of concentric casing members, one of said members being provided with a chamber and an opening for said chamber, of a coil above said chamber and inclosed by one of said casing members, a lining of non-magnetic material between said coil and said chamber and having a tubular portion within said coil, said lining extending between said casing members to form a gasket therefor, a movable core member within said chamber and said tubular portion, and a valve connected to said core member for controlling said opening.

In testimony whereof, I have hereunto subscribed my name this 29th day of Oct., 1913.

FRANK CONRAD.

Witnesses:
A. B. REYNDERS,
B. B. HINES.