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HOIST TROLLEY ANTITILTING MEANS

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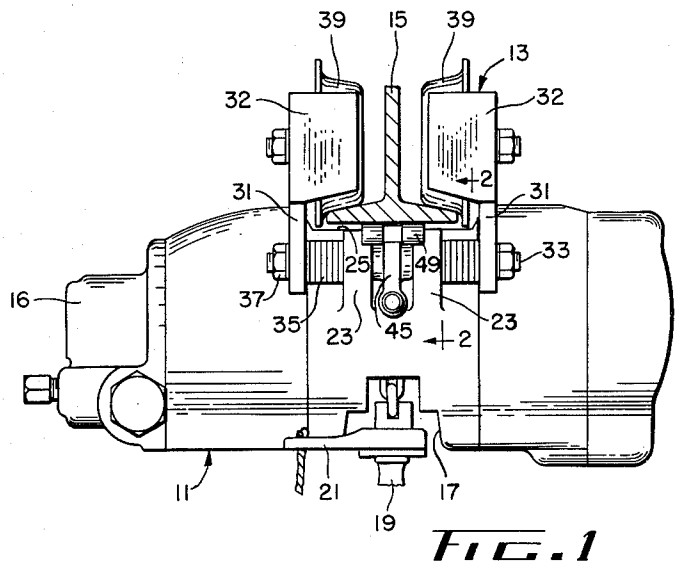

FIG. 1

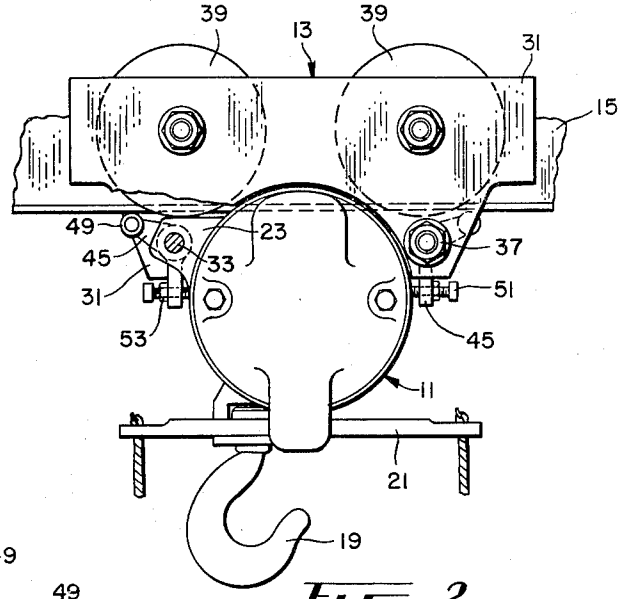

FIG. 2

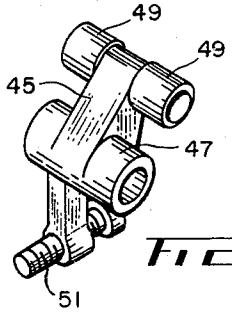

FIG. 3

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HOIST TROLLEY ANTITILTING MEANS

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This invention relates to a hoist trolley having means for preventing tilting of the trolley relative to a suspending track or rail; and more particularly to an integrated or unitized trolley and hoist assembly having antifriction means for engaging the lower face of a suspending track or rail to prevent tilting of the assembly.

With the development of hoists for use in low headroom areas, it has become necessary to integrate the trolley and hoist into a unitized assembly in order to minimize the distance between the suspending rail and the load hook. The hoist and trolley are, then, a rigid assembly as opposed to the conventional hoist suspension wherein the hoist is suspended from a trolley by means of a hook. With the hook suspension, the hoist assembly may pivot relative to the trolley to accommodate any unbalance in the hoist assembly, due particularly to control equipment or accessory equipment mounted on the hoist body. With a unitized assembly of trolley and hoist, any unbalance of the assembly may cause the entire assembly to tilt relative to the track thereby lifting certain of the trolley wheels off the supporting flange of the track. Such tilting may cause the trolley to jam on the track, or may cause damage to the trolley resulting in a safety hazard. In many hoist installations, safety engineers require means for preventing such tilting.

An object of this invention is to provide an antitilting means for a hoist trolley which prevents tilting of the trolley relative to the suspending track. Another object of this invention is to provide such an antitilting means having rollers which engage the lower face of the track to minimize friction when tilting does occur. A further object of this invention is to provide such an antitilting means which is readily adjustable to accommodate suspending tracks of different size.

The novel features of the invention, as well as additional objects and advantages thereof, will be understood more fully from the following description when read in connection with the accompanying drawing, in which:

FIGURE 1 depicts an integrated trolley hoist assembly, as viewed along a supporting track, including an antitilting arm assembly;

FIGURE 2 depicts the assembly of FIGURE 1, as viewed from the side of the supporting track; and is partially broken away to show details as viewed along the line 2—2 of FIGURE 1; and

FIGURE 3 is a perspective view of the antitilting arm assembly shown in FIGURES 1 and 2.

Referring now to the drawings in detail, the invention is embodied in an integrated trolley hoist assembly consisting of a hoist **11**, having a generally cylindrical body, rigidly secured to a trolley **13** which carries the assembly along a suspending track such as an I-beam **15**. The hoist **11** is an air operated hoist, of a well-known type, having an elongated generally cylindrical body; the body enclosing a chain sprocket in the central portion, a driving air motor in one end, and reduction gearing and braking mechanism in the other end. Housing portion **16** of the hoist encloses the control valves for the hoist motor. An opening **17** is provided in the hoist body for the load chain and hook **19**, and for mounting an actuator arm **21** for a rope control.

On each side of the central portion of the hoist body there are provided a pair of integral bosses **23** which project laterally from the upper portion of the body, lying in planes transverse to the longitudinal axis of the

hoist. These bosses are provided with holes aligned parallel with the longitudinal axis of the body, for the purpose of securing the hoist to the trolley **13**, as will be described. A flatted recess **25** is provided at the top of the hoist body for accommodating the lower flange of the I-beam **15** when the hoist is assembled with the trolley and mounted on the I-beam. The upper surfaces of the bosses **23** lie in the same plane as the flatted portion of the recess **25**, so that these bosses lie close to the lower face of the I-beam, in the above mentioned assembled relation.

The trolley **13** consists of a pair of side plates **31** which are secured to the hoist **11** by means of studs **33** which pass through suitable holes in the side plates and through the holes in the bosses **23**. The side plates are spaced from the respective bosses by means of washers **35** which fix the distance between the side plates, as determined by the width of the flange of the I-beam. In the drawing, all of the washers **35** are placed between the respective bosses and side plates; however, for a narrower I-beam flange, some of the washers might be placed outside of the side plates. The assembly of the hoist body, side plates and washers is rigidly secured together by nuts **37** threaded onto the ends of the studs **33**. Two flanged wheels **39** are rotatably mounted on each of the side plates **31** to ride on the upper faces of the lower I-beam flange, and to support the assembly of the trolley and hoist. The ends of the side plates **31** extend inwardly toward each other to form protective bumpers **32**.

Since the entire assembly of the trolley and hoist is rigid, any unbalance of the assembly relative to the I-beam, or an unbalancing force applied to the assembly, may cause the assembly to tilt relative to the beam whereby the trolley is supported by only two of the flanged wheels, for example. Such tilting may cause damage to the trolley, which may result in a safety hazard. Such tilting would probably occur more frequently when there is no load on the hoist; particularly when accessory equipment (not shown in the drawings) is mounted on the hoist or trolley. The hoist assembly might include an air operated pendent control, for example, which would normally be attached to the housing portion **16** which houses the motor valve assembly. This would create additional weight at the extreme end of the hoist body. The trolley might be provided with a drive motor and associated pendent control, for example, mounted on one of the side plates for the purpose of driving the associated wheels **39**. This also might produce an unbalancing weight on one side of the assembly. Further, the operator may apply an unbalancing force in his handling of the above mentioned pendent controls or the illustrated rope control. For these reasons, it is desirable to provide means for preventing excessive tilting of the assembly.

The preferred form of antitilting means, according to the present invention, consists of two arm assemblies which are pivotally mounted and adjustable to engage the lower face of the I-beam in the event of excessive tilting. As best shown in FIGURE 3, each arm assembly consists of a rocker arm **45** having a hub portion **47** intermediate its ends, the hub having a transverse bore defining a pivot bearing for the arm. A parallel bore is provided at one extremity of the arm **45** to accommodate a shaft upon which are rotatably mounted two rollers **49**. The rollers are positioned on the shaft on either side of the arm, and may be secured to the shaft by means of snap rings for example. At the other extremity of the arm **45** there is provided a threaded bore, transverse to the pivot axis, which accommodates an adjustment screw **51** and lock nut **53** for the purpose of adjusting the position of the rollers **49** relative to the I-beam.

Two of the above described roller assemblies are provided, each being pivotally mounted on one of the studs **33** and being positioned between the two bosses **23** at one side of the hoist body. As best shown in FIGURE 2, the inner ends of the adjustment screws **51** bear against the sides of the hoist **11**; and the screws are adjusted to position the rollers **39** close to the lower face of the I-beam. Some clearance is provided between the rollers and the beam to eliminate rolling contact during normal operation of the hoist and to accommodate any irregularities in the surface of the I-beam; however, such clearance is held to a minimum to permit only very slight tilting of the trolley hoist assembly. The adjustability of the arm permits use of the hoist trolley assembly with supporting beams or rails of different configurations. The rollers **49** permit the hoist trolley assembly to move freely along the track when tilting does occur.

What is claimed is:

1. In a hoist trolley assembly for use on a track comprising an upstanding central portion with a lateral flange extending to each side from the lower edge thereof:

a hoist comprising a rigid body; a trolley comprising a pair of side plates rigidly connected to said hoist body; wheels carried by each of said side plates to ride on one of the track flanges;

an arm pivotally mounted on said assembly, having a bearing member in position to engage the lower face of the track;

and means for adjusting the angular position of said arm, relative to its pivot axis, to position said arm bearing member in predetermined space relation to the track to prevent excessive tilting of the hoist trolley assembly.

2. In a hoist trolley assembly for use on a track comprising an upstanding central portion with a lateral flange extending to each side from the lower edge thereof:

a hoist comprising a rigid body; a trolley comprising a pair of side plates rigidly connected to said hoist body; wheels carried by each of said plates to ride on one of the track flanges;

an arm, having a roller mounted thereon, pivotally mounted on said assembly in position to engage the lower face of the track;

and means for adjusting the angular position of said arm, relative to its pivot axis, to position said roller in predetermined space relation to the track to prevent excessive tilting of the hoist trolley assembly.

3. In a hoist trolley assembly for use on a track comprising an upstanding central portion with a lateral flange extending to each side from the lower edge thereof:

a hoist comprising a rigid body; a trolley comprising a pair of side plates rigidly connected to said hoist body; wheels carried by each of said side plates to ride on one of the track flanges;

a pair of rocker arms mounted at opposite ends of the assembly, along the track, for pivotal movement in vertical planes; rollers mounted at the upper ends of said rocker arms for engagement with the lower face of the track;

and adjustment means mounted at the lower ends of said rocker arms bearing on said assembly for adjusting the angular positions of said arms relative to the pivot axes, to position said rollers in predetermined space relation to the track to prevent excessive tilting of the hoist assembly.

4. In a hoist trolley assembly for use on a track comprising an upstanding central portion with a lateral flange extending to each side from the lower edge thereof:

a hoist comprising a body having a pair of apertured bosses projecting from each of opposite sides thereof; a trolley comprising a pair of apertured side plates; wheels carried by each of said side plates to ride on one of the track flanges; a pair of studs, each passing through apertures in said side plates and in one of said pairs of bosses to rigidly secure said side plates to said hoist body;

a pair of rocker arms; each of said arms having a hub portion intermediate its ends provided with a transverse bore defining a pivot bearing, a pair of rollers rotatably mounted at one end of said arm about an axis parallel to the pivot axis, the other end of said arm having a threaded bore transverse to said pivot axis, and an adjustment screw threaded into said threaded bore;

each of said rocker arms being mounted on one of said studs between one of said pairs of bosses, said studs passing through said hub bores and defining pivot journals for said arms; and said adjustment screws bearing against said hoist body to position said rollers in predetermined space relation to the lower face of the track to prevent excessive tilting of the hoist trolley assembly.

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