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A. FEGEL

2,569,299

TESTING DEVICE FOR CARBURETOR VALVES

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Fig. 1

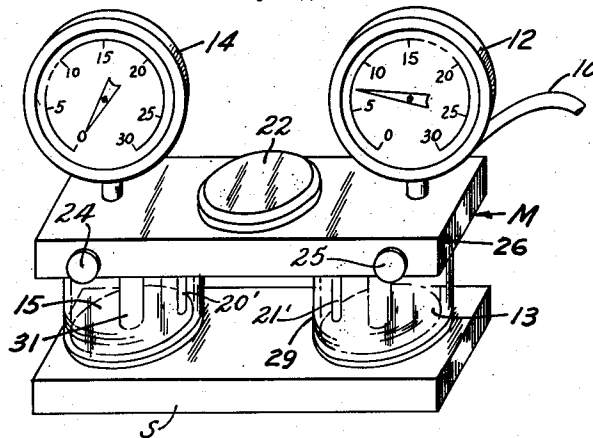


Fig. 2

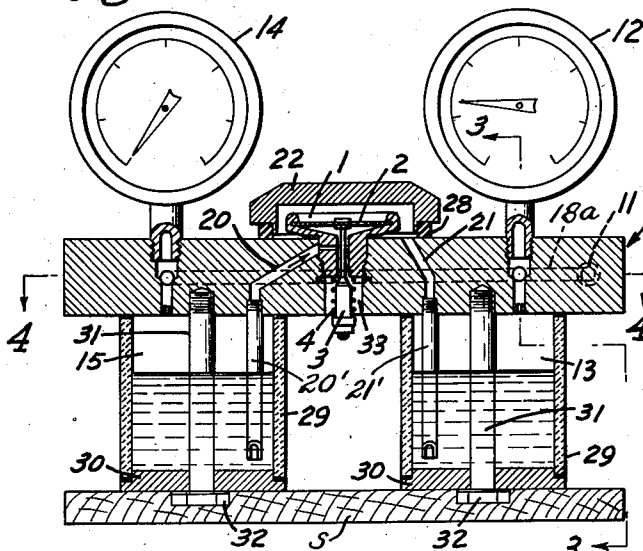


Fig. 3

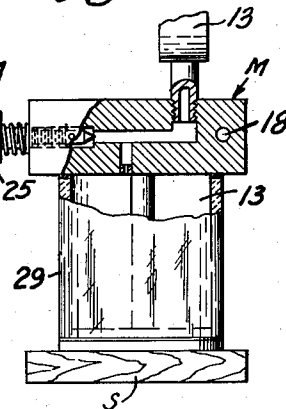
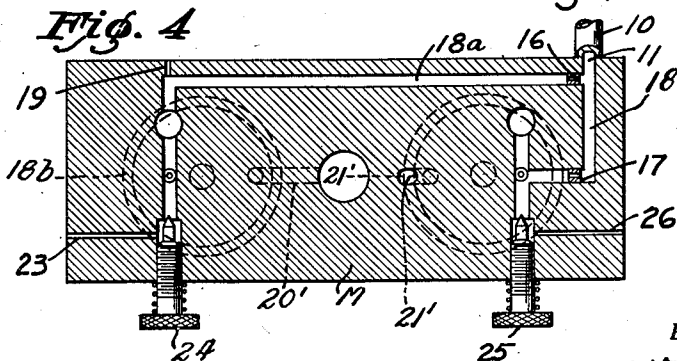


Fig. 4



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TESTING DEVICE FOR CARBURETOR VALVES

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1 Claim. (Cl. 73-46)

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This invention relates to a testing device for an automatic valve of a carburetor and it is an object of the invention to provide a device of this kind providing means whereby there can be determined if the valve is properly seating and opening.

It is also an object of the invention to provide a device of this kind for use in connection with a diaphragm operated valve member to determine if there is leakage occurring at the diaphragm.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved gauge for carburetor valve whereby certain advantages are attained, as will be hereinafter more fully set forth.

In order that my invention may be better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a view in perspective of a testing device constructed in accordance with an embodiment of the invention;

Figure 2 is a vertical sectional view taken lengthwise through Figure 1 with parts in elevation;

Figure 3 is a detail sectional view taken substantially on the line 3-3 of Figure 2; and

Figure 4 is a sectional view taken substantially on the line 4-4 of Figure 2.

This invention relates to a testing device for carburetors. In a type of carburetor now in general use there is provided a valve that opens thereby permitting the feeding of more gasoline, under certain operating conditions of the motor, namely, at speeds of 70 M. P. H. or better or when climbing a very steep grade. In the drawing this valve 1 is shown in cross section. You will note that the valve is provided with a diaphragm 2, a needle valve 3, and a spring 4. In operation, this valve is subjected, when the motor is idling, to a vacuum pressure of twenty inches of mercury on the side of the diaphragm indicated by the arrow. As the throttle of the carburetor is opened and the speed of the motor increases, the vacuum of the intake decreases. When the vacuum within the manifold reaches seven inches of mercury, the spring 4 overcomes the vacuum pressure against the diaphragm 2 and the needle valve 3 opens thereby permitting considerably more gasoline to enter the mixing chamber of the carburetor. As mentioned before this condition is designed to take place at speeds of 70 and above and/or when the car is laboring up a relatively steep grade. The purpose of

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the valve is, of course, to provide the economy of a small jet under low demand conditions and yet provide the additional fuel necessary under high demand conditions. Frequently this valve 1, is or becomes defective, either the diaphragm 2 begins to leak or the spring 4 because of vibrations weakens or tightens. Because prior to this there has been no convenient means of checking this valve; it has been the practice when adjusting the carburetor, to remove the old valve and replace it with a new one. Many times in so doing a perfectly good valve is discarded and it is replaced by a new valve defective in manufacture.

The present invention provides a convenient and certain means of checking the above described carburetor valve. A rubber hose 10 is connected to some convenient spot on the intake manifold of a car, customarily the windshield wiper connection, and to a port 11 to admit the flow of vacuum energy by way of a passage 18 to a gauge 12, a bowl 13, and by way of connecting passages 18a and 18b to a gauge 14 and a bowl 15; said bowls being mounted in spaced relation upon a flat support S and between the same and a flat head member M. As best shown in Figure 4 it is to be noted that this energy is caused to flow through a restrictor 16, in the passage 18a, before reaching the gauge 14 and bowl 15 and through a restrictor 17 in the passage 18, before reaching the gauge 12 and bowl 13. The passage 18b leading to the gauge 14 and the bowl 15 from the passage 18a, is provided with a restricted bleeder 19 to atmosphere for a purpose to be hereinafter described. Leading from the bowl 15 is a port 20 that opens into the body of the valve 3 to be tested below the diaphragm 2, and leading from the bowl 13 is a port 21 that opens into the interior of a cover 22 enclosing the diaphragm 2. Both of the bowls 13 and 15 are filled with a fluid, preferably kerosene, to a height to cover the lower ends of dive tubes 20' and 21', depending from the ports 20 and 21, respectively. The passage 18b is provided with a manually operated needle valve 24 that selectively shuts out or permits a flow of atmosphere through the port 23 and the passage 18 is provided with a manually operated needle valve 25 that selectively closes or opens a port 26 leading to atmosphere.

To operate this testing gauge the manual needle valves 22 and 25 are closed and the vacuum energy being generated by the motor is directed to the port 11. When this is done, the gauge 12 should indicate approximately twenty

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inches of mercury and the gauge 14 should indicate approximately five inches of mercury, gauge 14 showing substantially less vacuum energy, because atmosphere is entering the line through the port bleeder 19. Now if the diaphragm 2 of the valve 1 is leaking, air will travel through the port 21 and the dive tube 21' and cause the kerosene to bubble. If the needle valve 3 is leaking air will travel from the valve body through the port 20 and the dive tube 20', causing bubbles to rise through the fluid in bowl 15. Now, if the valve leaks either through its diaphragm 2 or needle valve 3, it is readily discernible and can be corrected. The final thing to be determined about the valve 1 is whether or not the valve is opening at the proper time. In order to do this the manual needle valve 24 is opened to that point that the gauge 14 reads one inch of mercury. This is done as it is known that within the carburetor approximately one inch of mercury vacuum energy is present. Next the valve 25 is opened and this will admit air through the port 26 and cause the vacuum pressure to drop, the gauge 12 being watched and notice taken when bubbles appear within the bowl 15 in relation to the indicated vacuum pressure on gauge 12. The needle valve 3 opens when the vacuum energy against the lower side of the diaphragm 2 reaches seven inches or less of mercury by reason of the spring 4 overcoming the vacuum energy.

In view of the foregoing, it is believed apparent that the device herein comprised clearly indicates if the diaphragm 2 of the valve is leaking, if the needle valve 3 seats properly, and if the needle valve opens at the desired time. The various passages are provided with restrictors as shown to make simpler the adjustment of pressure by the manual needle valves.

The cover 22 is provided with a gasket 28 and merely rests on the ground surface of the gauge thereby making a vacuum tight cover.

The bowls 13 and 15 each comprises a cylindrical tubular body 29 preferably transparent and having its lower end closed by a disc closure 30.

The upper ends of the bodies 29 are closed by the head member M which is of required dimension and configuration. The member M is herein disclosed as rectangular and is common to both of the bodies 29.

The disc closures 30 and the member M are held in desired placement with respect to the bodies 29 by the bolts 31 which extend from below through the central portions of the closures 30 and thread into the under face of the member M with the heads 32 thereof seated in recesses 32' formed in the top surface of the support S.

The member M substantially midway of the bowls 13 and 15 has disposed therethrough an opening 33 in which is snugly engaged from above the valve 1.

It is also clearly shown in the accompanying drawings that the port 11, passages 18, 18a and

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18b, and the ports 20, 21, 23, 24 and 26, open through the side edges of the member M, as does also the port 26.

From the foregoing description it is thought to be obvious that a gauge for carburetor valve constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated.

I claim:

Apparatus for testing an automatic valve for a carburetor, which valve comprises a body carrying a diaphragm which is subjected on one side to reduced manifold pressure and having a fluid passage through the same communicating at one end with a space on the other side of the diaphragm, a spring closed needle valve normally closing the other end of the passage and a port leading laterally from the passage between its ends; said apparatus comprising a flat support, a flat head member having an opening in which a part of the valve body seats to position the diaphragm with the said one side thereof upwardly directed, a cover member adapted to be placed on the head member over the diaphragm to form a chamber in which said one side of the diaphragm is housed, a pair of vacuum gauges mounted on the head member and interconnected by vacuum conducting passages in the latter, means for coupling a vacuum line with one of said passages, a pair of fluid receptacles having said head member disposed over and supported by the tops thereof, means securing the head member and said receptacles in spaced relation on said support, each of said gauges being in communication with one receptacle, said head member having a port opening at one end into said chamber and at its other end into one of said receptacles, a dive tube depending from the last named passage down into one receptacle, said head member having a port connecting with the lateral port of said valve body at one end and opening into the other of said receptacles at its other end, a second dive tube depending from the last named port in said head member into the other receptacle, said head member having an air bleed port connecting with the passage leading to that gauge which is in communication with the said other receptacle, and a valve controlled communication passage between each gauge and the atmosphere.

ALBERT FEGEL

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