

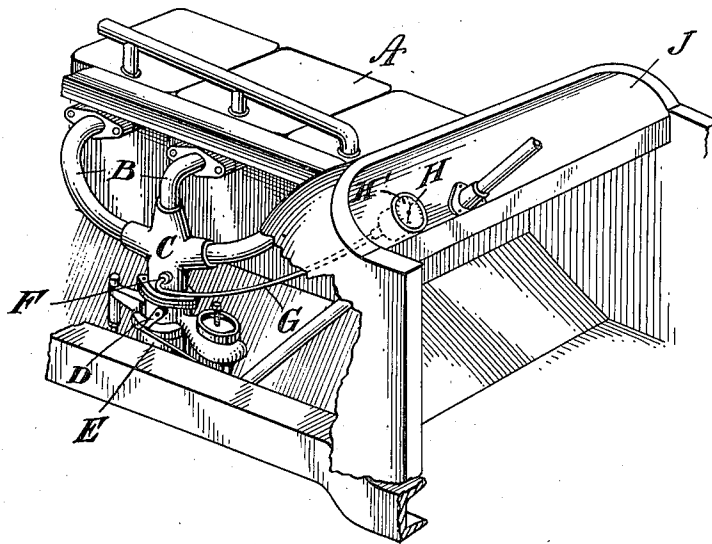
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MEANS TO MEASURE THE SUCTION IN THE MANIFOLDS OF INTERNAL COMBUSTION ENGINES.

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1,323,531.

Patented Dec. 2, 1919.



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UNITED STATES PATENT OFFICE.

EDWARD R. HEWITT, OF MIDVALE, NEW JERSEY.

MEANS TO MEASURE THE SUCTION IN THE MANIFOLDS OF INTERNAL-COMBUSTION ENGINES.

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Specification of Letters Patent.

Patented Dec. 2, 1919.

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To all whom it may concern:

Be it known that I, EDWARD R. HEWITT, a citizen of the United States, residing in the town of Midvale, county of Passaic, State of New Jersey, have invented certain new and useful Improvements in Means to Measure the Suction in the Manifolds of Internal-Combustion Engines, of which the following is a specification, reference being had to the accompanying drawings, illustrative of one particular embodiment of my invention.

My invention relates to the economical operation of internal combustion engines, and more particularly to the use of means to conserve fuel in the operation of such engines. I have discovered that the suction measured in a certain part of the intake manifold is practically an exact index of the percentage of maximum power being developed by the motor at any time. In view of this discovery I provide means to indicate to the operator of an engine the power condition, so that the operator may effect the necessary regulation of the engine for economy and thereby conservation of fuel.

In view of my discovery, one particular means of practising the conservation of fuel is shown in the accompanying drawing, in which—

The perspective fragmentary view of the forward part of a motor car shows one side of the engine and part of the cowl and instrument dash, with the following elements:

A indicates the engine, B—B are the individual manifolds to the different cylinder intake valves, C is the distributing manifold, D is the throttle valve lever, E is a carbureter, F is a coupling connecting the end of the suction tube G with the manifold C. H is a suction gage connected with the tube G, and mounted upon the instrument board J of the dash of the motor car. On the suction gage I prefer to have a guide mark indicating for the particular motor, the approximate critical suction point where economy begins and rapid increase of waste ceases; which in practice would be a red mark at the predetermined point, which I have indicated as H' on the suction gage.

It will be seen that the suction gage H connects with a tube which leads from the manifold between the throttle operated by the throttle lever D, and the engine A, so

that the instrument H indicates the suction at the point where I have found the degree of suction is an exact index of the percentage of maximum power being developed by the motor at any time.

I have made extensive tests and determinations, which illustrated in suitable curves show the relation of fuel consumption and the percentage of power. While this is variable over a short range due to the characteristics of a particular motor and due to compression, carbureting, suction resistance, etc., it is substantially true for all motors of the Otto cycle type operating on gasoline or kerosene. It will be appreciated that on farm tractors where the power required is fairly high relatively, and also in trucks, it is most important that the motor operates economically on fuel. The usefulness of my invention will be further evident, because the fuel consumption per horse power developed increases rapidly with the reduction of the load on the motor, as, for instance, when the load is less than 50 or 60 per cent. of maximum, the consumption of fuel will be greatly increased per horse power.

For any particular motor and carbureter, the exact suction for relative power must be exactly determined if an accurate result is required, but such accuracy is not necessary for approximate power readings. I find that in general a suction of 8" of Hg. corresponds to 50 per cent. of maximum load and that below this point the fuel economy becomes rapidly worse. In operating a tractor the operator should watch the gage, and if the suction rises above the 8" mark then he should shift his gears so as to reduce the speed and increase the load of the motor and thereby secure better fuel economy. My suction gage therefore is preferably marked with a red line or special designation at the predetermined critical point, such as the 8" suction mark, and therefore any operator can readily be taught the meaning of the suction condition so that he will change gears and thereby operate the engine under the most advantageous conditions.

It will be evident that the conservation of fuel in the millions of internal combustion engines now in operation, is a factor of the greatest economic importance, not alone at this time but a matter of great concern for the coming years. The primary object of

many engineers is and has been of late to devise means of conserving fuel, such as gasoline or kerosene, which in some cases has resulted in most complicated devices, sometimes of great expense,—and my discovery is therefore of greatest importance as a deduction from innumerable tests which I have conducted or supervised, because it has led to the provision of very simple and economical means to effect real economy and conservation of fuel. The means for such saving may be very inexpensively attached to any existing motors or to any new motors and for motor cars, tractors, trucks,—in fact any internal combustion engine, primarily, of course, where the operator may effect the load conditions by a change of gear or other like regulation.

While the benefits of my discovery may be realized in various ways, other than the

means shown in the particular embodiment in the accompanying drawing, what I claim and desire to secure by Letters Patent is:

In combination with an internal combustion engine, an inlet manifold between the throttle and the working cylinder of the engine, a suction measuring device located for convenient observation and the better serving as an indicator of the load factor and relative fuel economy in the motor, and a connection between said manifold and said suction measuring device.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses, this 13th day of Feb., 1919.

EDWARD R. HEWITT.

Witnesses:

HERMAN F. CUNTZ,
H. MUCHMORE.