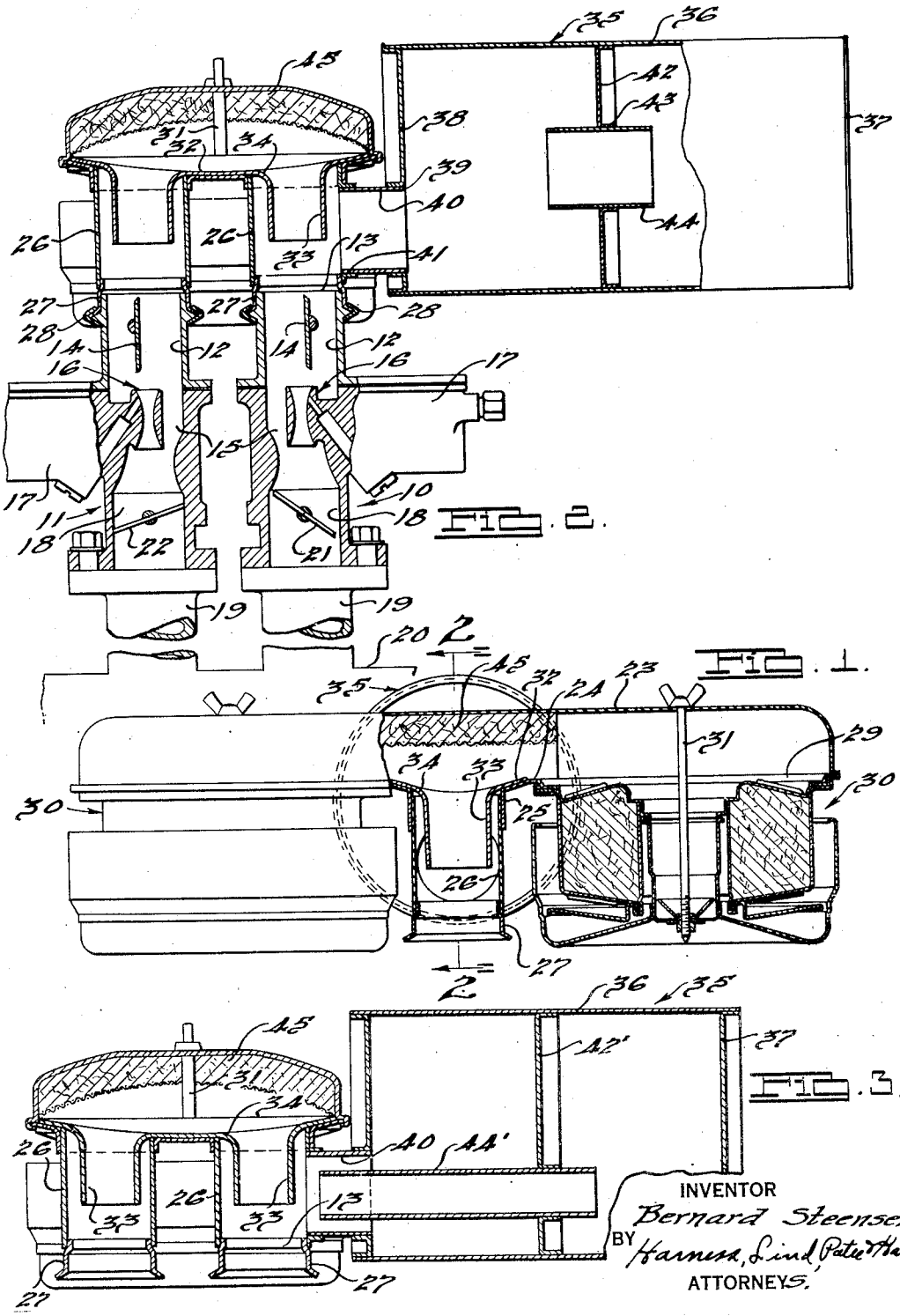
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TWIN CARBURETOR INTAKE SILENCER

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TWIN CARBURETOR INTAKE SILENCER

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This invention relates to improved internal combustion engine intake silencing apparatus.

More particularly, the invention pertains to silencing apparatus of this kind which is particularly adapted for silencing the air intake of an internal combustion engine fuel system of the type which has a pair of carburetors for supplying fuel mixture to the same intake manifold of an engine.

One of the main objects of the invention is the provision of an apparatus of this character which is especially adapted to silence the air intake of the twin carburetor fuel system in which the throttle valve of one of the carburetors is substantially completely closed while the throttle valve of the other carburetor is open during operation of the system within a predetermined speed range and in which both carburetor throttle valves are open during operation at higher speed ranges.

Another object of the invention is the provision in apparatus of this kind of a single sound attenuating silencing member which efficiently serves to silence the air inlet of a pair of carburetors.

Another object of the invention is the provision in the air inlet of said carburetors of means for obstructing the flow to atmosphere therethrough of sound waves emanating in the engine.

A further object of the invention is the provision of a direct communicative connection between the silencing member and only one of the carburetor inlet passageways through which may flow sound waves passing directly from the engine to the latter passageway as well as the sound waves which have been obstructed from escapement from the air inlet passageway of the other carburetor.

An additional object of the invention is the provision of silencing chambers so connected in series with one of the air intake passageways of a pair of carburetors as to serve in silencing both of said carburetor air intakes.

A still further object of the invention is the provision of silencing chambers so connected in parallel with one of the air intake passageways of a pair of carburetors as to serve in silencing both of said carburetor air intakes.

An illustrative embodiment of the invention is shown in the accompanying drawing, in which:

Fig. 1 is a side elevational view, partly in section, of an internal combustion air inlet filtering and silencing apparatus embodying the invention.

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view similar to Fig. 2 but showing a combined filtering and silencing apparatus embodying a modified form of the invention.

In Figs. 1 and 2 is illustrated the application of the invention to a fuel system having primary and secondary carburetors, generally designated by the numerals 10 and 11, respectively. Each carburetor includes an air inlet passage section 12 in which is disposed a choke valve 14. The air intake passage 12 is axially aligned with an intermediate passage section 15 at which fuel is introduced into the air stream by fuel discharging apparatus, generally designated by the numeral 16 which communicates with the carburetor fuel reservoir 17. Axially aligned with the inlet passage section 12 and fuel mixing passage section 15 is a fuel mixture outlet section 18 which is mounted on a riser 19. The risers 19 with which the fuel mixture outlets of the carburetors 10 and 11 are connected discharge fuel mixture at the same intake manifold 20. Provided in the fuel mixture passage sections 18 of the carburetors 10 and 11 are throttle valves 21 and 22, respectively.

The improved silencing apparatus may be advantageously employed in conjunction with a pair of twin carburetors having throttle valves operated in any of a large number of conventional ways. The apparatus is, however, particularly adapted to function in connection with the twin carburetor system having a primary carburetor which alone functions to supply fuel mixture to the engine during a predetermined speed range of operation of the engine and in which both carburetors simultaneously function during operation of the engine at a higher range of speed. This performance of a pair of twin carburetors may be accomplished by so controlling the throttle valves 21 and 22 by apparatus (not shown) as to allow the throttle valve 21 of the primary carburetor to open during a predetermined low speed operating range while the throttle valve 22 of the secondary carburetor is maintained substantially completely closed. During operation of the engine above the foregoing range, both throttle valves are open. One form of suitable control apparatus for accomplishing the foregoing functions is shown in Angell et al. Patent No. 2,075,330, issued March 20, 1937. Numerous other control mechanisms may be employed to accomplish this sequence of control of

the primary and secondary carburetors of a twin carburetor fuel system.

The improved combined silencing and filtering apparatus illustrated in Figs. 1 and 2 comprises a shallow inverted pan-shaped casing 23 having a bottom wall 24 on which is formed a pair of tubular sleeves 25 which depend downwardly in substantial axial alignment of the air inlet sections 12 of the carburetors 10 and 11. The sleeves 25 are connected to the air inlet sections 12 by telescoping collars 26 having flanged rings 27 on their lower extremities which are secured to the wall structures of the carburetors 10 and 11 in which the intake passage sections 12 are provided by clamping bands 28. The intake passage section 12 and the passageways provided by the sleeve 25, collars 26 and rings 27 provide air inlet passageways for supplying air to the respective carburetors. Provided in the bottom wall 24 of the casing 23 on opposite sides of the sleeves 25 thereof are apertures 29 for admitting air into the interior of the casing. Each air inlet aperture 29 of the casing 23 is provided with an air cleaning and filtering unit generally designated by the numeral 30 which is detachably secured to the casing 23 by a threaded bolt 31. Air is drawn through the filtering units 30 and into the interior of the casing 23 from which it flows outwardly through the sleeve 25, collar 26 and a connecting ring 27 to the intake passages of the carburetor.

Mounted on the upper side of the central part of the bottom wall 24 of the casing 23 is a transversely extending plate 32 on which is formed a pair of depending tubular sleeves 33. Each sleeve 33 is disposed centrally of the air passage leading from the casing 23 to one of the carburetors, respectively. The sleeves 33 have arcuately outwardly extending flange portions 34 at their upper extremities which form an obstruction at the entrances of the air passageway leading from the interior of the casing 23 to the carburetors 10 and 11, the purpose of these obstructions being hereinafter more clearly set forth.

A silencing member, generally designated by the numeral 35, is communicatively connected to the air inlet passageway of the primary carburetor 10 at a location between the obstructing flanges 34 of the sleeve 33 which is disposed in the air inlet passageway of the carburetor 10. This silencing member is of the sound attenuating type and includes a cylindrical casing 36 having its axis disposed substantially laterally with respect to the axis of the air inlet passageways of the carburetors. The casing 36 has a closed end wall 37 spaced from the carburetors and an end wall 38 adjacent the carburetors on which is formed an opening 39. A tubular collar 40 fitted in the opening 39 extends laterally with respect to the course of the flow of air through the air inlet passageways of the primary carburetor and is received in a flanged opening 41 formed in the wall of the collar. The interior of the silencer 35 is divided by a partition 42 having an opening 43 therein in which is disposed a sound attenuating sleeve 44 which serves to connect the space on the respective sides of the partition 42. The opening 41 through which the silencing device is connected with the primary carburetor air inlet passageway is located in lateral registration with a substantial portion of the length of the sleeve 33 but is spaced therefrom sufficiently to accommodate free flow of sound waves from this air inlet passageway to the interior of this silencing device.

In the operation of the improved air intake silencer, during operation of the fuel system throughout the predetermined low speed range of engine operation, only the throttle valve 21 of the primary carburetor is open, the throttle valve 22 of the secondary carburetor being substantially completely closed. Any sound waves emanating in the engine tending to flow to atmosphere through the air passageway of the secondary carburetor are obstructed by the throttle valve 22 and are thus caused to return through the intake manifold 20 to the air intake passageway of the primary carburetor 10. Such sound waves are mainly obstructed from passage through the entrances of the latter air passageway and into atmosphere by the sleeve 33 and its flange 34. This action causes the sound waves to enter the silencing device 35 where sound wave attenuation takes place.

During operation of the engine at speeds above the foregoing lower speed range, both throttle valves 21 and 22 of carburetors 10 and 11, respectively, are open. The sleeve 33 at the entrances to the air inlet passageway of the secondary carburetor 11 then functions in substantially identical manner to that of the corresponding sleeve of the primary carburetor 10, thus causing the sound waves that tend to escape through the entrances of the air passageway of the secondary carburetor to be returned through the manifold. Any of such sound waves obstructed from escapement from the secondary carburetor air inlet passage which enter the primary carburetor air inlet passage are obstructed from direct passage to atmosphere in the foregoing manner and are encouraged to enter the silencing device 35. The sound absorption material 45 may be provided on the inner surface of the top wall of the casing 23 immediately above the air inlet passageways of the carburetors in order to reduce noises by sound absorption of any of the sound waves which escape the obstructions in the entrances of the air inlet passageways and tend to flow into the casing 23.

In the form of the invention illustrated in Fig. 3, the combined silencing and air filtering apparatus is substantially identical to that shown in Figs. 1 and 2 with the exception that the sound attenuating tube 44' shown in Fig. 3 extends from a position within the collar 40 adjacent the opening 41 of the member 26 to the space on the side of the partition 42' which is remote from the carburetors. The attenuating tube 44' and the collar 40 thus connect the spaces on opposite sides of the partition 42' in parallel with the air inlet passageway of the primary carburetor 10 while the attenuating tube 44 shown in Fig. 2 and collar 40, also shown in Fig. 2, connect the spaces on opposite sides of the partition 42 in series with the air inlet passageway of the primary carburetor.

With the foregoing silencing apparatus, a single silencer member may be relied upon to effectively silence by sound attenuation noises emanating from the interior of the engine which tend to escape to atmosphere through the entrances of the air inlets of both carburetors of a pair which are connected to the same intake manifold.

Although but several specific embodiments of the invention are herein shown and described, it

will be understood that various changes in the size, shape and arrangement of parts may be made without departing from the spirit of the invention.

I claim:

1. Silencing apparatus for a twin carburetor engine fuel system having a pair of carburetors each provided with an air inlet passage and with a fuel mixture outlet for discharging into the same manifold comprising a sound attenuating chamber having an inlet throat connected directly to the air inlet passageway of only one of said carburetors and extending laterally of the path of flow of air therethrough, and a sleeve in the air inlet passageway with which said chamber is directly connected having a wall portion in front of but spaced from the entrance to said throat and having a flange obstructing the flow to atmosphere from the latter air inlet passage of sound waves emanating in said engine, said sleeve being adapted to encourage the flow of such sound waves into said chamber, and a similar sleeve in the air inlet passageway of the other carburetor having a flange obstructing the flow therethrough to atmosphere of said sound waves, said latter air inlet passageway being in sound wave communication with said chamber through said manifold.

2. Silencing apparatus for a twin carburetor engine fuel system of the type which has a closed secondary carburetor throttle valve and an open primary carburetor throttle valve during a predetermined speed range operation, and which has simultaneously open primary and secondary carburetor throttle valves during higher speed operation including a sound attenuating silencing chamber having an inlet throat connected directly to the air inlet passage of said primary carburetor, a sleeve in the entrance of said latter air inlet tube having a flange restricting said entrance for opposing the outward flow therefrom of sound waves emanating from the engine, said sleeve being so constructed and arranged as to accommodate free passage of such waves to said silencing chamber, and a similar sleeve in the entrance of the air inlet passageway of said secondary carburetor adapted to obstruct the outward flow of such sound waves therefrom when the throttle valve of said secondary carburetor is open.

3. In a twin carburetor fuel system having only a primary carburetor operating during a predetermined speed range and having said primary and a secondary carburetor operating simultaneously during higher speed ranges, silencing apparatus including a silencer having an inlet throat connected directly to the air inlet passage of said primary carburetor and extending laterally from the path of flow of air through said passage, and a sleeve restricting the entrance of each of the air inlet passages of said carburetor, the sleeve in the air inlet passage of said primary carburetor being in spaced relation to the entrance of the inlet throat of said silencer and both of said sleeves being so constructed and arranged as to oppose the outward flow of sound waves emanating in the engine structure from the entrances of said air inlet passages while encouraging the flow of such sound waves into said silencer.

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