United States Patent [19]

Armstrong

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[54] **PARALLEL WHEEL DRIVE**

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[73] Assignee: **Rexnord Inc.,** Milwaukee, Wis.

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[52] **U.S. Cl.** ..... **104/168,** 198/127 R

[51] **Int. Cl.** **B61b 13/00**

[58] **Field of Search** ..... 104/18, 20, 23, 168; 198/110, 127 R

[56] **References Cited**

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2,905,101 9/1959 Sinden 104/20

3,643,788 2/1972 Werntz ..... 198/127 R

Primary Examiner—M. Henson Wood, Jr.
Assistant Examiner—D. W. Keen
Attorney, Agent, or Firm—Sughrue, Rothwell, Mion, Zinn & Macpeak

[57] **ABSTRACT**

Devices for driving the propulsion wheels of a unit carrier system in which a plurality of cars are driven over a trackway by means of the frictional interaction of reaction surfaces on the cars with propulsion wheels mounted in the trackway. The devices consists of drive motors connected to a plurality of propulsion wheels by means of belts, chains, etc.

2 Claims, 4 Drawing Figures

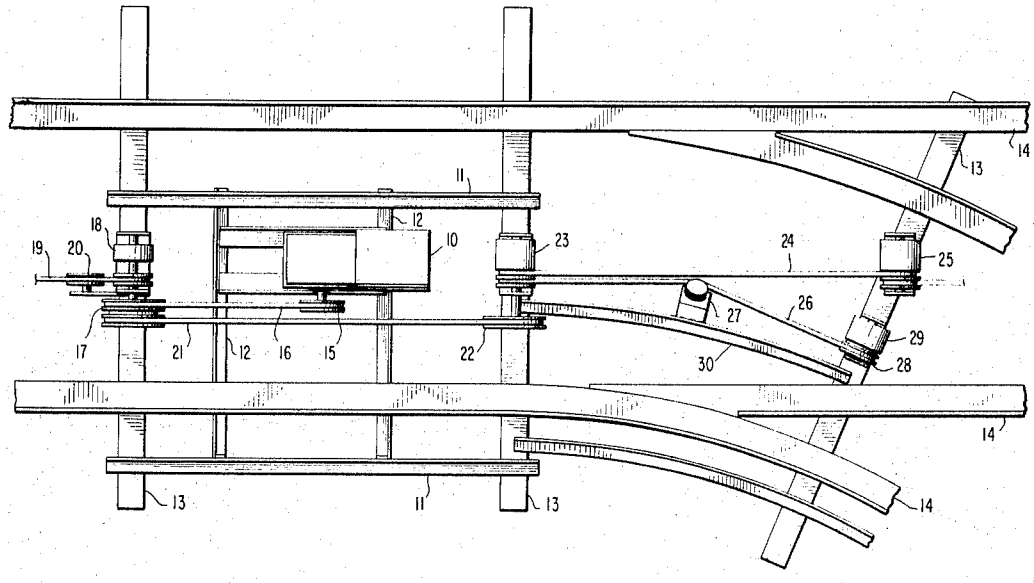


FIG 1

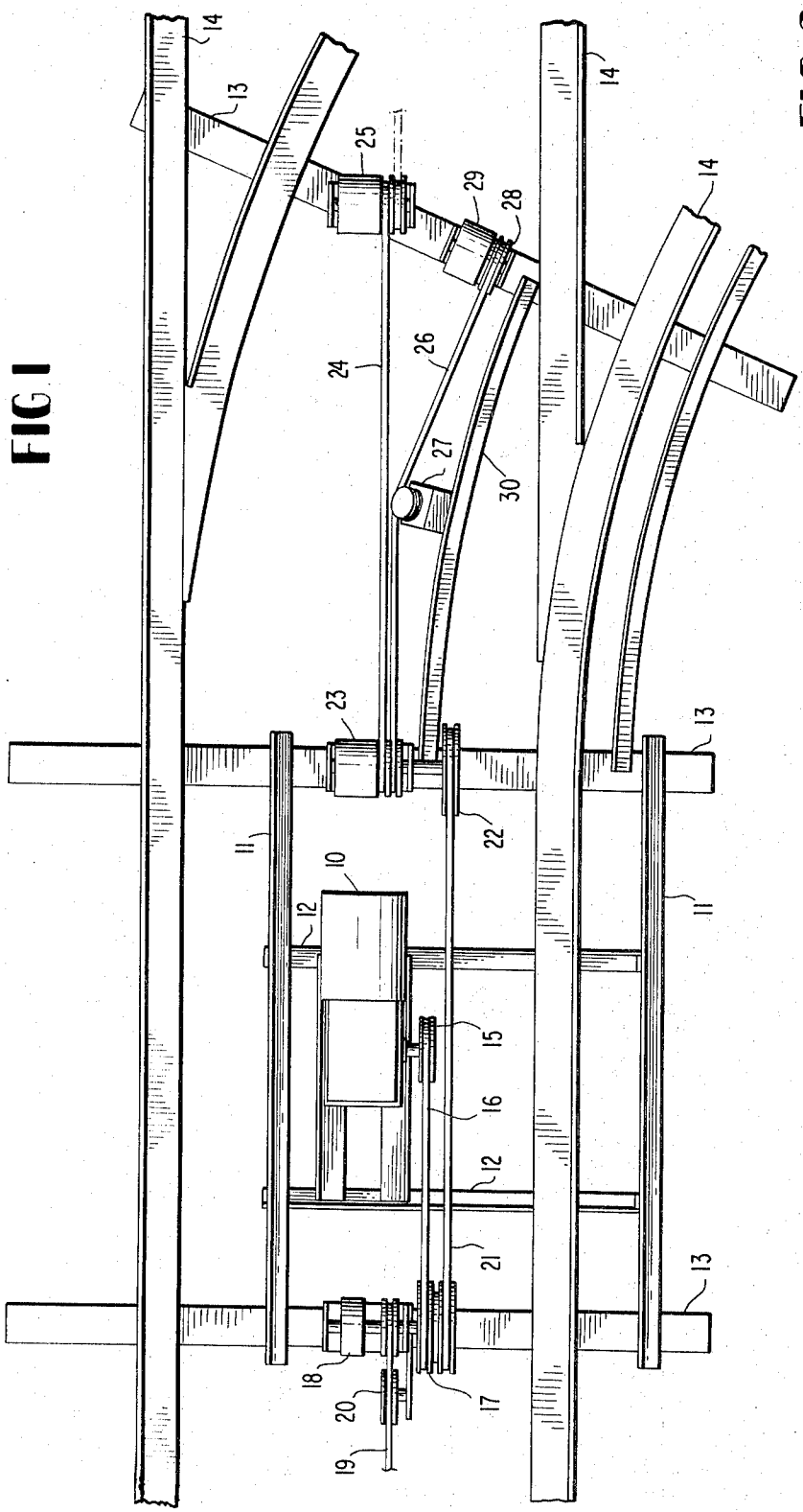
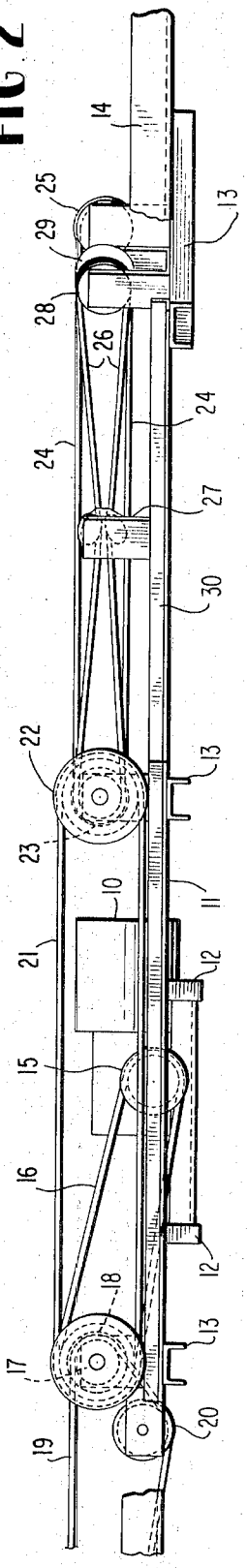

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FIG 2


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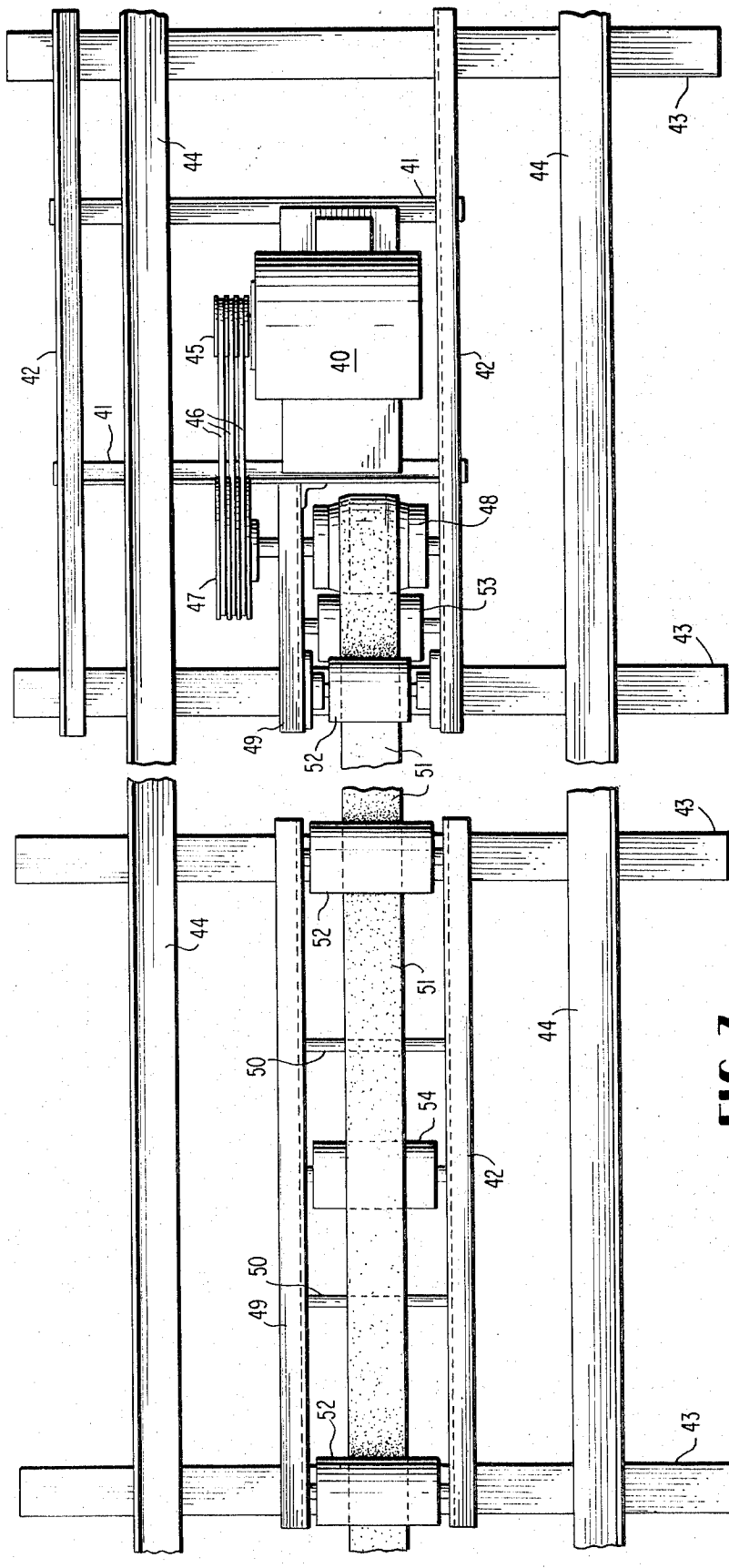

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FIG. 3

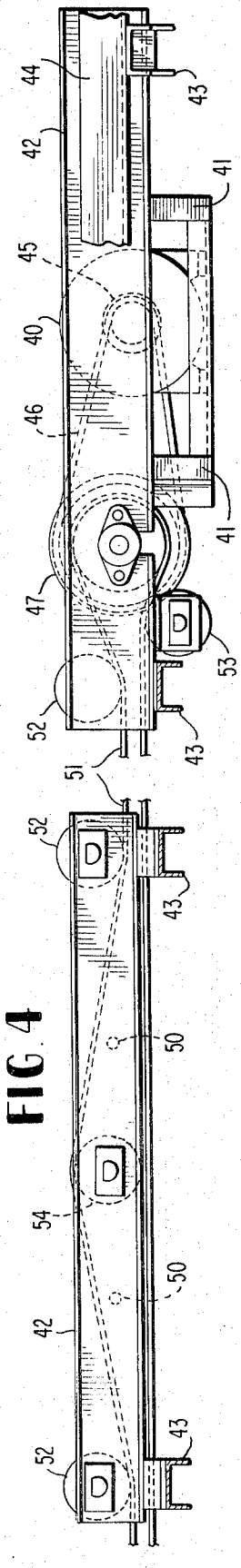

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FIG. 4

PARALLEL WHEEL DRIVE

FIELD OF THE INVENTION

This invention relates generally to the transmission of power to the propulsion wheels in a friction-powered unit transportation system and, more specifically, to the transmission of power to the propulsion wheels in a transportation system such as is disclosed in commonly assigned U.S. Pat. Nos. 3,621,790, 3,626,859, and 3,650,216.

BACKGROUND OF THE INVENTION

In a friction-powered unit transportation system such as is disclosed in U.S. Pat. No. 3,626,859, a plurality of cars are driven over a trackway by means of the frictional interaction of reaction surfaces on the cars with propulsion wheels mounted in the trackway. In the system disclosed in that patent, each propulsion wheel is provided with its own drive motor, which may be identical, constant-speed induction motors since the speed of the cars is controlled by varying the angle between the axis of the propulsion wheel and the direction of the track. This arrangement offers great flexibility, but the induction motors are relatively expensive, and the flexibility which this arrangement offers is not needed in all situations.

SUMMARY OF THE INVENTION

In areas of the unit carrier system where the flexibility offered by the arrangement described in commonly assigned U.S. Pat. No. 3,626,859 is not needed, a plurality of propulsion wheels may be driven by a single drive motor connected to the propulsion wheels by means of belts, chains, and the like. This arrangement is particularly adapted for long, straight sections of the trackway, but it may also be used on curves with the aid of ancillary devices disclosed herein.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a plan view of one species of the present invention.

FIG. **2** is an elevational view of the species of the present invention shown in FIG. **1.**

FIG. **3** is a plan view of a second species of the present invention.

FIG. **4** is an elevational view of the species of the present invention shown in FIG. **3.**

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

For illustrative purposes, two species of the generic invention are disclosed herein. The first to be described employs *v*-belts and sheaves and may be adapted for use on curved sections of the trackway. The second employs a flat belt which engage directly with the work surface of the propulsion wheels; it is somewhat simpler than the first species, but it is not as well adapted for curves.

The first species is illustrated in FIGS. **1** and **2.** As shown therein, the motor **10,** which may be a constant speed induction motor such as is used in the arrangement described in commonly assigned U.S. Pat. No. 3,626,859, is mounted on supports **11** and **12** which are bolted to the cross ties **13** of the tracks **14.** The motor **10** is mounted low in the trackway, clear of any possible interference with the bottoms of the cars (not shown). The motor **10** rotates a sheave **15,** which engages a *v*-belt **16** which also engages a sheave **17** which is co-axially mounted with a propulsion wheel **18.** The propulsion wheel **18** is mounted on a cross tie **13,** and the sheave **17** has two other grooves in addition to the groove which engages *v*-belt **16.** One of those other grooves engages a second *v*-belt **19,** which engages an idler sheave **20** movably mounted to take up any slack in the *v*-belt **19** and another sheave and propulsion wheel unit, which is mounted off to the left of the drawings. The other groove engages a third *v*-belt **21,** which engages a sheave **22** which is coaxially mounted with propulsion wheel **23.** It should be noted that the working surface of propulsion wheel **23** is broader than the working surface of propulsion wheel **18** because propulsion wheel **23** is mounted just before a switch, which means that the reaction surface of the cars taking the siding (i.e., the right-hand branch in FIG. 1) will contact its working surface at an angle.

The sheave **22** also has two other grooves in addition to the groove which engages *v*-belt **21.** One of these engages *v*-belt **24,** which engages another sheave and propulsion wheel unit **25,** mounted in the through track. This unit is connected to another, mounted off to the right of the drawings, and so on to the limit of the motor's power. However, it should be noted that, if the power is to be transmitted on down the through track in this manner, the *v*-belt will have to be passed underneath the left-hand track **14** of the siding, which may often be impractical, or at least not worth the effort. The other groove on sheave **22** engages a *v*-belt **26** which passes over a tension bracket assembly **27** before engaging a sheave **28** coaxially mounted with propulsion wheel **29** mounted in the siding. The tension bracket assembly **27** is mounted on a support **30** which is attached to two cross-ties **13** by any suitable means, and its purpose is to change the direction of the *v*-belt **26,** so that the linear force it exerts on both sheave **22** and sheave **28** is normal to their respective axes. While this configuration is illustrated here in connection with a switch, it will be obvious that it will be most frequently employed in connection with a curved portion of a single trackway. This is because of the previously mentioned inconvenience of passing the *v*-belt under the near track of a diverging trackway.

The second species of the generic invention is illustrated in FIGS. **3** and **4.** As shown therein, the motor **40,** which may again be a constant speed induction motor such as is used in the arrangement described in commonly assigned U.S. Pat. No. 3,626,859, is mounted on supports **41** and **42** which are bolted to the cross ties **43** of the tracks **44.** The motor **40** is mounted low in the trackway, clear of any possible interference with the bottoms of the cars (not shown). It rotates a sheave **45** which engages a plurality of *v*-belts **46** which also engage a sheave **47** which is co-axially mounted with a pulley **48.** The pulley **48** is rotatably mounted on rear support **42** and drive frame member **49,** which are braced at intervals by cross members **50.** The working surface of the pulley **48** transmits its rotary motion to flat belt **51,** and flat belt **51** in turn transmits this motion to propulsion wheels **52,** which are also rotatably mounted on rear support **42** and drive frame member **49.** Idler rollers **53** and **54,** which are also rotatably mounted on rear support **42** and drive frame member **49,** are provided, respectively, to lift the path of the flat belt **51** up over the cross ties **43** and to cause the flat belt to contact the propulsion wheels over an arc,

thereby insuring good frictional contact between the flat belt **51** and the propulsion wheels **52.** The flat belt **51** is shown rising towards another idler pulley **54** at the left edge of the drawing, and it will be obvious that is can power as many propulsion wheels **52** as the power rating of the motor **40** permits. Tension in the flat belt **51** can be regulated by take-up pulleys (not shown) in a manner well known in the art.

CAVEAT

While the present invention has been illustrated by detailed descriptions of two preferred embodiments thereof, it will be obvious to those skilled in the art that various changes in form and detail can be made therein without departing from the true scope of the invention. For instance, (1) the *v*-belts disclosed in connection with the first species could be replaced by round belts, chains, ropes, or any similar linear drive means, (2) a pulley could be mounted directly on the shaft of a drive motor, thereby eliminating the *v*-belts and sheaves shown in the second species, and (3) while the illustrations show constant speed drive systems, the peripheral speed of the various propulsion wheels can be varied by varying the diameter of the wheels themselves and the sheaves or the pulleys, all in a manner well known to the art. For that reason, the invention must be measured by the claims appended hereto and not by the foregoing preferred embodiments.

What is claimed is:

1. In a friction-powered unit carrier system having a plurality of cars which travel along trackways and are powered by the interaction of reaction surfaces on the cars with propulsion wheels mounted in the trackways, a device for transmitting power to said propulsion wheels comprising:

1. a drive motor mounted in a trackway;
2. a plurality of propulsion wheels;
3. linear drive means operatively connecting said drive motor to said propulsion wheels; and
4. a tension bracket assembly for changing the direction of said linear drive means.

2. A friction-powered unit carrier system as claimed in claim **1** wherein said linear drive means are *v*-belts connecting sheaves rotably mounted on said motor and coaxially and integrally mounted with said propulsion wheels.

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