

R. J. MacLAREN.
ENGINE STARTER.
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1,058,247.

Patented Apr. 8, 1913.

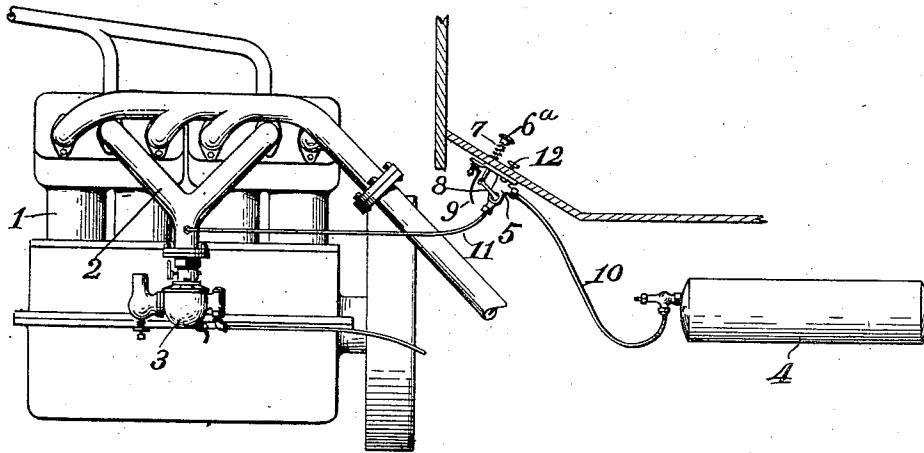


Fig. 1.

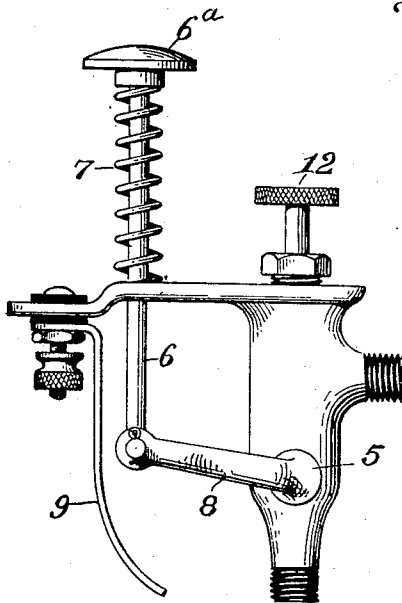


Fig. 2.

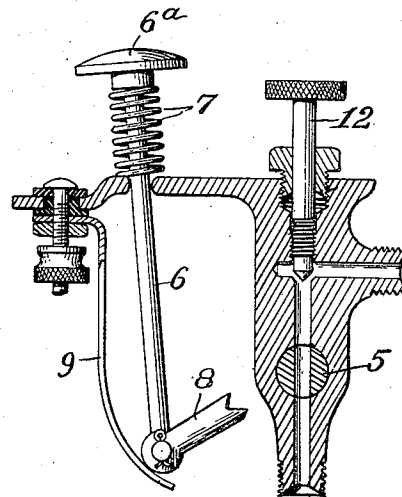


Fig. 3.

Witnesses
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ENGINE-STARTER.

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To all whom it may concern:

Be it known that I, RUSSELL J. MACLAREN, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Engine-Starters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in means for starting internal combustion engines, and its object is to provide means whereby when such an engine stops it will be charged with a mixture that will remain in proper condition for firing by the usual ignition means, whereby the engine may be readily started by igniting the said mixture; to provide a simple and reliable apparatus for the purpose and to provide the device with various new and useful features hereinafter more fully described and particularly pointed out in the claims reference being had to the accompanying drawings in which:—

Figure 1 represents an engine with my said device applied thereto; Fig 2 an enlarged detail of the valve and mechanism connected therewith shown in closed position; and Fig. 3 the same shown in open position and partially in vertical section.

Like numbers refer to like parts in all of the figures.

It is well known that an internal combustion engine frequently stops with an unconsumed charge in one or more of the cylinders, which charge if fired within a short time by the usual spark mechanism will start the engine again. The usual running charges of gasolene and air however, very quickly change to a condition in which they cannot be fired by any means. The compression is soon reduced and the gasolene soon condenses and separates from the air to such an extent that the charge is not combustible.

I have found that by supplying the engine with a mixture of some fixed combustible gas and air in proper proportion, that the same will remain in the engine for a long time in proper condition for ignition, and the engine may be started by firing this mixture by the usual firing spark in the manner sometimes done by firing the usual running charges before they have had time to as-

sume a non-combustible condition. I have also provided a device herein described, as one form of a convenient means for supplying a fixed gas in proper quantity, and at the same time short-circuiting the electric firing mechanism to avoid firing the charges whereby the engine stops with a charge of combustible mixture therein containing a mixture of fixed gas and air adapted to remain in the engine in proper condition for firing for a long time.

Referring to the drawings, 1 represents an internal combustion engine of any ordinary type, that shown being a four cylinder, four cycle engine, such as commonly used in automobiles.

2 represents the manifold conveying the charges of gasolene and air from the carbureter 3 to the various cylinders of the engine.

4 represents any convenient tank to contain a fixed gas, the usual "prestolite," so called, being convenient for the purpose.

5 represents a valve conveniently located, preferably beneath the foot board (if on an automobile), said valve being provided with an operating lever 8 to which is connected a push rod 6, extending through the foot board and provided with a spring 7 to engage a button 6^a on the push rod and move the valve to closed position.

9 is an insulated terminal in the path of the lever 8 and connected in the electric circuit of the spark mechanism in such manner that when the lever 8 is depressed to operate the valve 5 (as shown in Fig. 3) the lever 8 comes in contact with the terminal 9 and grounds the said circuit whereby the ignition spark in the engine is discontinued simultaneously with the opening of the valve 5. A pipe 10 connects the tank 4 with one side of the valve 5 and a pipe 11 connects the other side of the said valve with the manifold 2 close above the carbureter.

12 is a needle valve suitably arranged to throttle the valve 5 and thus limit the flow of gas to the proper quantity to form a suitable combustible mixture in the engine.

In operation the engine is stopped by depressing the push rod 6 by placing the foot of the operator upon the button 6^a. This cutting out of the spark stops the engine which in the meantime will run a few strokes by the momentum of the fly wheel and take in some unburned charges. The

flow of gas from the tank 4 will supply a sufficient quantity of fixed gas to the charges so that they will remain in the cylinders of the engine for a long time in proper condition for ignition by means of the usual spark 5 ignition whenever occasion arises to start the engine. The spark being produced as usual by shifting the ignition timer or by the usual circuit closer commonly supplied with 10 the ignition apparatus.

I am aware that it is not new to start an internal combustion engine by means of the ignition spark when there is remaining in the cylinder of the same a combustible 15 charge of the mixture used in running the engine. I am however not aware of any method of supplying a fixed gas in proper proportion to the last few charges taken in just before the engine stops whereby such 20 charges will remain in the engine cylinder in proper condition to be ignited for an indefinite period of time.

What I claim is:—

1. In combination with an internal combustion engine, a tank to contain a fixed gas 25 under pressure, a pipe connecting said tank with the intake manifold of the engine, a valve to control the flow through said pipe, and means for simultaneously opening said 30 valve and for cutting out the firing mechanism of the engine, whereby the engine stops with one or more charges therein containing a quantity of fixed gas, and means for firing said charges to start the engine.

35 2. In combination with an internal combustion engine having an intake manifold and an electric ignition device, a tank to contain a fixed gas under pressure, a pipe connecting the tank and the manifold, a valve

in the pipe to control the flow of gas there- 40 through, a lever to open and close the valve, an insulated terminal contacted by the lever when the valve is opened to short circuit the ignition apparatus, and an adjustable throttle to limit the flow of gas through the valve. 45

3. In combination with an internal combustion engine having a manifold and an electric ignition device, a tank to contain a fixed gas under pressure, a pipe connecting the tank and manifold, a valve in the pipe to 50 control the flow of gas therethrough, a lever to open and close the valve, a push rod to operate the lever, a spring on the rod to close the valve, a throttle to limit the flow of gas through the valve and an insulated 55 terminal engaged by the lever when the valve is open to ground the ignition apparatus.

4. In a starting device the combination with an internal combustion engine provided 60 with a carbureter for its regular operation, a fixed gas supply connected to the cylinders through the cylinder inlet valves, a controlling valve for said fixed gas supply, an ignition means for the regular operation of said 65 engine, means for cutting off said ignition means on the stopping of the engine and opening said control valve, whereby fixed gas is drawn into one or more of the cylinders to charge the same on the stopping of the en- 70 gine, and means for firing such charge or charges of fixed gas to start the engine.

In testimony whereof I affix my signature in presence of two witnesses.

RUSSELL J. MACLAREN.

Witnesses:

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LUTHER V. MOUNTON.