Aug. 1, 1967 H. F. GORHAM 3,333,550

RAIL APPARATUS

Filed May 24, 1965 2 Sheets-Sheet 1

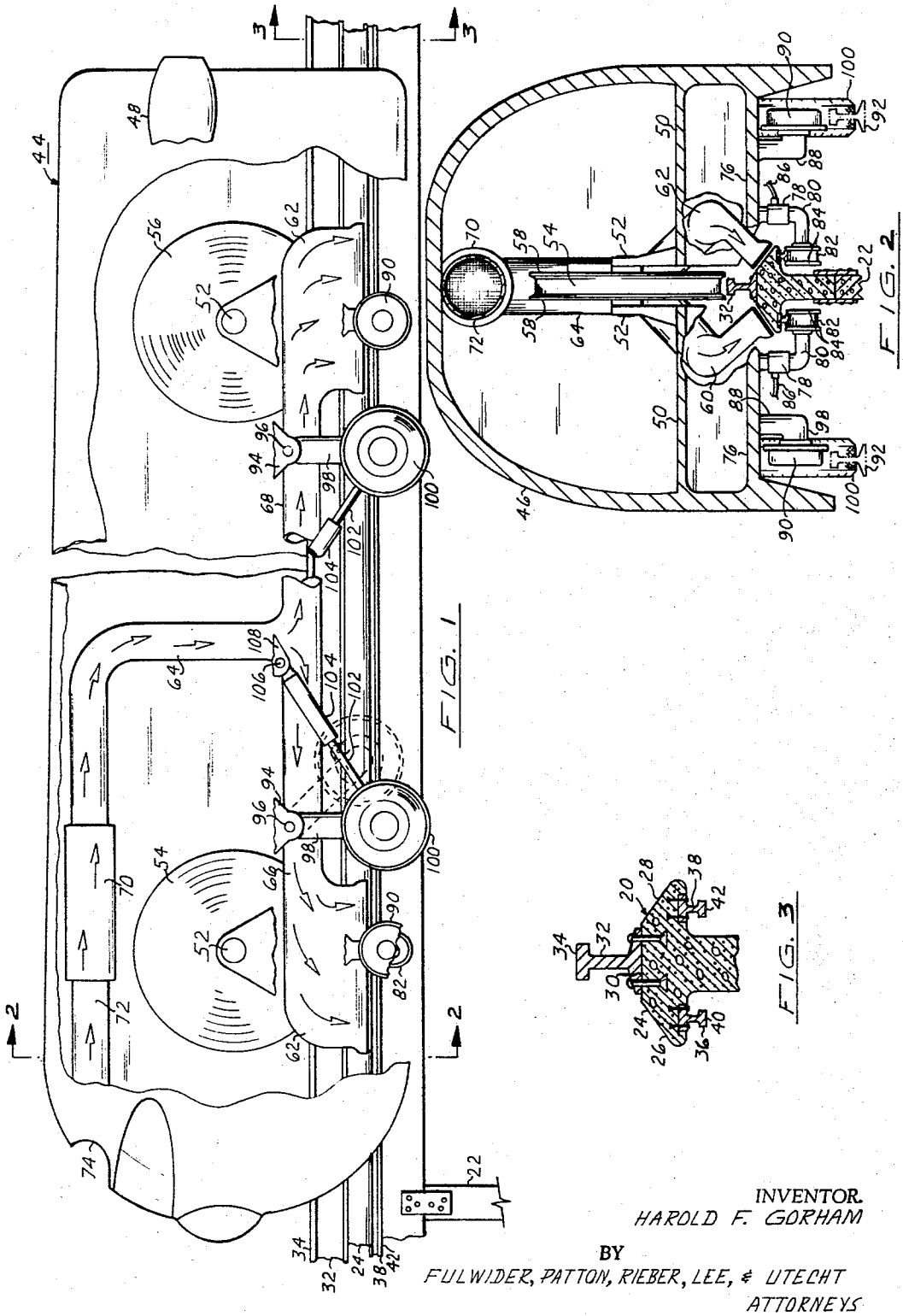

FIG. 1

FIG. 2

FIG. 3

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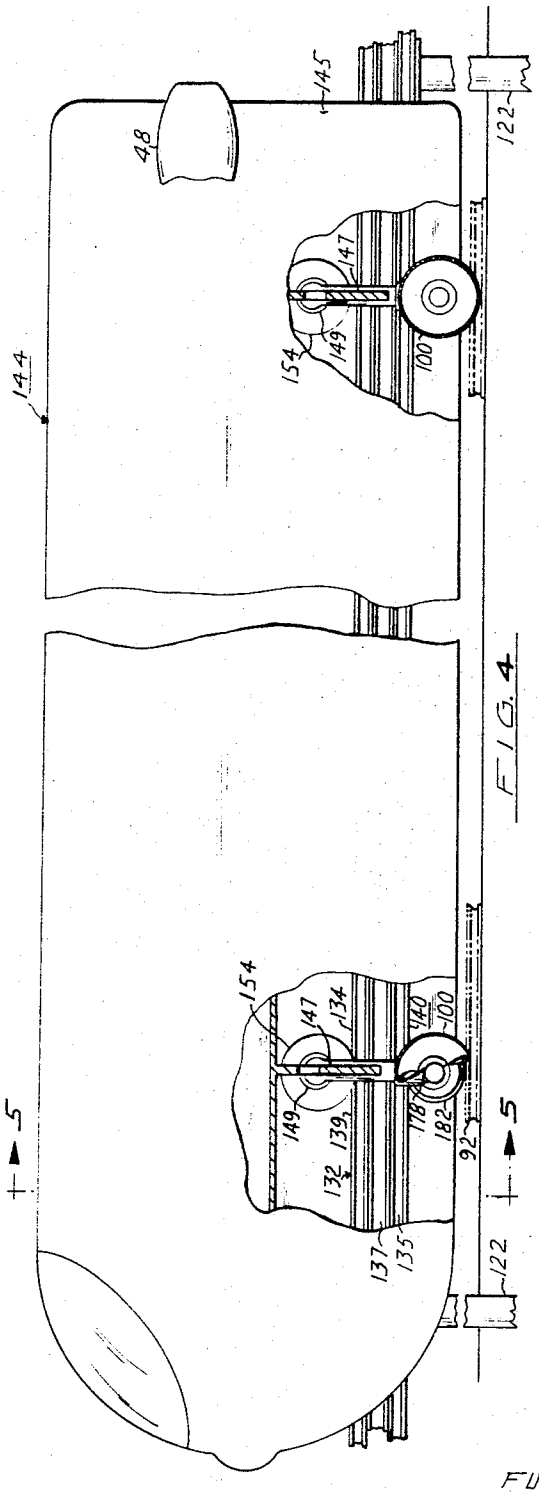

FIG. 4

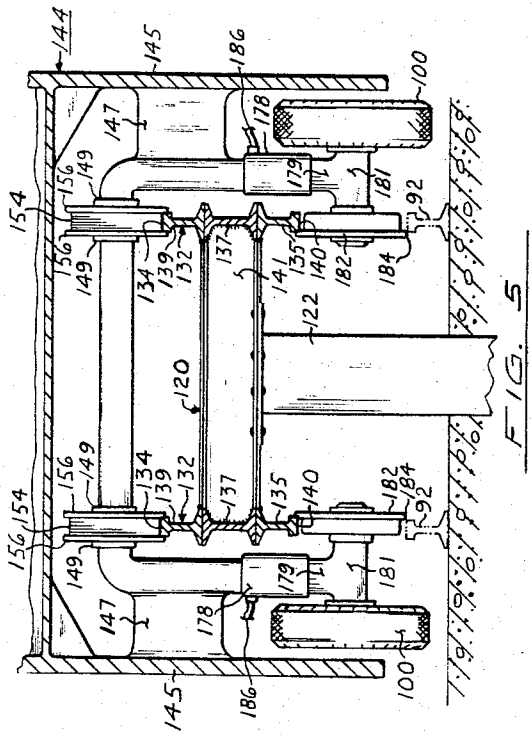

FIG. 5

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RAIL APPARATUS

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ABSTRACT OF THE DISCLOSURE

Transportation system employing a locomotor riding on a single rail or riding on air delivered by nozzles to surfaces which extend outwardly and downwardly from opposite sides of the rail.

The present invention relates to locomotors which are guided by a rail of rails.

Rail means, having an upwardly facing surface and having two downwardly facing surfaces, which surfaces are utilized, in conjunction with means on a locomotor, are provided for guiding the locomotor and for limiting the upward or tilting movements of the locomotor.

In one embodiment of the present invention, the rail means comprises three rails, namely a centrally disposed rail having an upwardly facing surface forming a track, and two parallelly disposed rails, on opposite sides of the central rail, each having a downwardly facing surface and each forming a track. The locomotor is provided with a wheel having spaced peripheral flanges. This wheel is disposed above the central track and the flanges thereon are utilized for guiding the locomotor. The locomotor is provided also with two flanged wheels disposed below the other two tracks which are utilized to limit the extent of upward or tilting movements of the locomotor.

In another embodiment of the invention, the rail means includes two rails having upwardly facing surfaces which cooperate with the flanges on two locomotor wheels for guiding the locomotor, and the same rails are also provided with downwardly facing surfaces which cooperate with two additional wheels on the locomotor for limiting upward movement of the locomotor.

The present invention also contemplates the inclusion of auxiliary wheels on the locomotor which wheels can be lowered for rolling the locomotor along rails or along trackless surfaces.

Other features and the advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein preferred embodiments of the invention are illustrated.

In the drawings:

FIG. 1 is a side view of the locomotor, part thereof being broken away to show operating mechanism therein, the view also showing the locomotor on the rail means;

FIG. 2 is a sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is a fragmentary sectional view taken along line 3—3 of FIG. 1, but on a larger scale;

FIG. 4 is a side view of another embodiment of the invention showing the locomotor designed to operate on a standard width railroad track or rails; and

FIG. 5 is a sectional view taken along line 5—5 of FIG. 4.

Referring more in detail to the drawings, and more particularly to FIGS. 1, 2 and 3, there the track means 20 is shown in cross-section in FIG. 3. The track means 20 is supported by a plurality of posts 22 disposed along the route. They are formed of any suitable material such as steel or re-enforced and prestressed concrete. The track means includes a runner 24 which may be formed of prestressed, re-enforced concrete and is provided with two

upwardly facing surfaces 26 and 28. The top 30 of this runner 24 carries a rail 32 formed of steel and having an upwardly facing surface 34. The underside of the runner 24 carries two rails 36 and 38 which are provided with downwardly facing surfaces 40 and 42, respectively. The rails 36 and 38 are arranged parallelly of the rail 32 and are spaced an equal distance laterally of the rail 32. The surfaces 26 and 28 extend downwardly whereby material falling thereon will slide off readily. These surfaces 26 and 28 are herein defined as air impinged surfaces.

The locomotor 44 includes a housing 46 which carries propulsion mechanism such as jet engines, disposed on opposite sides of the housing 46, one of which is shown at 48. The housing is provided with a floor 50 which carries a plurality of upwardly extending brackets forming bearing supports for a front wheel 54 and a rear wheel 56. These wheels are provided with spaced peripherally extending flanges 58. The wheels are disposed above the rail 32 and when lowered, the flanges 58 form guides for the locomotor.

The locomotor rides on an air cushion. This is accomplished by impinging air upon the angling surfaces 26 and 28 on the runner 24 through air nozzles 60 and 62. The air is supplied to the nozzles 62 through tube 64 and branch tubes 66 and 68. The air is compressed and forced through the tubes by a compressor 70 which receives air through a tube 72, the open end of which is at 74 at the forward part of the housing 46.

The housing 46 is also provided with a sub floor 76. The underside of the sub floor 76 carries two cylinders 78 of the pneumatic hydraulic type, in which pistons (not shown) are adapted to reciprocate. These pistons carry arms 80 which in turn form axles for wheels 82, each having a plurality of spaced flanges 84. These flanges are adapted to engage the rails 36 and 38 to assist in guiding the locomotor. The wheels 82 also stabilize the locomotor when it is stationary or is moving at a very slow speed. Thus the wheels are adapted to engage the underside of the surfaces 40 and 42 of the rails 36 and 38, respectively, for this purpose. When the wheels 82 are not needed, they can be lowered by forcing air or liquid through the pipes 86.

The underside of the sub floor 76 also carries brackets 88 which form axles for wheels 90. These wheels are spaced so as to ride on standard gauge rails shown in phantom at 92 in FIG. 2. In this manner the locomotor can also be conveyed over standard gauge railroad tracks.

The housing 46 is provided with a series of brackets 94 disposed on opposite sides of the runner 24 and these brackets through pivots 96 carry arms 98, the lower end of which carries wheels 100, preferably the type that carries rubber tires. These wheels 100 can be raised and lowered by pneumatic or hydraulic equipment including the ram 102 and the cylinder 104. The ram is connected with the axle for the wheels and the cylinders are pivoted at 106 to brackets 108. When the wheels are lowered, the locomotor can be moved over a trackless path such as a road. Any suitable steering mechanism may be provided for turning the wheels 100 so that they can be driven as an automobile truck.

Referring now to the embodiment shown in FIGS. 4 and 5, the locomotor is shown at 144 and the rail means which is shown at 120 is supported by a plurality of posts 122. Two rails 132 are provided and each is formed in superimposed sections 135, 137 and 139 welded to one another, the center section 137 is supported by the post 122 through a plurality of transversely disposed I-beams 141. Each of these composite rails 132 is provided with an upwardly facing surface 134 and a downwardly facing surface 140. Like the rails 92, the composite rails 132 are spaced at standard gauge distances from one another.

The sides **145** of the locomotor carry inwardly extending brackets **147** which brackets carry bearings **149** on an axis arranged transversely of the rails **132** for supporting wheels **154** which are adapted to ride on the upwardly facing surfaces **134** of the rails **132**. Each of these wheels is provided with peripherally extending flanges **156** which are arranged to engage the inner and outer sides of a rail **132** for guiding the locomotor.

Each of the brackets **147** carries a cylinder **178** of the pneumatic or hydraulic type. Each cylinder receives a piston (not shown) which is connected with a ram **179** which merges into axles **181** for a steel wheel **182** and a pneumatic wheel **100**. The cylinders **178** are connected to a source of fluid or air pressure through pipes **186** whereby when wheel **182** is riding on the standard gauge tracks **92** or riding upon a road, the locomotor can be raised above the rails **132**. Suitable steering mechanism would be provided for the wheels **100** whereby the locomotor can be driven and guided manually on a trackless road. When the locomotor **144** is riding on standard rails, such as **92**, the peripheral flanges **184** of the wheel **182** function as guides.

From the foregoing, it will be seen that by limiting upward movement of the locomotor by wheels **82**, in FIGS. 1 and 2, and the wheel **182**, in FIGS. 4 and 5, I have assured preventing of the locomotors from leaving the track although the locomotor is operating at a very high speed. Also, the wheels **82**, in the embodiment shown in FIGS. 1 and 2, prevent tilting of the locomotor **44** while it is stationary or is moving at a slowed speed.

While the forms of embodiment herein shown and described, constitute preferred forms, it is to be understood that other forms may be adopted falling within the scope of the claims that follow.

I claim:

1. In combination:

(A) Rail means forming upwardly facing surfaces and a downwardly facing surface, said upwardly facing surfaces including a centrally disposed rail and surfaces angling outwardly and downwardly from opposite sides of the rail;

(B) a locomotor having:

(1) wheels above the upwardly facing surface of the rail for supporting the locomotor,

(2) means below the downwardly facing surface for limiting upward movement of the locomotor;

(C) a plurality of nozzles carried by the locomotor and directed to simultaneously direct air onto both the outwardly and downwardly angling surfaces of the rail means for raising the wheels above the rail;

(D) and an air compressor carried by the locomotor for supplying air to the nozzles.

2. A combination as defined in claim **1**, characterized in that the rail means includes:

(E) a second downwardly facing surface; one of said downwardly facing surfaces being disposed below one of the outwardly and downwardly angling surfaces, and the other of said downwardly facing surfaces being disposed below the other of the outwardly and downwardly angling surfaces.

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