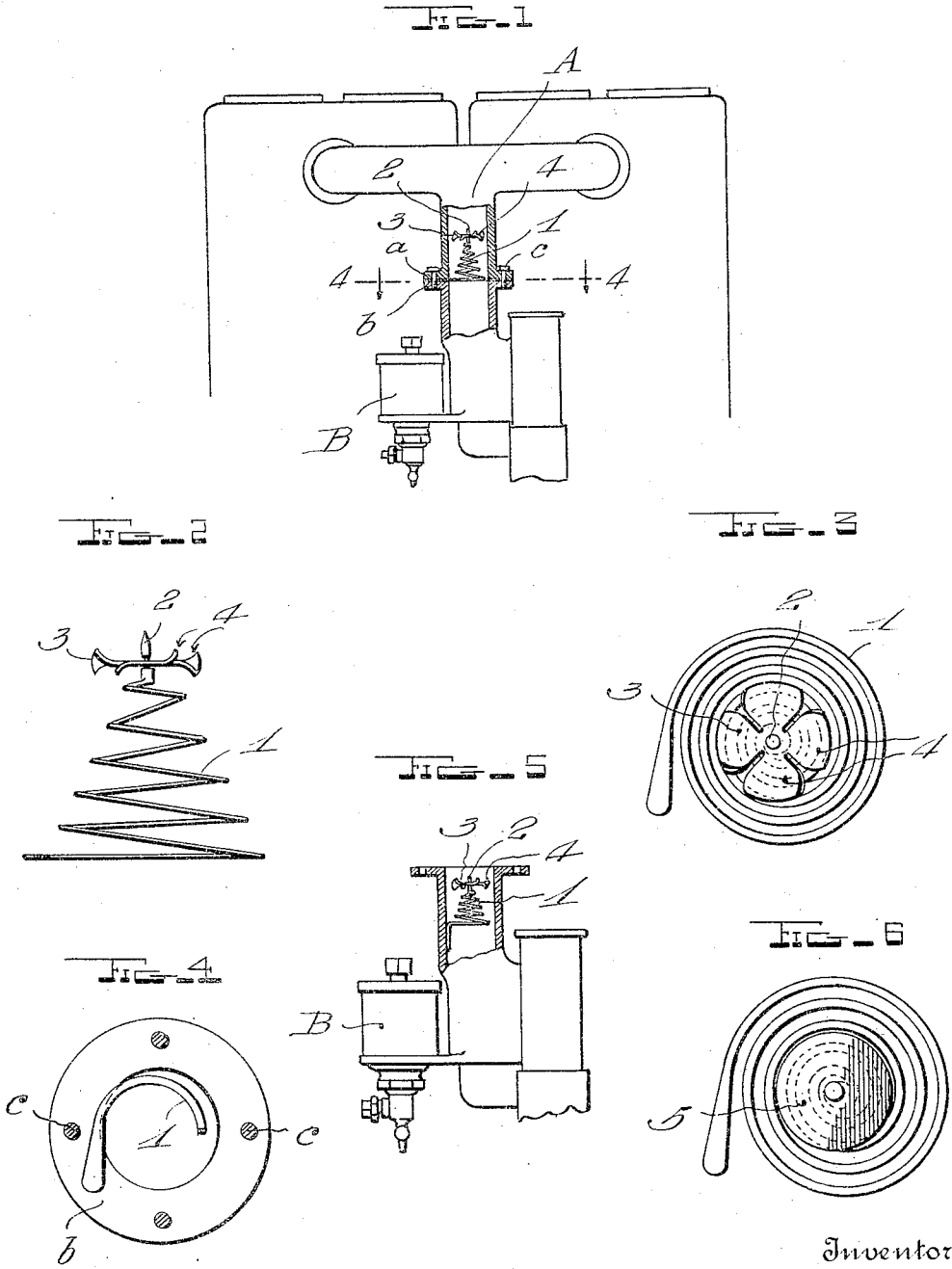


G. A. HEDRICK.  
 FUEL MIXING DEVICE.  
 APPLICATION FILED MAY 25, 1916.

1,237,779.

Patented Aug. 21, 1917.



Witness  
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Inventor  
*Glenn A. Hedrick*  
 By *A. B. Wilson & Co.*  
 Attorneys

# UNITED STATES PATENT OFFICE.

GLENN A. HEDRICK, OF SEATTLE, WASHINGTON.

## FUEL-MIXING DEVICE.

1,237,779.

Specification of Letters Patent. Patented Aug. 21, 1917.

Application filed May 25, 1916. Serial No. 99,812.

*To all whom it may concern:*

Be it known that I, GLENN A. HEDRICK, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Fuel-Mixing Devices for Internal-Combustion Engines; 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 certain new and useful improvements in fuel mixing devices designed more particularly for use in connection with internal combustion engines.

The primary object of the invention is to provide a device to be placed either in the intake manifold at one or the other of its extremities, or in the carbureter of an internal combustion engine, said device being adapted to thoroughly mix the fuel and air in its passage from or through the carbureter to the cylinders of the engine, and being designed to break up the liquid fuel and the air by causing these elements to come into closer contact after having left the mixing chamber of the carbureter.

Another object of the invention is to improve upon the devices of this character by the provision of a simple, comparatively strong, durable and inexpensive device, and one which is efficient and reliable in operation and well adapted to the purpose for which it is designed.

With these and numerous other objects in view, the invention resides in certain novel features of construction, and the combination and arrangement of parts as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of the specification, and in which similar reference characters designate like parts throughout the several views:

Figure 1 is a side elevation of an internal combustion engine, showing a device constructed in accordance with this invention arranged in the intake manifold thereof adjacent the carbureter, a portion of said intake manifold and said carbureter being shown in section;

Fig. 2 is a side elevation on an enlarged scale of the mixing device detached from the engine;

Fig. 3 is a top plan view of the same;

Fig. 4 is a horizontal sectional view taken

on the plane of the line 4—4 of Fig. 1, showing more particularly the manner in which the device is clamped between the flanges of the intake manifold and carbureter of the engine;

Fig. 5 is a vertical sectional view through an ordinary form of carbureter showing a mixing device installed therein; and,

Fig. 6 is a top plan view of a portion of a mixing device, showing the modified form of a baffle device mounted on the smaller end of the coil spring thereof.

Referring more particularly to the drawings, the reference character A designates the intake manifold, and B the carbureter of an internal combustion engine of any suitable construction. The carbureter B is attached to the intake manifold A in the usual manner by flanges *a* and *b* having clamping bolts *c* extending therethrough.

The reference numeral 1 designates a resilient member in the form of a conical spiral spring, the latter being preferably constructed from a comparatively thin flat strip of very resilient material and having its larger end clamped between the flanges *a* and *b* of the intake manifold and carbureter respectively, as clearly shown in Figs. 1 and 4 of the drawings. Any other suitable and equivalent means for attaching the larger end of the spring 1 to the intake manifold or carbureter of the engine may be employed instead of the means herein shown. The apex of the spring 1, or in other words, the smaller end thereof, is provided with a pivot stud 2 on which is rotatably mounted an agitator 3, the latter being preferably formed from a metal plate and having a plurality of blades 4 arranged on its periphery. Although the number of blades is immaterial, four are here shown.

In Fig. 5 of the drawings the mixing device is shown mounted or installed in any convenient manner within the mixing chamber of the carbureter. It is to be here noted that the device may be arranged at any convenient position within the intake manifold or carbureter of the internal combustion engine so long as it is in a fuel feeding member thereof, that is, so long as it is disposed in a member adapted to convey the fuel from the fuel tank to the cylinders.

In Fig. 6 of the drawings the agitator 3 is substituted by a flat disk or bottom 5, which similar to the agitator 3, is in effect a baffle device for a purpose to be hereinafter

described. This disk 5 may be either rotatably mounted with respect to the spring or it may be firmly fixed thereto.

In operation, when the engine is running, a mixture of hydro-carbon and air will pass through the coil spring on its way to the cylinders. In doing this, it will strike the baffle device; whichever form is used, and owing to the resiliency of the coil, because of the fact that it is made of comparatively thin material, said coil will be caused to vibrate, bounding in all directions, thereby effectively causing the fuel to be completely broken up and thoroughly mixed. An additional mixing is effected by the rotary agitator, as will be readily understood. The mixing of the fuel caused by its passage through the coil is due to the additional fact that it is given a whirling motion when it strikes the coil.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the device may be readily understood without a more extended explanation.

It may be seen that the objects of the invention have been effectively carried out by the provision of a very simple but extremely useful device which can be readily and easily applied to practically any form of internal combustion engine.

As numerous changes in form, proportion, and in the minor details of construction may be necessitated by the form or style of the carbureter, manifold or engine upon which

the device is to be installed, I do not wish to be limited to the precise construction of the device with respect to the different parts of the engine other than that set forth in the appended claims.

I claim:

1. The combination with an internal combustion engine, of a vibratory conical spiral spring having its larger end flattened and clamped between the abutting flanges of the carbureter and intake manifold of said engine, and an agitator rotatably mounted upon the smaller end of said spring, said agitator being adapted to be struck by the gases flowing through said manifold and said carbureter to rotate the same and to cause said spring to vibrate.

2. A device of the class described comprising a vibratory conical spiral spring having its larger end flattened to adapt it to be clamped between the abutting flanges of the carbureter and intake manifold of an internal combustion engine, a pivot stud formed integrally with the smaller end of said spring and extending axially with respect to the latter, and an agitator rotatably mounted on said stud.

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

GLENN A. HEDRICK.

Witnesses:

PHILIP EVANS,  
C. E. RIDGEWAY.