

C. I. SACKRIDER.
 STARTER FOR INTERNAL COMBUSTION ENGINES.
 APPLICATION FILED MAR. 3, 1910.

983,168.

Patented Jan. 31, 1911.

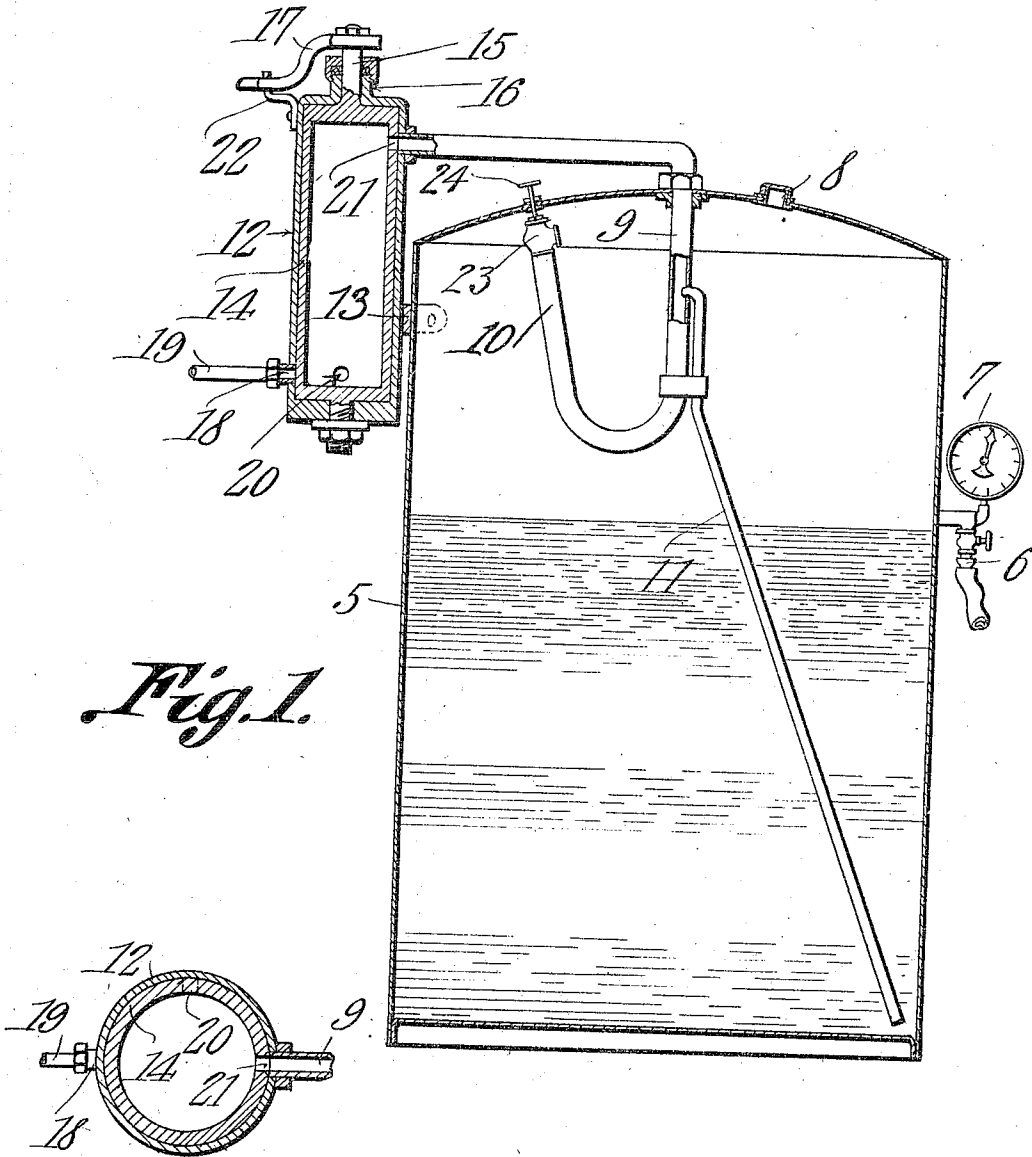


Fig. 1.

Fig. 2.

Witnesses
E. J. H. H. H.
 A. Easterday

Clarence I. Sackrider Inventor

By *Cashow & Co.* Attorneys

UNITED STATES PATENT OFFICE.

CLARENCE I. SACKRIDER, OF DELMAR, IOWA.

STARTER FOR INTERNAL-COMBUSTION ENGINES.

983,168.

Specification of Letters Patent.

Patented Jan. 31, 1911.

Application filed March 3, 1910. Serial No. 547,105.

To all whom it may concern:

Be it known that I, CLARENCE I. SACKRIDER, a citizen of the United States, residing at Delmar, in the county of Clinton and State of Iowa, have invented a new and useful Starter for Internal-Combustion Engines, of which the following is a specification.

This invention relates to that class of starting devices for internal combustion engines by which an initial combustible charge is supplied to the working cylinder from a source independent of the source which supplies the charge when the engine is in operation.

It is the object of the invention to provide improved means for forming the initial charge, and for delivering the same to the engine cylinder in a measured quantity.

The invention also has for its object to provide a starting device of the kind stated which can be readily applied to all existing forms of internal combustion engines without modifying or altering the structure thereof, and also one which is simple in construction, easily operated, and highly efficient in operation.

With these objects in view, the invention consists in a novel construction and arrangement of parts to be hereinafter described and claimed, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical sectional view of the apparatus. Fig. 2 is a horizontal section of the valve hereinafter referred to.

Referring to the drawing, 5 denotes a tank containing a supply of gasoline. The gasoline is under moderate pressure, air being pumped into the tank until the desired pressure is obtained. A pump connection is shown at 6, and a pressure gage at 7. In the top of the tank is a filling orifice provided with a suitable closure 8. The tank is entered by a pipe 9, said pipe entering the tank through the top thereof, and terminating within the tank in an upward bend 10. The end of the portion 10 of the pipe is open, and is located above the gasoline level in the tank. Entering the pipe 9 sideways, is a pipe 11 of considerably smaller diameter, said pipe 11 extending downwardly close to the bottom of the tank, and also extending for a short distance into the pipe 9.

The pipe 9 passes out of the tank 5, and leads to the casing 12 of a valve, said casing being mounted by means of brackets 13 on

the tank. The valve proper is a hollow plug 14 working in the bore of the casing 12. The plug 14 is mounted for turning movement in the casing 12, and has at one of its ends a stem 15 passing out of the casing through a suitable stuffing box 16, and having a handle 17 fitted to its outer end. The casing 12 has an outlet 18 which is connected by a pipe 19 to the engine cylinder (not shown). In the plane of the outlet, the plug 14 has a port 20, which, when it registers with the outlet, places the same in communication with the interior of the plug. The plug also has a port 21 adapted to register with that end of the pipe 9 which is connected to the casing 12, in which position said pipe discharges into the interior of the plug 14. The relative position of the ports 20 and 21 is such that when the port 21 is open, the port 20 is closed, and vice versa. On the casing 12 are stops 22 arranged in the path of the handle 17, and determining the two positions of the plug 14.

The operation of the apparatus is as follows: The tank 5 is partly filled with gasoline, and then pumped up to the desired pressure. To supply a combustible charge to the engine, the valve plug 14 is turned so as to open the pipe 9 into the interior of said plug. As already described, in this position of the valve plug, the port 20 is out of register with the outlet 18. The valve plug being in the position stated, a supply of air and gasoline vapor flows through the pipe 9 into the interior of the valve plug. The valve plug is then turned to shut off the pipe 9 from the interior of the plug, and to place the port 20 into registering position with the outlet 18, whereupon the valve plug empties into the engine cylinder, the charge being carried thereto by the pipe 19. The charge is fired in the engine cylinder by the ordinary ignition device of the engine. When the valve plug is turned as described to place the pipe 9 in communication with the interior of the plug, the compressed air in the tank enters the upper end of the bend 10 of the said pipe, and upon flowing past the end of the pipe 11 which enters the pipe 9, produces a suction in said pipe 11, and an atomizing action is had, the gasoline issuing from the pipe 11, and passing into the pipe 9 in the form of a fine spray, in which form it passes into the valve plug.

On the upper end of the bent portion 10 of the pipe 9 seats a valve 23 which is oper-

ated by a handle 24 from the outside of the tank, said handle passing through the top of the tank. The purpose of this valve is to regulate the amount of air entering the pipe, and thus obtain a properly proportioned mixture of air and gasoline vapor, to make an explosive charge capable of being ignited by the ignition device of the engine.

The valve plug 14 will be so proportioned that the supply will give the correct quantity of vapor to the engine cylinder, and as the inlet port 21 closes before the outlet port 20 opens, there is no danger of an excessive charge passing to the engine cylinder. The size of the plug will vary according to the number of cylinders to be supplied. The flow of gasoline vapor into the valve plug ceases when the pressure in the valve plug and the tank equalize, so that there is no danger of an excessive amount of gasoline vapor passing into the valve plug.

After the initial charge has been ignited, the engine "picks up" from its own carbureter.

25 What is claimed is:

1. A starter for internal combustion engines comprising a tank containing liquid fuel under pressure, an outlet pipe from the tank having its inlet end located above the liquid level, a pipe extending into the liquid, and opening into the outlet pipe, a valve casing having an inlet to which the aforesaid outlet pipe is connected, and an outlet connected to the engine cylinder, and a hol-

low valve working in the casing, and having ports controlling the inlet and outlets of the casing. 35

2. A starter for internal combustion engines comprising a tank containing liquid fuel under pressure, an outlet pipe from the tank having its inlet end located above the liquid level, a pipe extending into the liquid, and opening into the outlet pipe, a valve casing having an inlet to which the aforesaid outlet pipe is connected, and an outlet connected to the engine cylinder, and a hollow valve working in the casing, said valve having ports controlling the inlet and outlets of the casing, said ports being arranged to open the inlet when the outlet is closed, and vice versa. 40 45 50

3. A starter for internal combustion engines comprising a tank containing liquid fuel under pressure, an outlet pipe from the tank having a valve-controlled connection to the engine cylinder, and said outlet pipe having its inlet end valve-controlled and located above the liquid level, and a pipe extending into the liquid, and opening into the outlet pipe. 55 60

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CLARENCE I. SACKRIDER.

Witnesses:

G. W. WILSON,
E. S. MCCORD.