

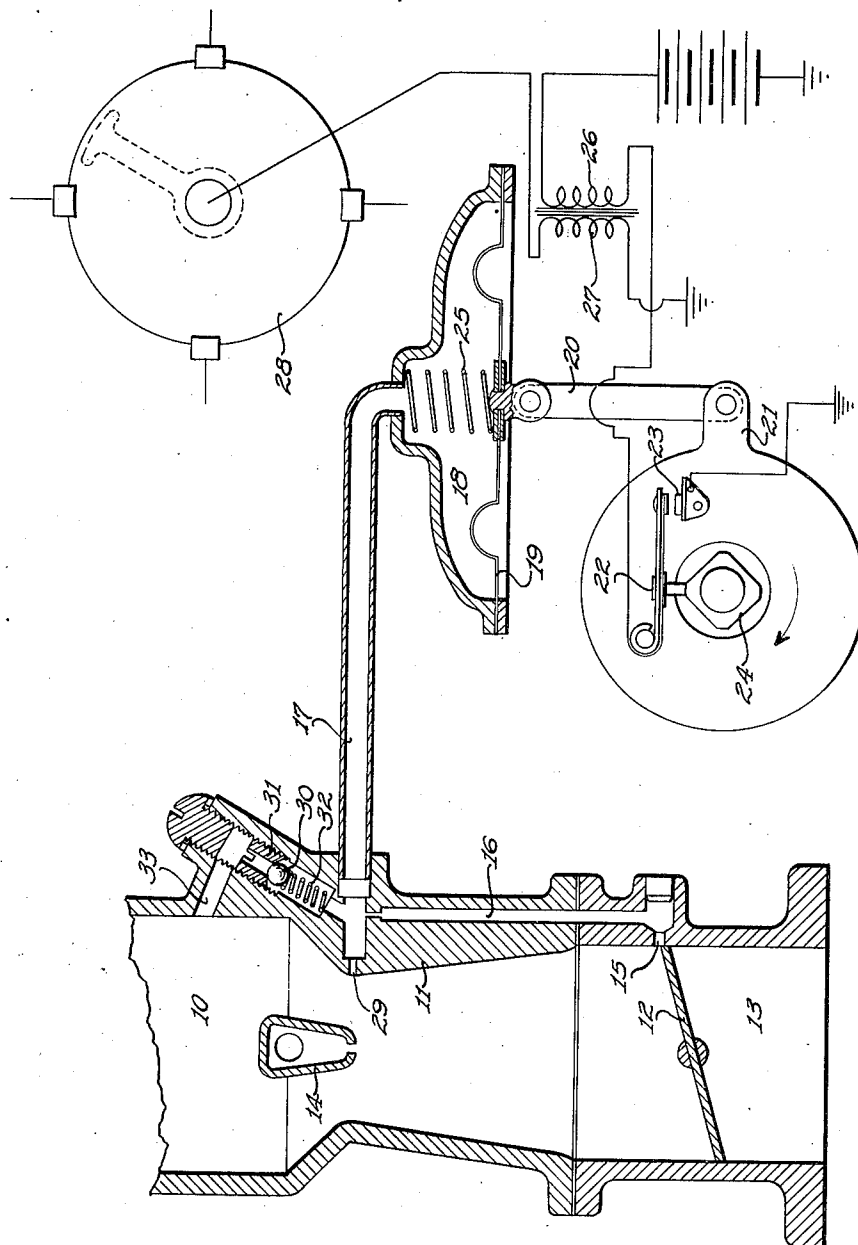
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IGNITION TIMING DEVICE

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UNITED STATES PATENT OFFICE

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IGNITION TIMING DEVICE

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1 Claim. (Cl. 123—117)

The object of this invention is to vary the ignition's advance at part throttle without interfering with wide open throttle advance. An additional object is to prevent knocking during acceleration. When an ignition device is adjusted for both part throttle and for wide open throttle, difficulty is experienced during acceleration because the ignition spark remains advanced under conditions which call for a retarded spark.

The figure shows diagrammatically the essential elements of my invention.

In the drawing, 10 is the air entrance, 11 is the venturi, 12 is the throttle located in the mixture outlet 13. 14 is a fuel nozzle discharging into the throat of the venturi 11. 15 is a restricted opening which I have found satisfactory when using a number 56 drill. This opening communicates with a passage 16 which communicates with a passage 17 which communicates with a chamber 18, one wall of which is formed by the diaphragm 19. This diaphragm 19 is connected by the link 20 to the circuit breaker plate 21 which carries the circuit breaker arm 22 which breaks contact with the stationary contact 23 which is grounded. An engine driven cam 24 makes the break at that time in the cycle of the engine determined by the position of the diaphragm 19. A spring 25 has a tendency to retard the time of ignition and the vacuum admitted through the opening 15 advances the timing and thus counteracts the effect of the spring 25. A low tension coil 26 is intermittently grounded when the circuit breaker arm 22 engages with the stationary contact 23. 27 is the high tension coil associated with the low tension coil 26 and this coil 27 supplies high tension current to the distributor 28 which distributes the spark to the cylinders in a well-known manner.

An opening 29 connects the passage 17 with the throat of the venturi 11. The opening 29 I have found satisfactory if made equal to a #70 drill. So far the ignition device corresponds to known devices. With such known devices, the timing would be defective as if the spring 25 were adjusted to be correct to respond to the opening 15, it would be too stiff for the opening 29. Therefore, some means must be provided to

reduce the suction created by the opening 15 when the throttle 12 is partly open. A relief valve 30 is adjusted to be unseated at 7 or 8 inches of mercury. The suction pressure at which it can be unseated is adjusted by the adjustable seat 31 which presses the ball check valve 30 against the spring 32. In order to get clean air, a passage 33 supplies air to the hollow seat 31. If the spark is too high when running under part throttle, the adjustable seat 31 is backed off so as to reduce the pressure of the spring 32 against the ball check valve 30. This means that the part throttle advance will not be as great as it otherwise would be. Assuming that the engine is running under part throttle and that the throttle is suddenly snapped wide open the valve 30 will be off its seat because at part throttle we are sure to have an excess above 7 inches of mercury. For that reason, the moment the throttle is opened air rushes in through the passage 33 and reduces the suction in the chamber 18 so that the spring 25 immediately becomes effected and the circuit breaker plate 21 is immediately rotated clockwise so as to retard the spark instantaneously.

What I claim is:

In an internal combustion engine a carburetor having an air entrance, a venturi therein, a mixture outlet, a throttle valve therein, ignition system for said engine including a low tension circuit breaker, a chamber associated therewith having a movable wall, said movable wall being adapted to advance and retard said low tension circuit breaker in response to an increase or a decrease of suction in said chamber, a passage connecting the chamber with the mixture outlet suction whenever the throttle is moved from its closed position, a restriction in said passage, a second passage connecting the throat of the venturi with the first passage at a point between said restriction and said chamber, a restriction in said second passage and a non-return check valve adapted to admit air at substantially atmospheric pressure into said second passage on the suction side of said restriction whenever the suction in the mixture outlet exceeds a predetermined value.

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