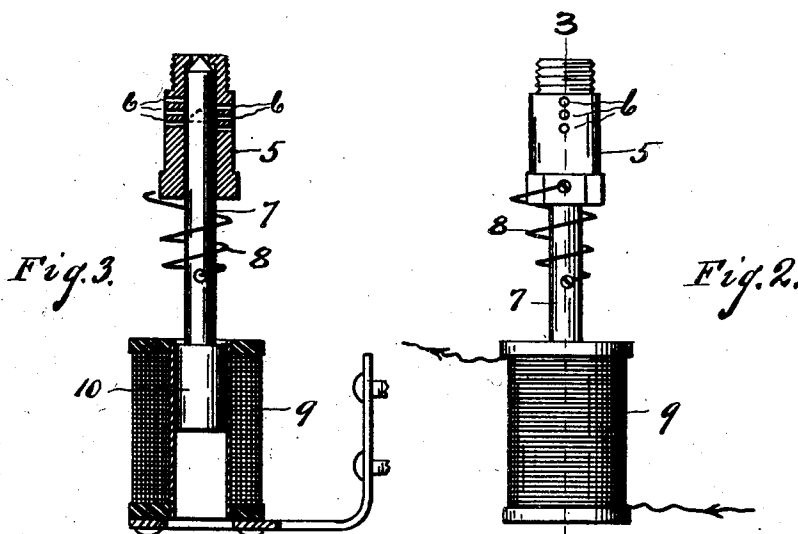


1,324,436.



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ELECTRIC AUTOMATIC AIR REGULATION FOR AUTOMOBILE GAS-ENGINES.

1,324,436.

Specification of Letters Patent.

Patented Dec. 9, 1919.

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To all whom it may concern:

Be it known that I, CHARLES G. SINGELYN, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Electric Automatic Air Regulation for Automobile Gas-Engines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to a device for furnishing automatically an additional supply of air to the gas mixture, at the higher running speeds, in gas engines of motor vehicles.

The object is to provide a device that is simple, inexpensive and easily installed and will furnish to the gas engine an additional supply of air for the gas mixture, at the higher running speeds.

A further object is to provide a device as above described, that is automatic of regulation and will admit an additional supply of air in volume directly proportional to the flow of current from the generator to the battery.

A further object is to provide a device as above described, that is capable of being so regulated that the admission of additional air supply to the gas mixture will automatically be proportioned to the flow of current from the generator and such admission can be set to begin, by regulation of the device, when any predetermined strength of current flow has been reached, such current flow bearing a direct ratio to engine running speed.

In the drawings:

Figure 1 is a diagrammatic view of a gasoline engine of conventional type showing my device as connected to the intake manifold, illustrating the electrical wiring of the same.

Fig. 2 is a side elevation of the device.

Fig. 3 is a longitudinal sectional view.

Similar numerals refer to similar parts throughout the drawings.

Referring more particularly to the drawings, in Fig. 1, 1 represents the intake manifold in any form of gas engine designed for use in self propelled vehicles, 2 is the device assembly attached thereto, preferably by having the plunger guide 5, inserted there-

in by being screwed into a threaded aperture in the manifold. The manner of attachment, or place on the intake pipe where it is attached, is immaterial so an open passageway is provided from the inlet holes 6, except when closed by the position of the plunger, to the interior of the intake pipe. The plunger is referred to in the drawings as indicated by Fig. 7. The device will be located as shown, in the direct charging line from the generator 3. The circuit is completed through the ammeter A. to the storage battery 4, and back to the generator 3.

Fig. 2, a side elevation of the device, shows the plunger guide 5 adapted to be inserted into the intake pipe 1, by being threaded so as to screw into a threaded aperture provided in the intake pipe. The plunger guide 5 is provided with inlet holes 6, in such number as is desired, for example five or six to the inch, or lesser or greater number per inch, as is thought desirable. The plunger 7 is preferably of soft iron, and is maintained in the plunger guide in normal position covering the inlet holes, by means of a tension spring 8, one end of which is attached to the plunger guide 5, and the other end to the plunger 7, in manner as illustrated, or other convenient fashion. Numeral 9 designates a sucking coil or solenoid. The relative vertical position of the magnetic solenoid with the plunger determines the extent of vertical movement of the plunger, consequently regulates the volume of air admitted to the intake pipe through the air inlet holes 6, and such vertical movement is in direct ratio to the flow of current from the generator through the magnetic solenoid and therefore dependent upon the running speed of the engine.

Fig. 3, a longitudinal sectional view is self explanatory.

The operation of the device is as follows:

The device is located in the charging line from the generator. At the lower speeds, and by lower speeds may be taken to mean below fifteen miles per hour, the amount of current passing through the magnetic solenoid from the generator will not be sufficient to draw the plunger down sufficiently to uncover the inlet holes in the plunger guide. As the speed of the motor increases however, and more current issues from the generator the current passing through the magnetic solenoid increases and the plunger is withdrawn and the first of the air inlet

holes are uncovered and air entering there-
through passes through the interior pas-
sageway of the plunger guide into the intake
pipe. Further increasing speed of the mo-
tor with consequent increased flow of cur-
rent through the magnetic solenoid further
withdraws the plunger and more air is ad-
mitted to the intake pipe. It will thus be
seen that the increase in volume of air ad-
mitted to the intake pipe bears a direct ratio
to the speed of the motor, which is the ob-
ject desired.

The purpose is apparent. At the higher
speeds a lighter mixture is desirable, and
by the use of the device herein provided
with its consequent increase of current
through the magnetic solenoid, withdrawal
of plunger admitting of additional volume
of air to the intake pipe upon increase in
speed of the motor is automatically provided
for. It will be seen that the plunger may be
made to uncover at a lower or higher speed
by lowering or raising the magnetic solenoid
with reference to the plunger. When thus
arranged it will automatically begin to un-
cover at the reaching of the pre-determined
speed. A tension spring for maintaining
the normal position of the plunger of any
desired degree of tension may of course be
provided, likewise mechanical means for
setting degree of tension. Not only will
there be by that means an increase in mile-
age, by virtue of using the lighter mixture,
which is possible at the higher speeds, but
the reduction of the mixture will, at such
higher speeds, eliminate the heaving running
and reduce the formation of the carbon in
the cylinders.

It is apparent that the magnetic solenoid
might be placed in series with the low ten-
sion side of the magneto instead of in
the charging line from the generator and
the operation of the device would be the
same.

Having thus described my invention what
I claim is:

1. In a gas engine for motor vehicles, the
combination of a magnetic solenoid and
plunger in the electrical circuit located in
the charge line from the generator, such
generator, an intake pipe, a plunger guide
fitted therein and provided with an air pas-
sageway thereto, air inlet holes through the
plunger guide leading from the inner air
passageway to the atmosphere, a tension
spring holding said plunger in normal posi-
tion in the plunger guide so as to cover
the air inlet holes, said solenoid bearing

such relative position to the plunger that
the plunger will be withdrawn in the
plunger guide upon sufficient increase of
current through the solenoid, such with-
drawal being in direct ratio to the current
flow from the generator.

2. In a gas engine for motor vehicles, the
combination of a plunger guide fitted with
a plunger, said plunger guide being fitted to
the intake pipe, such intake pipe, an air
passageway in said plunger guide communi-
cating by means of air inlet holes with the
atmosphere, a tension spring holding said
plunger in the plunger guide covering said
air inlet holes, a generator, a solenoid in the
electrical circuit located in the charging
line from such generator and so disposed
with reference to the plunger it encircles
that a determined strength of current there-
through acts upon the plunger drawing it
down into the solenoid and uncovering the
air inlet holes in the plunger guide, in direct
ratio to said flow of current through the
solenoid from the generator.

3. In a gas engine for motor vehicles, a
generator, a magnetic solenoid in the elec-
trical circuit located in the charging line
from such generator, a plunger within said
solenoid, an intake manifold, a plunger
guide fitted to the intake manifold and pro-
vided with an interior air passageway there-
to, such passageway being adapted to re-
ceive the plunger and being provided with
air inlet openings leading to the atmos-
phere normally closed by such plunger, with-
drawal of said plunger from the plunger
guide by increase in flow of current from the
generator through the solenoid operating to
uncover the air inlet opening to the interior
passageway in the plunger guide.

4. In a gas engine for motor vehicles, in
combination with a generator, a magnetic
solenoid in the electrical circuit located in
the charging line thereof, a plunger within
said solenoid, a plunger guide fitted to the
intake manifold and provided with an air
passageway thereto, said intake manifold,
such passageway being provided with at-
mospheric openings, the withdrawal of said
plunger from the plunger guide by increase
in flow of current from the generator
through the solenoid opening to uncover at-
mospheric openings to the air passageway
in the plunger guide.

In testimony whereof, I sign this speci-
fication.

CHARLES G. SINGELYN.