United States Patent

Smith et al.

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[54] CARBURETOR AIR DELIVERY SYSTEM

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[52] U.S. Cl. ..... **55/385**, 55/419, 55/DIG. 28, 123/122 D, 261/64 R

[51] **Int. Cl.** **F02m 31/14**

[58] **Field of Search** ..... 55/385, 419; 123/122 D; 261/64 R

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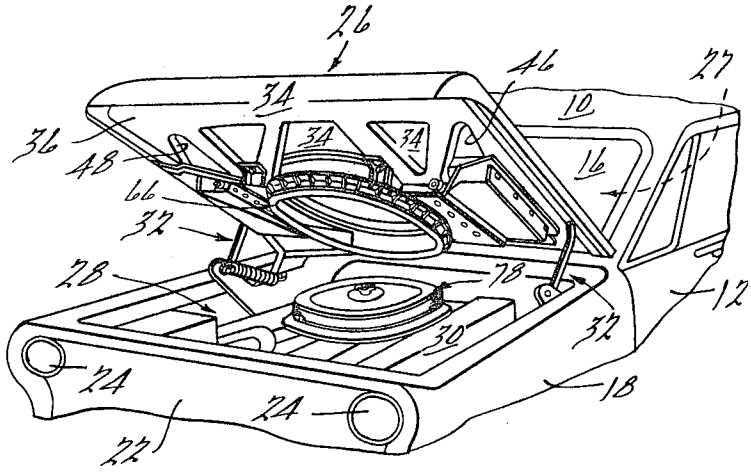
[57] **ABSTRACT**

An air delivery system for the carburetor of the engine of a motor vehicle in which cold outside air is taken in through laterally spaced scoops on the vehicle hood and then directed laterally to the opposite sides of a hood mounted chamber sealingly receiving the carburetor air cleaner; a door is provided in each lateral air duct and these doors may be selectively moved by a control member in the passenger compartment between a "cold air" position in which the doors open the ducts to allow cold outside air to enter the carburetor and a "warm air" position in which the doors block the flow of outside air through the ducts but open up a passage through the ducts for the delivery of warm under-hood air to the carburetor.

6 Claims, 5 Drawing Figures



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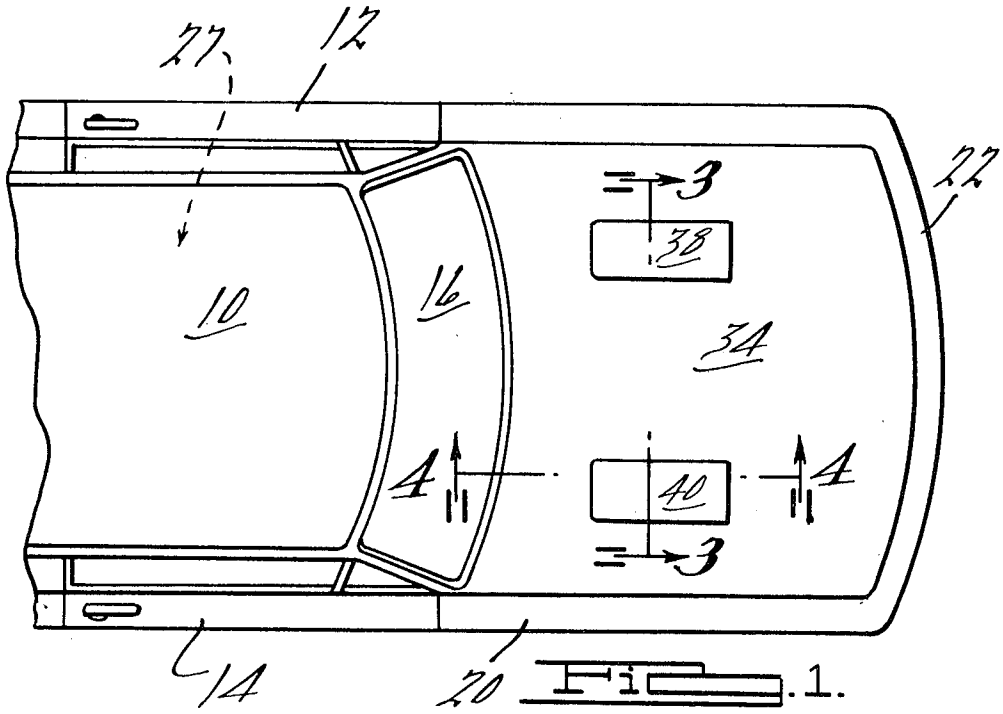

Fig. 1.

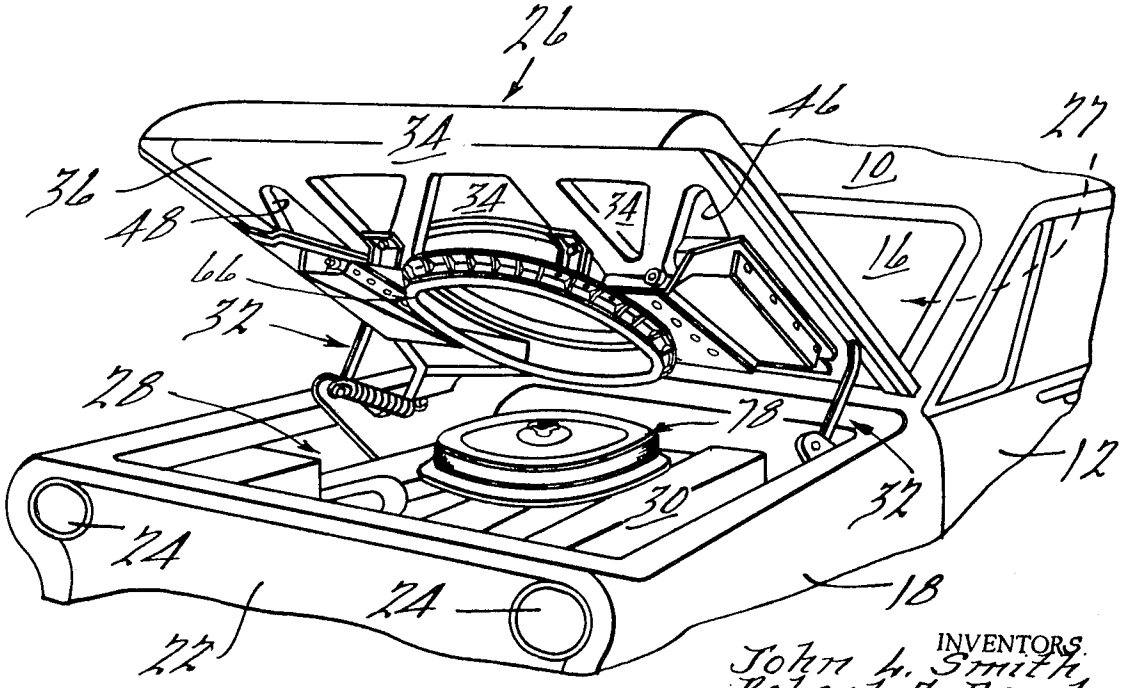

Fig. 2.

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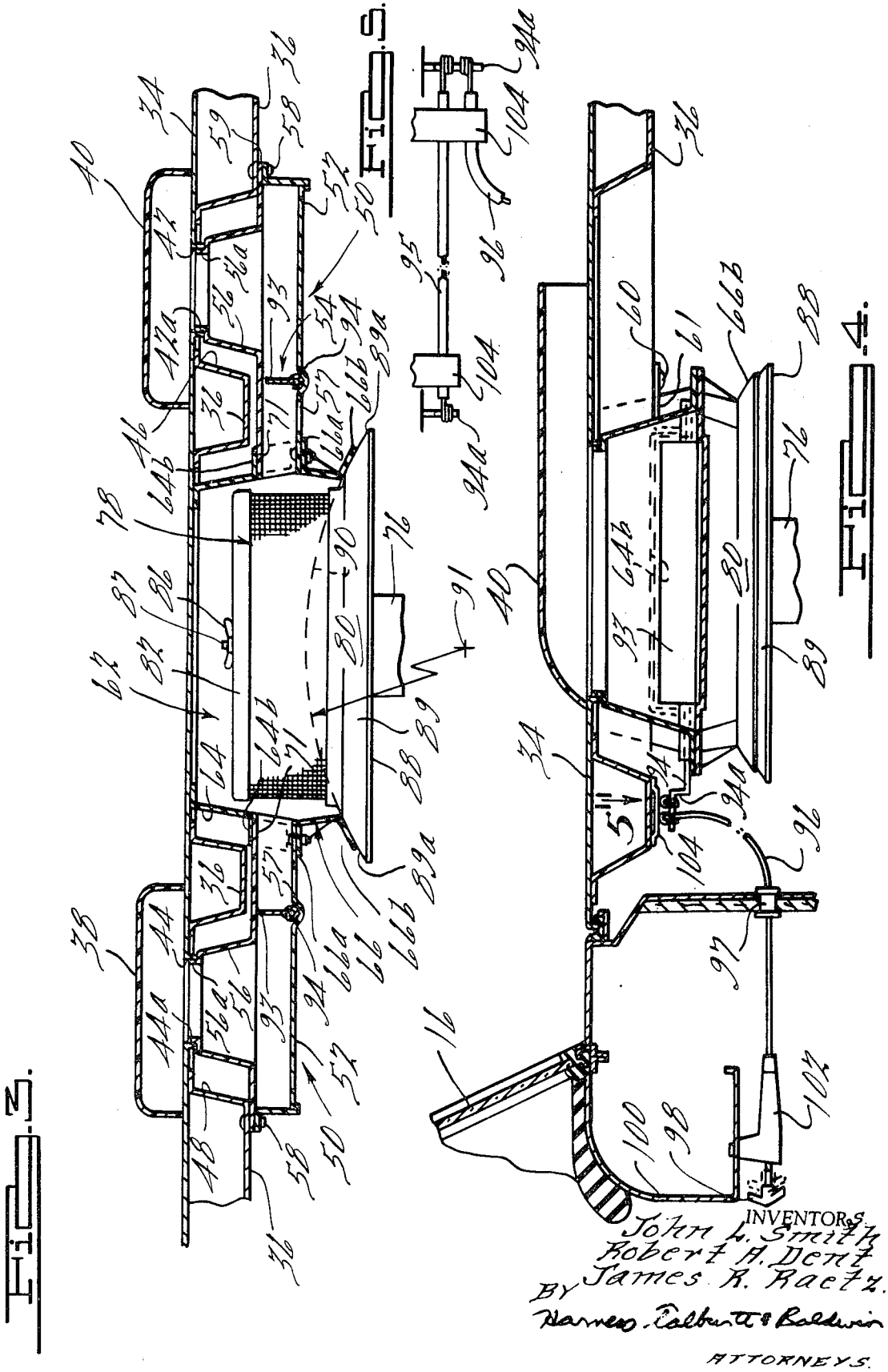

Fig. 3.

Fig. 4.

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CARBURETOR AIR DELIVERY SYSTEM

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an upwind air delivery system for the carburetor of the engine of a motor vehicle.

A more specific object is to provide a carburetor air delivery system for a motor vehicle whereby the vehicle operator may selectively provide warm under-hood air or cold outside air to the carburetor.

In the air delivery system of the invention, an opening is provided in the hood of the vehicle and conduit means fixedly secured to the underside of the hood provide an air passage communicating at one end with the hood opening and opening at its other end under the hood. Means are also provided which are operative with the hood in its closed position to provide sealed air communication between the carburetor and the other end of the air passage, and port means are provided in the conduit means to provide communication between the air passage and the underside of the hood. A door is mounted on the conduit means and control means, including a control member positioned within the passenger compartment, and provided to enable the operator, by selective manipulation of the control member, to move the door selectively between a "-cold air" position in which the under-hood port means are blocked and the air passage is open to deliver cold outside air to the carburetor through the hood opening, and a "warm air" position in which the air passage is blocked upstream of the port means and the port means are opened to admit warm under-hood air to the carburetor.

These and other objects, features and advantages of the invention will be apparent from the detailed description of the preferred embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention is illustrated in the accompanying drawings in which:

FIG. 1 is a top fragmentary view of a motor vehicle embodying the carburetor air delivery system of the invention;

FIG. 2 is a perspective fragmentary view of the motor vehicle of FIG. 1 showing the hood in a raised position;

FIGS. 3 and 4 are cross sectional views taken respectively in line 3—3 and 4—4 of FIG. 1; and

FIG. 5 is a fragmentary schematic view looking in the direction of the arrow 5 in FIG. 4.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The motor vehicle seen fragmentarily in the drawings includes a roof **10**, doors **12** and **14**, windshield **16**, front quarter panels **18**, **20**, grille **22**, headlamps **24**, and hood **26**. Roof **10**, doors **12** and **14**, and windshield **16** together define a passenger compartment **27**, and hood **26** overlies an engine compartment **28** housing an engine **30**. Hood **26** is mounted for movement between the closed position of FIG. 1 and the raised position of FIG. 2 by hood hinge structures **32** of known construction.

Hood **26** is of known sandwich construction and includes an outer panel **34** and an inner, reinforcing panel **36** suitably welded to outer panel **34**. Hood inner panel **36** is not a solid panel but rather comprises an imperforate outer periphery surrounding a generally spidery central rib network to provide a plurality of cutouts selectively exposing the underface of hood outer panel **34**. Outer panel **34** is provided with two forwardly opening air scoops **38**, **40** positioned on top of hood outer panel **34** at opposite sides of the vehicle centerline; scoops **38**, **40** directly overlie openings **42**, **44** provided in the portions of hood outer panel **34** overlying generally triangular-shaped cutouts **46**, **48** in hood inner panel **36**.

A conduit structure, seen generally at **50** and formed of phenolic or other rigid material, is provided for coaction with each hood opening **42**, **44**. Each conduit structure **50** includes a main body tubular structure **52** defining a laterally inwardly

extending air passage **54**, and a hollow lower structure **56** extending integrally upwardly from the outward end of tubular structure **52** to seat at its upper end in hood opening **42** or **44** with a downturned flange **42***a*, **44***a* around the hood opening coacting with a tower flange **56***a* to establish the seating. A longitudinally arranged row or ports **57** is provided in the bottom panel of each tubular structure **52** adjacent the inboard end of structure **52**. The outboard end of each conduit structure is fixedly secured to the underside of the hood by a plurality of screws **58** passing through a flange **59** provided on the outboard edge of tubular structure **52** for engagement with the adjacent peripheral portion of hood inner panel **36**; the inboard end of each conduit structure is secured to the underside of the hood by a screw **60** passing through a bracket **61** carried by the inboard end of tubular structure **52** for engagement with the adjacent hood inner panel portion.

The inboard end of each tubular structure **52** opens into a chamber **62** defined by two generally oval upper and lower chamber structure halves **64**, **66** having mating outboard peripheral flanges **64***a*, **66***a* suitably secured together. Member **64** has a stepped up portion **64***b* at each lateral side so that the halves in assembled location together define a generally rectangular opening **71** at either lateral side of chamber **62** for telescopic receipt of the inboard ends of tubular structures **50**. The chamber structure **64**, **66** is suitably secured to tubular structures **50** with upper chamber half **64** positioned against the underface of hood outer panel **34** within a large central cutout in hood inner panel **36** defining chamber **62** in part. Upper chamber structure half **64** is a rigid member and may be formed, for example, of a phenolic material. Lower chamber structure half **66** is a flexible member and may be formed, for example, of a rubber compound. The flange portion **66***a* of member **66** is reinforced for structural integrity and the lower portion of member **66** is relatively thin and outwardly curled to provide a sealing gasket **66***b*.

Engine **30** includes a carburetor **76**, and an air cleaner **78** is positioned on top of carburetor **76**. Air cleaner **78** is of known form and is held in sandwiched relation between its base structure **80** and lid member **82** by a wing nut **86** threaded on a bolt **87** upstanding from the upper end of carburetor **76**. Base structure **80** includes an external peripheral flange **88** extending completely around the air cleaner and defining at its upper face an angled annular sealing seat **89**. The longitudinal side portions **89***a* of seat **89** lie in planes tangent to an imaginary engine roll orbit **90** centered on the engine roll axis **91**. Air cleaner **78** may have the same oval configuration as chamber **62** but is somewhat smaller in exterior dimension than chamber **62**. With hood **26** in its closed position, air cleaner **78** is received within chamber **62** and spaced annularly from the chamber structure **64**, **66**; gasket member **66***b* defined by lower chamber structure member **66** seats sealingly against annular sealing seat **89** of air cleaner flange **88** so that the only air entrance into chamber **62** is through conduit passages **54**. Air may in turn enter passages **54** either through hood openings **42**, **44** or through port rows **57**.

A door or air valve **93** is provided in each passage **54** between port row **57** and hood opening **42**, **44**. Each door **93** comprises an elongated vane secured along its lower edge to a pivot rod **94**. Each rod **94** extends parallel to and immediately outboard of port row **57** and is pivotally received at its opposite ends in a journal molded into the bottom panel of conduit structure **52**. Rotary movement of rods **94** move doors **93** selectively between the vertically disposed positions of FIG. 3 in which port rows **57** are uncovered and passages **54** blocked upstream of port rows **57**, and a horizontally disposed positions in which passages **54** are open and port rows **57** are covered.

The two air doors **93** are ganged together for joint movement by a bowden cable **95** (FIG. 5) extending between crank arms **94***a* formed on the rear end of each rod **94**, and another bowden cable **96** extends from right hand crank arm **94***a* and passes through a grommet **97** in the vehicle firewall into pas-

senger compartment **27** where it terminates in a control knob **98** supported beneath instrument panel **100** by a suitable bracket **102** anchoring the end of the bowden cable sheath. Bowden cables **95, 96** are supported and directed by suitable brackets **104** secured to any convenient portion of the overall hood assembly.

The described air delivery system enables the vehicle operator to select between relatively cold outside air or relatively warm under-hood air for delivery to the carburetor. With control knob **98** in the extended solid line position of FIG. **4**, air doors **93** are disposed in the vertical solid line positions of FIG. **3** in which passages **54** are blocked and warm under-hood air is delivered to the carburetor through port rows **57**. When control knob **98** is pushed in to the dotted line position of FIG. **4**, air doors **93** are pivoted to their horizontal positions in which port rows **57** are covered and passages **54** are opened to allow cold outside air to be ram conducted to the carburetor through hood openings **42, 44**. Gasket member **66*b*** maintains its sealing engagement with air cleaner flange seat **89** irrespective of engine rock since flange seat portions **89*a***, by virtue of their tangential relation to the rock orbit, are not vertically displaced relative to the gasket member in response to engine rock but rather slide sealingly relative to the gasket member without generating any substantial distortion of the gasket.

While a preferred embodiment of the invention has been illustrated and described in detail, it is to be understood that various changes may be made in the disclosed embodiment without departing from the scope or spirit of the invention as defined by the appended claims.

We claim:

1. In an air delivery system for a motor vehicle having an engine compartment, an engine in said compartment having air inlet means for combustion supporting air, said inlet means including an air filter, a hood for said compartment movable between closed and open positions, a chamber for said air cleaner comprising wall portions carried by said hood and having air inlet portion means for conducting air into said chamber, said wall portions having flange means interengaging with said inlet means to provide communication between said filter and chamber and to close the latter for the admission of air thereto only through said inlet port means when said hood is in said closed position, air duct means carried by said hood and communicating with said inlet port means of said wall portions for supplying air thereto, air inlet port means in said hood communicating between the atmosphere at the exterior of said hood and said duct means for supplying atmospheric air to the latter, air inlet port means in said duct means communicating with said engine compartment for conducting air therefrom into said duct means, and control means for selectively controlling the air flow through said port means in said hood and duct means.

2. In an air delivery system according to claim **1**, said hood overlying said engine when in the closed position and comprising inner and outer panels integral with said wall portions and with said duct means, said wall portions depending from said hood around said filter in said closed position, said inlet means of said engine having a flange extending around said filter adjacent a lower portion of the latter, and said flange means of said wall portions comprising flexible resilient material yieldingly engaging said flange of said inlet means in sealing relationship when said hood is in said closed position.

3. In the combination according to claim **2**, said flange of said inlet means having portions at opposite sides of the axis of engine rock extending generally normally to a radial line from said axis to reduce distortion of said flange means of said wall portions upon rocking of said engine.

4. In a motor vehicle having a passenger compartment, an engine positioned forwardly of said passenger compartment and having an air inlet, and a movable hood adapted in a closed position to overlie said engine and being movable to a raised position to provide access to said engine, an air delivery system for said engine comprising

A. duct means operative with said hood in its closed position for delivering air to said inlet from outside of said hood;

B. said air inlet having an external peripheral flange;

C. said duct means comprising a gasket for engaging said flange in sliding sealing relationship to sealingly position said air inlet within said duct means when said hood is in said closed position;

D. portions of the upper face of said flange angling outwardly and downwardly from said air inlet and lying in planes that are generally tangent to an imaginary circle centered on the axis of engine rock, whereby to substantially preclude distortion of said gasket upon rocking movement of said engine.

5. In a motor vehicle having a passenger compartment, an engine positioned forwardly of said passenger compartment and having an air inlet for receipt of combustion air, and a movable hood adapted in a closed position to overlie said engine and being movable to a raised position to provide access to said engine, an air delivery system for said engine comprising

A. means defining an opening in said hood;

B. conduit means fixedly secured to the underside of said hood and providing an air passage communicating at one end with said hood opening and opening at its other end under said hood;

C. means operative with said hood in its closed position to provide sealed air communication between said air inlet and said passage other end;

D. the last named means including a chamber structure fixedly secured to the underside of said hood and defining a downwardly opening chamber therewithin;

E. said air inlet including an external peripheral flange;

F. said chamber structure including a peripheral gasket adjacent its lower edge for engaging said flange in sealing relationship to sealingly position said air inlet within said chamber when said hood is in said closed position;

G. said passage other end opening into said chamber to provide an air delivery path extending from said hood opening, through said passage, into said chamber, and thence through said air inlet;

H. portions of the upper face of said flange angling outwardly and downwardly from said air inlet and lying in planes that are generally tangent to an imaginary circle centered on the axis of engine rock, whereby to substantially preclude distortion of said gasket member upon rocking movement of said engine.

6. In an air delivery system according to claim **5**,

I. port means in said conduit means providing communication between said passage and the underside of said hood;

J. a door mounted on said conduit means movable between

1. a first position in which said port means is blocked and said passage is open, and

2. a second position in which said port means is open and said passage is blocked upstream of said port means; and

K. control means, including a control member accessible to an operator positioned within said passenger compartment, operative in response to operator actuation of said control member to selectively move said door between its said first and second positions and thereby enable the operator to selectively deliver relatively cold outside air to said carburetor through said hood opening or relatively warm under-hood air to said carburetor through said port means.

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