W. GEROLD.

AUXILIARY AIR SUPPLY DEVICE FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JULY 9, 1914.

**1,268,112.** Patented June 4, 1918.

FIG. 1.

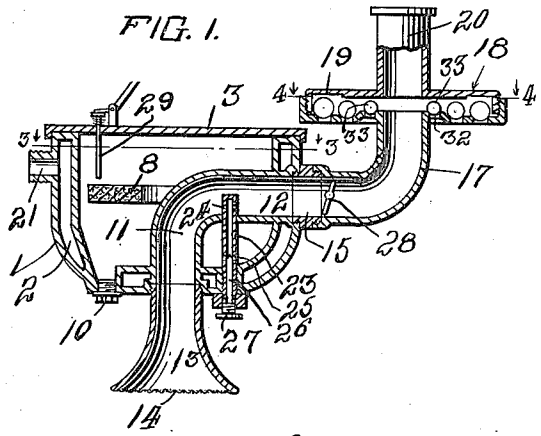



FIG. 2.

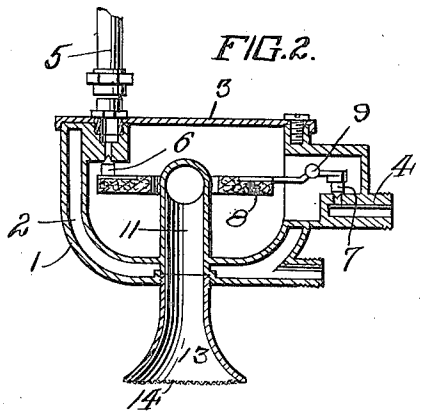



FIG. 3.

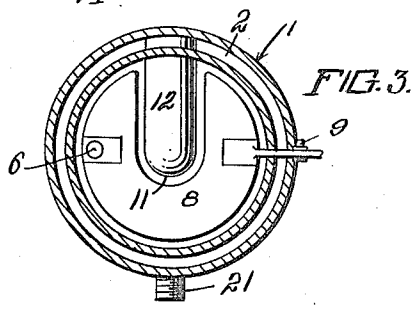



FIG. 4.

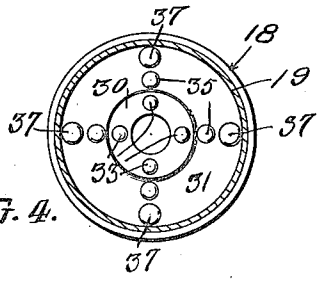



FIG. 5.

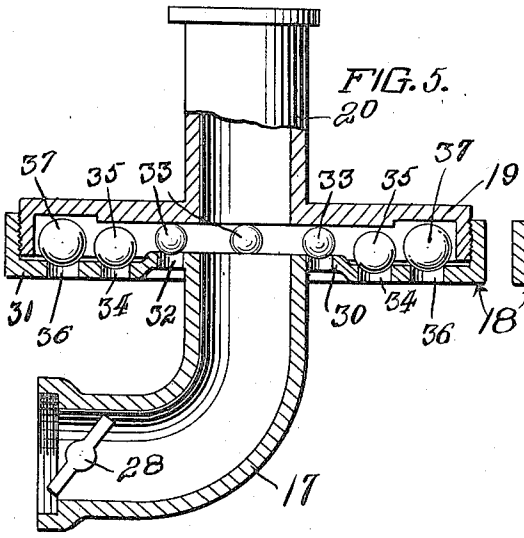
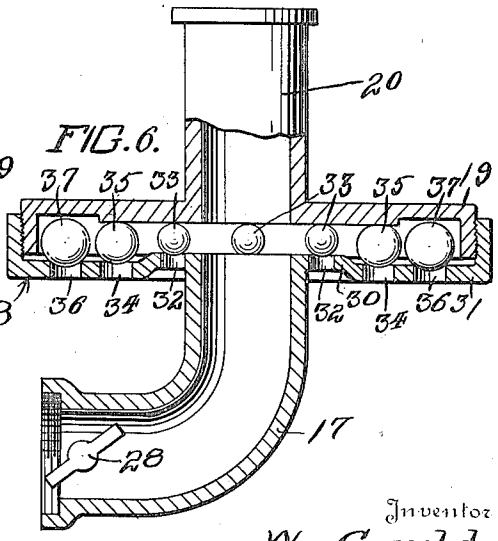



FIG. 6.




Witnesses

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# UNITED STATES PATENT OFFICE.

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## AUXILIARY AIR-SUPPLY DEVICE FOR INTERNAL-COMBUSTION ENGINES.

1,268,112. Specification of Letters Patent. Patented June 4, 1918.

Application filed July 9, 1914. Serial No. 850,037.

*To all whom it may concern:*

Be it known that I, WALTER GEROLD, a subject of the Emperor of Germany, residing at Milwaukee, in the county of Milwaukee, State of Wisconsin, have invented certain new and useful Improvements in Auxiliary Air-Supply Devices for Internal-Combustion Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a carbureter.

An object of the invention is to provide a device of this character by means of which the proper mixture will always be obtained.

A further object of the invention is to so construct the device that as the speed of the engine increases the rapidity with which air is taken into the intake pipe will be varied.

A further object of the invention is to so construct the device that a supplemental air intake will be provided between the throttle and the engine, which air intake will be automatic in its operation.

With these and other objects in view, such as will appear as the description progresses, my invention comprises the combination and arrangement of parts as herein set forth and subsequently claimed.

Referring to the drawing:

Figure 1 is a longitudinal sectional view of my device.

Fig. 2 is a similar view taken at right angles to Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 1.

Fig. 4 is a section on line 4—4 of Fig. 1.

Fig. 5 is a detail sectional view showing the position of the balls in the automatic air intake valve, when the engine is running at minimum speed.

Fig. 6 is a similar view showing the position of the balls when the speed of the engine has been greatly increased.

Referring to the drawing wherein like parts are indicated by like characters throughout the several views:

My device comprises a casing 1 formed of a double wall and having a space 2 between said wall. This casing is covered by a detachable cover 3 and has two gasolene intakes 4 and 5 which are closed by needle valves 7 and 6 which are mounted on a float 8 pivoted at 9 within the casing 1.

As the level of the gasolene within the casing 1 drops the float 8 drops about its pivot 9 and opens both of the valves 6 and 7 so that should one of the same become clogged the gasolene will always flow in the casing 1 through the other.

A drain plug 10 is provided in the bottom of the casing 1 by means of which gasolene may be drained from the casing.

Extending upwardly through the bottom of the casing is an air intake pipe 11 which is curved within the casing 1 and projects out to one side thereof as at 12.

Screwed to the bottom of the pipe 11 is a funnel-shaped member 13 having a screening 14 secured across its mouth so that air entering the pipe 11 will be kept free of all foreign substance.

Secured to this pipe 11 at the point 12 by means of a nipple 15 is a valve which comprises a curved pipe 17 having an annular casing 18 formed on its upper end, the lower face of which has a plurality of holes therein as will hereinafter be described.

Secured to this annular casing 18 is a cover member 19 which has an upwardly extending centrally located pipe 20 connected to the manifold pipe of the engine.

In order that the air passing through the pipe 11 and the gasolene within the casing 1 may be always heated I have provided ports 21 which communicate with a pipe leading to the exhaust pipe and by means of which the gases from the exhaust pipes are circulated in the chamber 2 of the casing 1.

Secured within the bottom of the casing 1 and extending upwardly through the horizontal portion of the pipe 11 within the casing 1 is a needle valve which comprises a hollow tubular member 23 having a plurality of apertures 24 therein within the pipe 11 and a plurality of apertures 25 therein within the casing 1 below the gasolene level. These latter mentioned apertures are adapted to be closed by a needle valve 26 slidably mounted within the casing 23 and operable by means of a screw 27 so that the amount of gasolene flowing in the pipe 11 may be varied at will.

Mounted in the pipe 17 is a throttle 28.

In order that the upward movement of the float 8 may be limited, I have provided a spring pressed pin 29 which is mounted on

the cover 3 and extends therethrough and is adapted to engage the upper face of the float 8.

The bottom portion of the annular casing 16 is formed on two levels which are designated by the reference characters 30 and 31.

In the portion 30 in the bottom of the casing 18 is formed four small apertures 32 extending entirely through the bottom of the said casing and having mounted therein four small balls 33 by means of which these apertures may be partially or entirely closed.

The lower portion 31 is provided with four apertures 34 of slightly larger size than the apertures 32 in which are mounted correspondingly larger balls 35. Between these apertures and the periphery of the casing 18 is formed a plurality of larger apertures 36 in which are mounted larger balls 37 by means of which the apertures are either opened or closed as will later appear.

In operation assuming that the engine is running at slow speed the throttle 28 is partly opened and the suction created in the pipe between this throttle and the intake funnel 13 is sufficient to cause air to flow into the pipe 11 and draw gasolene in as a spray to the tube 12, however, the suction formed in this pipe 11 is not very great at this time. As the mixture of gasolene and air passing through the throttle valve 28 and thence upwardly to the pipe 20 the innermost balls 33 which are the smallest and consequently of lesser weight than the other balls are drawn upwardly slightly from the apertures 37 and air is allowed to flow from these apertures into the other mixture of gas and air which is passing to the pipe 20 so that the mixture will be more nearly perfect which flows to the cylinders of the engine. As the speed of the engine increases the balls 33 are lifted higher and higher from the apertures 32 until they touch the top of the casing 18, which time their upward motion is limited and the apertures 32 are completely uncovered.

As the speed of the engine greatly increases the balls 35 are lifted from the apertures 34 in a manner similar to that in which the balls 33 are lifted from the apertures 32, but when the speed of the engine increased to such an extent that these balls have reached their uppermost positions the balls 37 in the apertures 36 are gradually raised so as to allow air to flow through all of the apertures 32, 34 and 36 and at this time when the engine is running at its maximum speed the maximum amount of air is flowing through the said apertures. Also at this time the suction in the pipe 11 is so great that the maximum amount of mixed air and gas is drawn through the pipe 11.

It may be thus seen that I have provided a carbureter which is provided with an auxiliary air intake, the action of which is automatic and which is located between the throttle valve and the cylinders of the engine, and I have further constructed this valve in a manner that the action thereof will be automatic and the amount of air left in this valve will be controlled by the speed of the engine.

I have further provided a device by means of which the maximum amount of mileage may be gotten out of a given quantity of gasolene for the reason that the automatically operated valve always insures a proper mixture entering the cylinders of the engine from the carbureter.

While I have described a particular construction of my invention, I wish it to be understood that I do not wish to be limited to that particular construction for it is obvious that numerous changes may be made within the scope of the invention as defined by the claim.

What is claimed is:—

An auxiliary air inlet for carbureters, comprising in combination, a pipe section terminating at its upper end in a horizontal plate having a marginal upstanding flange and including a central elevated portion surrounding the mouth of the pipe section, said elevated portion having a series of small ports formed therethrough and the main portion having a plurality of series of ports of graduated size, the ports increasing in size from the center, a second pipe section, a plate on the lower end thereof having a marginal downturned flange threaded into the upstanding flange, and balls of graduated size corresponding to and seated over the ports of the several series.

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

WALTER GEROLD.

Witnesses:
CHAS. M. GEROLD,
KATHERINE HOLT.