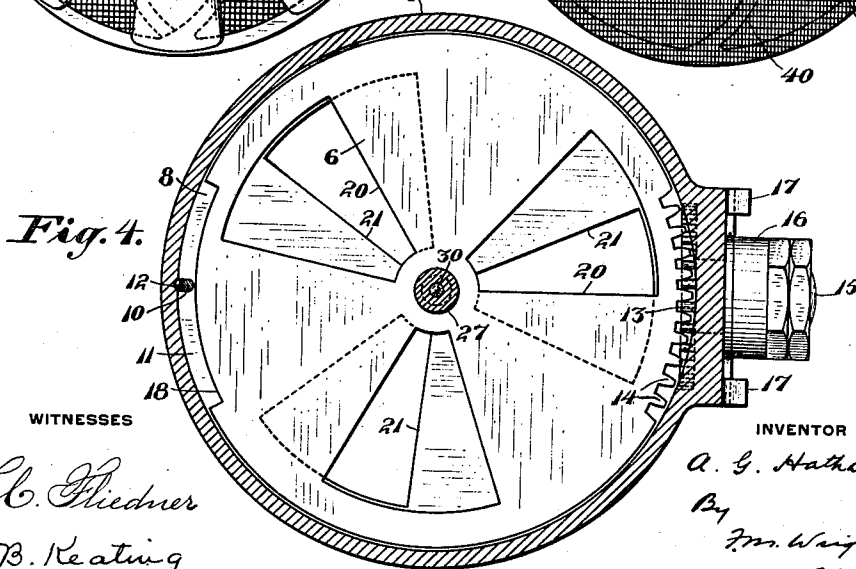
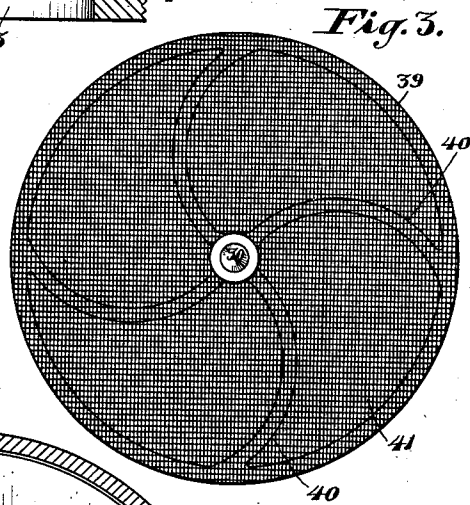
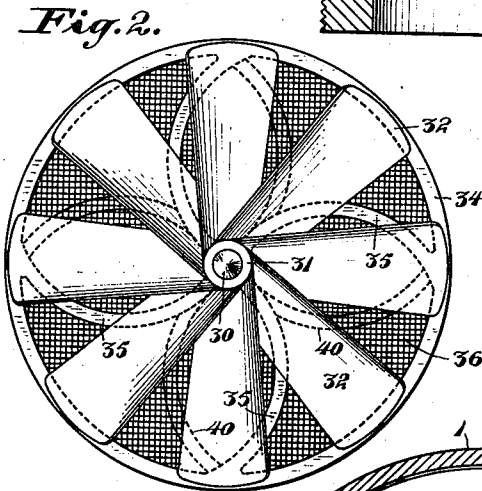
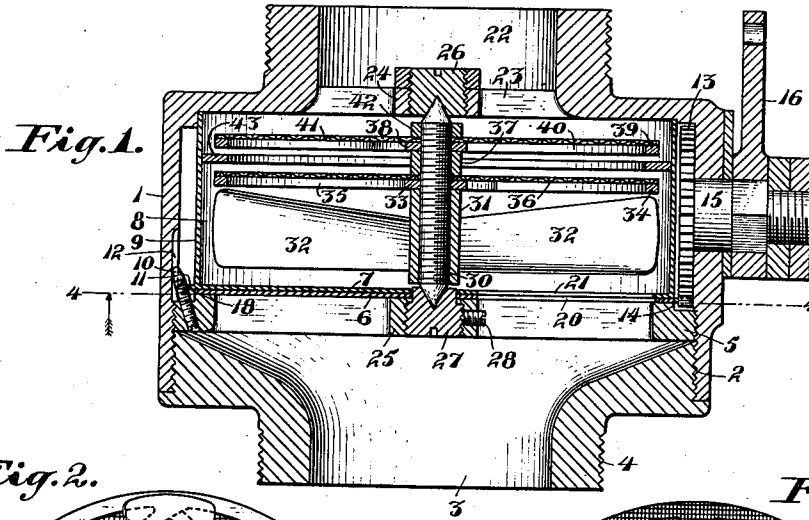


A. G. HATHCOCK.
GASEOUS FUEL MIXER.
APPLICATION FILED JULY 10, 1911.

1,014,391.

Patented Jan. 9, 1912.



WITNESSES

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UNITED STATES PATENT OFFICE.

ALIUS G. HATHCOCK, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO HATHCOCK MECHANICAL DEVICE COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

GASEOUS-FUEL MIXER.

1,014,391.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Application filed July 10, 1911. Serial No. 637,650.

To all whom it may concern:

Be it known that I, ALIUS G. HATHCOCK, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Gaseous-Fuel Mixers, of which the following is a specification.

This invention relates to an improved mixer for mixing the air and hydrocarbon supplied to internal combustion engines, and the object of the invention being to provide such a mixer as will be simple in construction, effective in use, and which can be easily regulated to permit any desired quantity of carbureted air to pass therethrough.

In the accompanying drawing, Figure 1 is a vertical section of my improved mixer; Fig. 2 is a bottom plan view of the mixing wheel and the lower and upper screens detached; Fig. 3 is a top plan view of the upper screen detached; Fig. 4 is a cross section on the line 4-4 of Fig. 1.

Referring to the drawing, 1 indicates the outer casing of the mixer, into which is screwed, as shown at 2, an inlet conduit 3 externally threaded at the lower end, as shown at 4, for attachment to the carbureter proper. Into the lower portion of the casing 1 is also screwed a spider 5, upon which rests a rotary shutter 6, upon which in turn rests a base 7, of an inner casing 8, having a cylindrical wall 9. After the spider 5 has been screwed up sufficiently high, said spider and the inner casing 8 are prevented from turning by a pin 10, screwed obliquely upward through holes in the rim of said spider and in a flange 11 of said inner casing, the point of said screw entering a vertical groove 12 in the inner surface of the outer casing. Said spider 5 is vertically adjusted and secured so that the shutter 6 is held between the spider and the inner casing firmly enough to prevent its turning unless by means specially provided therefor. This means consists of a

pinion 13 engaging gear teeth 14 in the marginal portion of said shutter 6, said pinion 13 being secured to a horizontal shaft 15, extending through the casing 1, and having secured outside said casing an arm 16 adapted to be rocked by any suitable means. The extent of movement of said arm is limited by lugs 17 on said casing. The pin 10 does not prevent the shutter from rotating because said shutter is formed with an arcuate recess 18 which in the rotary movement of the shutter moves on the pin 10. The shutter is formed with a number of sector-shaped openings 20, which can register to a greater or less extent with similar openings 21 formed in the base of the inner casing, whereby the amount of air and hydrocarbon passed through said shutter may be increased or diminished as desired.

Formed integral with the main casing in the outlet 22 thereof is a second spider 23, and in the hubs 24, 25, of said upper and lower spiders 23, 5, are screwed step bearings 26, 27, the lower bearing being adjustably secured in its lower hub 25 by a set screw 28. In said bearings can rotate a shaft 30, on which there is screwed a hub 31 from which extends a suitable number, eight being here shown, of mixer blades 32. There is next screwed on said shaft 30, above the hub 31, the hub 33 on a wheel 34 having curved spokes 35, to which wheel is attached a circular woven wire screen 36. Above the screen 36 there is screwed upon the shaft 30 a spacing nut 37, and above said spacing nut there is screwed upon the shaft 30 the hub 38 of a wheel 39 having spokes 40 curved oppositely to the spokes 35, and to said wheel 39 is secured an upper screen 41. Above said upper screen 41 there is screwed upon the shaft 30 a clamping nut 42. To the interior of the wall of the inner casing between the wheels 34 and 39 is secured an annular baffle 43.

While I have herein shown only two screens with their corresponding wheels at-

tached thereto, I may employ three or more such screens, according to the size of the carbureter for which the mixer is intended.

From the above description of the mixer, the operation thereof will be readily understood. When the internal combustion engine is in operation a powerful suction is produced through the outlet conduit 22, past the mixer blades 32 and the inlet conduit 3. The passage of the hydrocarbon vapor and gas between the mixer blades and through the rotating screens thoroughly mixes said gases, which mixing action is increased by the curved direction of the spokes of the wheels 34 and 39, and especially because the said spokes are oppositely curved. The annular partition 43 prevents the passage of gases within said inner casing outside of said screens.

An important feature of my invention is that, the mixing elements being placed above the air-motor, they are in motion before the gases arrive thereat, contrary to devices heretofore used, in which the gases must first pass the mixers before arriving at the air-motor. From this it results that the mixture strikes the motor with undiminished force, and consequently the motor is much more effective than in mixers in which the force of the gases is first diminished by passage through the mixers before striking the air motor.

A further important feature of my invention consists in the provision of step bearings for the shaft, the pointed ends of the shaft being pivotally mounted in said step bearings. Heretofore, when ball bearings were used for the purpose of avoiding friction, the condensation of vapor in the mixer caused the rusting of said ball bearings which prevented their efficient action. With my device this objection is avoided, since the points of the shaft, being case-hardened, do not rust.

A further important advantage of my invention is that it can be attached to any carbureter.

I claim:—

1. In a mixer for carbureters, the combination of a vertical shaft, blades extending from said shaft and arranged to produce rotation of said shaft by the passage of gases therebetween, wheels on said shaft above said blades, said wheels having oppositely directed spokes, and screens secured to said wheels.

2. In a mixer for carbureters, the combination of a vertical shaft, blades extending from said shaft and arranged to produce rotation on said shaft by the passage of gases therebetween, wheels on said shaft above said blades, said wheels having oppositely directed spokes, screens secured to said wheels, a casing around said mixing

blades and screens, and an annular baffle extending inwardly from said casing between said screens.

3. The combination of an outer casing, upper and lower spiders therein having central apertures, bearings screwed into said apertures, a shaft between said bearings, blades extending outwardly from said shaft and adapted to rotate said shaft by the passage of a fluid therebetween, screens carried by said shaft and extending transversely thereto into close proximity to said casing, and an annular baffle extending inwardly from said casing between said screens.

4. The combination of an outer casing, upper and lower spiders therein having central apertures, bearings screwed into said apertures, a shaft between said bearings, blades extending outwardly from said shaft and adapted to rotate said shaft by the passage of a fluid therebetween, screens above said blades rotatable with said shaft, a shutter below said shaft having openings there-through, means adapted by the rotation of said shutter to close said openings, said shutter having marginal gear teeth, a pinion meshing with said teeth, a shaft for said pinion extending through the main casing, and means for turning said shaft.

5. The combination of an outer casing, upper and lower spiders therein having central apertures, bearings screwed into said apertures, a shaft between said bearings, blades extending outwardly from said shaft and adapted to rotate said shaft by the passage of a fluid therebetween, screens above said blades rotatable with said shaft, a shutter below said shaft having openings there-through, means adapted by the rotation of said shutter to close said openings, said shutter having marginal gear teeth, a pinion meshing with said teeth, a shaft for said pinion extending through the main casing, means for turning said shaft, and means for opposing the passage of fluid in a straight direction past the margins of said screens.

6. The combination of an outer casing, an inner casing having a base and a cylindrical wall, said base having apertures, a rotary shutter below said base, having apertures adapted to register with the apertures in the base, a spider screwed into said outer casing upwardly against said base, the upper portion of said cylindrical wall being pressed against said outer casing when said spider is so screwed, means for preventing the spider and inner casing rotating within the outer casing, said shutter having its margin formed with gear teeth, a pinion having teeth meshing with the teeth of the shutter, a shaft for said pinion extending through said outer casing, means for turning said shaft, an upper spider supported by the casing, said upper and lower spiders

having central apertures, bearings screwed into said apertures, a shaft rotating in said bearings, blades extending outwardly from said shaft and adapted to impart rotation to said shaft by the passage of a fluid therebetween, screens above said blades and rotatable with said shaft, and an annular baffle extending inwardly from said wall.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses. 10

ALIUS G. HATHCOCK.

Witnesses:

F. M. WRIGHT,
D. B. RICHARDS.