E. V. PENNINGTON.

ENGINE STARTER.

APPLICATION FILED APR. 23, 1913.

1,100,091. Patented June 16, 1914.

Fig. 1.

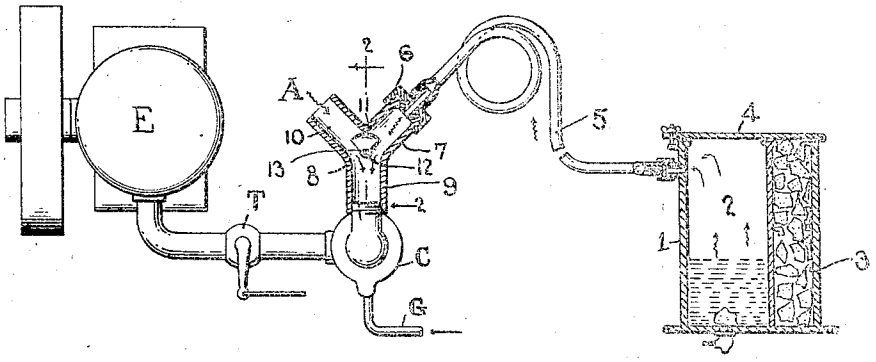


Fig. 2.

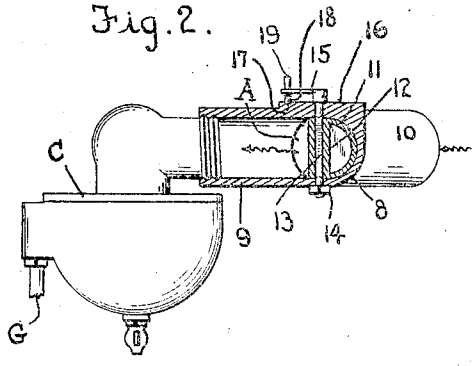


Fig. 4.

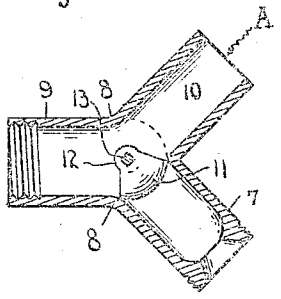


Fig. 3.

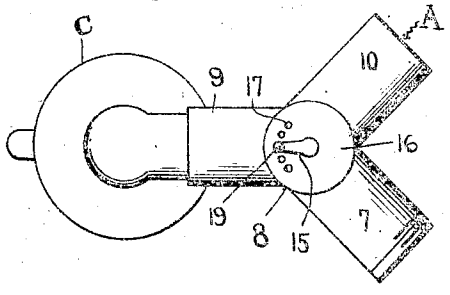
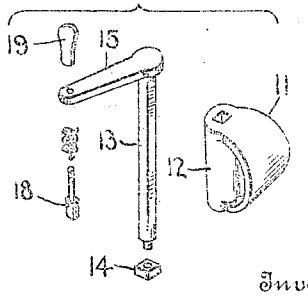


Fig. 5.



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UNITED STATES PATENT OFFICE.

EMORY V. PENNINGTON, OF MOHAWK, TENNESSEE.

ENGINE-STARTER.

1,100,091. Specification of Letters Patent. Patented June 16, 1914.

Application filed April 23, 1913. Serial No. 763,006.

To all whom it may concern:

Be it known that I, EMORY V. PENNINGTON, citizen of the United States, residing at Mohawk, in the county of Greene and State of Tennessee, have invented certain new and useful Improvements in Engine-Starters; and I do 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.

This invention relates to internal combustion engines, and more especially to the starting devices therefor; and the object of the same is to produce improved means for priming an engine cylinder or supplying it with a combustible mixture so that in the coldest weather a few revolutions of the crank shaft will start the engine. This and other objects are accomplished by the construction hereinafter more fully described and claimed, and as shown in the drawings wherein—

Figure 1 is a diagrammatic view, showing a one-cylinder engine in plan, a carbureter in horizontal section, and an acetylene gas tank in vertical section, with the parts all connected. Fig. 2 is an enlarged elevation of the carbureter and a section through its air valve, and Fig. 3 is a plan view of the carbureter. Fig. 4 is a horizontal section through said air valve. Fig. 5 is a perspective detail of the parts of the air valve.

In the drawings E designates a one-cylinder engine of the internal combustion type, although this engine might have any number of cylinders, and it could be a stationary engine, or of the type employed in automobiles or boats. The letter C designates the carbureter which is supplied with gasolene through a pipe G and takes in its air at A, and the letter T designates a throttle valve for controlling the flow of the charge to the engine, all as well understood. Considerable difficulty is experienced in cold weather in starting engines of this type, owing to the fact that gasolene does not vaporize well when cold, and the purpose of the present invention is to provide means for permitting the carbureter to take in a charge of acetylene gas mixed with air, so that when the engine is cranked the descent of the piston will suck in the charge which will be fired by the ignition system at the proper moment, and thereafter the engine will run of its own accord.

Coming now to the details of the present invention, the numeral 1 designates an acetylene generator mounted on the running board of an automobile, or in convenient proximity to the engine, and herein illustrated as containing a water chamber 2, a second chamber 3 for the carbid crystals, and a removable cover 4 so that a crystal may be dropped into the water in the chamber 2 and gas generated at will. From the top of this chamber leads a pipe 5 whose other end is connected by a coupling 6 with one arm 7 of a Y-shaped valve-casing 8 whose stem or shank 9 leads direct to the carbureter, and the other arm 10 of this casing is open for the admission of air as shown at A. When now a suitable valve or switch-plate is disposed within this casing and properly set, it will be obvious that just the desired mixture of acetylene gas and air can be fed through the shank 9 to the carbureter C, to start the engine in cold weather.

The action of the mechanism thus far described will be as follows: The operator sets the valve referred to, drops a crystal into the water compartment 2, opens the throttle T, and gas immediately generates. As soon as a little gas has accumulated in the top of the compartment 2 and flows along the pipe 5, he gives the starting crank a revolution, with the result that the descending piston within the engine sucks in a charge of mixed acetylene gas and air (possibly enriched by some gasolene vapor within the carbureter C, although this is immaterial) and the charge is exploded within the engine so that the latter commences running, and continues until the cylinder is heated.

The particular form of valve which I prefer to employ at the juncture of the two arms 7 and 10 with the shank 9 of the valve casing 8 is best seen in Figs. 2 and 5. The numeral 11 designates a curved switch plate carried by or fixedly mounted on a hub 12, and the latter is mounted on a squared shaft 13 which has a nut 14 at its lower end and a crank arm 15 at its upper end. Said arm moves over a dial 16 which may be suitably inscribed, but I prefer to provide it with a series of holes 17, and through the outer end of the crank arm is inserted a spring-actuated pin 18 carried by the crank handle 19, so that when the latter is raised the pin is lifted out of the hole and the arm 15 may be turned to adjust the plate 11 to and fro. By

turning this plate to the left as seen in Fig. 1 less air is admitted at A and more gas through the arm 7, and by turning it in the other direction a reverse of these conditions prevails. It is obvious that by proper manipulation of the crank arm 15 the gas can be shut off entirely, after which the carbureter C will take its proportion of air and mix it with the gasolene vapor as usual.

The parts of this device are of the desired proportions and materials and detailed construction with the exception of the features brought out in the following claims.

A starting device of this character becomes effective at once in the coldest weather by one or at most two revolutions of the starting crank, the acetylene gas is sucked in by the descent of the piston and is exploded within the cylinder rather than externally of it, the device is cheap, simple, and reliable and can be applied to any internal combustion engine, it is definitely controlled by the peculiar form of valve described, produces no carbonization or clogging of the gas tube, and can be applied to any form of carbureter by simply attaching the Y-shaped valve case thereto.

What is claimed as new is:

1. The combination with a gasolene engine, and its carbureter; of a Y-shaped coupling whose shank is connected with the air intake of said carbureter and one arm of which is open to the air, a source of acetylene gas, connections between it and the other arm of said coupling, and means for opening either arm to the shank and simultaneously closing the other arm.

2. The combination with a gasolene engine, and its carbureter; of a Y-shaped valve casing whose shank is connected with said carbureter and one arm of which is open to the air, an acetylene gas generator, connections between its gas chamber and the other arm of said casing, and a valve at the juncture of said arms and shank.

3. The combination with a gasolene engine, and its carbureter; of a Y-shaped valve casing whose shank is connected with said carbureter and one arm of which is open to the air, an acetylene gas generator, connections between its gas chamber and the other arm of said casing, a valve at the juncture of said arms and shank, the same consisting of a curved switch plate mounted on an upright hub, a shaft fixed through the hub and journaled through the casing, and a crank arm on one outer end of said shaft.

4. The combination with a gasolene engine, and its carbureter; of a Y-shaped valve casing whose shank is connected with said carbureter and one arm of which is open to the air, an acetylene gas generator, connections between its gas chamber and the other arm of said casing, a valve at the juncture of said arms and shank, the same consisting of a curved switch plate mounted on an upright hub, a shaft fixed through the hub and journaled through the casing, a crank arm on the upper end of said shaft, a dial mounted on the casing and having a series of holes, and a spring-actuated pin carried by the outer end of said arm and adapted to engage any of said holes, for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

E. V. PENNINGTON.

Witnesses:
J. E. Schrider,
J. Ralph Hoge.