

No. 867,122.

PATENTED SEPT. 24, 1907.

R. W. GODFREY.
GAS ENGINE STARTER.
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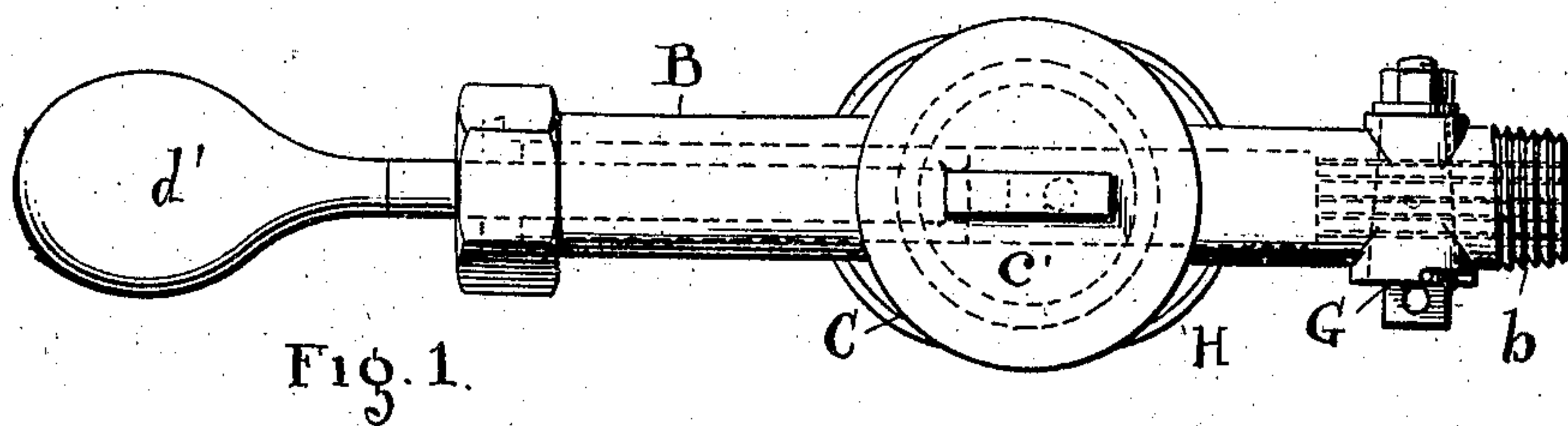


Fig. 1.

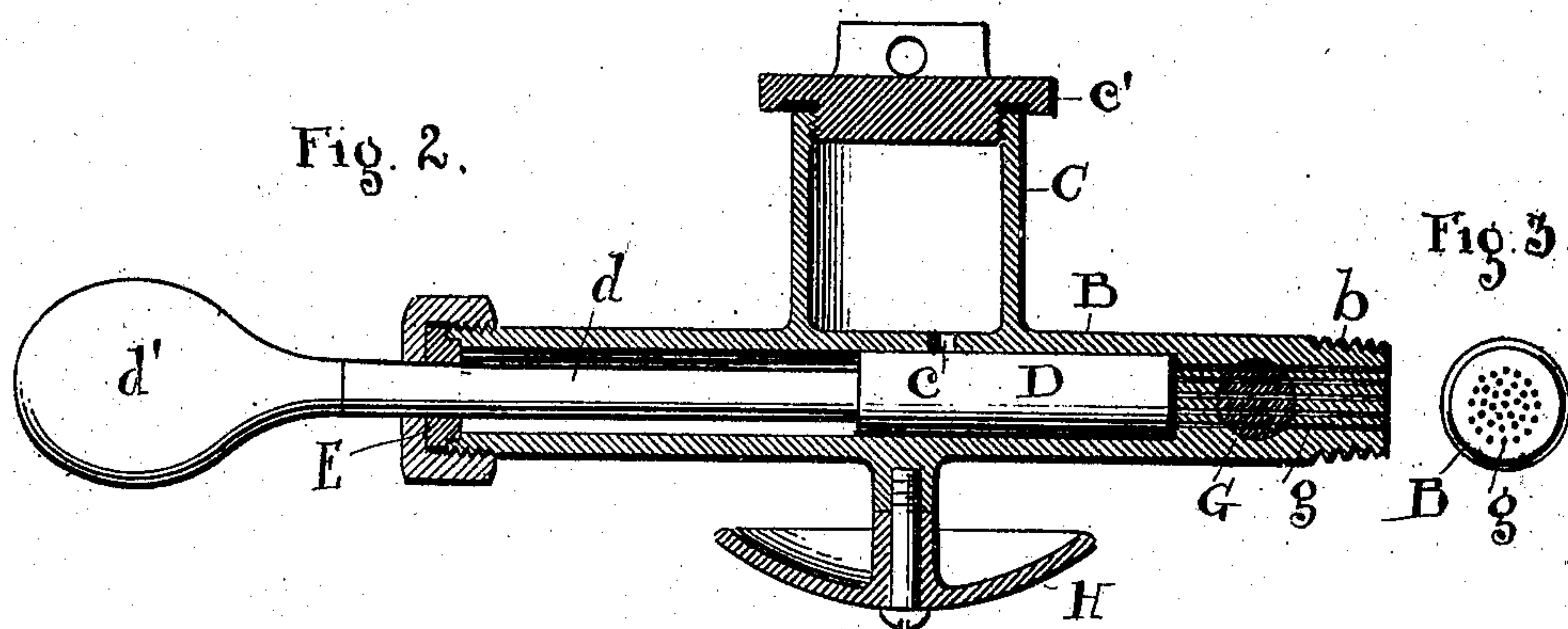


Fig. 2.

Fig. 3

ATTEST

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INVENTOR

Raleigh W. Godfrey

BY *H. J. Fisher* ATTY

UNITED STATES PATENT OFFICE.

RALEIGH W. GODFREY, OF ELYRIA, OHIO, ASSIGNOR OF ONE-HALF TO H. F. THOMPSON, OF LEXINGTON, OHIO.

GAS-ENGINE STARTER.

No. 867,122.

Specification of Letters Patent.

Patented Sept. 24, 1907.

Application filed March 28, 1906. Serial No. 307,603.

To all whom it may concern:

Be it known that I, RALEIGH W. GODFREY, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Gas-Engine Starters; and do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to gas engine starters, and the invention consists in a pump which is adapted to be connected with a gas engine cylinder, and to inject or spray a charge of gas or gasolene into the cylinder in a more or less heated state to charge the same for starting, all substantially as shown and described and particularly pointed out in the claims.

In the accompanying drawings Figure 1 is a plan view of a simple form of my new and improved starter or starting device, and Fig. 2 is a longitudinal central sectional elevation thereof. Fig. 3 is a front end view of the barrel showing the small channels therein for the discharge of the gasolene into the cylinder.

The device as shown in Figs. 1 and 2 comprises a tubular barrel B having a chamber or receptacle C supported thereon substantially midway between its ends and provided with an opening *c* in its bottom which communicates with the interior of said barrel. A suitable cap *c'* is threaded into or upon the top of said chamber and may be provided with a gasket or the like to make the connection gas and liquid tight, but still leaving the said cap removable for the purpose of filling the said chamber with liquid, presumably gasolene or its equivalent.

D represents a plunger, which has a stem *d* extending through the rear end of the said barrel and is provided with a handle *d'* for manipulating the said plunger. A suitable stuffing gland E is provided at this end of the barrel about the said plunger stem to avoid leakage, and the said plunger is adapted to operate within the barrel back and forth in respect to the hole in the bottom of cylinder C so as to open the same when a charge of gasolene or other explosive fluid is to be taken into the pump and to cut off the said supply and keep it closed while the plunger is being pushed forward to expel the gasolene from the pump. This requires that the said plunger be of such length that when the forward end of the stroke is reached it will still cover the hole *c* and prevent the outflow of gasolene from the said chamber into the barrel behind the plunger.

The front end of pump barrel B is threaded at *b* to be engaged in or with the relief cock connection or directly with the rear of a gas engine cylinder as hereinafter described when charging is to be accomplished,

and the said end of the barrel is provided with a series of relatively long and fine or small channels *g* which are preferably shown herein as arranged in concentric circles and of such length as to produce a rectilinear spraying effect when the plunger forces the liquid through the same. Possibly the main and essential effect of this construction may be said to be a direct or linear projection of the streams of gasolene at considerable distance individually into the motor cylinder from said channels instead of having the gasolene run together at a short distance from the nozzle of the barrel as occurs when the gasolene is forced through a series of fine perforations in a disk or the like set into the end of the barrel. In such case there is no lengthened projection or prolongation of the jets and they soon converge into a more or less solid volume and defeat the more important object of diffusion and rapid vaporization which it is important to obtain in a device of this kind to get the desired admixture of air and gas and a prompt action in explosion. Said channels *g* are traversed by a cut off valve G, which is adapted to be rotated axially and to be opened when a discharge of gasolene is to be obtained and closed when the barrel is being charged with the gasolene, and an end view of the nozzle of the barrel is shown in Fig. 3.

The channels *g* are continued transversely through said valve, and the said channels are drilled when the valve G is in open position so that they pass through said valve and are cut off when the valve is quarter turned.

H represents a heating pan or saucer, which is adapted to receive a quantity of some suitable burning fluid or other combustible for heating the device to the requisite condition for starting purposes and this part as well as the others shown may be more or less modified to equivalent forms without departing from the spirit of the invention.

In operation the device is heated and the plunger is drawn back to its limit, which opens hole *c* and permits the barrel in front of the plunger to fill with gasolene or vapor or both, the valve G in the meantime being closed. Then the said valve is opened and the plunger is pressed to the front, and the gasolene forced in very fine streams, jets or sprays, liquid or vapor, through the channels *g* into the engine cylinder, it being presumed of course that the pump has first been screwed in place in the said cylinder as hereinbefore mentioned. Meantime it is also presumed that the engine piston has been set so as to start the engine upon firing the mixture and that there is a quantity of air present or artificially supplied in or to the cylinder into which the gasolene is injected.

Plunger D is adapted to be withdrawn a greater or less distance beyond opening *c* to provide a larger or

smaller liquid chamber at the front of the plunger. The amount of liquid forced into the engine may be thus regulated to suit varying conditions.

Although the device is classed and described as a starter for gas engines, it will be understood that it is adapted for use with any type of explosive engine.

What I claim is:—

1. A gas engine starter having a tubular pump barrel, a liquid receptacle mounted on said barrel and having an orifice opening into said barrel, a plunger in said barrel adapted to traverse said orifice and a heating pan on the bottom of said barrel beneath said receptacle.
2. A gas engine starter adapted to be connected with an engine cylinder at its front end and comprising a liquid receptacle and a pump cylinder carrying said receptacle and open thereto, a plunger in said pump and a spraying outlet for said pump in direct line with said plunger.
3. A gas engine starter comprising pump and a liquid receptacle mounted thereon between its ends and open to said pump, said pump having a spraying discharge, and a heating pan beneath said barrel and receptacle.
4. A gas engine starter comprising a liquid receptacle

and a tubular barrel open thereto, a plunger in said barrel to force feed the liquid and said barrel having a series of outlets for the liquid at its front end and a valve adapted to close said openings.

5. A gas engine starter comprising a liquid receptacle and a pump barrel open thereto, a plunger in said barrel adapted to control the flow of liquid from said receptacle to said barrel, a spraying nozzle for said barrel in advance of said plunger, and a heating pan on the bottom of said barrel beneath said receptacle.

6. In a gas engine starter, a receptacle and pump barrel having a spraying nozzle and a valve to close said nozzle, a receptacle on said barrel substantially at its middle and having an outlet at its bottom into said barrel, a cylindrical plunger in said barrel adapted to close said outlet and to expel the liquid from the barrel at the same time, and a heating pan midway beneath said barrel.

In testimony whereof I sign this specification in the presence of two witnesses.

RALEIGH W. GODFREY.

Witnesses:

FRANK WILFORD,
LOLA W. STEARNS.