N. A. MATHIAS & B. S. HARDER.

AUXILIARY AIR INTAKE DEVICE.

APPLICATION FILED OCT. 23, 1913.

1,102,066. Patented June 30, 1914.

FIG. 2

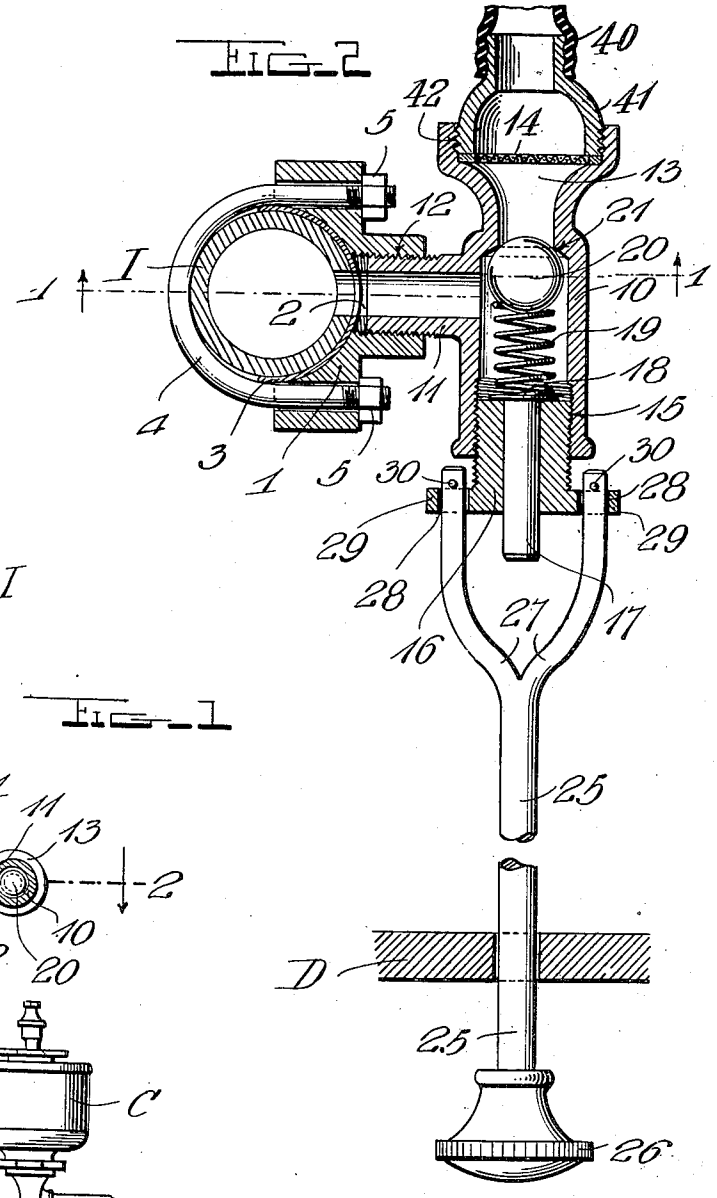
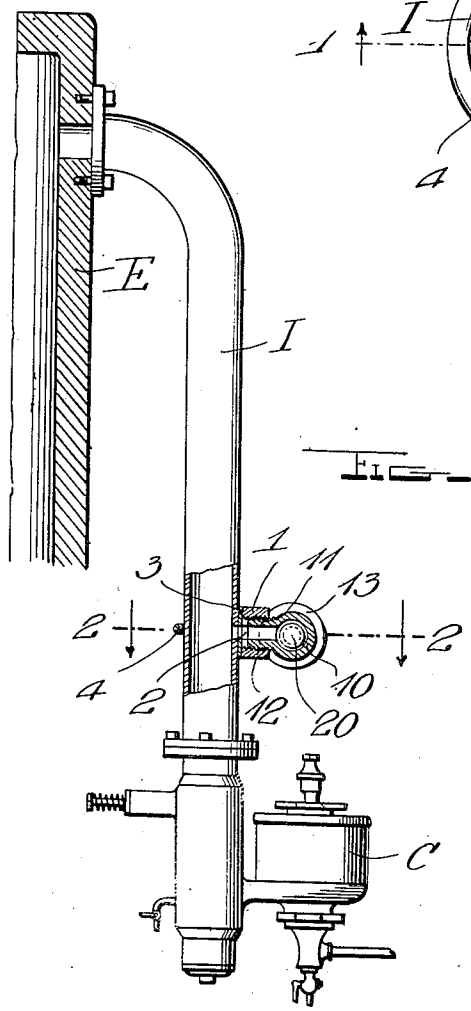


FIG. 1



Witnesses

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UNITED STATES PATENT OFFICE.

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AUXILIARY AIR-INTAKE DEVICE.

1,102,066. Specification of Letters Patent. Patented June 30, 1914.

Application filed October 23, 1913. Serial No. 796,886.

To all whom it may concern:

Be it known that we, NICHOLAS A. MATHIAS and BURT S. HARDER, citizens of the United States, residing at Bartlesville, in the county of Washington and State of Oklahoma, have invented certain new and useful Improvements in Auxiliary Air-Intake Devices; and we do 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 internal combustion engines, and more especially to the charge forming devices therein; and the object of the same is to produce an improved means for diluting the charge with air in its passage from the carbureter to the engine, so that less of the charge need be formed and consumed and the power and speed of the engine increased.

This object is accomplished by a special construction of the devices for thus accelerating the movements of the engine, and as hereinafter more fully described and claimed and as shown in the drawings wherin—

Figure 1 is a vertical sectional view of this invention, taken on about the line 1—1 of Fig. 2, showing its application to the inlet manifold of a gasolene engine; Fig. 2 is an enlarged horizontal section on the line 2—2 of Fig. 1.

In Fig. 1 of the drawings the reference letter C designates a carbureter, I is an intake mainfold leading therefrom to the engine cylinders E, and it is at a suitable point on this manifold that we dispose our improved accelerator so that after the charge is formed in the carbureter it is automatically diluted with air before it reaches the cylinders. This dilution conserves the gasolene vapor and therefore reduces the gasolene consumption, and yet it does not detract in any way from the energy of the engine and in fact we have found that in many cases it increases its efficiency. Our accelerator may be used with any type of carbureter, as there are few in general use which convert all the gasolene into vapor or gas.

At a point not less than two inches above the carbureter we form a hole in the intake pipe I, and as this pipe may be quite thin we prefer to employ a saddle 1 having a curved face overlying said hole and an aperture 2 alining therewith, a washer 3 being interposed between the saddle and the pipe, and a U-bolt 4 passed around the latter with its arms extending through holes in the saddle and receiving nuts 5. The outer end of the aperture 2 through the saddle is threaded, internally in the drawings although of course it might be externally, and with these threads is connected the accelerator proper. We prefer such a saddle not only because the intake pipe I may be thin, but because when this device is applied to an intake pipe already in place and as an attachment thereto the same pipe may be used without removing it and inserting one having a T-joint therein.

The accelerator proper comprises a T-shaped casing 10 whose stem 11 has threaded connection at 12 with the threaded end of the bore 2 in the saddle, and whose head has a bell-mouth 13 at one extremity, preferably containing a gauze strainer 14, while its other extremity is internally threaded at 15 for the reception of a screw plug 16 which closes this end of the head. The plug is made tubular and through its bore is slidably and rotatably mounted the shank 17 of a pin whose head 18 stands at the inner end of the plug and is somewhat larger than its shank so that the bore of the plug is reliably closed and may not leak profusely. Resting against said head 18 is an expansive spring 19 standing within the head of the T which constitutes the casing of this member, and the other end of the spring bears against a ball valve 20 and presses it normally against an internal seat 21 formed within the head of the T near the bell mouth 13. The plug is intended to be adjusted so that the expansive force of the spring will be sufficient to hold the ball valve seated under all ordinary conditions, but when the engine is speeded up and considerable suction on the intake tube is exerted by the pistons in the cylinders this ball valve will be opened slightly and will admit a certain amount of air. The latter will of course mix with the charge, dilute it with beneficial results to the engine and produce a saving in the fuel.

While any suitable means may be provided for adjusting the plug, we prefer to use a rod 25 which may extend through the dash D of the automobile and have a knob or handle 26 within reach of the driver,

while the other end of the rod is forked as at 27 and the fork-arms passed through eyes 28 in lugs 29 which project from opposite sides of the outer end of the plug, pins or other fastening devices 30 being passed through the extremities of said fork-arms to prevent their dislodgment from the eyes. When now the operator turns the knob 26 from his seat, the rod is turned and its forks cause the rotation of the plug in one direction or the other with the result that it is screwed inward or outward within one end of the head of the T-shaped casing 10. If it be screwed inward the tension on the spring 19 is increased, if it be screwed outward the tension is reduced. In either case, however, the shank 17 of the pin which passes loosely through the bore of the plug remains stationary while said plug is rotated, or in other words the pin is swiveled through the plug and the flattened head thereof bears against the adjacent end of the spiral spring 19. The result is that the latter is not dislodged from position, it never comes in contact with the inner end of the plug, and there are no extraneous conditions which tend to interrupt its successful action or interfere with the nicety of its adjustment.

As above suggested, the parts may be of any desired sizes, shapes, proportions and materials, and doubtless considerable change in detail will be necessary to adapt the accelerator to the various makes of automobiles. While we have shown the accelerator handle or knob 26 as inside the dash, it is quite obvious that it could be placed elsewhere, or even that the manual control of the plug could be omitted. With this attachment complete, the operator can adjust the accelerator from his seat after the engine has been running some time and the parts have become warm. Attention is directed to the fact that the movement of the ball valve away from its seat is on a line transverse to the length of the bore of the stem 11, rather than directly along the line in which the air is sucked into this device. We find that if the movement of the valve were in the direction last indicated, it would sometimes chatter, and therefore we prefer to employ a casing 10 which is of substantially T-shape with its stem directed toward the intake manifold.

Another feature of our invention consists in the provision of a hose or flexible pipe 40 of any kind which is by preference detachably connected with the bell mouth 13 as by means of a coupling 41 in the inlet end of the hose having threads 42 adapted to engage similar threads within the bell mouth, and in this case the coupling may hold the strainer 14 in place. The other end of this hose may lead to various points. In warm weather we lead it outside the hood to take in air which is cooler than that within the hood. In cold weather we eliminate tardy action by the carbureter by leading the other end of the hose to some point on the crank case where it will draw in warm air, or possibly the hose could be long enough to lead to an opening through the floor in front of the passengers, or both. The idea is to have a flexible connection between the inlet end of the accelerator and some point from which temperate air can be drawn, because we find that air of a medium temperature will mix better with gasolene vapor, produce a better charge, and give more power and speed with less consumption of gasolene.

We are not aware that hitherto any means have been provided whereby the intake of the accelerator or carbureter was through a flexible connection whose remote end could be disposed as desired, nor that such a connection has been detachably connected with an accelerator by any means.

What is claimed as new is:

1. An auxiliary air intake device for internal combustion engines comprising a T-shaped casing having a mouth formed at one end of its head and a valve seat adjacent its mouth, a valve in said head and adapted to be seated on the referred-to seat, a plug threaded into the end of said head opposite the mouth, the outer end of said plug projecting beyond the end of the head and having oppositely extending lateral ears thereon and said ears being provided with eyes, an expansive spring disposed between the inner end of the plug and said valve to seat the latter, an operating rod having a forked inner end engaged with the eyes of said ears and extending outwardly from the last mentioned end of the head of said casing, and means for connecting the stem of said T-shaped casing with the intake manifold of an engine.

2. An auxiliary air intake device for internal combustion engines comprising a T-shaped casing having an internal valve seat near one end of its head and the other end of its head internally threaded, a ball valve resting on said seat, a tubular plug screwed into the other end of the head, a pin whose shank is swiveled through the bore of said plug and whose head overlies the inner end of the plug, a coiled expansive spring between said valve and the head of the pin, and connections between the stem of the T-shaped casing and the intake manifold of the engine.

3. A device of the class described comprising a substantially T-shaped casing, one end of the head of which is designed to form a bell mouth, said latter end being internally threaded, a strainer arranged in the internally threaded end of said casing, a bell-shaped coupling externally threaded and en-

gaged with the threaded end of said casing and retaining said strainer in place therein, a tubular connection engaged with said coupling and disposed to a predetermined point, the head of said casing being also provided with a seat at a point adjacent the last mentioned threaded end thereof, a valve arranged in the head of said casing adapted to be mounted in the seat, spring means in connection with the valve to normally force the latter to its seat, and means for adjusting the tension of said spring.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

NICHOLAS A. MATHIAS.
BURT S. HARDER.

Witnesses:
LLOYD TROUGH,
FRANK E. ULSEY.