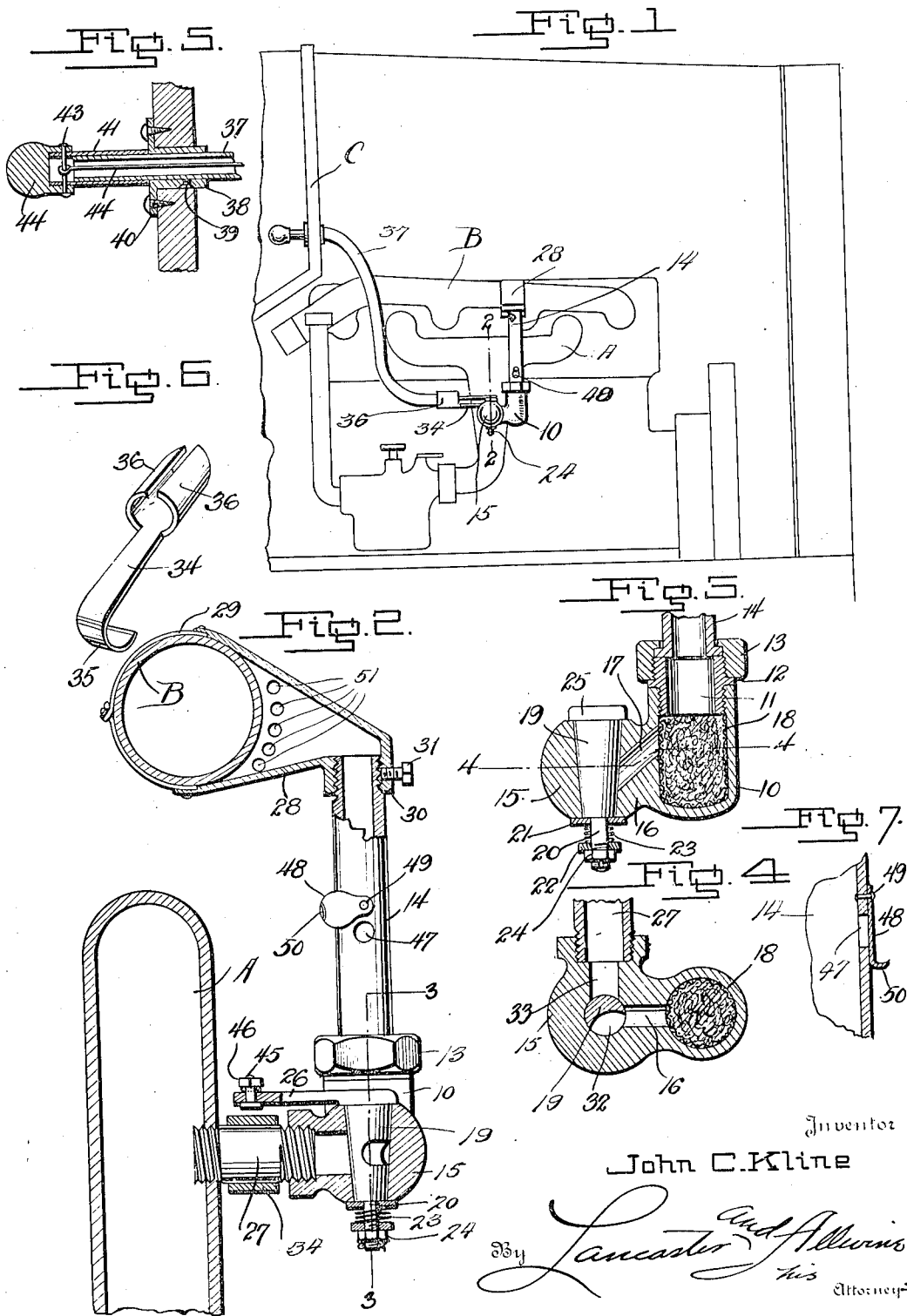


J. C. KLINE.
 INTAKE MANIFOLD ATTACHMENT FOR INTERNAL COMBUSTION ENGINES.
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INTAKE-MANIFOLD ATTACHMENT FOR INTERNAL-COMBUSTION ENGINES.

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To all whom it may concern:

Be it known that I, JOHN C. KLINE, a citizen of the United States, and a resident of Tacoma, in the county of Pierce and State of Washington, have invented a certain new and useful Improvement in Intake-Manifold Attachments for Internal-Combustion Engines, of which the following is a specification.

10 The present invention relates to internal combustion engine attachments, and more particularly to a device adapted for connection with the intake manifold to regulate the feeding of air to the charge as the latter is drawn from the carbureter.

15 An object of the present invention is to provide a relatively simple device adapted for attachment directly to the intake manifold for feeding air therethrough and for admitting of the easy priming of the engine in starting the same, particularly in cold weather.

20 The invention further aims at the provision of a device of this character which increases the power of the engine, which offsets the formation of carbon; which provides means for removing carbon formed prior to the application of the device, a device, by the use of which, economy in the consumption of fuel is effected, and which admits of the efficient use of a distillate, or a low-grade of fuel; and, to provide a device with controlling means which may be actuated from the dash or instrument board of a motor vehicle.

25 The above, and various other objects, and advantages of this invention will be in part described, and in part understood, from the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawing, wherein:

30 Figure 1 is a side elevation of an attachment constructed according to the present invention, and as applied to an internal combustion engine.

35 Fig. 2 is a transverse vertical section, enlarged, taken on a plane indicated by the line 2—2 of Fig. 1, showing parts in section, and parts in elevation, of the attachment.

40 Fig. 3 is a longitudinal vertical section taken substantially on the line 3—3 of Fig. 2, through the cup or well and the valve which is connected thereto.

Fig. 4 is a horizontal section taken substantially on the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary enlarged section taken longitudinally through the hand-engaging end of the controlling device, for the attachment.

Fig. 6 is a detail perspective view of the detachable bracket or connector for supporting and coupling the outer end of the controlling device to the valve of the attachment.

Fig. 7 is a fragmentary sectional view of the feed pipe, showing the fuel valve in the side of the same.

Referring to this drawing, wherein like parts are designated by similar characters of reference throughout the several views, 10 designates a cup or receptacle which is relatively deep and closed at its lower end to form a well, and which is internally threaded at its upper open end for the reception of a nipple 11 therein, the latter having an outstanding annular flange 12 abutting the upper end of the receptacle 10 to bind the lower end of the nipple 11 therein. The nipple 11 is externally threaded above and below the flange 12, and is adapted to receive a union coupling member 13 upon its upper end, into which is flanged a connecting pipe 14 which extends upwardly from the cup or well 10.

35 The receptacle or body part 10 is provided at one side with an enlarged projection 15 provided with a preferably downwardly tapering bore and forming a valve casing. The valve casing 15 is connected to the receptacle or body part 10 by a web portion 16 constituting a bracket arm. The web or bracket arm 16 is provided with a diagonally extending relatively small opening or passage 17 which communicates with the interior of the cup or receptacle 10 adjacent to the upper end thereof, and which opens into the valve casing 15 at its lower end. A perforated cage or strainer 18 is fitted in the well or receptacle, and terminates at its upper end portion in closely spaced relation to the lower end of the nipple 11, and is adapted to contain a suitable filtering substance, such as steel wool to prevent dirt, grit, and the like passing from the well into the relatively small opening or passage 17. This filtering substance is also placed in the well for the purpose of reduc-

ing the noise incident to the suction created in the parts of the device.

A turning plug 19 is fitted in the tapering bore of the casing 15 and has a downwardly extending stem 20 projecting through the lower end of the casing 15, and upon which is fitted a pair of spaced-apart washers 21 and 22. A spring 23 surrounds the valve stem 20 between the washers 21 and 22, and a nut 24 is secured to the lower end of the stem 20 against the lower washer 22, to hold the latter against the spring 23 and thus tension the upper washer 21 against the lower side of the casing 15. The stem 20 is drawn downwardly by the spring 23 and the turning plug 19 is thus held within the bore of the casing 15. The upper end of the turning plug 19 is provided with an annularly enlarged head 25 from which laterally extends an operating arm 26, the same projecting preferably inwardly in a direction toward the engine, when the attachment is applied thereto.

The inner side of the valve casing 15 is provided with an internally threaded projection into which is engaged the outer threaded end of a connecting nipple 27, the opposite end of the nipple being externally screw-threaded for engagement in the outer wall of the intake manifold A of the internal combustion engine. An air chamber 28 having the top and bottom walls thereof converging from the outer to the inner edge of the chamber, having the inner edge thereof open, and having the ends thereof concave, is adapted to receive the outer side of the exhaust manifold B therein. Straps or wires 29 are secured to the upper and lower walls of the air chamber 28, and are adapted to pass around the exhaust manifold B and secured together, by twisting or the like, as shown in Fig. 2, for retaining the air chamber 28 against the outer side of the exhaust manifold. The air chamber 28 is provided in its lower side, and adjacent to its outer edge with a depending internally threaded projection 30 adapted to receive the upper exteriorly threaded end of the pipe 14, the latter being secured in the projection 30 by means of a set-screw 31 which binds through the projection and against the pipe 14.

The turning plug 19 is provided in one side thereof with a port or concavity 32, and the valve casing 15 is provided with a horizontally extending outlet opening 33 which leads to the nipple 27 and communicates therethrough with the intake manifold A. The port 33, and the opening 32, lie in substantially the horizontal plane of the lower end of the passage 17, the adjacent side of the receptacle 10 constituting a dam or wall to prevent overflow of liquid contained in the receptacle or well 10, into the valve casing 15.

The valve 19 is adapted to be controlled from the dash or instrument board C of a motor vehicle, or the like. A preferably sheet metal clip 34 is provided with an outstanding tongue 35 overturned at its free extremity for engagement about the nipple 27, the clip 34 extending rearwardly from the attachment. Laterally extending flanges 36 are formed upon the rear end of the clip 34 and are preferably overturned upwardly to form a socket for the reception of the adjacent end of the flexible pipe 37 which leads to the dash or instrument board C of the vehicle.

The flexible pipe 37 is carried backwardly to any desired point, such as to the instrument or dash board C. A sleeve 38 is fitted around the flexible pipe or tube 37 at a point spaced from the rear extremity thereof, and is provided with a set-screw 39 adapted to bind through one side of the sleeve 38 and against the pipe to hold the latter from sliding through the sleeve. The rear end of the sleeve 38 has an outstanding annular flange 40 adapted to be secured by screws or the like to the inner side of the dash or instrument board C with the sleeve 38 projecting through a suitably formed aperture in the board. The tube 37 projects rearwardly through the board C for a considerable extent. Surrounding the inner projecting end of the tube or pipe 37 is a tubular shank 41 adapted to slide longitudinally upon the pipe 37 and to abut at its forward end against the plate or flange 40, and which is provided upon its rear end, with a knob or handle 42 fixed thereon by a cross pin 43.

A wire, or other flexible element, 44 is secured at one end to the cross pin 43 within the tubular shank 41, the flexible element 44 extending through the flexible tube or pipe 37 throughout its entire length and projecting from the forward end of the tube 37, and being adapted for attachment to the arm 26 of the valve 19. The arm 26 is vertically apertured, and a connecting bolt 45 is inserted upwardly through the arm 26 with the head of the bolt resting against the under side of the arm. The bolt 45 is transversely apertured for the reception of the forward extremity of the flexible element 44 therethrough, as shown in Fig. 2, and the free end of the wire or element 44 is suitably rolled around the exterior surface of the bolt 45, and is clamped thereabout and against the upper face of the arm 26 by a clamping nut 46.

For facilitating the introduction of fluid, or the like, into the well or receptacle 10, the pipe 14 is provided in its outer side with a relatively large opening 47 adapted to be normally closed by a slide valve 48 in the form of a disk of sheet metal or the like which is pivoted at one edge upon a rivet

or pin 49 against the exterior surface of the pipe 14. A lip or projection 50 is turned outwardly from the free end of the disk 49 and may be engaged by the finger, or the like, for swinging the disk into and out of closed position with respect to the opening 47.

The air chamber 28 is provided, preferably in its opposite ends with air inlet openings 51 arranged adjacent to the enlarged open edge of the chamber, and adapted to conduct air to the interior of the chamber 28 adjacent to the manifold B when the device is applied thereto.

In use, when the device is installed as above described and as shown in the accompanying drawing, the knob 42 may be drawn rearwardly from the instrument board C to pull the wire 44 and thus swing the arm 26 of the valve 19 to open the same to the desired extent. The tubular shank 41 slides longitudinally upon the rearwardly extending end of the tube 37 and guides the handle 42 in its backward and forward movement. Thus, the operator may adjust the valve 19 while the engine is actually running under working conditions, and the best desired results may thus be obtained.

For the purpose of starting the engine in cold weather, the disk valve 48 may be opened, and a quantity of gasoline, or the like, introduced into the pipe 14, the gasoline flowing into the well 10, and resting therein below the upper end of the restricted passage 17. When the engine is now turned over or cranked, suction is created through the passage 17, the valve 19, being opened to the desired extent, and the relatively great force of the suction through the small passage 17 insures the thorough mixing of air drawn downwardly through the tube 14 with the fuel contained in the well, and delivers a relatively rich mixture through the valve and into the manifold A. After the engine is started, the valve 48 may be closed, and the air is then drawn through the air chamber 28, and is heated by passage therethrough incident to the radiation of heat from the adjacent side of the exhaust manifold B. It is of course understood that a quantity of water or other suitable fluid may be placed in the well 10 through the opening 47 so that heated moistened air may be delivered through the intake manifold A, and thus any carbon deposit in the engine will be removed, incident to the presence of steam in the cylinder. The steel wool or other filtering substance employed in the well, insures the cleansing of the air, when the latter is drawn downwardly through the pipe 14 so as to collect sediment and the like which would otherwise be carried in the relatively small passage 17 and into the cylinder and valves of the engine.

The device comprises but relatively few parts, and the same may be quickly and economically manufactured and assembled, and occupies but relatively small space when in position. It is of course understood that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of the invention, without departing from the spirit thereof, and being restricted only by the scope of the following claims.

I claim:

1. In an attachment for internal combustion engines, the combination with the intake manifold of an internal combustion engine, of a well, a valve connected to the upper end of the well, a connection between the valve and said intake manifold, an air supply pipe connected to the upper end of the well for supplying air thereto, said pipe having an opening therein, and a closure carried by the pipe for said opening, said pipe being adapted to receive a liquid through said opening to be introduced into the well for admixture with air drawn therethrough when said valve is opened.

2. In an attachment for internal combustion engines, the combination of a body part including a well and a valve casing, said body part being provided with a relatively small passage leading downwardly from the upper end of the well to the intermediate portion of the valve casing, a valve in said casing, a connecting nipple carried by the body part leading from said casing, and adapted for communication with the intake manifold of an internal combustion engine, an air chamber adapted for attachment to the exhaust manifold of an internal combustion engine, and a connection leading from said air chamber to said well adapted to conduct heated air to the latter.

3. In an attachment for internal combustion engines, the combination of a body part including a well and a valve, said body part being provided with a relatively small port leading from the well to the valve, attaching means carried by the body part leading from the valve and adapted for communication with the intake manifold of an internal combustion engine, a hot air supplying device connected to the body part and communicating with the well, and means connected to said hot air supplying device for the introduction of material to be deposited in the well.

4. In an attachment for internal combustion engines, the combination with the intake manifold of an internal combustion engine, of a well, a valve connected to the upper end of the well, a connection between the valve and said intake manifold, a filtering substance arranged in the well and intersecting the outlet therefrom to said valve,

a hot air supply pipe connected to the upper end of the well for supplying air thereto, said pipe having an opening therein, and a closure carried by the pipe for said opening, said pipe adapted to receive a liquid through said opening to be introduced into the well for admixture with air drawn therethrough when said valve is opened.

5. In an attachment for internal combustion engines, the combination of a well, a valve communicating with the upper end of the well, a connection carried by the valve and adapted for engagement with the intake manifold of an internal combustion engine, an air chamber adapted for attachment to the exhaust manifold of an internal combustion engine, a connection between said air chamber and said well for conducting heated air to the latter, and means in

said connection to permit introduction of material to be deposited in said well.

6. In an attachment for internal combustion engines, the combination of a body part including a well and a valve, said body part being provided with a relatively small port leading from the well to the valve, a filtering substance arranged in the well and intersecting the outlet therefrom to said relatively small port, attaching means carried by the body part leading from the valve and adapted for communication with the intake manifold of an internal combustion engine, a hot air supplying device connected to the body part and communicating with the well, and means connected to said hot air supplying device for the introduction of material to be deposited in the well.

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