May 5, 1925. 1,536,910

O. G. NORTON

ACCELERATING DEVICE

Filed April 12, 1924

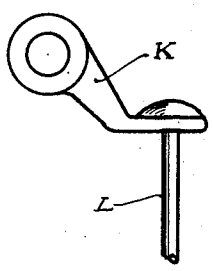


FIG. 2

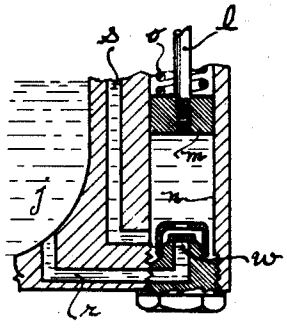


FIG. 3

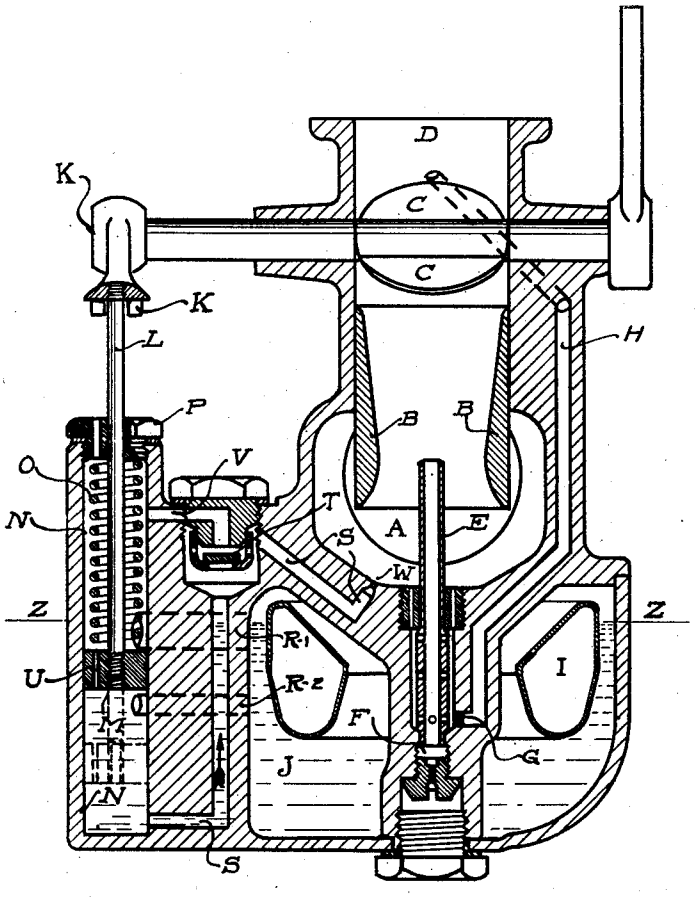


FIG. 1

OLIVER G. NORTON
INVENTOR.

BY Stanley M. Hale

ATTORNEY.

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UNITED STATES PATENT OFFICE.

OLIVER G. NORTON, OF DETROIT, MICHIGAN, ASSIGNOR TO GEORGE M. HOLLEY, OF DETROIT, MICHIGAN.

ACCELERATING DEVICE.

Application filed April 12, 1924. Serial No. 706,008.

To all whom it may concern:

Be it known that I, OLIVER G. NORTON, a citizen of the United States, residing at 2923 Second Blvd., Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Accelerating Devices, of which the following is a specification.

The object of this invention is to provide means whereby a gradual discharge of an extra supply of fuel is obtained when the throttle is opened suddenly.

Figure 1 shows a cross sectional elevation showing the elements of a carbureter arranged in one plane for the purposes of illustration. Obviously the parts may be arranged more advantageously.

Figure 2 is a partial end elevation of the operating means.

Figure 3 is a partial elevation showing a modification of the accelerating device illustrated in Figure 1.

In Figure 1, A is the air entrance, B is the venturi which forms the mixing chamber, C is the throttle controlling the mixture outlet D. E is the fuel nozzle discharging into the throat of the venturi B. F is the master metering orifice controlling the fuel discharged through the nozzle E and also controlling the flow of fuel through the slow speed orifice G and the low speed fuel passage H, which discharges into the mixture outlet D adjacent to and in advance of the throttle valve C. I is a float maintaining the fuel level in the float chamber J at the level Z—Z. The above elements are the elements of a well known carbureter of the type corresponding to the Jouffret & Renee Patent, #1,002,700.

The accelerating means which constitute this invention are as follows:—

A forked arm K which is rigidly connected with the throttle C engages with the rod L provided with a suitable head. This rod L is threaded into a piston M which reciprocates in a cylinder N. The head of the rod L is caused to engage with the forked arm K by means of the compression spring O, the upper end of which engages with the perforated cap P. The cylinder N communicates with the float chamber J through the passages R^1 R^2. The passage R^1 being located at the fuel level Z—Z, the passage R^2 being located below the piston M when the piston M is in its upper position. The lower portion of the cylinder N communicates with the air entrance A through a passage S. In this passage S a check valve T is provided for a purpose to be described later. The piston M is provided with a bypass U so that the piston M will allow a definite leak of fuel through it.

The check valve T is provided with a passage V communicating with the upper portion of the cylinder N, which is vented to the atmosphere through the perforated cap P.

In Figure 3 the piston rod 1 engages with the piston *m* which reciprocates in the cylinder *n*, and draws fuel from the fuel supply chamber *j* through the passage *r*. A check valve *w* is provided in the passage *r* where it delivers into the cylinder *n*. *s* is the delivery passage from the cylinder *n* to the accelerating outlet not shown.

Operation.—Describing the operation of the Figure 1, which shows the piston M in its upper position, when the throttle valve is opened quickly the piston M descends in the cylinder N under the action of the spring O, which is compressed whenever the throttle C is closed. Thus the rate of descent of M is independent of the rate of opening of the throttle C. The liquid fuel below M is trapped in N when the piston M passes R^2. The fuel is compressed and therefore forced up the passage S and the check valve T is closed. The accelerating fuel then passes past the check valve and out of the accelerating nozzle W into the air entrance A, from where it is drawn into the venturi-shaped mixture chamber B.

The function and purpose of the check valve T is as follows:—

When the throttle valve is opened very slowly the piston M descends at such a rate that the flow of fuel up S will not raise the check valve T from its seat. In this case fuel flows up S, past T, through B, and back into N, which of course communicates with the float chamber J through the passage R^1 located at the fuel level Z—Z. It therefore happens that when the throttle valve is opened slowly little or no fuel is discharged through W, it having been found that under such circumstances accelerating fuel is not only unnecessary but a serious detriment to the smooth operation of the engine. On the

other hand when the throttle is opened quickly the maximum amount of accelerating fuel which the device is capable of giving is required, not only whilst the throttle is opening but immediately thereafter.

The purpose of the bypass U through the piston M is as follows:—

When the throttle valve is closed quickly there is a tendency to draw air back through W and through the cap P, down S, into cylinder N. To avoid the accelerating pump becoming air bound it is necessary to ensure that fuel will flow through R^1 into N and it is for this purpose that the passage U is provided.

In Figure 3 a modification of the above device is shown which operates as follows:—

Instead of a bypass or leak U the check valve *w* is provided in the passage *r*, which connects the cylinder *n* with the float chamber *j*. With this exception the operation of the device is as that described above. That is to say, when the throttle valve is opened the piston *m* descends under the action of the spring *o*, fuel is ejected from the cylinder *n* through the passage *s* to the accelerating nozzle not shown..

What I claim is:

1. In combination with a throttle controlled carbureter, an accelerating device comprising spring operated fuel pumping means and means actuated by the throttle for storing energy in the spring during the closure of the throttle, and means for disconnecting the pumping means from the throttle valve on opening the throttle, whereby fuel is gradually discharged from the pumping means to the carbureter immediately after the throttle is opened.

2. In combination with a throttle controlled carbureter, accelerating means comprising a spring operated pumping means, means actuated by the throttle for compressing the said spring, means for releasing the compressed spring when the throttle is quickly opened, whereby the spring pumping means gradually discharges under the action of said compressed spring.

In testimony whereof I affix my signature.

OLIVER G. NORTON.