N. CHOATE.

STARTING DEVICE FOR INTERNAL COMBUSTION ENGINES.

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1,085,541. Patented Jan. 27, 1914.

Fig. 1.

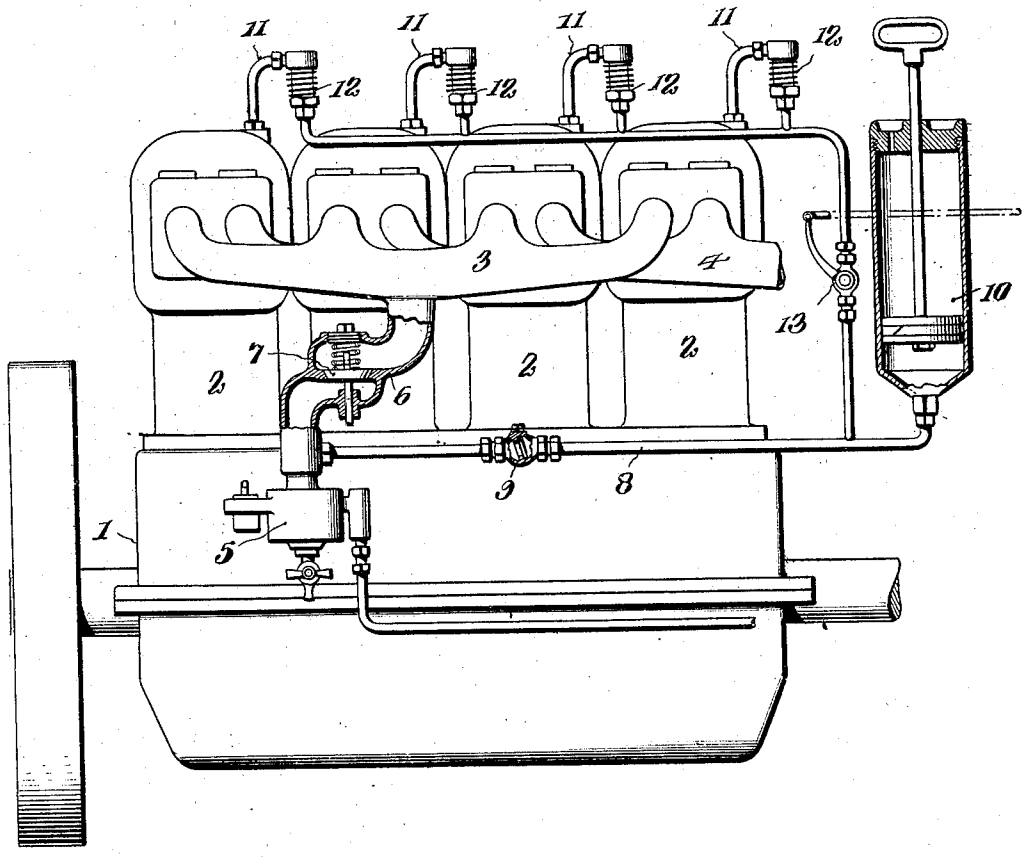
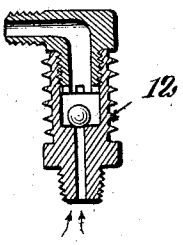


Fig. 2.



Witnesses

Helge A. Murray.

Grace P. Brereton

Inventor

Nai Choate

By Shurtleff & Mason

Attorneys.

UNITED STATES PATENT OFFICE.

NAI CHOATE, OF WASHINGTON, DISTRICT OF COLUMBIA.

STARTING DEVICE FOR INTERNAL-COMBUSTION ENGINES.

1,085,541. Specification of Letters Patent. Patented Jan. 27, 1914.

Application filed January 17, 1912. Serial No. 671,711.

To all whom it may concern:

Be it known that I, NAI CHOATE, a subject of the King of Siam, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Starting Devices for Internal-Combustion Engines, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

The present invention relates to certain improvements in devices for starting internal combustion engines, the object being to provide an initial proper mixture to the combustion chamber from the engine carbureter while the engine is at rest, so that the starting of the engine is facilitated, whether by cranking or the application of the proper igniting apparatus.

The invention, therefore, consists primarily in the combination with the cylinder or cylinders of a gas engine, of a carbureter supplying a mixture of air and gas to the engine, and means for supplying from said carbureter an initial charge to the engine for starting purposes, said means including a by-pass leading from the carbureter to the cylinder or cylinders, with a mechanically operated pump for forcing fuel through the by-pass to the cylinder or cylinders, and a check valve located in the by-pass between the pump and the carbureter.

It also consists in the various matters hereinafter described and referred to in the appended claim.

My invention is illustrated in the accompanying drawings, in which,—

Figure 1 is an elevation partly in section of a multiple cylinder internal combustion engine having my invention applied thereto; and Fig. 2 is a detail sectional view of the check valve leading from the by-pass to each cylinder.

In these drawings, 1 represents the usual multiple cylinder engine having the cylinders 2 herein shown as four in number. The intake manifold is shown at 3 and the exhaust manifold at 4. The carbureter is shown at 5 and has the inlet pipe 6 to the intake manifold controlled by the spring seated valve 7, normally closed to check the admission of air from outside sources, except through the carbureter, when under the suction of the pump hereinafter described, but opening under the suction of the engine to allow an uninterrupted passage of the mixture through the intake manifold into the cylinder combustion chambers.

To the passage 6 leading from the carbureter 5 to the intake manifold, is attached a pipe 8, having a check valve 9 therein. This pipe 8 is connected with a mechanical pump 10 of ordinary construction, and through branch pipes 11 controlled by check valves 12 is connected to the cylinders of the engine.

At the upstroke of the pump piston, the mixture is drawn from the carbureter through the pipe 8, passing the check valve 9, and at the pressure stroke of the pump, the mixture being prevented by the check valve from returning to the carbureter, is forced through the remainder of the pipe and through the check valves 12 into the individual combustion chambers of the engine. A shut-off cock 13 is placed in the vertical portion of the pipe 8, so that the by-pass may be entirely closed.

The check valves 12 are shown in detail in Fig. 2. They are attached to each engine cylinder, and allow them to receive the mixture independently, and prevent the mixture from escaping into other cylinders whose ports are open; thus allowing the cylinder that is ready for firing to receive good compression. As herein shown, the check valve casing has fins to insure cooling while the engine is in motion.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

The combination with a multiple cylinder internal combustion engine, of an intake manifold therefor, devices connecting said manifold to each engine cylinder, a carbureter, a pipe connecting said carbureter to said manifold, a check valve in said pipe for preventing the return of the gases through said pipe, an auxiliary intake port for each cylinder, a pipe common to each intake port,

a check valve for each intake port for preventing the gases from escaping from the cylinder, a pump, means independent of the engine for operating the pump, a pipe connecting the carbureter with said pump, a check valve in said pipe for preventing the return of the gases to the carbureter from the pump, and means for connecting the pump to the pipe common to the auxiliary intakes.

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

NAI CHOATE.

Witnesses:
C. L. STURTEVANT,
A. M. PARKINS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."