

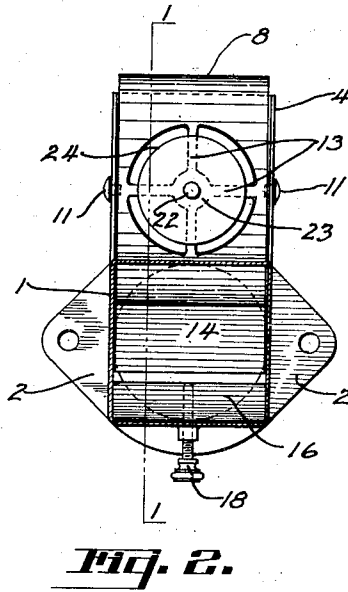
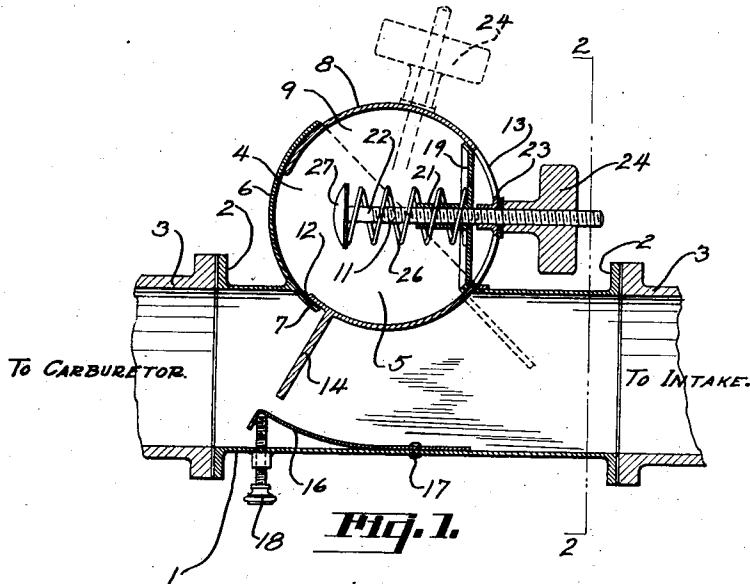
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INTERNAL COMBUSTION ENGINE

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INTERNAL-COMBUSTION ENGINE.

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The present invention relates to improvements in internal combustion engines and has particular reference to those using a carburetor as a charge forming device, and in which a charge is drawn into the combustion chamber of the engine from the carburetor through an intake pipe. The special object of the invention is to provide a means for insuring better control of the charge passing through the intake pipe. It is generally known that different engine speeds call for differently constituted charges, a rather lean charge being the ideal for a fast running engine, while a rich charge is better adapted to meet the requirements of a slow running engine. It is the object of the present invention to provide a control means in connection with the intake pipe of a internal combustion engine, which will automatically control the port area of the intake in accordance with the intensity of the draft caused by the suction of the engine. It is further proposed to incorporate in such control means a means which allows atmospheric air to enter through the wall of the pipe whenever the intensity of the draft reaches a certain predetermined degree. It is further proposed to provide means whereby the admixture of atmospheric air into the charge is automatically and substantially proportionately increased with an increase in draft. Further objects and advantages of my invention will appear as the specification proceeds.

The preferred form of my invention is illustrated in the accompanying drawing in which Figure 1 shows a longitudinal section through a fragmentary piece of intake pipe having my control means attached thereto, substantially taken along line 1—1 of Figure 2, and Figure 2 an end view of the device substantially as seen from line 2—2 of Figure 1.

While I have shown only the preferred form of the invention, it should be understood that various changes or modifications may be made within the scope of the claims hereto attached, without departing from the spirit of the invention.

The pipe section 1 is flanged on both ends as shown at 2 and is adapted for insertion into the intake pipe 3 of an internal combustion engine which latter connects at one end with the carburetor, not shown in the drawing, and at the other end with the intake manifold of an internal combustion engine,

also not shown. The pipe which is preferably rectangular in cross section has a portion of its upper face removed as shown at 5 and has its two sides extended upwardly to form two slightly more than semi-circular supporting elements 4 connected by a sectional drum face 6 extending into the pipe for a short distance as shown at 7. A drum shaped valve 8 having two circular end pieces 9 is supported in the two bearing plates 4 as at 11 and is formed with two apertures 12 and 13 disposed in the drum face thereof on diametrically opposite sides. In the normal position of the valve, as indicated in full lines in Figure 1, the opening 12 is covered by the section 6 of the outer rim and a blade 14 extends from the drum valve into the pipe section 1 to reduce the port area thereof. To aid in the exact control of the port area I provide a second blade 16 of spring material fastened with one end to the bottom of the pipe section as shown at 17 and lifted at its upper end in confronting relation to the blade 14 by means of a screw 18. The exact port area suited for best conditions with the valve in the initial position shown in Figure 1, may therefore be obtained by adjusting the set screw 18.

The second aperture 13 in the valve drum is adapted to be closed by means of a second valve 19 guided by means of a sleeve 21 on the rod 22 which latter passes through a spider 23, and has a nut 24 threaded on its outer end, while a spring 26 is interposed between the valve 19 and the head 27 of the rod. It will be seen that the spring tends to seat the valve 19 and that the tension of the spring may be adjusted by means of the nut 24, which latter serves at the same time as a weight tending to hold the drum valve in the position indicated in full lines in Figure 1.

The operation of my invention is as follows:—

When the engine runs slowly and there is comparatively little draft in the intake pipe, my mechanism assumes the position indicated in full lines in Figure 1 restricting the available port area of the intake pipe to the narrow passage left between the end of the blade 14 and the spring 16. The width of the passage may be adjusted by operation of the set screw 18. The valve at this time is closed and no atmospheric air may enter the intake pipe. As the draft increases the

blade 14 is pulled forward until gradually the passage increases as is indicated in the dotted line position. As the opening increases the valve also begins to open so that at a certain predetermined intensity of draft atmospheric air is admitted through the opening 12 in the drum valve. The admission of atmospheric air may be controlled by means of the second valve by adjustment of the nut 24 thereon so that a very nice adjustment may be obtained. The nut 24 at the same time serves as a weight which opposes the advance of the blade 14 and returns the latter to its initial position when the draft ceases or decreases.

I claim:—

1. A control for the intake of an internal combustion engine comprising a pivoted element extending into the pipe so as to reduce the cross-sectional area thereof and yielding to the draft of the engine in proportion to the intensity of the draft, a rotary valve in the wall of the pipe actuated by the said element to provide an opening in the wall of the pipe when the intensity of the draft rises to a predetermined degree, and a second spring-operated valve controlling air admitted through the opening for allowing a delicate adjustment to be effected.

2. A control for the intake pipe of an internal combustion engine comprising a drum valve pivoted to have a peripheral section extend into the pipe and a blade projecting from the drum surface into the pipe for reducing the port area thereof, the blade yielding to the draft in the pipe for increasing the port area thereof as the draft increases, and a port in the valve beginning to register with an opening in the wall of the pipe for admitting atmospheric air into the pipe when the draft reaches a predetermined intensity.

3. A control for the intake pipe of an internal combustion engine comprising a drum valve pivoted to have a peripheral section extend into the pipe and a blade projecting

from the drum surface into the pipe for reducing the port area thereof, the blade yielding to the draft in the pipe for increasing the port area thereof as the draft increases, and the drum being formed with opposing apertures, one of which is made to register with an opening in the pipe when the draft reaches a predetermined degree of intensity while a spring operated valve controls the other aperture.

4. A control for the intake of an internal combustion engine comprising a pivoted element extending into the pipe so as to reduce the cross-sectional area thereof and yielding to the draft of the engine in proportion to the intensity of the draft, a weight associated with the element and tending to oppose the action of the draft, a valve forming part of the said element and opening the pipe to atmospheric air at a predetermined intensity of draft and a second valve controlling the port area of the first valve.

5. A control for the intake of an internal combustion engine comprising a pivoted element extending into the pipe so as to reduce the cross-sectional area thereof and yielding to the draft of the engine in proportion to the intensity of the draft, a weight associated with the element and tending to oppose the action of the draft, a valve forming part of the said element and opening the pipe to atmospheric air at a predetermined intensity of draft and a second valve controlling the port area of the first valve and made adjustable by means of the weight.

6. A control for the intake of an internal combustion engine comprising a rotary valve having an element extending into the intake to be operated by the draft passing there-through, a second valve associated with a port opening of the first valve, and an adjusting element for the second valve arranged to yieldingly oppose operation of the first valve by the draft.

In testimony whereof I affix my signature.

VERNER AUGUST NELSON.