J. E. SMITH.

ENGINE ATTACHMENT.

APPLICATION FILED APR. 17, 1918.

1,325,266.

Patented Dec. 16, 1919.

2 SHEETS—SHEET 1.

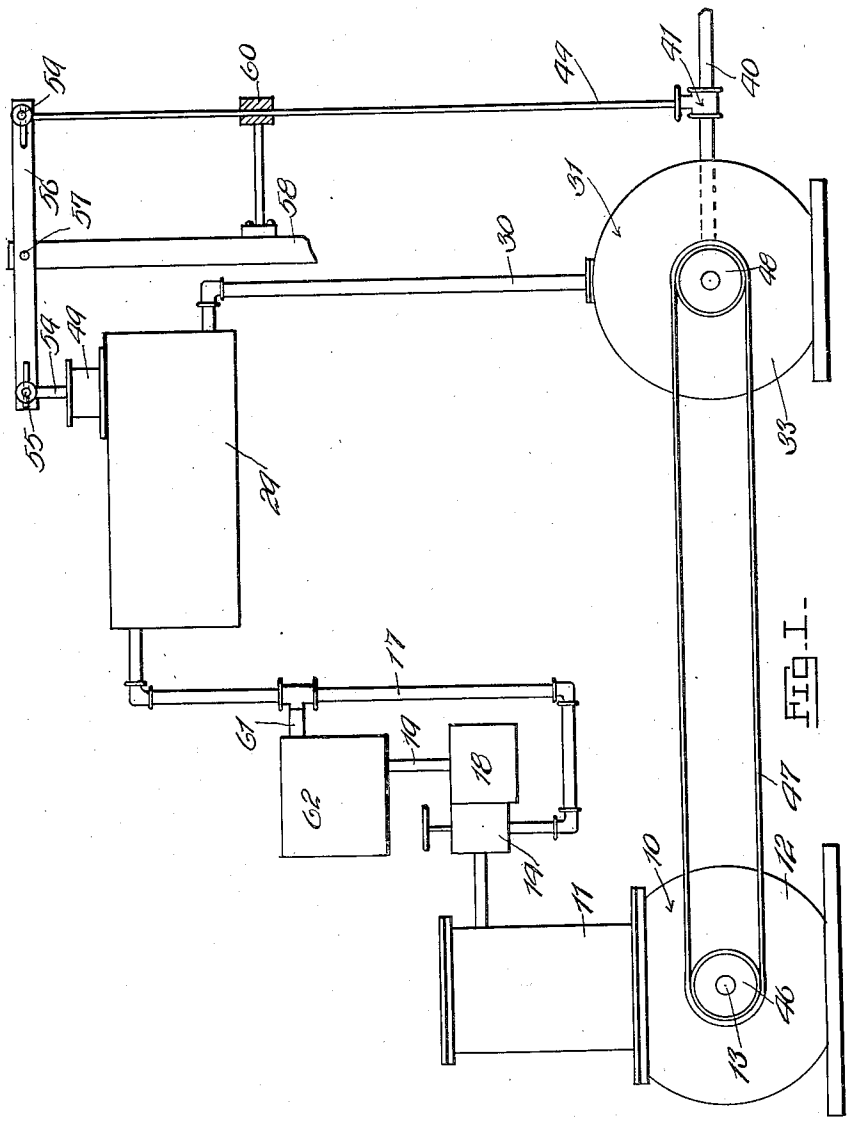


FIG. 1.

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2 SHEETS—SHEET 2.

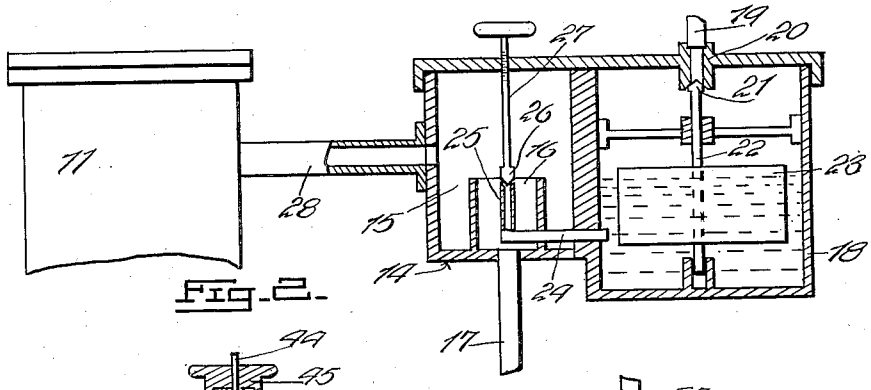


Fig. 2.

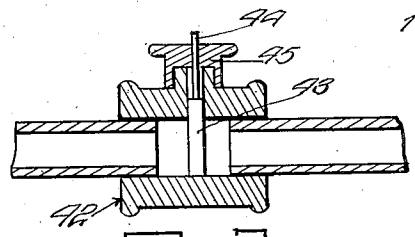


Fig. 3.

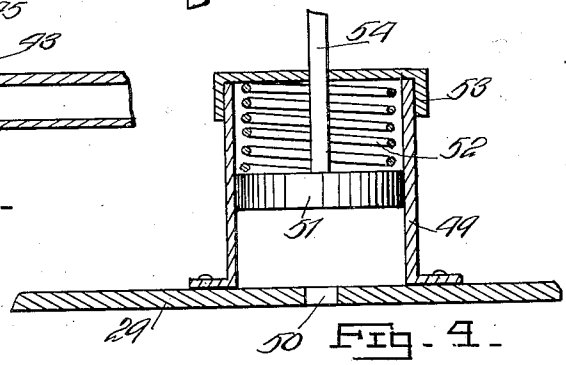


Fig. 4.

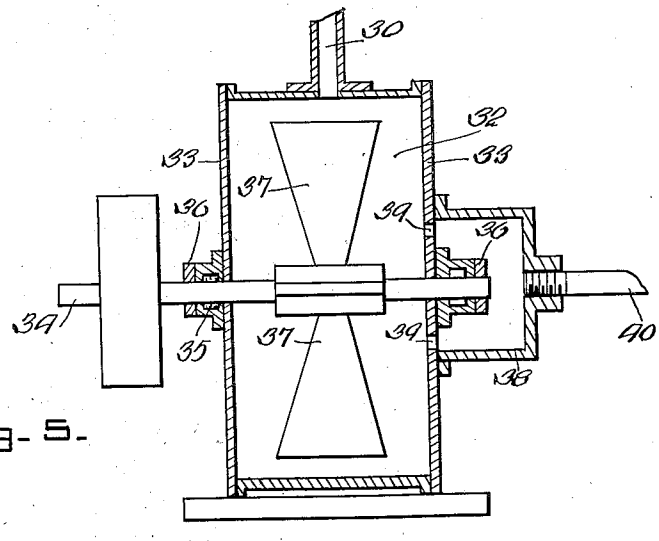


Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN EVERETT SMITH, OF PACHUCA, MEXICO.

ENGINE ATTACHMENT.

1,325,266. Specification of Letters Patent. Patented Dec. 16, 1919.

Application filed April 17, 1918. Serial No. 229,075.

To all whom it may concern:

Be it known that I, JOHN E. SMITH, a citizen of the United States, residing at Pachuca, in the county of Hidalgo and State of Mexico, have invented certain new and useful Improvements in Engine Attachments, of which the following is a specification.

My invention is an apparatus for supplying carbureted air to the cylinder or cylinders of an internal combustion engine, at constant pressure.

An important object of the invention is to provide apparatus of the above mentioned character, which is adapted to increase the capacity of the engine.

A further object of the invention is to provide apparatus of the above mentioned character, adapted to render the engine independent of changes in barometric pressure, by automatically maintaining the gases entering the cylinder or cylinders at constant pressure.

A further object of the invention is to provide apparatus of the above mentioned character, which is simple in construction, and reliable in operation.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of apparatus embodying my invention,

Fig. 2 is a central vertical longitudinal sectional view through a carbureter,

Fig. 3 is a similar view through a control valve included in the apparatus,

Fig. 4 is a similar view through a pressure operated device for actuating the control valve, and,

Fig. 5 is a central vertical transverse sectional view through a rotary blower.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates an internal combustion engine of any well known or preferred type, having a cylinder 11 and crank case 12. The usual piston (not shown) is connected with the crank shaft 13 to drive the same.

The numeral 14 designates a carbureter as a whole. This carbureter may be of any well known or preferred construction and embodies a mixing chamber 15, having an upstanding annular flange 16 arranged therein. Leading into the lower end of the flange 16 is an air supply pipe 17, as shown. The numeral 18 designates a feed tank, for receiving the liquid fuel, such as gasolene. The gasolene is fed into the tank 18 by gravity through a pipe 19, discharging into a sleeve 20, provided at its lower end with a valve seat, adapted to coact with the valve 21, carried by a vertically movable rod 22. The rod 22 is operated by a float 23 thereby maintaining a constant level of gasolene within the feed tank 18. The gasolene discharges through a pipe 24, having an upstanding portion 25, arranged within the annular flange 16, and terminating near the upper end thereof. This discharge of gasolene from the upstanding pipe portion 25 is controlled by a valve 26 carried by an adjustable valve rod 27, as shown.

The mixing chamber 15 has connection with a pipe 28, discharging into the intake opening of the cylinder 11 of the engine as shown.

The numeral 29 designates a compressed air storage tank, receiving compressed air from a pipe 30, connected with the outlet of a rotary blower 31. This rotary blower comprises a closed casing including an annular portion 32 and sides 33, as more clearly shown in Fig. 5. The blower embodies a horizontal shaft 34, operating through gas-tight bearings 35, and held against longitudinal movement by rings 36, rigidly secured thereto. Rigidly connected with the shaft 34 and arranged within the casing 31 is a centrifugal fan 37, as shown. Surrounding one bearing 36 is a hood 38, suitably connected with the side 33. This hood incloses openings 39, leading into the interior of the casing 31. Connected with the closed side of the hood 38 is an air supply pipe 40 having a cut off valve structure 41 connected therein, as shown. This valve structure, as more clearly shown in Fig. 3, embodies a valve casing 42, receiving a vertically movable slide valve 43, moved by a rod 44. This rod operates through a cap 45, as shown.

The crank-shaft 13 of the engine carries a pulley 46, engaged by a belt 47, engaging a second pulley 48, rigidly secured to the shaft 34. Any other suitable means may be employed to positively gear the engine with the rotary blower.

Connected with the upper end of the tank

29 is a pressure operated device to shift the valve 43, comprising a cylinder 49, shown more clearly in Fig. 4. An opening 50 is provided in the top of the tank 29 whereby pressure in the tank passes into the cylinder 49, beneath a vertically movable piston 51 having its upward movement opposed by a compressible coil spring 52, which may be of any suitable stiffness or strength. The spring 52 contacts with an end or cover 53, secured to the cylinder 49 by any suitable means and apertured for the passage of a rod 54, secured to the piston 41.

Pivotally connected with the upper end of the rod 54, as shown at 55, is a vertically swinging beam 56, pivoted at 57 with a vertical standard 58. Pivotally connected with the opposite end of the beam 56, as shown at 59, is the rod 44, operating through a guide 60, rigidly attached to the standard 58, as shown.

The pipe 17 leads from the tank 29, and a branch pipe 61 is connected with the pipe 17. The pipe 61 leads into the upper end of a normally closed gasolene storage tank 62, arranged above the feed tank 18, and connected with the pipe 19 thereof. The gasolene is fed by gravity into the tank 18 and pressure is maintained in the tank 62 at the pressure of the tank 29.

The operation of the apparatus is as follows:

The rotation of the crank shaft 13 drives the rotary blower 31 at a speed proportional to that of the engine. The rotary blower has a capacity of displacement slightly greater than that of the engine, when the two are operating in positive gear, as illustrated. The air from the blower is fed by the pipe 30 into the storage tank 29. From this tank the air passes from the tank 29 through the pipe 17 into the mixing chamber 15 of the carbureter. The air becomes carbureted with the gasolene discharging through the pipe 24 and the carbureted air passes through the pipe 28 into the cylinder 11 of the engine. When the pressure within the tank 29 rises above a predetermined limit the piston 51 is elevated, thereby swinging the lever 56 upon its pivot and partly or wholly closing the valve 43, thus cutting off the supply of air to the blower 41. When the pressure is lowered in the tank 29 the valve 43 is moved toward the open position and an increased amount of air supplied to the tank 29. It is thus apparent that means are provided to maintain the pressure of air constant in the tank 29, irrespective of the changes in barometric pressure. This constant air pressure is supplied to the mixing chamber of the carbureter and the gasolene storage tank 62, whereby the carbureted air is fed to the cylinder of the engine at a constant pressure.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claim.

Having thus described my invention, I claim:

In apparatus of the character described, an internal combustion engine, a carbureter connected therewith, a compressed air storage tank having means of communication with the carbureter to supply air thereto, an air pump having means of communication with the storage tank and driven by the engine, a cylinder having means of communication with the tank, a piston mounted to reciprocate within the cylinder, a pivoted beam connected with the piston, an air supply pipe leading to the pump, a valve structure connected with the air supply pipe, and means connecting the valve structure with the pivoted beam.

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

JOHN EVERETT SMITH.

Witnesses:
N. A. KEAT,
M. L. MARQUEZ.