

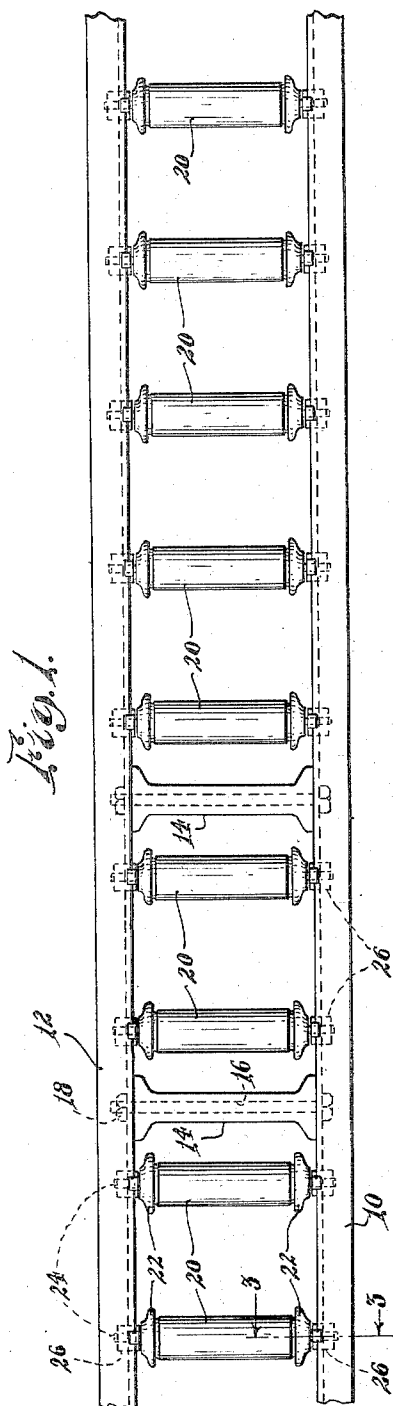
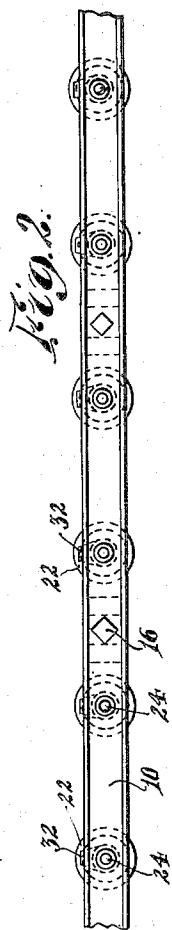
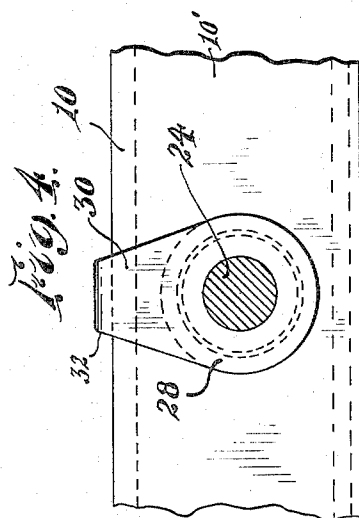
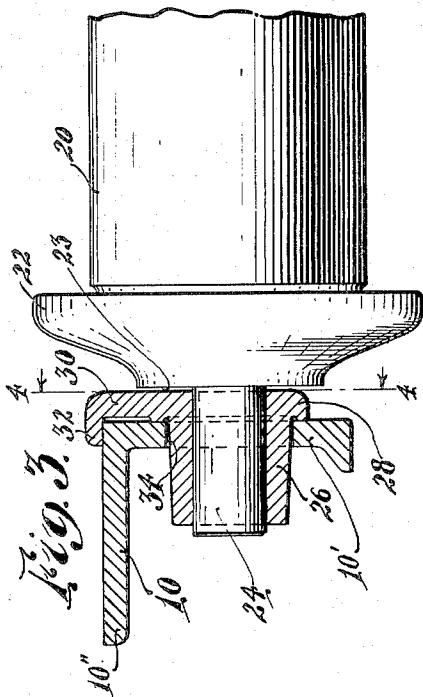
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MULTIPLE-ROLLER BEARING UNIT

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MULTIPLE-ROLLER BEARING UNIT

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1

This invention relates to improvements in roller bearing units for dry-docking facilities, and the like. More particularly it relates to multiple-roller bearing units wherein the rollers are mounted in spaced parallelism in a retaining frame, so that the unit may constitute an elongate roller carriage between generally parallel supporting tracks and a body which is to be moved along the tracks, or between such supporting tracks and generally parallel runners of one or more cars or trucks which may carry the body which is to be moved along the tracks, such as a ship or hull being moved to or from a body of water, or from place to place in a railway dry-docking facility.

Multiple-roller units of the general type to which the invention relates are made in various lengths to suit the requirements of different operations in any particular dry-docking facility. For example, at more or less level regions of a dry-docking facility, relatively short units having but five or six rollers in each unit conveniently are useable in tandem for supporting a cradled hull in the process of construction, or undergoing overhauling. Such hulls are more readily shiftable from place to place on the short roller units than would be the case with longer units, and the short units need no endwise connection together, which enables removal of units as they become free of the load and their replacement forward of the moving load.

On the other hand, it is preferable to employ relatively long roller units, mechanically connected together in tandem, on the railway tracks leading to and from a body of water inasmuch as these tracks may have substantial inclination requiring endwise connection of the units so that units in advance of a load moving down the incline will not run away, and so that units in rear of a load moving up the incline will be maintained against running away.

Heretofore, the rollers of these roller bearing units have been mounted in carrier frames which have had parallel side bars of wood, or angle iron side bars with wooden bar fillers. In the case of the all-wood side bars, the rollers customarily have been rotatably mounted on axially extending shafts whose ends have had bearings directly in the wooden side bars. While these shafts serve primarily for maintaining the rollers in predetermined spaced parallelism, and are relatively free of any load which is being transported on the rollers, the heavy loads which are required to be carried by such roller units do impose stresses on the shafts which gradually en-

2

large and distort the holes in the wood side bars in which the shaft ends are mounted, so that the rollers can depart from their desired parallelism with each other which deleteriously affects the desired free rolling action of the rollers. Correction of this fault involves replacement of the entire side bars by new ones.

The prior composite angle iron and wood side members for such multiple-roller bearing units represent an attempt to prolong the effective useful life of the units. Where these composite metal and wood side members have been employed, it has been usual to form the rollers with integral end pintles, and these pintles have been mounted in holes in the angle iron bars with substantial extent also into the wooden filler bars. In this case, each roller and its pintles rotate as a unit, and the rotating pintles gradually enlarge and distort the holes in the side members with results comparable to those described in connection with the all-wood side bars, including the need to replace entire composite side members in order to correct the fault. Also, the engagement of metal on metal gradually wears an annular groove in each pintle, which further aggravates the looseness of the rollers in their carrier frame.

It is among the objects of my present invention to provide multiple-roller bearing units wherein the individual rollers have end pintles mounted in retainers which are readily insertible in and removable from the side bars of the roller-carrying frames of the units. I provide a pintle retainer insert of suitable material which quickly may be inserted in a hole or socket of a carrier frame side bar to provide a substantial length of surface engagement for a roller pintle engaged therein, and having means coacting with the bar to prevent rotation of the insert relative to the bar.

Another object is to provide a multiple-roller bearing unit having a roller-carrying frame including generally parallel side bars between which the rollers are arranged transversely of the frame in spaced parallelism, each roller having integral end pintles and each pintle being engaged, substantially throughout its extent, in an insert retainer element which is non-rotatably associated with a side bar of the frame and which is maintained in its said non-rotatable association with the bar by an end portion of the roller whose pintle is engaged therein.

Yet another object is to provide a retainer element for an end pintle of a roller in a carrier frame, said element being readily insertible in

and removable from roller-carrying frame members of either wood or metal or a combination of wood and metal and having means preventing relative rotation of the retainer element and any particular frame member in which it may be mounted.

It is, moreover, my purpose and object generally to improve the structure, efficiency and durability of multiple-roller bearing units and especially such units suitable for use on the rails or tracks of railway dry-docking facilities.

In the accompanying drawing:

Fig. 1 is a plan view of a substantial section of a multiple-roller bearing unit embodying features of the invention;

Fig. 2 is an edge elevation of a portion of the unit represented in Fig. 1;

Fig. 3 is a cross-sectional view on line 3—3 of Fig. 1, on a larger scale, but showing the roller and its pintle in elevation; and

Fig. 4 is a cross-sectional view on line 4—4 of Fig. 3.

Referring to the drawing, the particular embodiment of the invention as illustrated has a roller-carrying frame consisting of two angle iron side members 10 and 12 maintained in spaced general parallelism by the cross braces 14 against whose opposite ends the side members 10, 12 are rigidly secured by the bolts 16. The bolts extend through a wall of each side member and lengthwise through the respective cross-braces, with the head of each bolt engaging one side member and a nut 18 screwed on the other end of each bolt into engagement with the other side member.

The rollers 20 may be of a usual type, each having an annular flange 22 at each end of the roller proper, and each having an integral pintle 24 extending axially outward beyond each flange 22.

According to the invention, however, the roller pintles 24 are not mounted directly in the side members of the frame, as has been customary heretofore, but extend each into its own retainer element 26 which in turn is supported by a side member 10 or 12.

As best seen in Figs. 3 and 4, each retainer element 26 has integrally formed thereon, at one end, a head portion 28 of larger external diameter than the main body of the retainer, and this head portion 28 has a lateral extension 30 which terminates in a foot 32.

Before the roller-carrying frame is assembled into its final rigid form, the retainer elements 26 are inserted each into one of a series of holes 34 which are suitably spaced apart along each side member 10 and 12. Each of the elements 26 has its head 28 on that side of its side member which will be innermost in the assembled frame, and each is positioned on its side member with its foot 32 engaged over an edge margin of the side member whereby each element is positively restrained against rotation in its side member. When all of the retainer elements are in place on the respective side members, the pintles 24 at one end of all of the rollers may be inserted one into each retainer element of one side member, followed by similar insertion of the pintles at the other end of the rollers into the retainer elements of the other side member, after which the side members may be secured by the bolts 16 against the opposite ends of the cross-braces 14. As shown in the drawing, each of the angle iron side members has one wall 10' disposed in a vertical plane and has its other

wall 10'' extending outward, in a horizontal plane, from the upper end of the wall 10'. The holes 34 extend through the wall 10' of each side member, the number and spacing of the holes in each side member agreeing with the number and spacing of rollers to be mounted in any particular frame. The retainer elements 26 preferably have their body portions formed with slight external taper, as shown, to facilitate their insertion in holes 34, and each element, as it is being inserted, is held with the foot 32 of its projection 30 in position to engage over the inner margin of wall 10'' of the side member, as clearly seen in Fig. 3, where the head 28 of the retainer element is shown seated against wall 10', with the adjacent body portion of the element nicely fitting the hole 34 in which the element is held against rotation by the foot 32.

After the rollers have been mounted as described, and the carrier frame made rigid, the multiple-roller bearing unit is ready for service, with the outer shoulders 23 of the flange portions of the rollers in positions to maintain the retainer elements against any appreciable inward movement axially of the respective rollers. However, slight clearance is provided between the shoulders 23 and the retainer elements when the latter are fully seated.

It will be obvious from the foregoing description, in connection with the drawing, that I have provided effectively durable and efficient retainers for the individual rollers of a multiple-roller bearing unit, and have eliminated the need for combining wooden filler members with angle iron side members as has been considered requisite in the prior comparable roller units which have employed angle iron frame members. I provide a substantial length and area of surface engagement between each roller pintle and its retainer in the relatively thin wall of an angle iron side member, with each retainer an insert element which quickly may be non-rotatably seated in a side member, and which quickly may be removed for replacement by loosening and spreading the side members, which latter may serve indefinitely inasmuch as the replaceable inserts take such wear as may be incident to stresses and friction at the pintle regions.

I claim as my invention:

1. A multiple-roller bearing unit for railway dry-docks, comprising a roller-carrying frame adapted to be supported on a single rail of the railway with the rollers resting on the rail and with a hull resting on the rollers whereby the hull may be moved along the railway with simultaneous movement of the roller-carrying frame in the same direction but at one-half the rate of travel of the hull, said frame having a plurality of generally parallel side members, and means extending transversely between the side members connecting them rigidly together in spaced relation, each said side member having a series of spaced holes therein open toward the other side member, and said holes being axially aligned in the two side members, a series of rollers, each extending transversely between the side members and each having a pintle at each end, a retainer element for each of said roller pintles, each said retainer element having a body portion inserted in a said hole in a side member, and each said body portion having an axial hole therein within which a said pintle has substantial extent, and rigid means extending radially outward from said body portion of each retainer element in a plane generally parallel to the adjacent end of a said

5

roller and having a relatively broad foot engaged over an edge of a said side member for preventing relative rotation of the retainer elements and said side members, the ends of the rollers coacting with said radially extending means to maintain the said feet in engagement over the edges of the side members.

2. A multiple-roller bearing unit for railway dry-docks, comprising a roller-carrying frame adapted to be supported on a single rail of the railway with the rollers resting on the rail and with a hull resting on the rollers whereby the hull may be moved along the railway with simultaneous movement of the roller-carrying frame in the same direction but at one-half the rate of travel of the hull, said frame having a plurality of generally parallel side members, and means extending transversely between the side members connecting them rigidly together in spaced relation, each said side member having a series of spaced holes therein open toward the other side member, and said holes being axially aligned in the two side members, a series of rollers, each having a body portion, and each having an integral pintle projecting axially at each end of the roller body portion, a retainer element for each said pintle and seated respectively in said holes in the side members, each retainer element having a head portion intervening between a side member and an end of a roller body portion, and each said head portion of a retainer element having a radial projection thereon terminating in an angular foot, engaging over an edge portion of a side member, for maintaining the retainer element against rotation in the side member, the ends of the rollers coacting with said head portions of the retainer elements to maintain said angular feet in engagement over said edge portions of the side members.

3. A multiple-roller bearing unit for railway dry-docks, comprising a roller-carrying frame adapted to be supported on a single rail of the railway with the rollers resting on the rail and with a hull resting on the rollers whereby the hull may be moved along the railway with simultaneous movement of the roller-carrying frame in the same direction but at one-half the rate of travel of the hull, said frame having a plurality of generally parallel side members, and means extending transversely between the side members connecting them rigidly together in spaced relation, each said side member having a series of spaced holes therein open toward the other side member, and said holes being axially aligned in the two side members, a series of rollers, each having a body portion, and each having an integral pintle projecting axially at each end of

6

the roller body portion, a retainer element for each said pintle and seated respectively in said holes in the side members, each said retainer element having a head portion intervening between a side member and an end of a roller body portion, and a body portion inserted in a said hole in a side member, and means on the head of each retainer element extending radially outward between a side member and the adjacent end of a roller and having relatively broad engagement with a side member outward of said body portion of a retainer element thereby to prevent relative rotation of the retainer element and side member, the ends of the rollers maintaining said radially extending means in engagement with the side members.

4. In a multiple-roller bearing unit for railway dry-docks, a frame with a multiplicity of rollers mounted therein adapted to be supported on a single rail of the railway with the rollers resting on the rail and with a hull resting on the rollers whereby the hull may be moved along the railway with simultaneous movement of the roller-carrying frame in the same direction but at one-half the rate of travel of the hull, an insert retainer element for each end of each roller, said frame having generally parallel side members, and there being spaced holes in the side members, each said retainer element having a body portion inserted in one of said holes and seated on the walls thereof, and each having a head end portion intervening between a side member and a body portion of the roller whereby the retainer element is restrained against any appreciable axial movement, and means on each retainer element extending radially outward from said head end portion of the retainer element with an angular foot portion engaged over an edge of a side member, whereby said radially extending means and said feet stabilize the retainer elements in the side members and prevent their rotation in the side members.

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