Aug. 18, 1964 R. W. CRIPE ETAL 3,144,836

MONORAIL SYSTEM

Filed April 3, 1962 2 Sheets-Sheet 1

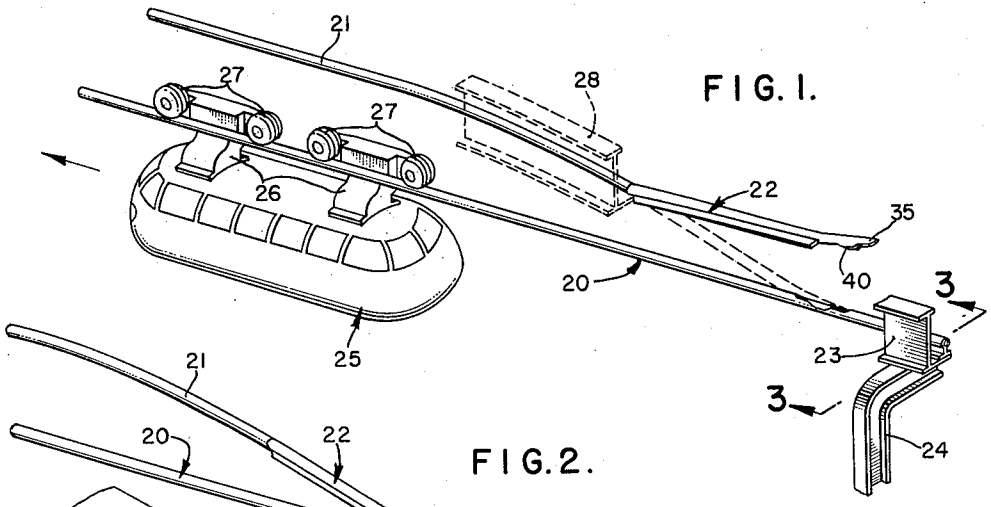


FIG. 1.

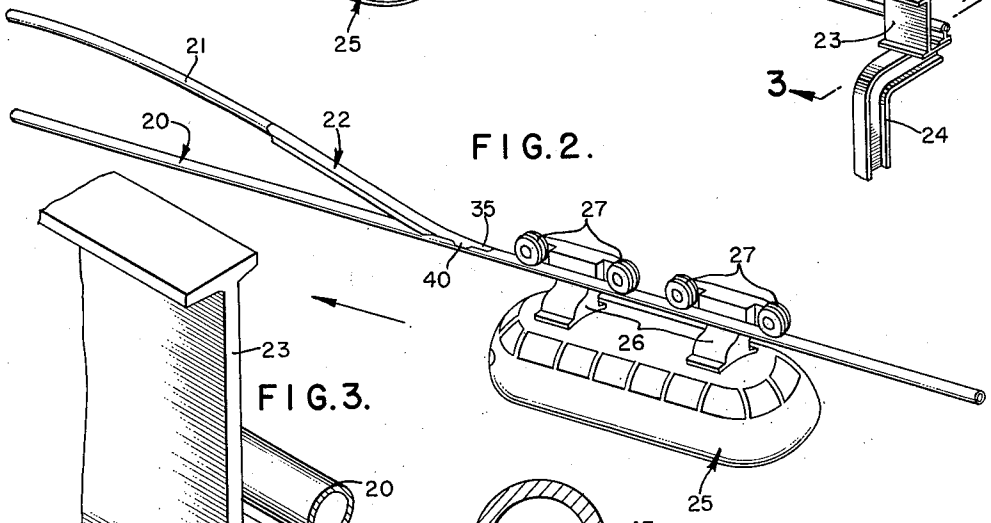


FIG. 2.

FIG. 3.

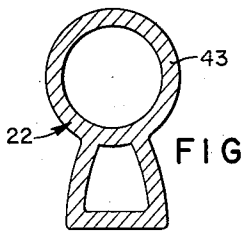


FIG. 12.

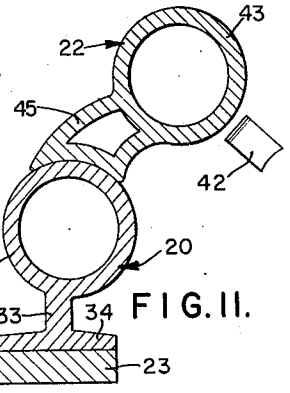


FIG. 11.

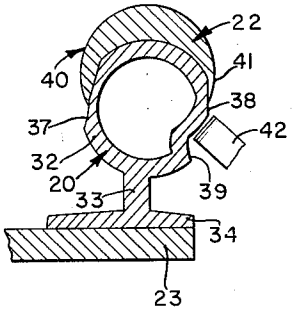


FIG. 9.

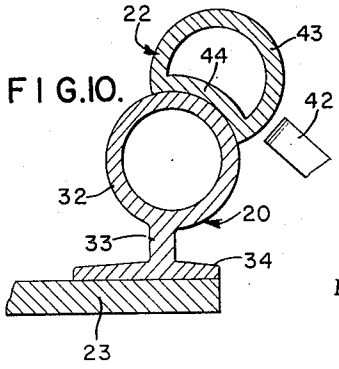


FIG. 10.

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Aug. 18, 1964 R. W. CRIPE ETAL 3,144,836

MONORAIL SYSTEM

Filed April 3, 1962 2 Sheets-Sheet 2

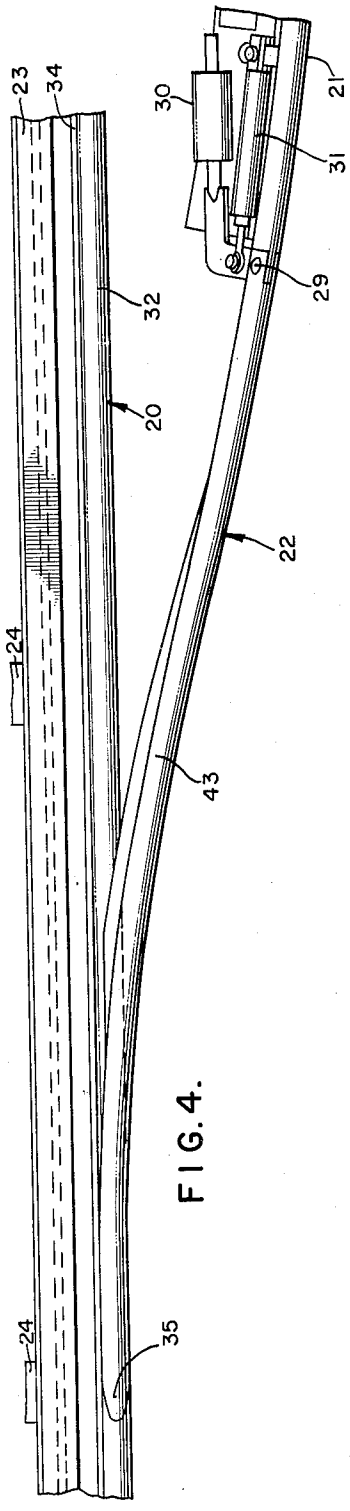


FIG. 4.

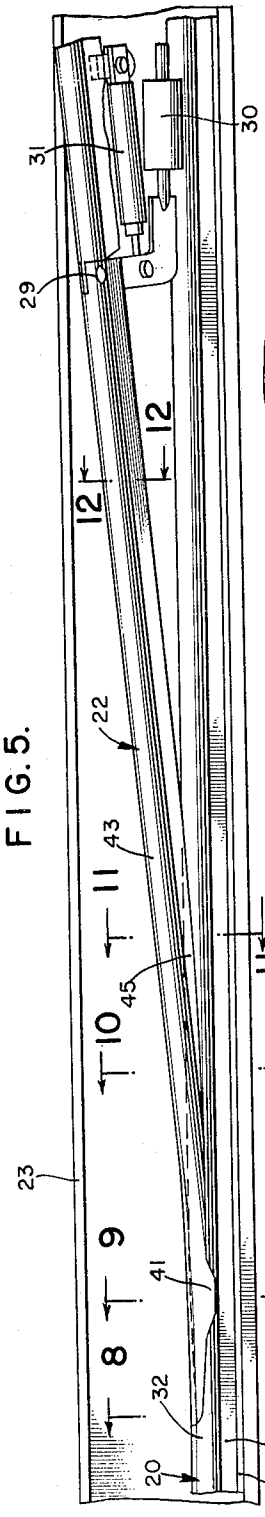


FIG. 5.

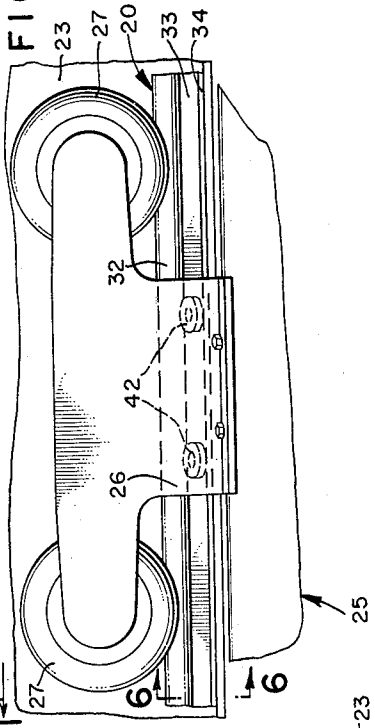


FIG. 7.

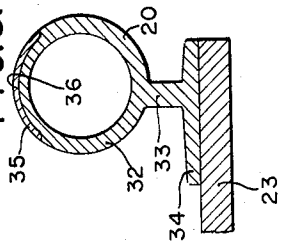


FIG. 8.

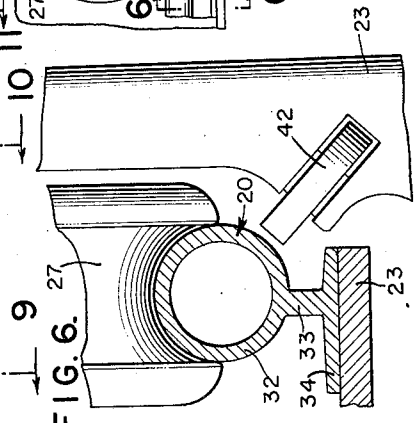


FIG. 6.

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United States Patent Office 3,144,836 Patented Aug. 18, 1964

3,144,836

MONORAIL SYSTEM

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Filed Apr. 3, 1962, Ser. No. 184,811
3 Claims. (Cl. 104—103)

This invention relates to a monorail system and more particularly to the rail itself and the associated switching mechanism.

It is a primary feature of this invention that the rail head has a perfectly round shape which provides a consistent shape for the riding surface despite changes in angle, sway or swing of the suspended vehicle.

It is another feature of this invention that the rail head is tubular, providing a hollow space which may be used for a variety of purposes including heating, wiring, etc.

It is another feature of this invention that the rail is mounted on another, larger beam for support.

It is one object of this invention that the tubular rail is mounted to its base in an offset, which permits the use of a keeper or retainer wheel which prevents the main wheel from being lifted off the track.

The roundness of the rail head also permits the pivot point of the car to be at the center of the rail permitting a free swing of the car with small resistance and consequently the rail receives very little torque. Sway of the vehicle can be controlled from within the cab by compensating weights movable as the vehicle starts to sway, controlled by suitable sensing mechanism.

The associated switching mechanism is designed for use with the round rail head and is itself round or arcuate in cross-section with the same curvature as the main rail head which permits all of the advantages of the main rail stemming from its roundness to be carried over to the switch rail.

It is another feature of this invention that due to the constant curvature of the rail head and switch rail head the bogies at all times ride on their normal riding surface and never do they transfer to flanges or other running surfaces.

It is a salient feature of this invention that the main running rail head is continuous and unbroken at all times.

These and other objects, features and advantages will be apparent from the annexed drawings, in which:

FIGURE 1 is a fragmentary perspective elevation of the system;

FIGURE 2 is similar to FIGURE 1 with the switch closed;

FIGURE 3 is an enlarged section taken along the line 3—3 of FIGURE 1;

FIGURE 4 is a plan view of the main rail and switch;

FIGURE 5 is a side view of the mechanism shown in FIGURE 4;

FIGURE 6 is a section taken along the line 6—6 of FIGURE 7 showing a section of the main rail, bogie wheel, cab supporting arm and retainer wheel;

FIGURES 8, 9, 10, 11 and 12 are sections taken along the lines 8—8, 9—9, 10—10, 11—11 and 12—12 of FIGURE 5, respectively.

Referring now more particularly to the drawings, the system is shown to include a main rail 20, a switch rail 21 which includes a pivoted section 22, a rail support 23 supported on posts 24, a vehicle 25 hung from the rail by support arms 26 mounting bogies 27 which ride on the rails. Beyond the pivoted section 22 rail 21 is supported by a rail support 28 mounted similarly to support 23.

Referring now particularly to FIGURES 4 and 5, it will be noted that section 22 is pivoted as at 29 for combined horizonal and vertical movement and a suitable actuator 31 is connected to section 22 by appropriate linkage to impart such movement. A counterweight 30 balances section 22. Most of the movement of section 22 is in the horizontal component, but the section should be raised or lowered during switching at an angle of approximately 30°. Actuator 31 may be electrical or hydraulic and controlled either from the vehicle or from the spur station as desired.

Referring to FIGURE 6, it will be noted that the rail 20 comprises a tube 32 connected by a web 33 to a base 34 and that the tube 32 and web 33 are offset to one side of base 34.

In FIGURE 8 there is shown where section 22 joins rail 20. It will be seen that at its free end section 22 tapers down to a very thin arcuate member 35 which is entirely received in an indentation 36 in rail head 20. Indentation 36 may be dispensed with, as member 35 can be thin enough to effect transfer of the vehicles without appreciable bumping especially where bogie wheels with rubber tread surfaces are used.

From the free end as seen in FIGURE 8 section 22 changes progressively in cross-section. In FIGURE 9 it is seen that rail 20 is flattened at 37 and 38 to receive downwardly extending flanges 41 and 40 and relieved as at 39 to accommodate retainer wheel 42. At this point section 22 has thickened into a generally crescent shape and is still entirely supported on rail 20.

Progressing to FIGURE 10 one finds that section 22 has become a hollow tube 43 with an arcuate portion 44 designed to still ride on rail head 20. Tube 43 is off-center of rail 20, as section 22 is progressively moving away from rail 20.

As seen in FIGURE 11 at that point an extension 45 has been required to still provide support for tube 43 from rail 20.

Finally at FIGURE 12 section 22 has entirely left rail head 20 and is provided with cross-section shown in FIGURE 12 which continues throughout the balance of section to provide strength.

Referring now to FIGURES 6 and 7 it will be noted that the bogie wheels 27 are of concave shape with a curvature matching that of the rail heads and that support arm 26 mounts retainer wheels 42 adapted to engage under the rails if there is any tendency of the bogies to lift off of the rail.

While there has been described what is at present considered a preferred embodiment of the present invention, it will be appreciated by those skilled in the art that various changes and modifications can be made therein without departing from the essence of the invention and it is intended to cover herein all such changes and modifications as come within the true spirit and scope of the appended claims.

We claim:

1. A monorail system comprising: a single continuous main rail of substantially hollow tubular cross-section throughout substantially its entirety; a base for said main rail, a web extending from said hollow tubular rail to said base, said web and said main rail being mounted to one side of the center line of said base; a switch rail mounted for movement vertically and horizontally towards and away from said main rail, said switch having its upper riding surface curved with the same radius of curvature as said main rail; bogie wheels engaging said rails; a vehicle; a support arm depending from said bogie wheels and supporting said vehicle in suspension from said rails; a retainer wheel mounted on said support and adapted to engage under a portion of said rails on the side of said rail disposed the furthest from the center line of said base to prevent said bogie wheels from leaving said rails.

2. A monorail system comprising: a single continuous main rail of substantially hollow tubular cross-section throughout substantially its entirety; a base for said main rail, a web extending from said hollow tubular rail to said base, said web and said main rail being mounted to one side of the center line of said base; a switch rail mounted for movement vertically and horizontally towards and away from said main rail, said switch having its upper riding surface curved with the same radius of curvature as said main rail, said switch rail at its free end tapering to a thin arcuate cross-section adapted to fit over said main rail when in switching position, said switch rail becoming progressively thicker from its free end inwardly; bogie wheels engaging said rails; a vehicle; a support arm depending from said bogie wheels and supporting said vehicle in suspension from said rails; a retainer wheel mounted on said support and adapted to engage under a portion of said rails on the side of said rail disposed the furtherest from the center line of said base to prevent said bogie wheels from leaving said rails.

3. A monorail system comprising: a single continuous main rail of substantially hollow tubular cross-section throughout substantially its entirety; a base for said main rail, a web extending from said hollow tubular rail to said base, said web and said main rail being mounted on one side of the center line of said base; a switch rail mounted for movement vertically and horizontally towards and away from said main rail, said switch having its upper riding surface curved with the same radius of curvature as said main rail, said switch rail at its free

end tapering to a thin arcuate cross-section adapted to fit over said main rail when in switching position, said switch rail becoming progressively thicker from its free end inwardly, said switch rail riding upon and being supported by said main rail until it becomes thick enough to support a vehicle; bogie wheels engaging said rails; a vehicle; a support arm depending from said bogie wheels and supporting said vehicle in suspension from said rails; a retainer wheel mounted on said support and adapted to engage under a portion of said rails on the side of said rail disposed the furthest from the center line of said base to prevent said bogie wheels from leaving said rails.

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