

Dec. 16, 1930.

J. A. SECOR

1,785,501

METHOD OF AND APPARATUS FOR REATOMIZING FUEL

Filed Feb. 17, 1928

Fig. 2.

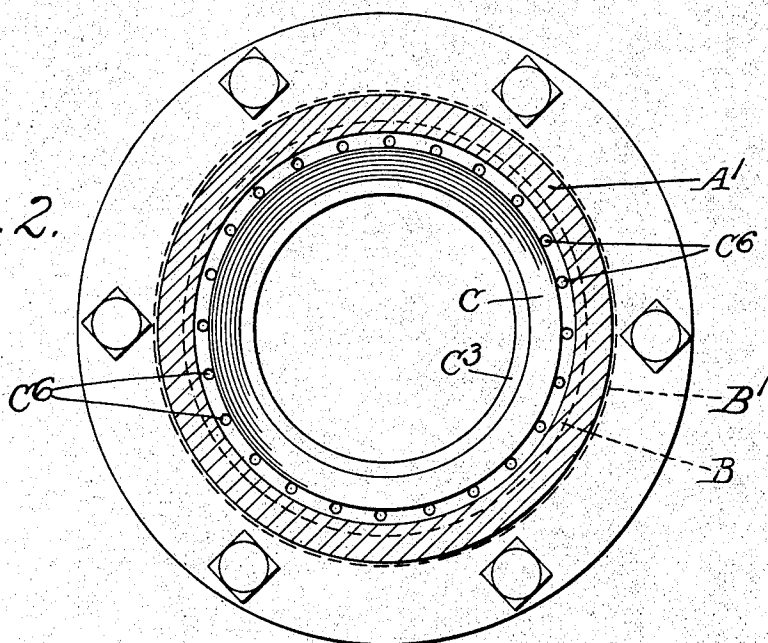


Fig. 1.

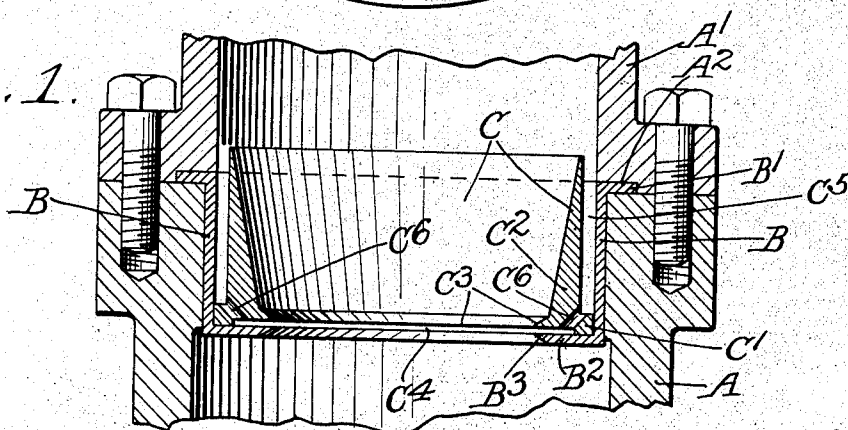


Fig. 3

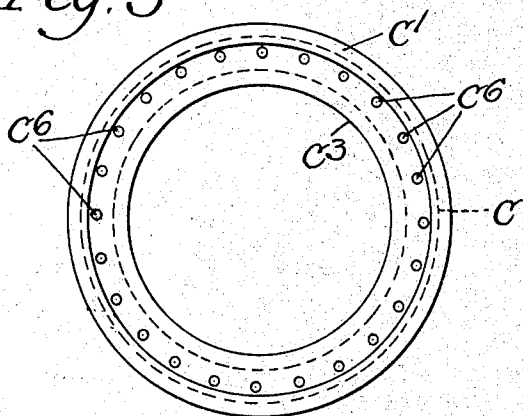
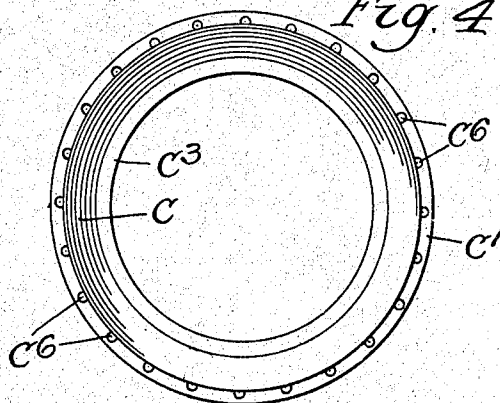


Fig. 4



Inventor
John A. Secor
by Parker & Carter
Attorneys.

UNITED STATES PATENT OFFICE

JOHN A. SECOR, OF LA PORTE, INDIANA, ASSIGNOR TO ADVANCE-RUMELY COMPANY,
OF LA PORTE, INDIANA, A CORPORATION OF INDIANA

METHOD OF AND APPARATUS FOR REATOMIZING FUEL

Application filed February 17, 1928. Serial No. 255,165.

This invention relates to a method of and apparatus for preparing fuel for burning. It has for one object to provide means and a method whereby liquid hydrocarbon fuel which has been wholly or partially mixed with air and subsequently deposited out of the air may be remixed and reatomized to permit more perfect combustion. This remixing may be carried out at any point in the fuel line after the original mixing. Thus in the case of a carburetor engine the remixer may be located anywhere and the remixing process may be carried out anywhere between the carburetor and the point of entrance of the fuel into the chamber in which it is to be burned. Another object of the invention is to provide means for separating out liquid fuel from the main mixed body and for remixing it. Another object is to provide means for collecting such separated liquid fuel, holding it separated, distributing it about the fuel passage and remixing and reintroducing it into the main mixture stream in an even manner. Other objects will appear from time to time in the course of the specification and claims:

My invention is illustrated more or less diagrammatically in the accompanying drawings wherein—

Figure 1 is a cross section of an apparatus for carrying out the process;

Figure 2 is a plan view of the apparatus in position in a fuel supply line with parts in section;

Figure 3 is a plan view of the bottom or down stream side of the reatomizer core;

Figure 4 is a plan view of the upper or up stream side of the same member.

Like parts are indicated by like characters throughout the specification and drawings.

A indicates a portion of the fuel supply line. It may be merely a pipe or a portion of the intake manifold or any suitable inclosed member by means of which fuel may be conducted to the point of combustion. As here shown this member is joined to a second similar member A¹. This latter member is provided with an annular depression A² so that the shield of the reatomizer may be positioned in it.

The reatomizer proper is formed of two parts, an outer member or shield B which is generally cylindrical in shape and provided with a laterally and outwardly extending flange B¹. At its other end it is provided with an inwardly extending flange B² which is sharpened at its inner edge as at B³.

The core or inner member of the reatomizer is the member C. It is provided at one end with an outwardly extending flange C¹. It is thickened towards one end as at C² and provided with an inwardly extending sharpened flange or edge C³. The flange C¹ extends below the end of the reatomizer proper and thus provides an annular depression C⁴. When the core and shield are assembled together as shown in Figure 1, the depression C⁴ provides clearance between the two parts except for the limited space where the bottom of the flange C¹ contacts the inner face of the member B². The flange C¹ serves to center and space the core away from the shield so as to provide an annular air space C⁵. At approximately the juncture of the flange C¹ and the body C there are formed a number of relatively small perforations C⁶. These perforations extend through the thickened part of the member C and communicate with the depression C⁴ so that when the parts are in the position shown in Figure 1 these perforations extend from the air space C⁵ to the open space formed between the bottom of the core C and the upper face of the flange B². By reason of this construction air and liquid may pass from the annular space between the sides of the core and the shield through these perforations and over the partially reatomizing edges.

While I have illustrated and described an operative device it will be obvious that many changes might be made in the size, shape, number and distribution of parts without departing materially from the spirit of my invention, and I wish, therefore, that my showing be considered in a large sense as diagrammatic.

The use and operation of my invention are as

It is so positioned that the open end of the annular air space extends toward the upstream side and thus it faces directly into the current of fuel as the latter is drawn into the combustion space of the engine. Liquid which has been separated out from the fuel stream or current will be largely deposited on the sides of the passage and by reason of the current of air and from other causes it will be caused to move into the annular space C⁵ and will be retained and distributed about the entire reatomizer. It will be forced through the perforations and so will come out into the narrow annular space between the bottom and down stream side of the core and the upper face of the flange member B² of the shield. The current passing through the center of the reatomizing device will act upon this liquid after it passes out between the two adjacent sharp edges C³ and B³ and will thus reatomize the liquid, and by reason of its construction this reatomizer will evenly distribute the liquid and so will evenly distribute the reatomized fuel after it is reintroduced into the main fuel current or stream.

The device therefore prevents the entrance of liquid fuel into the combustion space by catching it as it runs along the walls of the fuel passages and it reatomizes it as above explained.

I claim:

1. The method of preparing a liquid fuel for combustion which includes the following steps: mixing the fuel with air, conducting the mixture through a conduit toward the point of combustion, separating liquid particles which have been deposited from the mixture stream, segregating them and accumulating them, re-inserting them into the stream of mixture in an extended even distribution about the conduit by reatomizing them at the point of their re-entrance into the mixture stream.

2. The method of preparing liquid fuel for combustion which includes the following steps, mixing the fuel with air, conducting the mixture in a closed member toward the point of combustion, separating out from the stream liquid particles, collecting these particles in a storage space, distributing them in a continuous manner about the passage, re-discharging them into the moving stream of mixture at a point of increased velocity.

3. The method of preparing liquid fuel for combustion which includes the following steps, mixing the fuel with air, conducting the mixture in a closed member toward the point of combustion, separating out from the stream liquid particles, collecting these particles in a storage space, distributing them in a continuous manner about the passage, re-discharging them into the moving stream of mixture at a point of increased velocity

at a plurality of points evenly spaced about the passage.

4. The method of reatomizing liquid fuel and air, which includes collecting and accumulating separated fuel particles, redistributing them in an extended jet about the mixture current, and reatomizing the liquid fuel evenly into the current.

5. The method of reatomizing liquid fuel and air, which includes collecting and accumulating separated fuel particles, redistributing them in a continuous jet about the mixture current, and reatomizing the liquid fuel evenly into the current at a point of increased velocity.

6. A reatomizer including an outer member having an inwardly extending flange, an inner member positioned within the first and provided with an outwardly and downwardly extending flange which contacts the outer member and holds the inner member away from contact with the first and provided with an inwardly extending flange, the inner member provided with a perforation communicating with its exterior and with the space between the flanges of the two members.

7. A reatomizer including an outer cylindrical member having an outwardly extending flange and an inwardly extending sharpened flange, an inner cylindrical member positioned within the first and provided with an outwardly extending flange which contacts the outer cylindrical member and holds the inner cylindrical member away from contact with the first and is also provided with an inwardly extending flange, the inner cylindrical member provided with a perforation communicating with its exterior and with the space between the flanges of the two cylindrical members.

8. A reatomizer including an outer cylindrical member having an outwardly extending flange and an inwardly extending flange, an inner cylindrical member positioned within the first and provided with an outwardly and downwardly extending flange which contacts the outer cylindrical member and holds the inner cylindrical member away from contact with the first and is also provided with an inwardly extending flange, the inner cylindrical member provided with a perforation communicating with its exterior and with the space between the flanges of the two cylindrical members.

9. A reatomizer including an outer cylindrical member having means for securing it within an intake passage, an inwardly extending flange, an inner cylindrical member positioned within the first and provided with an outwardly and downwardly extending flange which contacts the outer cylindrical member and holds the inner cylindrical member away from contact with the first throughout the major portion of its exterior and provided with an inwardly extending flange, the inner cylindrical

cal member provided with a perforation communicating with its exterior and with the space between the flanges of the two cylindrical members.

5 10. A reatomizer including an outer member having an inwardly extending flange, an inner member positioned within the first and provided with an outwardly and downwardly extending flange which contacts the outer
10 member and holds the inner member away from contact with the first, such inner member being thickened at its bottom and provided with an inwardly extending flange, the inner member provided with a perforation
15 communicating with its exterior and with the space between the flanges of the two members.

11. A reatomizer including an outer member having an inwardly extending sharpened
20 flange, an inner member positioned within the first and provided with an outwardly extending flange which contacts the outer member and holds the inner member away from contact with the first and provided with an inwardly extending sharpened flange, the inner
25 member provided with a perforation communicating with its exterior, and with the space between the flanges of the two members.

12. The method of reatomizing liquid fuel
30 for combustion which includes collecting liquid particles out of a moving constricted current of mixture, accumulating said fuel particles, redistributing them in a constricted space about the mixture current and reatomizing them in an extended jet by drawing
35 them over a sharpened edge at a point of increased velocity.

Signed at La Porte, county of La Porte,
and State of Indiana, this 7th day of February,
40 1928.

JOHN A. SECOR.

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