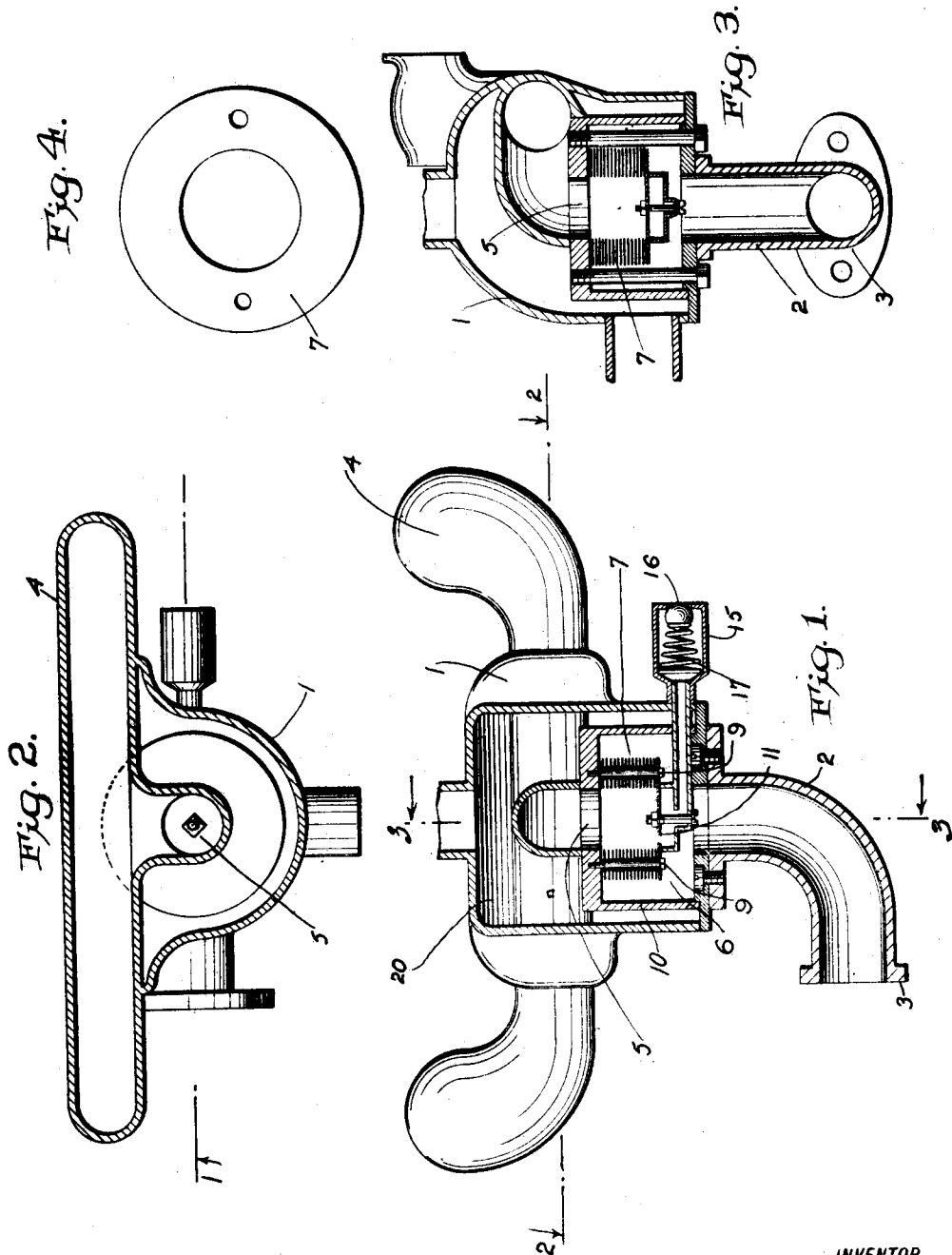


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GAS MIXER.
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1,379,437.

Patented May 24, 1921.



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GAS-MIXER.

1,379,437.

Specification of Letters Patent.

Patented May 24, 1921.

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To all whom it may concern:

Be it known that I, CLARENCE H. BENNETT, a citizen of the United States, and a resident of Jamesburg, in the county of Middlesex and State of New Jersey, have invented a new and Improved Gas-Mixer, of which the following is a full, clear, and exact description.

The present invention relates to internal combustion engines, and has for an object to provide a mixer having means for improving the character of the mixture of gas and air used in an internal combustion engine by causing the small drops of vaporizable liquid ordinarily held in suspension to be broken up and vaporized.

In accordance with the invention, an obstruction is introduced into the passages through which the mixture flows, such obstruction presenting narrow interstices through which the mixture flows and against the sides of which the minute drops of liquid ordinarily carried in suspension will contact and thereby be broken up and evenly vaporized.

In the drawings, accompanying and forming part of this specification, is shown an illustrative embodiment of the invention.

Figure 1 is a vertical sectional view taken on the line 1—1, Fig. 2, of a device embodying the invention and designed to be introduced between the carbureter and a four-cylinder engine of an automobile;

Fig. 2 is a horizontal sectional view taken on the line 2—2, Fig. 1;

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 2; and

Fig. 4 is a detail plan view of one of the annular plates constituting the obstruction shown.

The embodiment illustrated comprises a casing 1 with an inlet connection 2 secured thereto and provided with a flange 3 for attachment to the outlet end of a carbureter. The casing as shown is provided with a manifold 4 integral therewith and connected with an outlet 5 from the mixing chamber 6 of the device. Interposed in the mixture passage, and preferably in the mixing chamber 6, is a series of parallel plates 7 closely spaced and between which the mixture must pass from the inlet to the outlet of the device. As shown, the plates are annular and mounted on parallel bolts 9

secured in an inverted cup-shaped member 10 positioned in the casing and forming the mixing chamber 6. The rings 7 surround the outlet 5; and a plate 11 bearing against the lowermost ring forms a closure, thereby causing the mixture to pass laterally inward between the annular plates 7 as it passes to the outlet 5 and manifold 4. The annular plates are spaced closely together, thin washers being interposed therebetween on the bolts 9.

The space between the annular plates may vary in accordance with conditions and should be small enough so that the minute drops which are ordinarily carried in the mixture from the carbureter will contact with the face of the plates, thereby causing the same to be broken and to be vaporized into the mixture. It has been found that satisfactory results may be obtained if the plates are spaced about one two-hundredths of an inch apart. The bolts may be screwed into the member 10 more or less tightly, thus constituting means for adjusting to a slight extent the distance between the several plates. As a result of the action of the plates, the mixture which enters the manifold is practically free from the minute drops of liquid ordinarily carried from the carbureter, and because the mixture is a more complete and more perfect vapor a greater efficiency is maintained.

I prefer to provide an auxiliary air inlet controlled by a check valve 16, the spring 17 of which is tensioned to permit inlet of air through such auxiliary inlet only when the suction of the engine exceeds a certain predetermined degree. Although I have shown a check valve, it is to be understood that I may use any suitable form of valve, such as one manually controlled from the dash, or a valve which might be set for varying weather conditions and left in such adjustment for any desired length of time.

It is desirable, also, to maintain the device in heated condition, and to this end the casing is formed to provide a jacket provided with an inlet and an outlet and through which exhaust gases from the engine are passed. The device is thus maintained at a high temperature and increased efficiency is thereby obtained.

It is to be understood that modifications may be made within the spirit of the inven-

tion without departing from the scope of the claims appended hereto.

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

1. A vaporizer comprising a casing having a mixture inlet and outlet opening, a series of similar annular plates within the casing and arranged in such proximity to each other as to effect a fine breaking up and vaporizing of the mixture on its passage between them, the said annular plates being formed with central openings coinciding with each other and with the outlet opening forming a central space in communication with the said outlet opening, the outer edges of the plates being spaced from the casing to permit the passage of the mixture between the outer edges of the plates and thence into the central chamber, the end of said central chamber opposite the outlet opening being closed against the passage of the carbureted mixture whereby to force the passage of such mixture between the outer edges of said plates in its course to the central chamber and thence to the outlet.

2. A mixer comprising a casing having a mixture inlet and outlet opening, a series of similar ring-shaped plates within the casing and arranged in such close proximity to each other as to effect a fine breaking up and vaporizing of the mixture on its passage between them the central openings in the said annular plates coinciding with each other and with the outlet opening forming a central space in communication with the said outlet opening, the outer edges of the plates being spaced from the casing to permit the passage of the mixture between the outer edges of the plates and thence into the central chamber, the end of said central chamber opposite the outlet opening being closed against the passage of the carbureted mixture whereby to force the passage of such mixture between the outer edges of said plates in its course to the central chamber and thence to the outlet.

3. A mixer comprising a casing having mixture inlet and outlet openings, a series of similar annular plates within the casing and arranged in such close proximity to each other as to effect a fine breaking up and vaporizing of the mixture on its passage between them the central opening in said annular plates coinciding with each other and with one of the openings in the casing forming central communication with said opening, the outer edges of the plates being spaced from the casing to permit the passage of the mixture between said edges of the plates, the end of said central chamber opposite the opening communicating therewith being closed against the passage of the carbureted mixture and being provided with an air inlet.

4. A mixer, comprising a series of spaced parallel plates having openings therein to form a common passage, a casing surrounding said plates and spaced therefrom, and having an inlet and outlet, the end of the common passage opposite the outlet opening being closed whereby to cause an explosive mixture to pass from said inlet to the outside of said plates and from said passage to said outlet, after it has passed between said plates.

5. A mixer including a casing formed with inlet and outlet openings, a baffling means within such casing and arranged around said outlet opening, said baffling means including a nest of spaced annular plates whose central openings are co-equal in diameter, such plates having their outer edges spaced from the inner face of the casing and an imperforate plate arranged beyond the outermost of such annular plates and opposite said outlet opening.

6. A mixer including a casing formed with inlet and outlet openings, a baffling means within such casing and arranged around said outlet opening, said baffling means including a nest of spaced annular plates whose central openings and outer edges respectively are co-equal in diameter, such plates having their outer edges spaced from the inner face of the casing and an imperforate plate arranged beyond the outermost of such annular plates and opposite said outlet opening.

7. A mixer including a casing formed with inlet and outlet openings, a baffling means within such casing and arranged around said outlet opening, said baffling means including a nest of spaced annular plates whose central opening are co-equal in diameter to one another and to the outlet opening, such plates having their outer edges spaced from the inner face of the casing and an imperforate plate arranged beyond the outermost of such annular plates and opposite said outlet opening.

8. A mixer including a casing formed with inlet and outlet openings, spaced annular plates arranged around said outlet opening, an imperforate plate associated with the outermost annular plate and opposite such outlet opening, all of such plates being spaced from the inner face of the casing, the mixture after reaching the space between the plates and casing flowing toward a common center and so into the outlet opening.

9. A mixer including a casing formed with inlet and outlet openings, a baffling means arranged around said outlet opening and spaced from the inner face of the casing, said baffling member comprising a nest of spaced annular plates and an imperforate plate arranged beyond the outermost of said annular plates, and opposite the outlet opening, the cross-sectional area of the inlet and

outlet openings being less than that of the casing whereby to cause the mixture, after its having reached the point adjacent to the outer edges of such plates, to flow toward
5 the common center at an accelerated speed.

10. A mixer, including a baffling means comprising a plurality of spaced parallel

plates, each having a central opening, a casing inclosing said baffling means and having an inlet and outlet opening, and means to 10 divert the mixture from said inlet opening to the outside of said plates, and thence to the central opening thereof.

CLARENCE H. BENNETT.