

E. L. MINOR.
FUEL ECONOMIZER FOR ENGINES.
APPLICATION FILED OCT. 28, 1918.

1,333,558.

Patented Mar. 9, 1920.

Fig. 1.

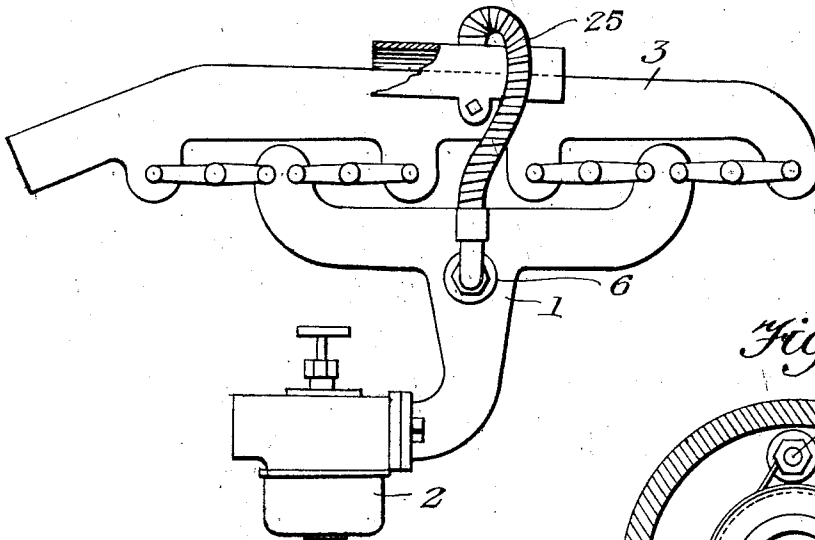


Fig. 3.

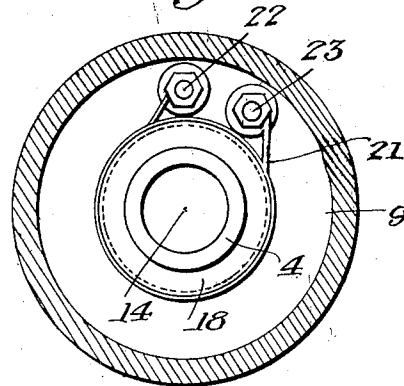
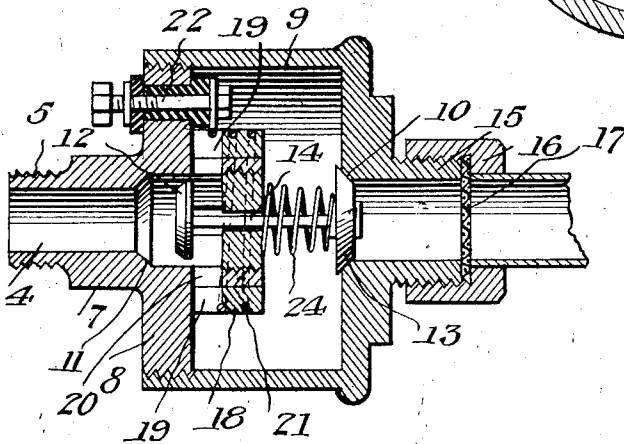


Fig. 2.



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FUEL-ECONOMIZER FOR ENGINES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD L. MINOR, a citizen of the United States, residing at Marfa, in the county of Presidio and State of Texas, have invented new and useful Improvements in Fuel-Economizers for Engines, of which the following is a specification.

This invention relates to fuel economizers for internal combustion engines, the object in view being to economize fuel, increase the power efficiency of the engine, and reduce the accumulation of carbon deposits within the engine by supplying air in a heated condition to the intake pipe or manifold of the engine between the carbureter and the combustion chamber or chambers of the engine, said air being automatically controlled by the suction produced by the pistons as is well understood by those familiar with the art to which this invention appertains.

The invention relates particularly to the air controlling valve mechanism or structure by means of which the engine may be more easily started and by means of which the engine runs with greater power and smoothness after it is started and in accordance with the varying speed of the engine as regulated by the main throttle valve of the carbureter.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts, as herein described, illustrated and claimed.

In the accompanying drawing:—

Figure 1 is a side elevation showing one form of my device in its applied relation to the intake manifold of an engine.

Fig. 2 is an enlarged diametrical section through the valve structure of a modified form of the device.

Fig. 3 is a transverse sectional view through the economizer certain parts being shown in elevation.

Referring to the drawings, 1 designates the intake manifold of an internal combustion engine, 2 the carbureter attached to the receiving end thereof, and 3 the exhaust manifold, said parts being arranged in the usual manner.

The auxiliary air device comprises an air tube 4 which is threaded as shown at 5, adapting it to be screwed into the intake manifold 1 at the point 6 or any other convenient point between the carbureter

and the engine. The pipe 4 comprises an enlarged portion 7 having flat surfaces to receive a wrench which enables the auxiliary air device to be securely fastened to the manifold and removed therefrom without throwing the working parts of the valve out of adjustment. The tube 4 has an enlarged and peripherally threaded flange 8 forming the lower or outer wall of a hot air chamber, the remainder of said chamber being formed by a hollow cylindrical cap 9 which, as shown, is threaded upon the flange 8. The cap 9 is formed with an internal valve seat 10 and within the tube 4 is another valve seat 11. Working in conjunction with the valve seat 11 is a valve 12 and working in conjunction with the valve seat 10 is a second valve 13. The valves 12 and 13 are reversely disposed, or in other words, they face in opposite directions. Both of the valves 12 and 13 are mounted upon a common valve stem 14 so that they work in unison. The distance between the valves 12 and 13 is less than the distance between their seats, so that both valves can not be closed at the same time. The cap 9 is formed with a threaded air inlet nipple 15 which is adapted to receive an internally threaded strainer 16 carrying a fine meshed wire screen 17, through which air is admitted to the heating chamber 9. Arranged within the chamber 9 is an electrically operated heater comprising an insulating core 18 of tubular formation surrounding the adjacent end of the tube 4 and having radially extending air inlet ports 19 which are in line with other ports 20 in the tube 4. A resistance coil 21 is wrapped around the insulating core 18 and connected with terminals 22 and 23, the latter being connected with a source of electrical energy. The air passing through the heating chamber is thus heated before it is delivered to the intake manifold. The valve 13 is held yieldingly but normally closed by means of a spring 24, the other valve 12 being held normally open by the same means. When suction occurs in the starting of the engine, the valve 12 is drawn against its seat, thus preventing air from passing at such time into the intake manifold. This produces a rich mixture upon which the engine starts. As the speed of the engine is increased by opening the throttle of the carbureter, the valve 12 moves away from

its seat in proportion to the degree of suction, thereby allowing a proportionate amount of heated air to be delivered to the manifold. Thus the device regulates itself automatically to the varying speed conditions of the engine.

Instead of employing the electric heater hereinabove described, hot air may be drawn by means of a suitable hot air connection 25 from the exhaust manifold or pipe and directed into the nipple 15 to which said hot air connection 25 may be connected by any suitable means such as a union. If desired, the hot air connection 15 and the electric heating coil may both be used either separately or simultaneously in accordance with varying climatic conditions.

I claim:—

20 A fuel economizer for internal combustion engines,—embodying an air inlet tube adapted to be attached to the intake mani-

fold of the engine, an enlarged peripherally threaded flange on said tube, a hollow cylindrical cap threaded on said flange, a 25 valve seat in said cap, another valve seat in said tube, said valve seats being reversely disposed, valves cooperating with said seats and having a common stem, the distance between said valves being less than 30 the distance between the seats, means for normally holding one of the valves against its seat, said tube having air inlet ports within the cap, an electric heater comprising an insulating core of tubular formation 35 surrounding one end of the tube, said core having air inlet ports communicating with the ports of said tube, electric terminals carried by said flange, and a resistant coil wrapped about the core and terminally 40 connected with said terminals.

In testimony whereof I affix my signature.

EDWARD LYNNWOOD MINOR,