E. D. SAINT CYR.

GASEOUS FUEL MIXER.

APPLICATION FILED DEC. 3, 1913.

1,118,237. Patented Nov. 24, 1914.

Fig. 2

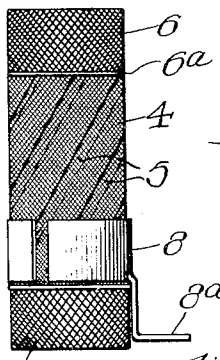


Fig. 7

Fig. 1

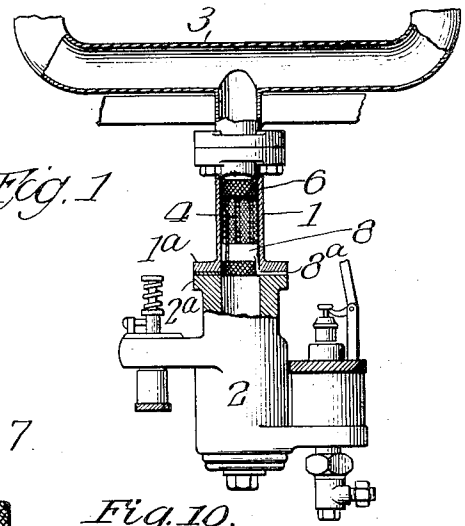


Fig. 9

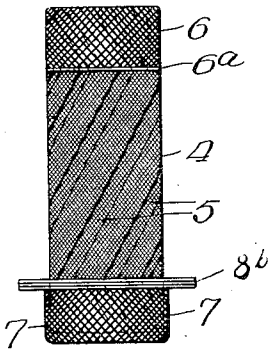


Fig. 10.

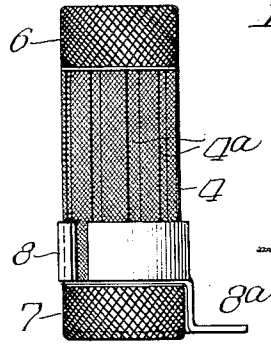


Fig. 4.

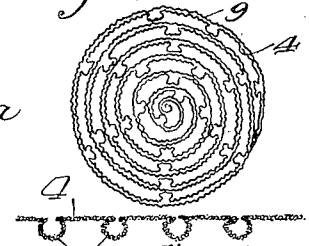


Fig. 3

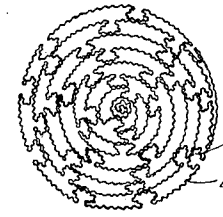


Fig. 6

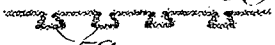


Fig. 5

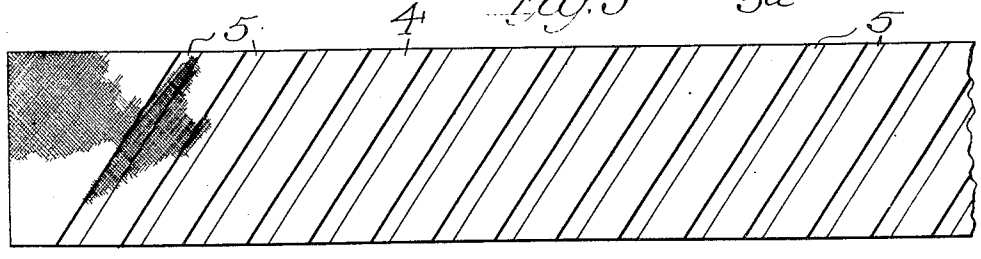
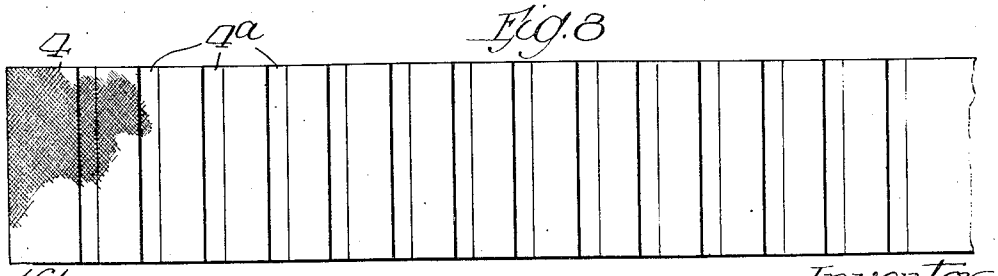


Fig. 8



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His Attys

UNITED STATES PATENT OFFICE.

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GASEOUS-FUEL MIXER.

1,118,237. Specification of Letters Patent. Patented Nov. 24, 1914.

Application filed December 3, 1913. Serial No. 804,474.

To all whom it may concern:

Be it known that I, EMILIEN D. SAINT CYR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gaseous-Fuel Mixers, of which the following is a specification.

My invention relates to a device for mixing vaporizing liquid fuels and the object thereof is to provide simple and efficient means for rapidly and perfectly vaporizing and mixing the fuel.

Speaking in general terms the device constituting an embodiment of my invention consists of a strip of fine metal gauze, preferably corrugated and rolled upon itself until the diameter of the roll is sufficient to fill the space or cavity chosen as the vaporizing chamber which may be located anywhere between the needle valve or aspirating nozzle of any suitable form of carbureter and the cylinders of the motor. In practice a suitable top and bottom preferably made of metal gauze of coarser mesh is added to hold the different layers of the rolled-up structure and means are also provided to hold the entire device in proper position in such vaporizing chamber.

The construction and arrangement of the device is such that the fuel as it issues from the carbureter is sprayed upon the gauze fabric and is spread over the extremely large surface presented by such fabric with the result that it is rapidly and effectually vaporized by the reduction of the atmospheric pressure caused by the suction produced by the pistons of the motor and also vaporized by the strong current of air resulting from such suction. The fuel is then introduced into the motor as a perfectly vaporized and mixed fuel.

Inasmuch as the device is made of metal the heat of the adjacent parts is readily conducted thereto which materially assists in the vaporizing action.

By the use of my device a perfect and uniform vaporization and mixture is obtained thereby resulting in (1) increased power, (2) ease of starting, (3) utilization of cheaper and lower grade fuels, (4) economy in quantity of fuel used for the same mileage, (5) less carbonization in the cylinders, (6) greater flexibility of motor. In addition, by use of my device, all danger of fire due to back-firing through the carbureter is eliminated.

In the drawing Figure 1 is an elevation of a carbureter and the intake pipe of the motor, that is a gasolene engine in which my device is shown arranged in the intake pipe between the carbureter and the manifold, the same representing one embodiment of my invention; Fig. 2 an elevation of the device removed from the intake pipe and shown on a larger scale than in Fig. 1; Fig. 3 a cross section of the device but on a larger scale than Figs. 1 and 2; Fig. 4 a detail edge view of the gauze fabric which is corrugated in the preferred manner, that is on the bias; Fig. 5 an elevation of the angularly corrugated fabric extended; Fig. 6 an edge view of a plaited form of fabric; Fig. 7 a view similar to Fig. 2 but illustrating the gauze fabric shown in Fig. 8; Fig. 8 a view similar to Fig. 5 but illustrating a fabric having cross corrugations or plaits; Fig. 9 a view similar to Fig. 2 but illustrating a different form of attachment, and Fig. 10 a cross section of a modified form of device.

My invention may be embodied in different forms and for the purposes of a clear and definite disclosure of my invention I have illustrated two embodiments thereof without intention of limiting my invention in its broader aspect thereto. Moreover, it will be understood that my device may be presented in any suitable location for accomplishing the desired result and may be associated with any suitable character of carbureter, the one herein shown being simply selected as a conventional one for illustrative purposes.

Referring to the embodiment of my invention as illustrated in Figs. 1 to 5 my device is in the form of a cylinder inasmuch as it is here interposed in the cylindrical passage of the fuel intake pipe 1 connecting between the carbureter 2 and the engine manifold 3. The body of the device is formed of a strip of wire gauze 4 such as illustrated in Fig. 5 according to which and by preference the fabric is provided with suitably-formed and shaped corrugations 5 which extend thereacross on the bias, that is at an angle to the length and width thereof. These corrugations may be plain or they may be made like the plaits 5^a shown in Fig. 6. A strip of this gauze fabric of suitable width is thus

corrugated and then rolled firmly or tightly upon itself into cylindrical form, the fabric being of a length to make the proper diameter of roll or cylinder so as to fill up the cavity or conduit in which it is placed.

In order that the cylinder of gauze may be held together and be a contained article which can be handled like a cartridge for instance and also to increase the vaporizing surface, I prefer to provide the bottom and top of the cylinder with metal gauze fabric preferably of somewhat coarser or larger mesh, although it may be sufficient if only one end of the cylinder be thus bound. This coarser gauze is preferably formed for the top as a cap 6 fitting over the top proper and also partially along the sides, the same being secured to the cylinder in any suitable manner as by soldering along the line 6^a. In like manner the coarser fabric for the bottom of the cylinder is formed as a cap 7 and such cap is secured to the cylinder in suitable manner as by soldering and in addition there is secured to the cylinder by soldering or otherwise a ring 8 here shown as a spring ring having a depending flange 8^a which provides a means for securing the device in place in the intake pipe. As shown in Fig. 1 this flange is clamped between the flanges 2^a and 1^a of the carbureter and intake pipe respectively although it will be understood that my invention in its broader aspect is not limited to this particular manner of attachment. If desired, the attaching means may be in the form of a gasket 8^b as shown in Fig. 9, such gasket being adapted to be clamped between said flanges 1^a and 2^a. This may be secured to the body of the device at any desired place along the length thereof in order to adjust such device toward or away from the carbureter according to the position of its nozzle.

Although I prefer the diagonal or bias running of the plaits or corrugations as shown in Fig. 5, yet if desired these corrugations 4^a may run transversely of the strip as illustrated in Figs. 7 and 8. As a matter of fact some measure of my invention may be obtained by omitting the plaits or corrugations altogether and merely rolling up the plain gauze fabric into cylindrical form and by preference providing the end cap or caps as described.

By preference and as shown the corrugations or plaits are constricted at their openings so that in the rolling operation they will not intermesh, thereby separating the layers of fabric and providing canals or conduits for the air and vapor. Although I prefer to provide corrugations made from the rolled fabric itself, yet it is obvious that they may be formed by tubes of gauze secured to the fabric by soldering or otherwise, such tubes being arranged diagonally if that formation is desired. Inasmuch as the corrugations are used to provide a plurality of passages, either straight or at an angle, it is obvious that such passages may be formed by omitting the strip and using a plurality of gauze tubes bunched and connected together. Furthermore, if desired, the device may be produced by rolling up together a corrugated strip and a plain strip as seen in Fig. 10.

The device provides the largest possible amount of surface upon which the liquid or fluid to be vaporized is spread and permits the current of air to readily come into contact with the liquid thus spread out in a thin film on the surface of the metallic gauze, (made warm by conduction of heat from the manifold and carbureter after the engine has been in operation), with the result that the liquid is quickly and perfectly vaporized and mixed and delivered in that condition to the cylinders. In addition the formation of thin films of fuel in the innumerable minute openings in the gauze fabric still further facilitates vaporization. Moreover, when the plaited or corrugated form of strip is employed in forming the cylinder there is no straight course but in the bias form of corrugation there is a spiral course or path which the sprayed or only partially vaporized fuel can follow so that such fuel will strike innumerable places in the gauze which causes the spreading of the fuel to take place upon the large surface of the device. It is not intended that the fuel shall follow any one spiral path after entering the same at the bottom but that it may pass through the walls of the corrugations, following the path of least resistance. Furthermore, the gauze whose edges only are presented in the direction of the flow does not offer resistance to the intake of the mixture.

By the use of my device I am enabled to obtain the several practical and advantageous results specified in the preamble of this specification. It will be understood that in the claims I use the term "corrugated" in the broad or general sense.

I claim:

1. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon itself and means attached thereto for binding one end of such rolled-up strip.

2. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon itself and means for binding one end of such rolled-up strip, such means comprising another piece of gauze secured to such end.

3. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon itself and means for binding one end of such rolled-up strip, such means comprising a gauze cap fitting upon such end.

4. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon

itself, and means attached thereto for binding the top and bottom of the rolled-up strip.

5. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon itself, and gauze for binding the top and bottom of such rolled-up strip.

6. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon itself, and caps of gauze fitting over the top and bottom of such rolled-up strip.

7. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon itself, and caps of gauze made of larger mesh than the strip and fitting over the top and bottom of the rolled-up strip.

8. A gaseous fuel mixer for liquid fuel comprising a strip of gauze which is corrugated and which is rolled upon itself, said corrugations having constricted openings to prevent intermeshing.

9. A gaseous fuel mixer for liquid fuel comprising a strip of gauze which is corrugated on the bias and which is rolled upon itself to form circuitous passages.

10. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon itself and having secured to itself a means whereby it may be attached within a gaseous fuel conduit.

11. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon itself and provided with a flange whereby it may be attached within a gaseous fuel conduit.

12. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon itself and a ring attached to the rolled-up body of gauze and provided with a flange whereby it may be attached within a gaseous fuel conduit.

13. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon itself and a ring attached to the rolled-up body of gauze and provided with a flange depending from one side of the ring whereby it may be attached within a gaseous fuel conduit.

14. A gaseous fuel mixer for liquid fuel comprising a strip of gauze rolled upon itself and a split ring secured to the rolled-up body of gauze and provided with a flange whereby it may be attached within a gaseous fuel conduit.

15. A gaseous fuel mixer for liquid fuel comprising a structure having a plurality of substantially spiral passages whose walls are of gauze.

16. A gaseous fuel mixer for liquid fuel comprising a strip of gauze which is corrugated and which is rolled upon itself into a cylinder, said corrugations running at an angle to the longitudinal axis of such cylinder to form a plurality of spiral passages.

17. A gaseous fuel mixer for liquid fuel comprising two strips of gauze which are rolled upon themselves into cylinder form, one of such strips being corrugated with the corrugations running at an angle to the longitudinal axis of said cylinder to form a plurality of spiral passages, the other strip being plain.

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Witnesses:
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