R. C. REICHEL.

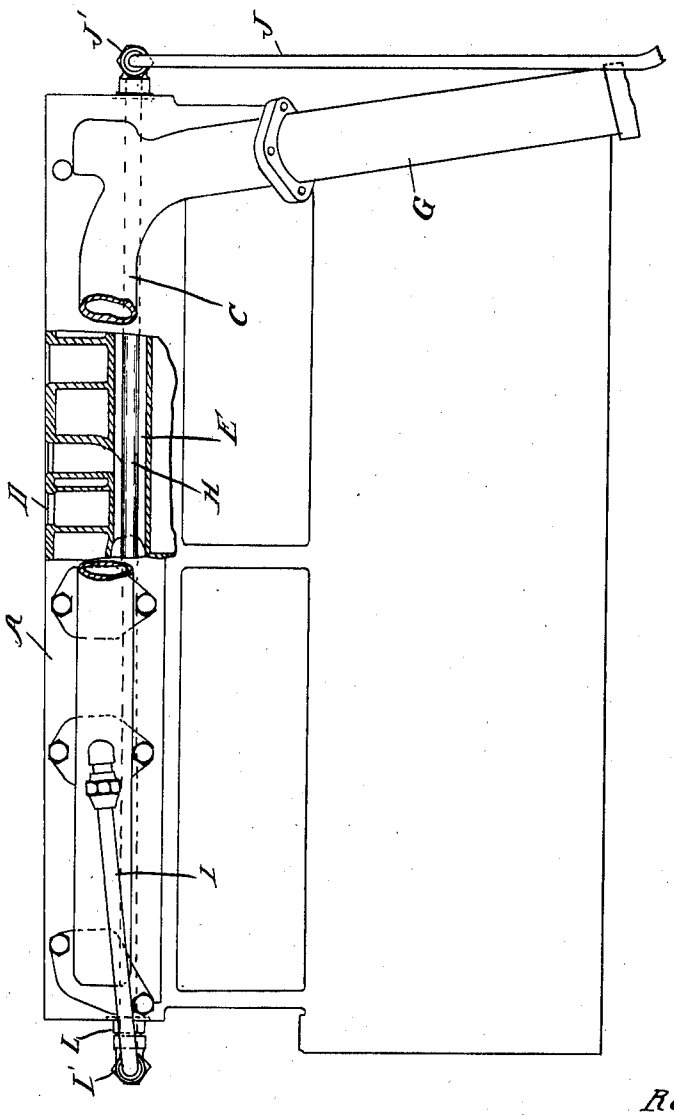
INTAKE MANIFOLD HEATER.

APPLICATION FILED APR. 22, 1918.

1,338,527. **Patented Apr. 27, 1920.**

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2

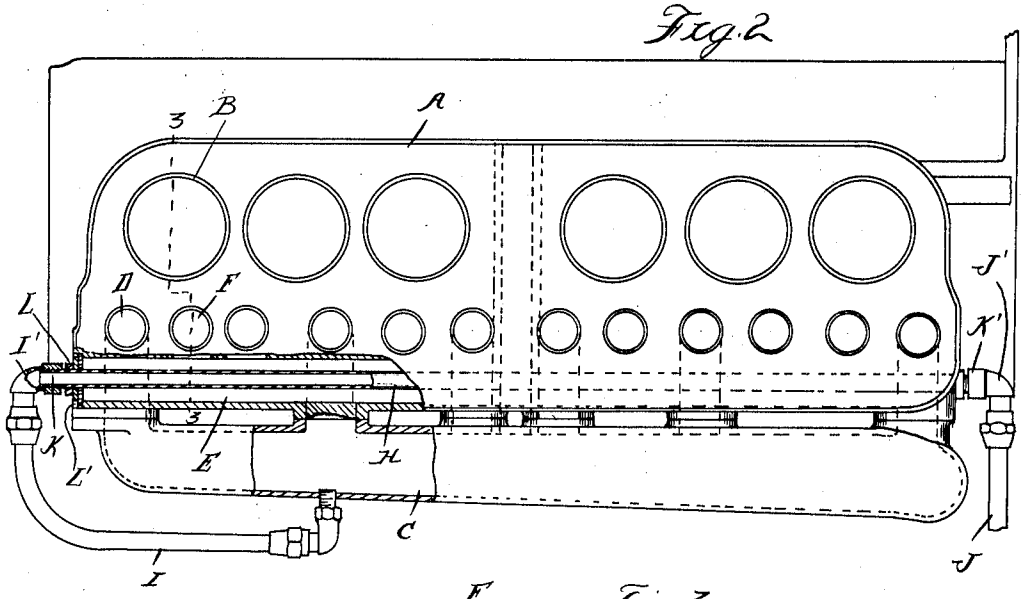
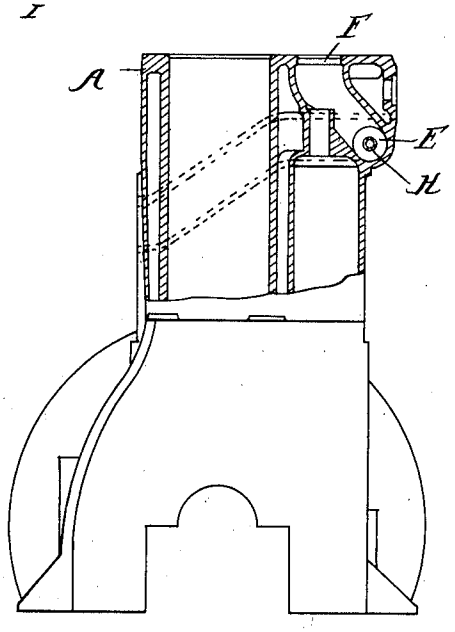


Fig. 3.



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UNITED STATES PATENT OFFICE.

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INTAKE-MANIFOLD HEATER.

1,338,527. Specification of Letters Patent. Patented Apr. 27, 1920.

Application filed April 22, 1918. Serial No. 230,010.

To all whom it may concern:

Be it known that I, ROY C. REICHEL, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Intake-Manifold Heaters, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to an intake manifold heater. It has been the usual practice, where the intake-manifold is bolted to the cylinder casting, to apply an external preheating device for the gaseous mixture as it passes through the intake-manifold. Such external appliances are not practical where the intake-manifold is cored in the cylinder casting. The object of the present invention is to obtain an internal heater for the intake-manifold cored in the cylinder casting. Another object is to obtain a heater which extends longitudinally through the intake-manifold and is attachable thereto. Other objects of the invention reside in the novel arrangements and combinations of parts as more fully hereinafter set forth.

In the drawings:

Figure 1 is a sectional side elevation of the engine embodying my invention;

Fig. 2 is a sectional top plan view;

Fig. 3 is a cross section on the line 3—3 of Fig. 1.

A is the cylinder casting of the engine forming the cylinders B, and C the exhaust manifold bolted to the casting and communicating with the cylinders B through the valve-controlled ports D. E is the intake-manifold cored in the cylinder casting A, extending longitudinally thereof and communicating with the cylinders B through the valve-controlled ports F. The exhaust manifold C is connected to the downwardly and rearwardly extending conduit G, which is connected to the muffler (not shown).

For the purpose of pre-heating the gaseous mixture in the intake-manifold before it passes into the engine cylinders, the engine is provided with the tube or conduit H extending longitudinally through the intake-manifold E and with the tube or conduit I connected to the forward end of the tube or conduit H and to the exhaust manifold, the inner end of the tube or conduit I being substantially flush with the inner wall of the exhaust manifold. Suitable tubes or conduits J are connected to the tube or conduit H and extend downwardly and rearwardly beside the exhaust conduit G, the rear or free end of these tubes or conduits being open to the air.

For the purpose of readily attaching the tube or conduit H to the engine, the latter is of a length such that both its forward and rear ends K and K′ respectively extend out through the cylinder casting A. These ends are threaded and are engaged by the lock nuts L which engage in the recesses L′ in the ends of the cylinder casting. The ends K and K′ are also threadedly engaged by the elbows I′ and J′ respectively forming parts of the tubes or conduits I and J.

In operation, the gaseous mixture passing through the intake-manifold E is heated by means of the tube or conduit H extending through the intake-manifold and connected to the exhaust manifold so that a portion of the exhaust gases pass therethrough. Due to the length of the tubes or conduits connected to and forming the heater, the exhaust gases will not make an appreciable noise upon passing into the air at the rear or free end thereof since the tubes or conduits have a muffler effect.

What I claim as my invention, is:

1. In an internal combustion engine, the combination with a cylinder block, of a water-jacket therefor, an intake manifold cored in said block and passing through said water-jacket to the ends of said block, and a conduit for exhaust gases extending through said intake manifold and spaced from the side walls thereof.

2. In an internal combustion engine, the combination with a cylinder casting, of a water-jacket therefor, an intake-manifold cored in said casting and extending longitudinally and to the opposite ends thereof and through said water-jacket, an exhaust manifold, a conduit extending longitudinally through said intake-manifold, the ends of said conduit extending beyond said casting, nuts threadedly engaging said ends for positioning said conduit, and a conduit threadedly engaging one of said ends and connected into said exhaust manifold.

In testimony whereof I affix my signature.

ROY C. REICHEL.