

Feb. 6, 1968

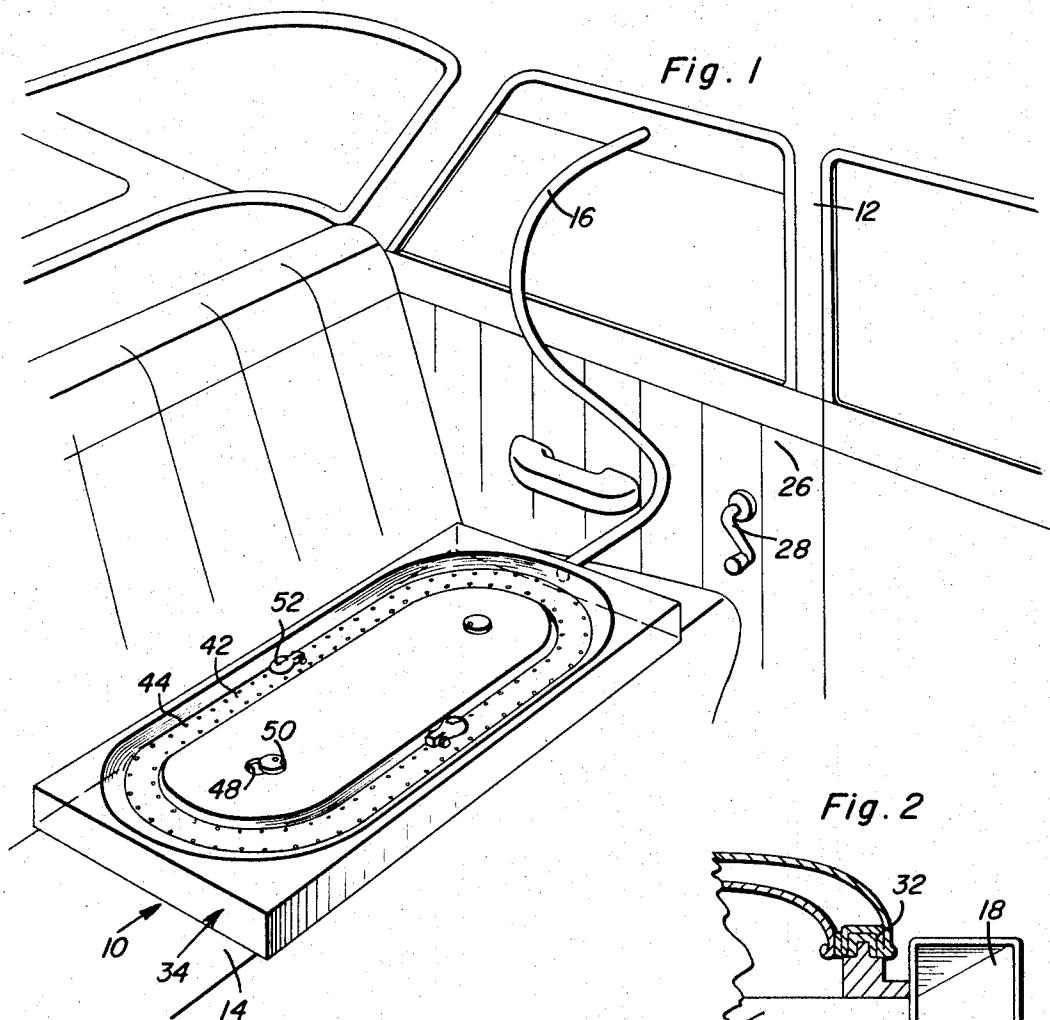
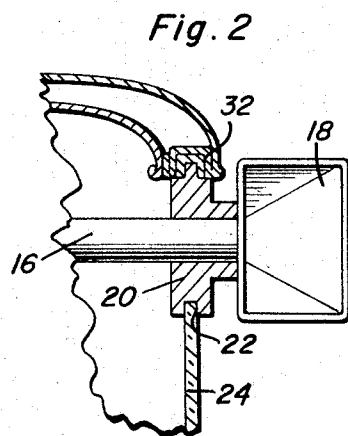
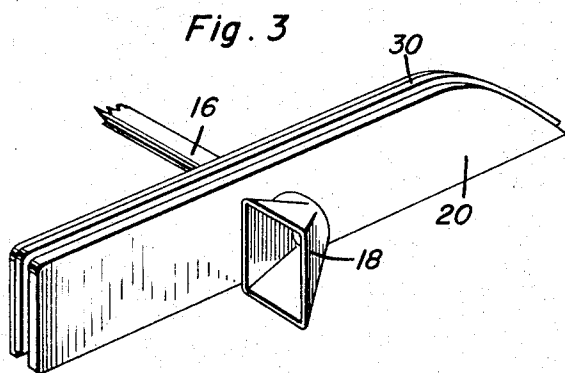
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3,367,658

AIR JET TOY

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2 Sheets-Sheet 1



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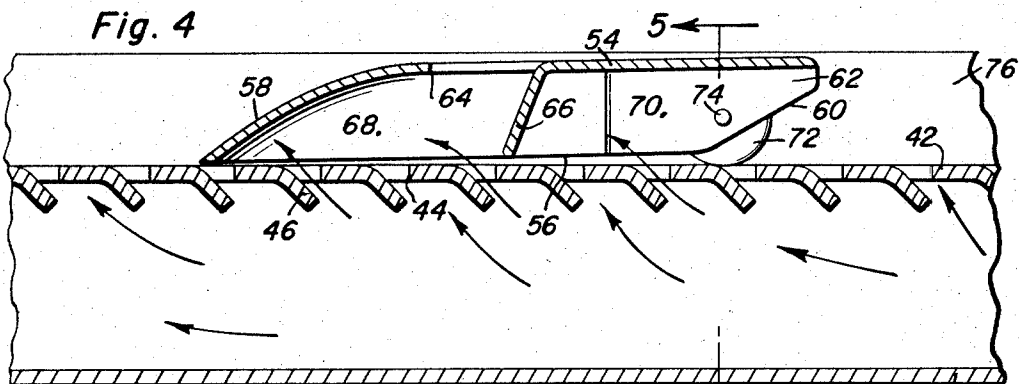
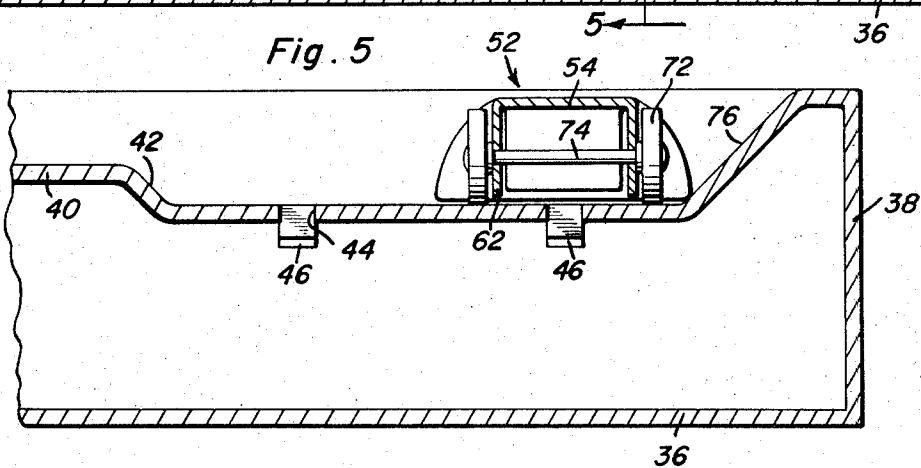
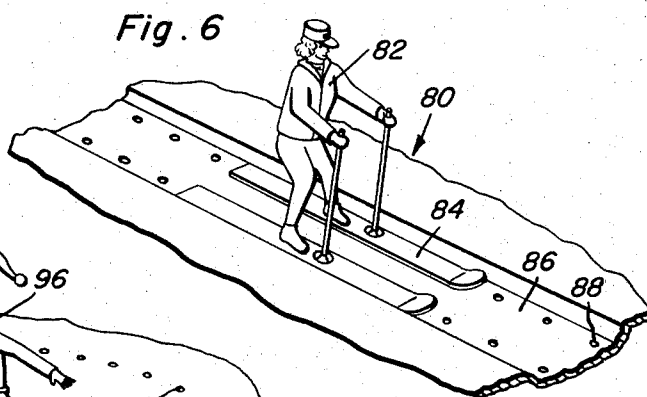
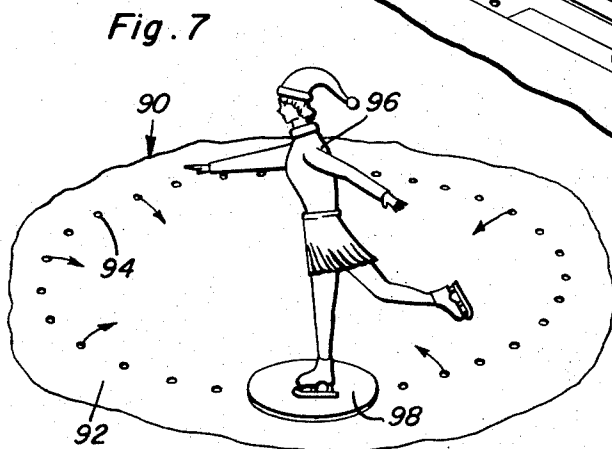
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AIR JET TOY

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2 Sheets-Sheet 2



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3,367,658

AIR JET TOY

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ABSTRACT OF THE DISCLOSURE

A toy having a course and air urged elements movable over said course including pressurized air housing disposed in a vehicle and including at least one air outlet opening, a ram air conduit having its outlet end opening into said housing and its inlet end supported on the exterior of said vehicle in forwardly opening position with said conduit passing through a variably closable window opening of said vehicle.

The present invention generally relates to a propulsion system employing the basic principles of an air jet motor in various orientations and for various uses.

An object of the present invention is to provide an air jet motor incorporating a basic structure of a plurality of discharge jets for passage of air therethrough together with a motivated device upon which the discharged air acts for driving, moving or otherwise motivating the motivated device so that the force on the motivated device caused by the discharge of air will efficiently and effectively actuate the motivated device.

It is one object of the present invention to provide an air jet motor incorporated into an amusement toy for use by children when they occupy an automobile on long trips such as may be encountered when driving over turnpikes, interstate highways and the like. The game incorporates a simulated racetrack having racing cars thereon with the air jet motor causing the racing cars to be propelled along the simulated racetrack so that the children will be entertained and amused during the trip.

Still another object of the present invention is to provide an air jet motor which is extremely versatile in use, efficient in operation, relatively inexpensive to manufacture and highly novel when used in various manners.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the embodiment of the invention in the form of a toy racetrack orientated inside of a vehicle;

FIGURE 2 is a vertical sectional view illustrating the construction of the air scoop for supplying air to the air jet motor incorporated into the racetrack of FIGURE 1;

FIGURE 3 is a perspective view of the air scoop;

FIGURE 4 is a longitudinal sectional view, on an enlarged scale, illustrating the construction of the racetrack and simulated racer disposed thereon;

FIGURE 5 is a transverse, sectional view taken substantially upon a plane passing along section line 5—5 of FIGURE 4 illustrating further structural details of this embodiment of the present invention;

FIGURE 6 is a perspective view of another embodiment of the invention illustrating a simulated skier being propelled along a trackway;

FIGURE 7 is a perspective view illustrating another embodiment of the invention illustrating a skater being propelled by the air jet motor.

Referring now specifically to the drawings, the numeral 10 generally designates a racing game in which the air

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jet motor principles of the present invention are incorporated. The racing game 10 is disposed in a rear seat of an automobile 12 and may conveniently rest on the rear seat cushion 14. For supplying air to the racing game 10, there is provided a flexible inlet hose 16 connected to a funnel-shaped air scoop 18 which opens forwardly of the vehicle and generally faces the direction of travel for scooping in air as the vehicle moves forwardly. The air scoop 18 may be rectangular in configuration or any other suitable configuration and it generally will have a diverging throat area for scooping in air so that forward movement of the vehicle will, in effect, ram air into the intake tube 16.

The intake tube 16 extends through an adapter 20 having a groove 22 along the bottom edge thereof for receiving the upper edge of the window glass 24 in the vehicle door or side wall 26 which may be elevated or lowered by the usual handcrank 28. The top edge as well as the forward edge and rear sloping edge of the adapter 20 are provided with a central rib 30 that is telescopically received within the channel track or trough 32 which normally receives the upper edge of the window glass 24. The adapter 20 is shaped to conform to the upper portion of the window opening and is inserted therein by lowering the window 24, inserting the adapter 20 therein and then elevating the window 24 until it engages the groove 22 and serves to retain the adapter 20 in place.

The inlet hose 16 is connected to a hollow housing or racetrack generally designated by numeral 34 which includes a bottom 36 and peripheral side walls 38 as well as a top 40 which may all conveniently be made of one-piece construction or formed of plastic materials secured together in any suitable manner. Disposed peripherally in the top 40 is a recessed track or raceway 42 which has two longitudinal rows of longitudinally spaced openings or apertures 44 formed therein with one edge of each aperture 44 being defined by a downwardly inclined tab or lug 46 which is formed when the aperture 44 is defined such as by inwardly striking the lug 46 in a conventional manner. With this construction, air introduced into the interior of the housing 34 will be discharged upwardly and longitudinally through the openings 44 as indicated by the arrows in FIGURE 4.

As illustrated, the top wall 40 is also provided with a pair of apertures 48 disposed adjacent opposite ends of the raceway or track 42 and a pivotal closure 50 is provided for each of the apertures 48 which is in the form of a baffle so that air pressure within the housing may be controlled so that the racing cars generally designated by numeral 52 will not fly off of the track when they proceed around the end portion of the oval-shaped trackway.

Referring particularly to FIGURES 4 and 5, it is pointed out that each of the racing vehicles 52 includes a generally hollow body 54 having an open bottom 56 and a downwardly curved nose 58 and an open rear end portion 60. The body 54 is also provided with depending flanges 62 which closely overlie the track surface 42 and which are spaced on opposite sides of a row of apertures 44 so that air passing through the apertures 44 will be more or less entrapped in the hollow body 54. Adjacent the rounded nose 58, the hollow body 54 is provided with an opening 64 therein which is formed by a downwardly struck baffle or flange 66 which generally divides the hollow body 54 into two compartments 68 and 70. Thus, air passing through the openings 44, as illustrated in FIGURE 4 will impinge against the inner surface of the rounded nose portion 58 of the hollow body 54 and be discharged through the aperture 64. Air also will impinge against the rear surface of the baffle or flange 66 and be discharged out the open rear end 60 of the vehicle 54.

The rear portion of the vehicle or racing car 54 is supported by a pair of wheels 72 (although not necessarily) orientated externally of the flanges 62 and being rotatably journaled by an axle 74 thus serving to support the vehicle with the nose or forward end of the vehicle being elevated above the surface of the trackway 42 by air pressure when the forward motion of the automobile exceeds a predetermined speed such as 35 miles per hour thereby reducing the frictional resistance to movement of the racing car.

With this construction, the racing cars 52 are propelled in a forward direction by the slanting jet of air from the holes 44 in the track surface 42. Air is taken into the air scoop 18 due to the forward motion of the automobile 12 and is discharged into the housing 34 through the conduit 16 with the adapter 20 serving to hold the scoop in proper orientation. The flexible duct 16 transmits the air to the air chamber defined by the housing 34. Due to the tabs 46 being disposed in angular relation to the track surface, the air is directed at an angle and causes the forward motion of the racer due to air pressure impinging against the rounded nose portion 58 of the body and also the center flange or flap 66 with the air escaping through the hole 64 and the rear end of the racer respectively.

When the automobile reaches approximately 35 miles per hour in the absence of any high outside winds, the air pressure in the housing is sufficient to more or less lift the front end of the racer and produces forward motion with the rear of the racer riding on and being supported by the two wheels 72. Due to the shallow construction and generally spoon-shaped configuration of the front end of the racer, the racer is self-guided and remains over the row of air openings or outlets 44. Of course, the racers will leave the curve at speeds which are too high and in this case, there is provided an inclined shoulder or flange 76 at the outer edge of at least the curved portions of the trackway so that the racer may ride on the shoulder or flange 76 which is preferably at 45° to the horizontal. As the racers ride on the flange 76, they are without power and as they slow down, they will re-enter the power area and again register with the openings 44. The control flap 50 may be employed to enable the racers to perform at any speed of the automobile over 35 miles per hour by varying the air pressure within the housing. When the two flaps are used, one at each end of the housing, the speed of the racers may be controlled through pressure changes thus pitting one "driver" against another so that the racers may be propelled at high speeds along the straight-of-ways and then slowed down by reducing the air pressure by opening the apertures 48 when they approach the curved ends thereby enabling a considerable degree of skill to be introduced into operation of the present invention.

While FIGURES 1-5 disclose the invention incorporated into a racing game, many toys may be operated on this same principle. For example, complex highway assemblies may be employed along with other road hazards and any number of vehicles, trolley cars and the like may be employed with the game. Trains with each car adding its share of power may be employed along with a circus with wind-driven acrobatic figures, a carnival with air-driven amusement rides and riders, hockey and soccer games with air-motivated puck or ball or any other game in which a portion thereof may be motivated by the air jet motor as disclosed herein.

FIGURE 6 illustrates rather schematically another embodiment of the invention generally designated by numeral 80 in which a figurine 82 having a pair of skis 84 is mounted on a trackway 86 comparable to the trackway 42 in FIGURES 1-5 with a plurality of slanted openings 88 being provided for propelling the skis inasmuch as the skis 84 overlie the rows of openings 88. This same principle may be employed with a figurine or figurines mounted on ice skates, sleds, toboggans and the like

where the sliding elements overlie the apertures 88 and may be provided with suitable baffles or the like on which the escaping air impinges.

FIGURE 7 illustrates another embodiment of the invention generally designated by numeral 90 and including a top plate 92 provided with a plurality of inwardly slanted apertures or air outlets 94. A figurine 96 representing an ice skater has one foot thereof mounted on a circular disc or plate 98 which is of relatively thin material and may be metal, plastic or the like. In view of the disc 98 overlying the apertures and due to the inclination of the apertures or air outlets 94, the skater figurine 96 will spin, change direction and slide generally in the direction of the slanting holes thereby enabling the skater figurine 96 to move generally in a manner approximating the movements of a skater.

The basic principles include the discharge of air in an inclined direction so that it impinges against a baffle or body and then is discharged freely to the atmosphere in a direction out of the rear end of the vehicle so that the jet effect of the air will serve to propel the vehicle or other object.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. An air jet motor comprising a housing including an air chamber, said housing having a plurality of openings therein communicating the air chamber with the exterior of the housing, a movable member orientated adjacent the housing and having a surface area thereon against which the air discharged from the air chamber impinges for propelling said movable member, said housing including a trackway on a generally planar upper surface thereof, said air openings being spaced longitudinally along said trackway, said movable member being in the form of a simulated racing vehicle having the air impinging surface area incorporated therein, certain portions of said trackway including upwardly and outwardly inclined portions extending along at least one side thereof for retaining the racing vehicle on the trackway when proceeding around a curve, said housing being provided with pressure control means communicating with the air chamber in the form of manually openable openings for controlling the air pressure, and air scoop means for supplying air to said air chamber in response to forward movement of a vehicle carrying said air jet motor.

2. The structure as defined in claim 1, wherein said air outlets are formed by downwardly striking tabs that are inclined for directing airflow out through the air outlets in a slanting manner.

3. An air jet motor comprising a housing including an air chamber, said housing having a plurality of openings therein communicating the air chamber with the exterior of the housing, a movable member orientated adjacent the housing and having a surface area thereon against which the air discharged from the air chamber impinges for propelling such an object, said housing including a recessed trackway on the top planar upper surface thereof, said air outlets being disposed in longitudinal rows in said trackway, said object being in the form of a simulated racing vehicle having the air impinging surface incorporated therein, said portions of the trackway having an inclined flange outwardly thereof for retaining the vehicle on the trackway when proceeding around a curve, said air outlets being formed by downwardly striking tabs that are inclined for directing airflow out through the air outlets in a slanting manner, said vehicle including a rounded nose having an inclined surface forming a surface area for impingement of air, said vehicle also

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having an opening in the top thereof rearwardly of the inclined surface for discharge of air, said vehicle also including a transverse flange spaced from the discharge opening and having an open rear end for enabling air to impinge against the flange and be discharged from the rear thereof.

4. The structure as defined in claim 3, together with wheels supporting the vehicle at the rear only whereby the forward end of the vehicle may be elevated slightly from the surface of the trackway.

5. An air jet motor comprising a housing including an air chamber, said housing having a plurality of openings therein communicating the air chamber with the exterior of the housing, a movable member orientated adjacent the housing and having a surface area thereon against which the air discharged from the air chamber impinges for propelling such an object, said housing including a recessed trackway on the top planar surface thereof, said air outlets being disposed in longitudinal rows in said trackway, said object being in the form of a simulated racing vehicle having the air impinging surface incorporated therein, said housing being provided with pressure control means communicating with the air chamber in the form of manually openable openings for controlling the air pressure, said housing being provided with a flexible air tube, and an air scoop on the end of said air tube for air entry.

6. The structure as defined in claim 5 wherein said air scoop is mounted on an adapter adapted to be positioned between the upper edge of a vehicle window and the track which normally receives the upper edge of the vehicle window for receiving air into the air scoop in response to forward movement of the vehicle.

7. For use with a motor vehicle of the type including a variably closeable window opening, a toy comprising an elongated conduit means including a ram air inlet end and a forced air outlet end, means mounting said inlet end exteriorly of said opening, and said inlet end opening forwardly of said vehicle, said conduit means extending through said opening, a housing disposed inwardly of said vehicle and including a pressurized air chamber, said outlet end opening into said pressurized air chamber, said housing having a plurality of openings therein communicating the air chamber with the exterior of the housing, a movable member orientated adjacent said housing and having a surface area thereon against which the air discharged from the air chamber impinges for propelling said movable member, said housing including means defining a path of movement for said movable member relative to said housing along which said movable member is guided, the last-mentioned means including the relative positions of and orientation of said openings.

8. The combination of claim 7 wherein said means mounting said inlet end of said conduit means exteriorly of said vehicle includes a panel defining body removably secured in the open portion of said window opening and forming a closure therefor, said conduit means extending through said panel defining body in air-tight engagement therewith.

9. The structure as defined in claim 7, wherein said object is in the form of a figurine having a slidable member overlying a series of air outlets whereby the figurine will be propelled to simulate a skier, sledder or the like.

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10. An air jet motor comprising a housing including an air chamber, said housing having a plurality of openings therein communicating the air chamber with the exterior of the housing, a movable member orientated adjacent the housing and having a surface area thereon against which the air discharged from the air chamber impinges for propelling said movable member, said outlets being arranged in a circular pattern and are slanted inwardly, said movable member being in the form of a figurine having a flat disc on the bottom thereof overlying the apertures whereby air passing through the apertures will cause the figurine to spin, move inwardly and outwardly, and slide along the surface within the confines of the circular orientation of the apertures, and air scoop means for supplying air to said air chamber in response to forward movement of a vehicle carrying said air jet motor.

11. An air jet motor comprising a housing including an air chamber, said housing having a plurality of openings therein communicating the air chamber with the exterior of the housing, a movable member orientated adjacent the housing and having a surface area means against which the air discharged from the air chamber impinges for propelling said movable member, said housing including means defining a path of movement for said movable member relative to said housing along which said movable member is guided, the last-mentioned means including the relative positions of and orientation of said openings, said path defining a trackway on a generally planar upper surface of said housing, said air outlets being spaced longitudinally along said trackway and operative to direct upward jets of air therethrough inclined in one direction along said trackway, said movable member being in the form of a simulated racing vehicle having the air impinging surface area means thereon, said surface area means being in constant registry with at least two of said air outlets, manually operable air pressure control means communicating with the air chamber for controlling the air pressure therein, and air scoop means for supplying air to said air chamber in response to forward movement of a vehicle carrying said air jet motor.

12. The combination of claim 11 wherein said trackway defines a continuous closed path including curved portions, at least some of said curved portions including upwardly and outwardly inclined portions disposed on the outside of the curves defined by said some curved portions.

References Cited

UNITED STATES PATENTS

1,899,706	2/1933	McClellan	273—86
2,582,844	1/1952	Mourfield	273—86
2,630,320	3/1953	Francis	273—86
1,518,715	12/1924	Walker	98
2,604,055	7/1952	Snowden.	
2,758,532	8/1956	Awe	98—2
2,918,183	12/1959	Petersen.	
3,104,496	9/1963	Macks	46—44 X
2,678,237	5/1954	Allander et al.	302—31
2,805,898	9/1957	Willis	302—29
2,848,820	8/1958	Wallin et al.	302—29 X

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