J. H. KOONTZ.

CARBURETER.

APPLICATION FILED MAR. 11, 1907.

975,696.

Patented Nov. 15, 1910.

Fig. 1.

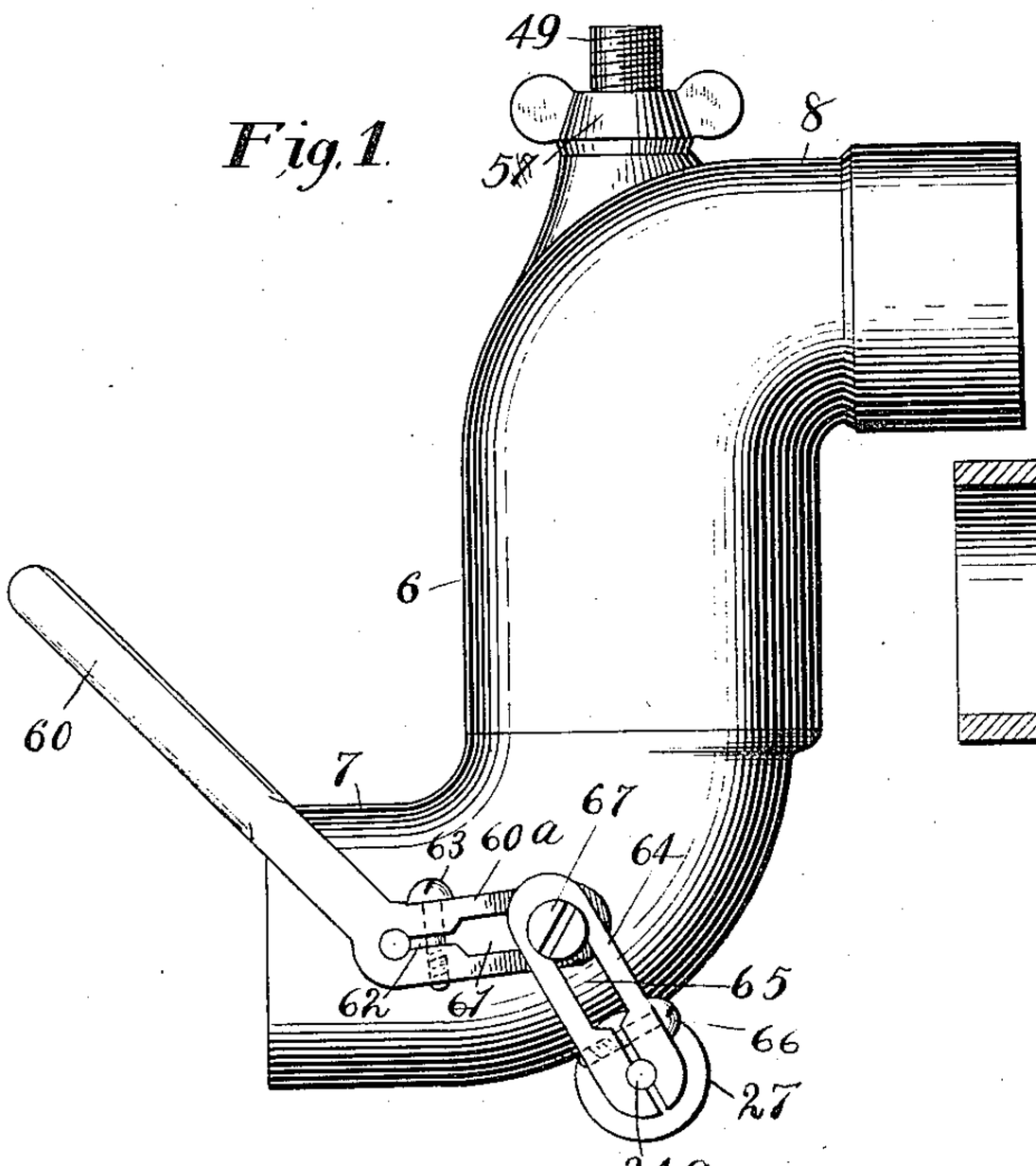


Fig. 2.

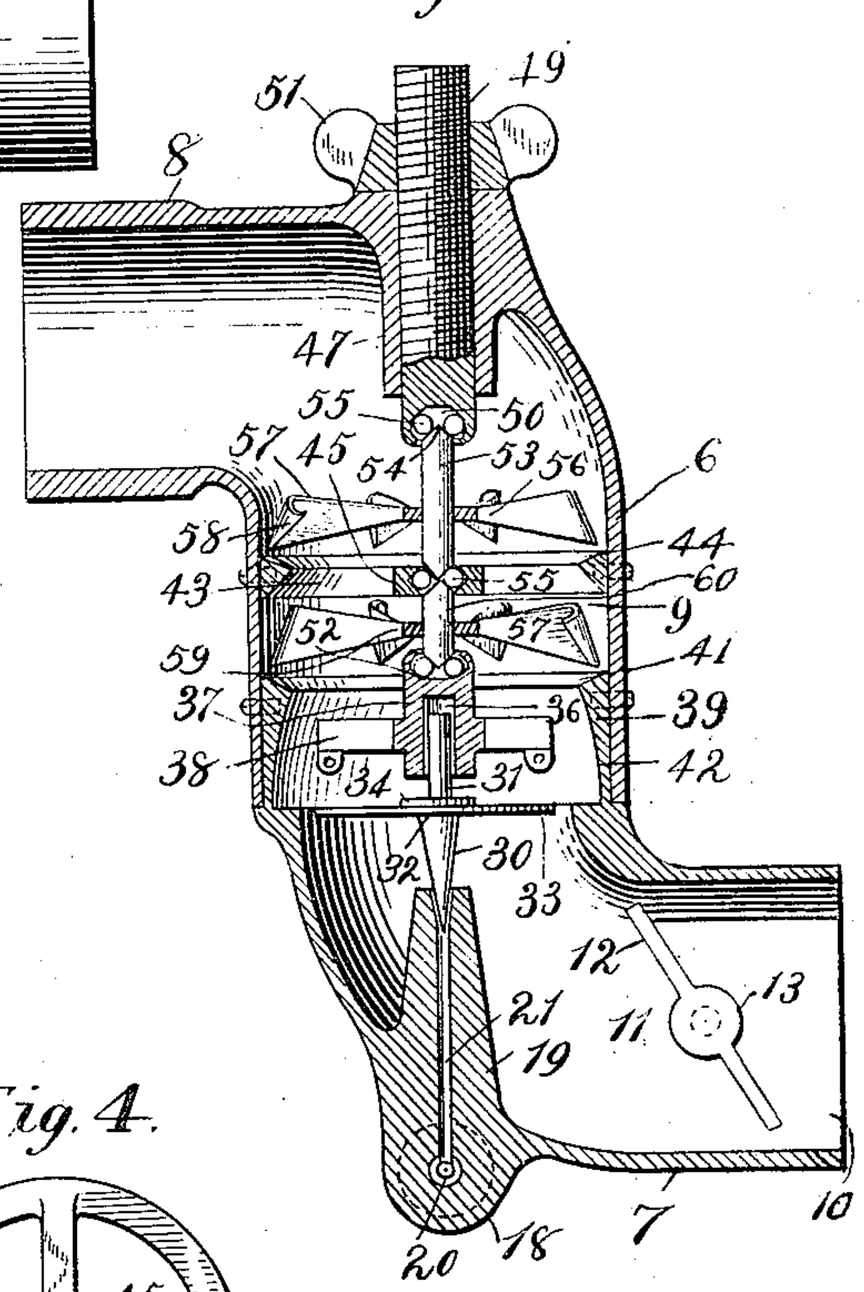


Fig. 3.

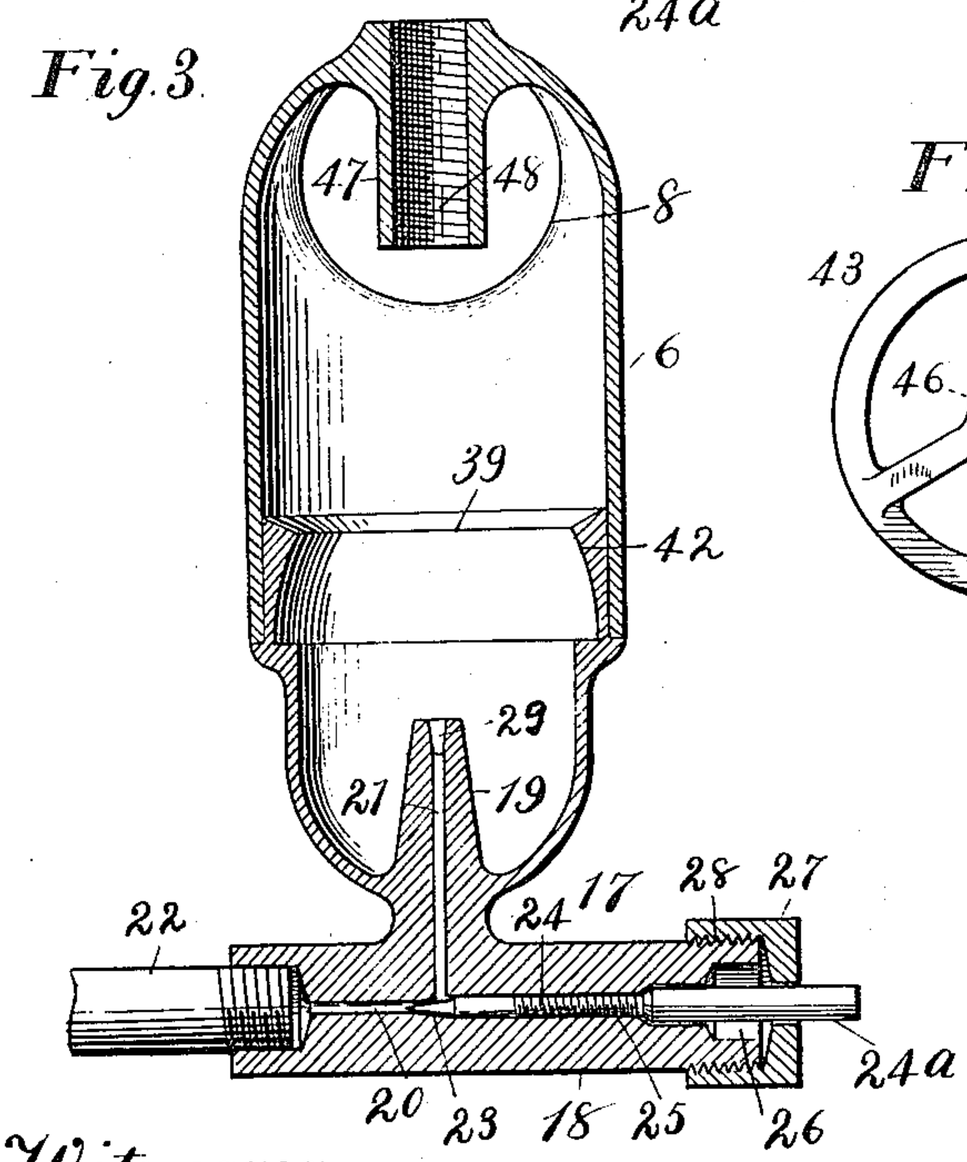


Fig. 4.

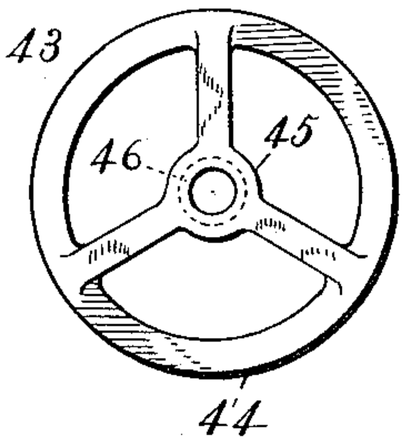
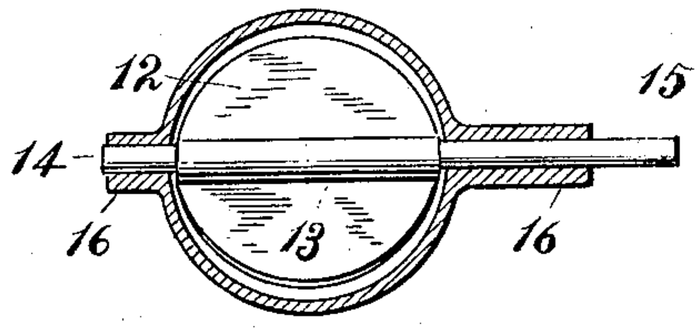


Fig. 5.



Witnesses:

Chas. F. Bassett

M. A. Milord

Inventor

John H. Koontz

By Frederick Benjamin

Atty.

UNITED STATES PATENT OFFICE.

JOHN H. KOONTZ, OF CULVER, INDIANA.

CARBURETER.

975,696. Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed March 11, 1907. Serial No. 361,686.

To all whom it may concern:

Be it known that I, JOHN H. KOONTZ; a citizen of the United States, residing at Culver, in the county of Marshall and State of Indiana, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

My invention relates to carbureters and especially to that class in which the adequate mixture of the gases employed for internal combustion engines, is accomplished largely by the action of agitating mechanism.

The chief objects of this invention are to produce a simple and effective mechanism for thoroughly commingling the gases preliminary to igintion; to provide rotary elements that will have unusual efficiency in the production of numerous eddies and cross currents in the fluids presented to their action; and to furnish improved bearings and supports for the moving parts so that their speed and efficiency will be augmented with the expenditure of a minimum amount of energy.

Further objects are secured by arranging automatic means for controlling one of the valves, and manually controlled means for operating the supply valves simultaneously. Improved forms of gyrating mechanism and current deflectors are disclosed, and the appliance having few parts will not be liable to get out of order and can be economically manufactured.

I accomplish the above and other important objects by the apparatus illustrated in the accompanying drawing which forms a part of this specification and in which—

Figure 1 is a side elevation of my improved rotary carbureter; Fig. 2 is a vertical longitudinal section; Fig. 3 is a vertical transverse section with some of the parts removed; Fig. 4 is a plan view of the fan shaft bearing ring; and Fig. 5 is a fragmentary view showing the throat valve in position.

Referring to the drawing in detail, the numeral 6 indicates the body portion of a tubular casing having its end portions 7, 8, curved in opposite directions. The interior of said casing, and more particularly that part inclosed by the body shell, forms a mixing chamber 9. The air to be utilized as an ingredient enters the chamber through the inlet 10 of the lower curved branch 7, its inflow being regulated by a valve 11 consisting of a circular plate 12 formed integral with a spindle 13 which has its ends 14, 15, reduced in size and journaled in bearings 16 extending laterally from the casing walls. The plate 12 has a diameter approximating that of the throat of the casing and when the valve is in its closed position it will shut off practically all of the air supply.

The hydrocarbon fuel is introduced into the mixing chamber through a pipe which has the form of a T 17 and preferably cast integral with the lower section casing. This T consists of a horizontal body portion 18 from which projects vertically a branch 19 disposed axially in said mixing chamber. The body has a central bore 20 which communicates with a duct 21 in the branch 19, and is supplied with an inlet pipe 22. At the point of junction of the bore 20 with the duct 21 is a valve-seat 23 for a needle supply valve 24, which fits an enlargement 25 in the bore, its free end 24ª projecting from the end of the body 18 of the T through a stuffing box 26 which is closed by a gland 27 having threads 28 to fit external threads on the end of the tee body. The upper end of the duct 21 is furnished with a valve seat 29 for an inlet valve 30, which has a stem 31 reduced in size to form a shoulder 32 on which is located a circular disk valve 33 of thin metal which is secured in position against the shoulder 32 by a nut 34. This valve disk has a diameter slightly less than the bore of the casing at that plane, thus leaving an annular space around the periphery of the disk. The valve 30 has a needle point which rests by gravity upon its valve seat 29 in the extension 19 and the upper end of its stem is received into the socket 36 of a guide 37 which is suspended in the axis of the casing by arms 38 extending radially inward from a deflecting ring 39 which is cast integral with the lower section of the casing. The said ring has a thickened upper margin 41 inclined on its upper aspect toward the inner edge, the inner face 42 of the ring being somewhat contracted from below upward. Above said ring is a bearing wheel 43, its rim 44 being triangular in cross section and having radial arms which support a hub 45, in which is formed a ball race 46.

In the upper side of the curved end 8 of the casing is a sleeve 47 preferably cast with the casing and projecting downward in the axis of the casing and having internal threads 48 cut therein. A screw 49 is in-

serted in the sleeve and is provided at its lower end with a ball race 50. The screw can be adjusted longitudinally and when set is held firmly by a winged lock nut 51. In the upper end of the guide 37 is also formed a ball race 52.

Between the bearing wheel 43 and said adjusting screw 49 is located a wheel consisting of a shaft 53 having conical end bearings 54 supported by hardened balls 55, located in the said races 46 and 50. Upon this shaft is fixed a fan 56 which has suitably inclined blades 57, their outer ends being recurved to form peripheral volutes 58. Below the bearing wheel 43 is arranged a similar fan 59, its shaft 60 being journaled in the bearings 46 and 52 supplied with balls 55. The wings 57 are recurved in the same manner at the free ends as in the fan 56 above described, the only difference being in the inclination of the wings and the direction of the curvature which are opposite in alternate wheels. The pressure upon the balls in the races of the shaft bearings may be varied by turning the said screw 49 until the proper adjustment is secured, thus reducing the frictional resistance to the rotary movement of the fans to a minimum.

Upon the projecting end 15 of the air supply valve spindle 13 is mounted a control lever 60 which is provided with an arm 60^a furnished with a slot 61 connected by a slit 62 with the hole through which the end of the spindle passes, and an adjusting set screw 63 serves to clamp the lever firmly upon the said spindle. A link arm 64 provided with a slot 65 has a set screw 66 which secures the link to the projecting end 24^a of the needle valve 24. At the opposite end is a shouldered screw 67 which is fixed in the end of the said arm 60^a and is adapted to slide in the slot 65 in the link arm.

It will be evident that a movement of the control lever will operate simultaneously the air supply valve 11 and the hydrocarbon supply valve 24, and when the said valves are properly adjusted the coaction of the two valves thus linked together will insure the introduction of the proper proportion of air when there is an increase or diminution in the full liquid fuel.

It will be seen that the conformation of the parts within the casing will break up the entering stream of commingled gases into innumerable counter currents, eddies and whirls. An especial feature being the oppositely gyrating movements of the fans which are automatically rotated by the action of the air currents impinging upon their wings, the sensitive ball bearings permitting a comparatively moderate volume of flowing gas to produce a high rate of speed.

It will be noticed that the disk valve 33 presents a large area to the incoming stream and as the impact upon the under surface of said valve increases it will rise higher unseating its needle point to a greater extent and allowing a larger proportional quantity of the liquid fuel to enter the chamber. Conversely when the control lever is operated to shut off the supply there will be less force on the said disk valve and its point will become partially or wholly reseated, thus producing an automatic regulation of the liquid fuel, in addition to the manual control by means of the control lever 60.

It is obvious that many changes may be made in the devices of my invention as herein disclosed without departing from the spirit and scope thereof and I do not wish therefore to be limited to the precise construction set forth.

What I claim is:—

1. A fluid mixing device, including a casing, a plurality of fan wheels mounted concentric to the casing, the alternate wheels having their blades oppositely inclined and the peripheral margins of the blades extending inwardly and inclined toward the center of the passageway.

2. A fluid mixing device, comprising a cylindrical casing, a plurality of fan-wheels, each of said wheels having its blades oppositely inclined and the ends of said blades bent inwardly and inclined relatively to the walls of the casing, and anti-frictional bearings for said wheels.

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

JOHN H. KOONTZ.

Witnesses:
F. BENJAMIN,
T. L. VANDEVENTER.