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H. SURLEMONT

AUTOMATIC INFLATER ARRANGED ON AND ACTUATED BY INTERNAL COMBUSTION ENGINES

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Fig. 1.

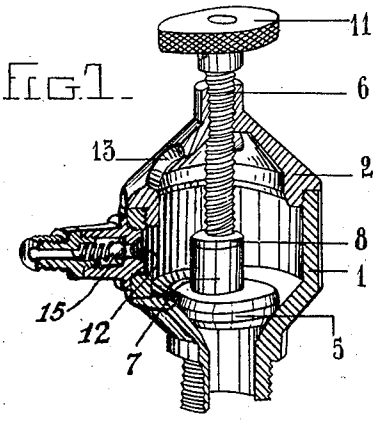


Fig. 2.

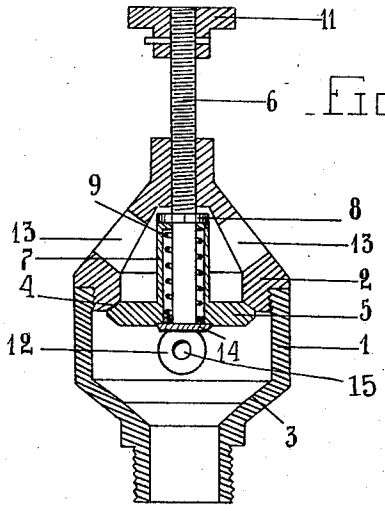


Fig. 3.

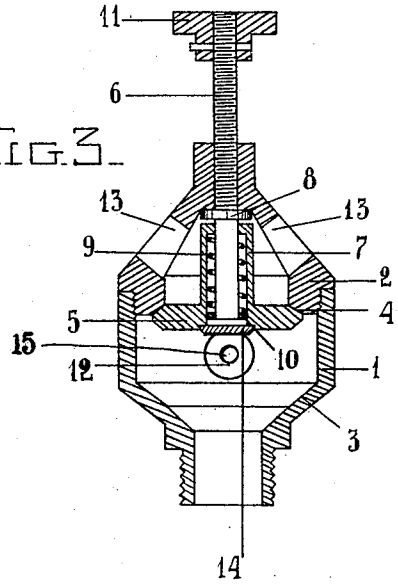
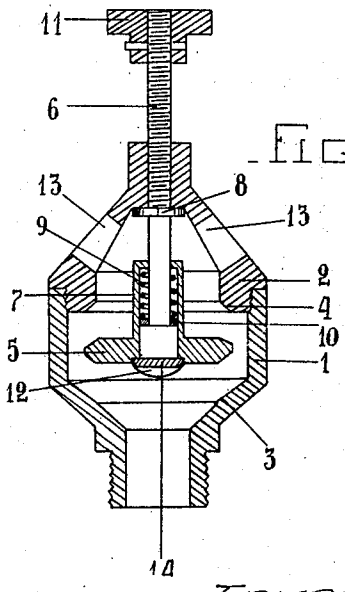


Fig. 4.



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AUTOMATIC INFLATER ARRANGED ON AND ACTUATED BY INTERNAL-COMBUSTION ENGINES.

Application filed December 23, 1924, Serial No. 757,752, and in Belgium December 29, 1923.

The present invention relates to automatic inflaters the object of which is, in particular, to allow of inflating tires, or other similar uses by utilizing one of the pistons of the explosion engine on the cylinder of which it is mounted, as a compression piston.

Devices of this kind are usually fixedly mounted on one of the cylinders of the motor in place of one of the plugs provided above the valves, the plug thus replaced being usually the one which corresponds to the exhaust valve.

In case of the motor not having any such plugs it is likewise a matter of ordinary knowledge to mount appliances of this kind on one of the arms of a tubular piece shaped like a Y, or the like, the other arm of which receives the sparking plug; the whole device thus formed being screwed on the motor in the place of one of the plugs.

The invention relates especially to inflaters of a known type, comprising an aperture for admission into the cylinder, a delivery aperture and an open-air inlet. The object of this last inlet is to allow the induction into the cylinder of a quantity of fresh air through the inflater, this arrangement permitting the admission into the cylinder of a sufficient quantity of fresh air to prevent the formation of a carburetted mixture subject to explosion.

The fluid delivered by the piston will consequently be relatively cold and will consist for the most part of pure air.

Inflaters of this kind known to this day generally have the disadvantage of relatively great complexity, entailing in particular high expenses of machining. On the other hand these devices have several valves and there result, during the operation of the appliance, high inertia forces, due to the great mass of the working parts. Consequently it is necessary, with a view to ensuring the safety of the device likewise to increase the dimensions of the organs.

The object of the present invention is to avoid these drawbacks by means of a very simple device, in which the mass of the working parts is reduced to the minimum.

For this purpose the control of the two above mentioned admission apertures is effected by a single valve, which is actuated by a suitable operating agency.

This valve is connected to its operating agency by an elastic link, while a stop limits its displacement in a given direction so that the valve is able to open under the suction of the engine when it shuts off admission of free air, while it is held against its seat by the above mentioned stop when brought into the position in which it shuts off the aperture of admission into the cylinder.

Other characteristic features of the invention will appear from the description of the drawings annexed by way of example. On these drawings:

Fig. 1 represents a perspective view with part of the inflater broken away, in its position of non-operation.

Fig. 2 is a section of the inflater at the moment when the valve shuts off the free air inlet.

Fig. 3 is a section of the inflater in a position of operation.

Fig. 4 represents a section of the inflater in the course of operation.

The inflater consists of a cylindrical body 1 screw-threaded in its lower part and receiving in its upper part a cap 2.

The body 1 and the cap 2 are respectively provided with valve seats 3 and 4, against which the valve 5 may be brought by a suitable operating agency.

According to the embodiment shown, this operating agency consists of a threaded rod 6 screwed into a suitable prolongation of the cap 2.

The valve 5 is provided with a nozzle guide 7 which enables it to slide along the lower part of the rod 6 and is pulled towards a collar 8 integral with the rod 6, by a spring 9 placed inside the said nozzle guide and having its support on the one hand against an enlarged base 10 of the rod 6 and on the other hand against a flange of the said nozzle piece 7.

It will be seen that from this arrangement the screwing of the threaded rod 6, effected by acting on a milled button 11 connected to it by some suitable means, will cause the downward movement of the rod 6 which, owing to the collar 8, will force back the valve 5 until it bears against its seat 3, as shown on Fig. 1.

In this position the admission from the driving cylinder, not shown, into the inflater is cut off and the inflater does not operate.

To bring it into its position of action, it will be sufficient to carry out the reverse operation of unscrewing the threaded rod 6 and

it is evident that in that case the valve will be driven upwards by the agency of the spring 9 until the valve 5 bears against its seat 4 (see Figure 2). It should be noted that in this position the threaded rod 6 has not yet reached the end of its upward stroke and that it is still necessary slightly to unscrew the rod 6 before the collar 8 strikes against the cap.

The object of this arrangement is to ensure certain contact of the valve 5 against its seat 4 by bringing about a certain tension of the spring 9.

If, in this position (shown in Fig. 3) the motor of the vehicle is started, the suction of the driving piston will produce the downward movement of the valve 5 (as shown in Fig. 4) and fresh air may be drawn through the holes 13, provided in the cap 2.

On delivery by the driving piston (not shown) of the fluid previously drawn in, the valve 5 will automatically be forced back on its seat and the compressed fluid will be forced outside of the inflater through a delivery aperture 12, provided in the body 1 and connected by a suitable conduit, not shown, to the tire and similar organs.

It need hardly be said that an automatic valve 15, opening outwards is provided directly beyond the aperture 12.

It should be remarked that in order to avoid leakage and loss, the nozzle piece 7 is closed off in its lower part by a button 14 fitted in the valve 5.

It should also be remarked that the inertia forces produced during the running of the apparatus by the alternate movement of the working parts will be reduced to a minimum because the above working parts are limited to a single valve.

What I claim is:

1. An automatic inflater to be arranged on and actuated by internal combustion engines, comprising, a housing, an admission port for communication with the upper part of a cylinder of an engine and an inlet port open to atmosphere, positioned in the housing, in line, and in the lower and upper parts of the housing respectively, a delivery port in the side of the housing, a non-return valve controlling the delivery port, and a single valve positioned in the housing for controlling the said admission and inlet ports.

2. An automatic inflater to be arranged on and actuated by internal combustion engines, comprising, a housing, an admission port for communication with the upper part of a cylinder of an engine and an inlet port open to atmosphere, positioned in the housing, in line, and in the lower and upper parts of the housing respectively, a delivery port in the side of the housing, a non-return valve controlling the delivery port, and a single valve in the housing, the single valve comprising, opposing double seats, a controlling rod movable in the housing along the axial line of the admission and inlet ports, an elastic connection between the valve and the rod for elastically and movably mounting the valve on the rod, a stop collar on the rod for limiting displacement of the valve on the rod in one direction while permitting elastic displacement of the valve on the rod in the opposite direction.

3. An automatic inflater to be arranged on and actuated by internal combustion engines, comprising, a housing, an admission port for communication with the upper part of a cylinder of an engine and an inlet port open to atmosphere, positioned in the housing, in line, and in the lower and upper parts of the housing respectively, a delivery port in the side of the housing, a non-return valve controlling the delivery port, and a single valve in the housing, the single valve comprising, opposing double seats, a controlling rod movable in the housing along the axial line of the admission and inlet ports, an elastic connection between the valve and the rod for elastically and movably mounting the valve on the rod, a stop collar on the rod for limiting displacement of the valve on the rod in one direction while permitting elastic displacement of the valve on the rod in the opposite direction, the rod being screw threaded into the housing, inward movement of the rod positively forcing the valve to close the admission port by means of the collar, an outward movement of the rod permitting the valve to be elastically held against the inlet port.

In testimony whereof I affix my signature.

HENRI SURLEMONT.