M. EGOROFF.

CARBURETER.

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1,222,941.

Patented Apr. 17, 1917.

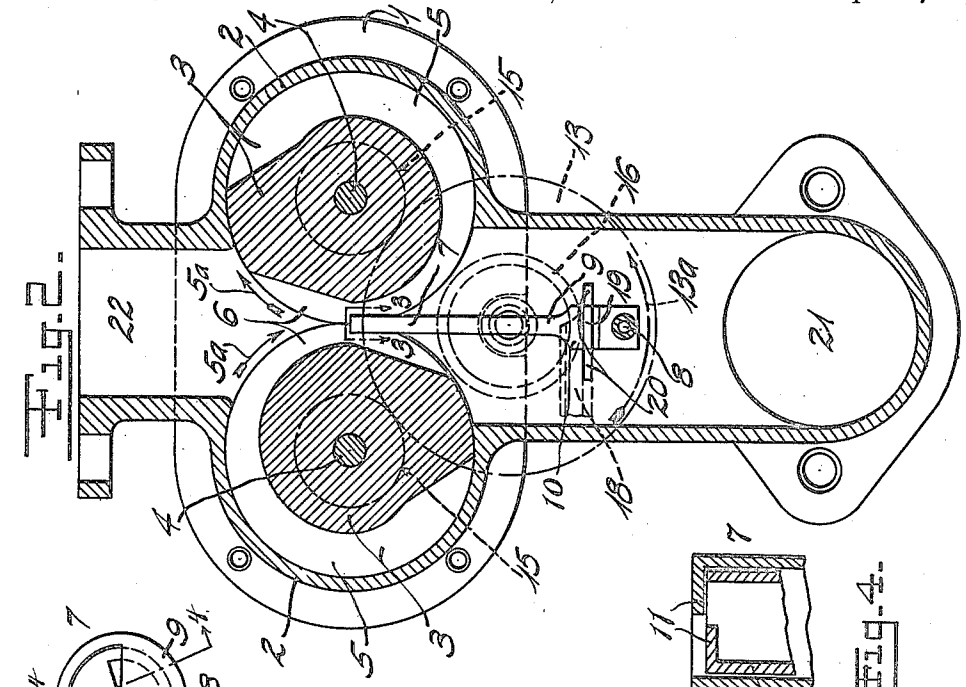


Fig. 2.

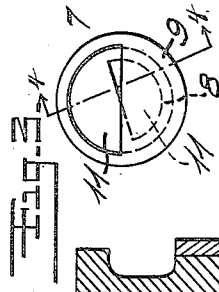


Fig. 3.

Fig. 4.

Fig. 1.

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CARBURETER.

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To all whom it may concern:

Be it known that I, MICHAEL EGOROFF, subject of the Emperor of Russia, residing at Petrograd, in the Empire of Russia, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to improvements in carbureters, and primarily involves the provision of an improved carbureter adapted to insure a proper supply of liquid fuel as the result of regulating the fuel in respect to its admission to the carbureter and also in respect to its supply to the engine, the mixing and discharge aperture for the charge having the shape of a divergent cone similar to that of the "Zenith" carbureter. In the accompanying drawing which shows a preferred embodiment,

Figure 1 is a sectional view taken axially of the air-inlet (21) and air-outlet (22); Fig. 2 is a similar view, taken on the line 2—2 of Fig. 1; Fig. 3 is an enlarged detail view taken on the line 3—3 of Fig. 2; and Fig. 4 is a vertical section on line 4—4 of Fig. 3.

According to the invention, a carbureter casing 1 is enlarged and shaped interiorly as shown at 2, to receive and partially sleeve each of a pair of rollers 3. These rollers are secured on spindles 4 suitably journaled in the casing. In adjusting the carbureter for fuel regulation, the rollers are simultaneously rotated by means described below. The cylindrical surface of each roller is provided with a groove 5. Each of these grooves has such a shape that in any adjustment of the rollers 3 the mixing and discharge aperture 6 formed between the rollers always resembles a cone diverging outwardly toward the carbureter's outlet. The adjustment of the rollers shown in Fig. 2 is that which they assume when they have been rotated to a predetermined limit in a direction opposite to that of the arrows 5^a; and then the aperture 6 is the smallest possible according to the design of the illustrated carbureter. Of course it will be understood that this selected minimum aperture will depend on the nature of the engine with which the carbureter is to be associated; and that the grooves 5 may be varied considerably, and yet remain within the scope of the invention, dependent upon the characteristics of the engine.

A fuel-spraying nozzle 7 terminates closely adjacent to the aperture 6. The nozzle includes a pipe 8 within a sleeve 9, the length 8′ of the pipe 8 being arranged concentric with the pipe 9, which latter is secured to a collar 10 loose on the pipe 8. The outer ends of pipe-length 8′ and sleeve 9 which face the aperture 6 are both partially closed by a substantially half circular end wall 11, so that the outlet opening in pipe-length 8′, as well as the outlet opening in sleeve 9 has an area equal to about half the cross-sectional area of the pipe or sleeve. Liquid fuel may be fed to the inner pipe 8 by any suitable means, such as a float chamber 12 of a familiar type, the interior of which is in communication with pipe 8 as shown. To vary the discharge capacity of the nozzle, the sleeve 9 is rotated relatively to the pipe 8, such rotation being controlled by means associated with the means for rotating the rollers 3, whereby a single common controlling means is provided for regulating the fuel-discharge of the carbureter; the rollers 3 and the pipe 8 and sleeve 9 of course being so conformed and arranged that a proper correlation between the discharge capacity of the nozzle and the size and design of the aperture 6 will always be assured.

The single common controlling means above referred to includes the following parts. A "general" pinion 13, adapted to be suitably driven by a governor or by hand, is loosely mounted on a stud shaft 14 arranged exterior to the casing 1. A pinion 15 is fixed on each spindle 4, and these two pinions mesh with the general pinion 13. When the general pinion is rotated a certain fractional amount in the direction of the arrow 13^a of Fig. 2, the rollers 3 turn in the direction of the arrows 5^a and increase the size of the aperture 6. A conical pinion 16 is loosely mounted on the stud

shaft, between the casing 1 and the general pinion 13, the conical pinion and the general pinion being keyed together as indicated at 17. The conical pinion 16 engages with a gear segment 18 integrally carried at one end by a swing arm 19 secured to the sleeve 9 of the spraying nozzle 7, the swing arm projecting from casing 1 through a slot 20. From a comparison of Figs. 2 and 3 it will be noted that when the general pinion is rotated in the direction of the arrow marked thereon, to increase the size of the aperture 6 as above described, the conical pinion will also rotate in the direction of said arrow and the outlet opening of the nozzle will be increased in size. Thus, when the general pinion 13 is rotated to coact with the pinions 15 to increase or decrease the size of the aperture 6, the conical pinion 16 simultaneously coacts with the gear segment 18 to rotate sleeve 9 of the spraying nozzle 7 to correspondingly increase or decrease the outlet of the nozzle. Therefore, in the embodiment described, and by the use of a single common controlling means, it is possible to always maintain a proper correlation between the liquid fuel-feed and the quantity of air admitted into the engine cylinder, the liquid fuel coming from the float chamber 12 through the pipe 8 to be discharged into the aperture 6, the air entering the carbureter by way of an inlet 21, and the mixture escaping from the aperture by way of an outlet 22.

I claim:

1. An improved carbureter including, in combination, a pair of cylindrical rollers mounted for rotation in the same direction, grooves of variable cross-section on the rollers to form between the rollers a carbureting chamber and a diverging outlet for the charge, a spraying nozzle including a pipe and a sleeve therefor both substantially concentric, and a single gear train for rotating one of the pipes relatively to the other and simultaneously rotating both rollers in the same direction, to insure a proper regulation of the fuel supply.

2. An improved carbureter including, in combination, a pair of cylindrical rollers rotating on axially arranged spindles carried thereby, grooves of variable cross-section on the rollers adapted in any rotative adjustment of the rollers to form between the rollers a carbureting chamber and a diverging outlet for the charge, a spraying nozzle including two elements, a pipe and a sleeve therefor both substantially concentric, a pinion secured on each roller's spindle, a general pinion engaging the two pinions first mentioned, a conical wheel secured to the general pinion, and a segment engaging the conical wheel and moved when the general pinion is rotated and connected to one of the nozzle elements to adjust the nozzle to regulate the aperture thereof.

3. In an improved apparatus of the kind described, the combination with a carbureting chamber and a source of fuel-supply therefor, of a tube leading from said source and having an end directed toward the outlet of the carbureting chamber with an opening in said end of less area than the cross-sectional area of the tube's interior, a second tube arranged concentric with the first mentioned tube and having an opening closely adjacent to the first tube's opening and of less area than the cross-sectional area of the second tube's interior, a pair of cylindrical rollers arranged side by side to partially close the outlet end of the carbureting chamber and mounted for rotation on their axes, each roller having a groove in its side wall of varying cross-section so designed that the rollers may be adjusted on their axes to establish an outwardly diverging outlet for the carbureting chamber, and means for rotating the two rollers in the same direction and for simultaneously rotating one of the tubes relatively to the other, the parts being designed so that in any adjustment of the rollers on their axes the grooves form an outwardly diverging outlet from the carbureting chamber and so that said outlet and nozzle are correspondingly increased and decreased to insure a proper regulation and discharge of the fuel mixture.

4. In an improved apparatus of the kind described, the combination with a carbureting chamber and a source of fuel-supply therefor, of a tube leading from said source and having an end directed toward the outlet of the carbureting chamber with an opening in said end of less area than the cross-sectional area of the tube's interior, a rotatable tube arranged concentric with the first-mentioned tube and having an opening closely adjacent to the first tube's opening and of less area than the cross-sectional area of the second tube's interior, a pair of cylindrical rollers arranged side by side to partially close the outlet end of the carbureting chamber and mounted for rotation on their axes, each roller having a groove in its side wall of varying cross-section so designed that the rollers may be adjusted on their axes to establish an outwardly diverging outlet for the carbureting chamber, gears carried by each of the rollers, a gear meshing with the two gears carried by the rollers, a conical gear driven by the gear last mentioned, and a gear segment meshing with the conical gear and connected to the rotatable tube so that when the conical gear is rotated the rotatable tube will be rotated relatively to the other tube.

5. In an improved apparatus of the kind

described, a pair of rollers arranged side by side having contacting cylindrical surfaces, each roller having a groove in its side wall between its ends varying in depth substantially from end to end, the two grooves being similar, opposite to each other and extending around their rollers in the same direction, so that the grooves in central section define an S-shaped figure in any operative position of the rollers.

In testimony whereof I affix my signature in presence of two witnesses.

MICHAEL EGOROFF.

Witnesses:

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FOSTER F. MCCLELLAND.