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J. A. GIBBINS ET AL
GANTRY WITH ADJUSTABLE SPAN

3,490,385

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2 Sheets-Sheet 1

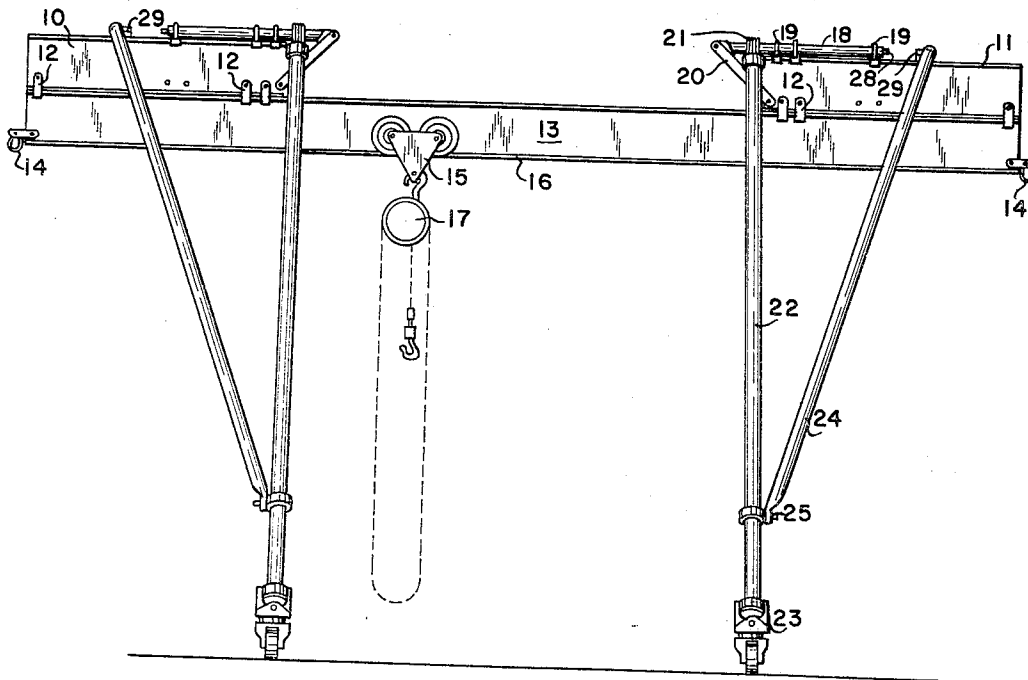


Fig. 1

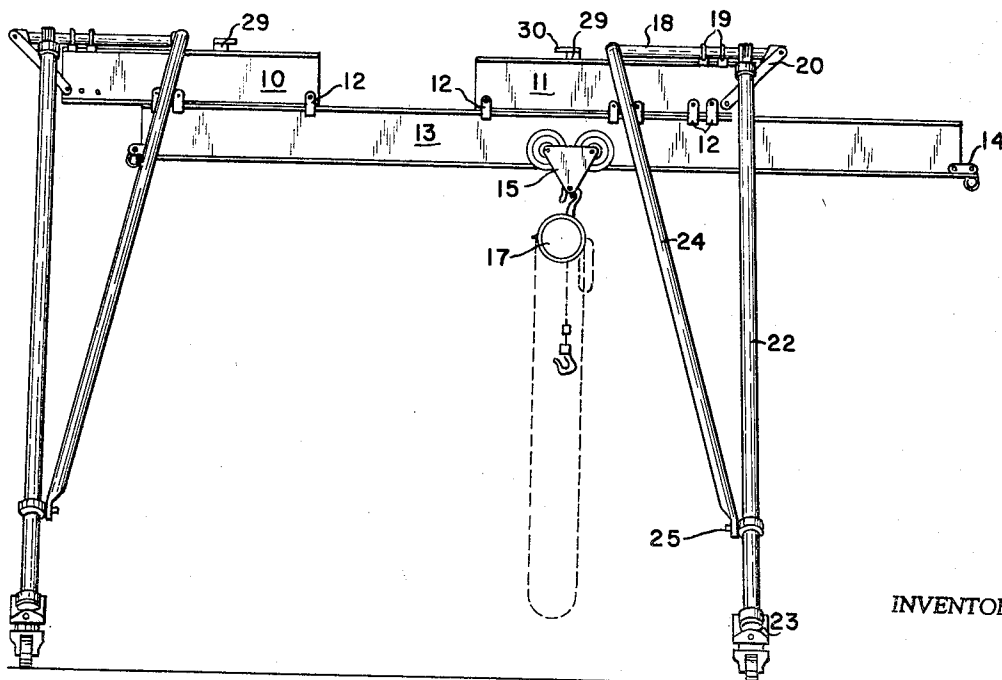


Fig. 2

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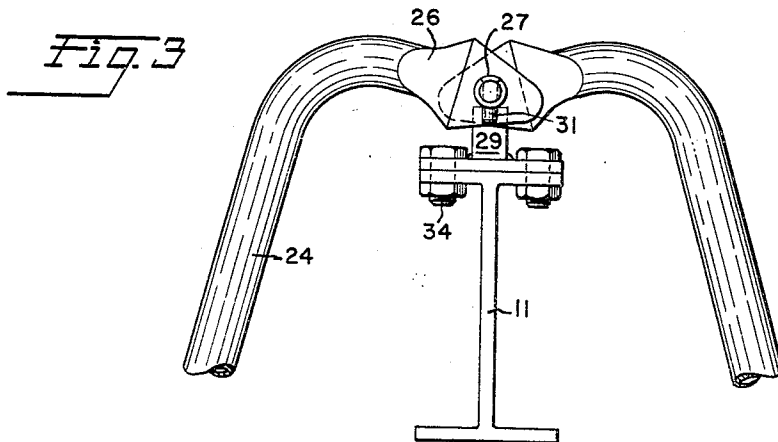
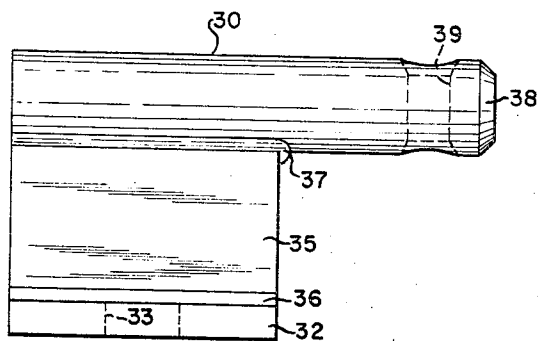


Fig. 4

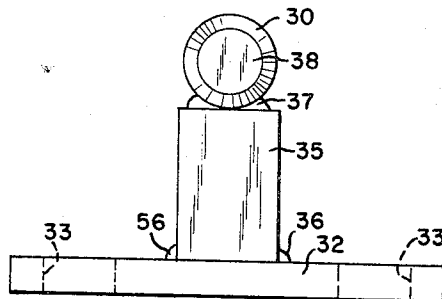


Fig. 5

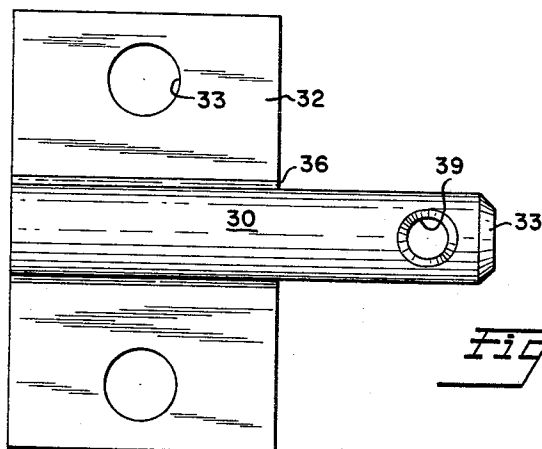


Fig. 6

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GANTRY WITH ADJUSTABLE SPAN

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U.S. Cl. 104-126

2 Claims

ABSTRACT OF THE DISCLOSURE

A gantry with adjustable span has opposed pairs of legs each leg being of adjustable length and each pair of legs being adjustable for spread. Each pair of legs is pivotally mounted on a short length of I beam and a longer bridging I beam is slidably mounted beneath the short lengths of I beam. Each leg has a leg brace normally pivoted on the same axis as its leg but spaced from the leg pivot point. Each leg has an outward camber of about 1.5°. When the gantry is assembled with the leg braces toward the ends of the bridging beam the leg braces are moved further from the pivot points of the legs to preserve this camber and a separate pivot in the same axis is provided on each short beam to receive the respective pair of leg braces for this purpose.

Background of invention

The bridging I beam may support thereon for motion along the beam any suitable hoisting device such as a chain hoist hooked into a trolley rolling on the lower flange of the beam. For this reason patents relating to similar structure are classified under portable elevated railways. More particularly the present invention relates to structures in which the bridging element is slidably mounted beneath two short beams, each of the short beams being carried beneath a pair of legs of adjustable length and spread. Each leg has a leg brace pivoted on a first pivot on the short beam in the pivotal axis of the legs and a second pivot for the braces is provided to maintain the camber of the legs when the braces are disposed toward the ends of the bridging element. A caster may be mounted at the lower end of each leg.

The most pertinent prior art to the present concept is found in the United States patents to Bernard E. Wallace, one of the applicants herein, Nos. 2,990,788 and 2,995,094 granted, respectively, on July 4, 1961, and Aug. 8, 1961.

The first of these patents discloses an adjustable gantry in which pairs of legs of adjustable length and spread are each mounted on a pivot bar secured to the top of the bridging element or bar. Each leg has a brace extending inwardly from the ends of the bridging bar and mounted on the inner end of the leg pivot bar. Casters are mounted on the bottoms of the legs. The second of these patents discloses a similar structure but includes a jack for each pair of legs to raise or lower the bridging element with respect to the casters and to adjust the lengths of the legs.

These structures have proved to be very useful and have gained wide acceptance and commercial success. However, in certain uses for gantries, it has been found desirable to be able to adjust the positions of the pairs of legs with respect to the ends of the bridging element as, for example, to permit the bridging element to extend beyond one or both pairs of legs; to adjust the positions of the pairs of legs with respect to the bridging element for best support of the load to be handled; and, in certain instances, to reverse the positions of the pairs of legs so that the leg braces extend outwardly towards the ends of the bridging element to eliminate brace interference be-

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tween the legs, as required under certain conditions or types of loads.

In use of these gantries it has been found that the structure is more stable under load if the plane of each pairs of legs is given a camber of about 1.5° from the vertical and toward the adjacent end of the bridging element. Less camber has little stabilizing effect and more camber places excessive bending moments on the lower extendable portion of the legs, and excessive wear on the casters. Normally this camber is provided by the length of the leg brace and the location of the pivot mount point of the end of the leg brace on the pivot bar for the leg. However, when the position of a pair of legs is reversed so that the leg braces extend toward the end of the bridging element, it is necessary, in order to maintain this camber, and use the same brace legs, to reposition the pivot point of the ends of the leg brace away from the normal pivot position but in the axis of the pivot bar for the legs. A second pivot pin is therefore mounted on the top of the short beam in suitable spaced position in the axis of the pivot bar of the legs to receive the ends of the pair of braces for the adjacent legs.

Summary

The present invention provides an adjustable gantry having an adjustable span by mounting the bridging element for sliding movement beneath two short beams which are in turn each supported by a pair of legs which may have adjustable length and spread each leg being pivotally mounted on the top of its short beam. Each leg has a leg brace having one end pivotally mounted on the top of the short beam with the pivots of the leg and of the brace spaced to provide camber of about 1.5° for the leg. A second pivot for the brace is spaced from the first brace pivot and is provided to maintain the camber of the legs when the positions of the short beams are reversed with respect to the bridging element bringing the leg braces toward the ends of the bridging element.

It is therefore the object of the present invention to provide an adjustable span gantry which may have legs of adjustable length and spread and having the position of the bridging element adjustable with respect to the supporting legs in which spaced pivots are provided for the ends of the leg braces to maintain the desired camber of the legs.

Brief description of the drawings

The present invention is capable of various mechanical embodiments within the scope of the inventive concept, a preferred embodiment being shown in the accompanying drawings in which like reference characters indicate like parts. In the drawings:

FIG. 1 is a side view of an adjustable gantry of this invention in which the supporting legs are disposed with the leg braces extending towards the ends of the bridging element;

FIG. 2 is a view similar to that of FIG. 1 but with the position of the legs reversed and with the leg braces extending toward the middle of the bridging element;

FIG. 3 is an end view of a second pivot for a pair of leg braces;

FIG. 4 is a side view of the pivot of FIG. 3;

FIG. 5 is a top view of the pivot of FIG. 4; and

FIG. 6 is an end view similar to FIG. 3 but with the braces omitted.

Description of preferred embodiment

Referring now to FIGS. 1 and 2, the adjustable gantry has two short I beam members 10 and 11 provided with downwardly and inwardly turned clips 12 in which clips the bridging I beam 13 is slidably mounted. Beam 13 may have rings 14 at the ends thereof for lifting the

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beam. A suitable trolley 15 rides on the lower web 16 of beam 13 and supports a suitable hoist 17.

The structure of the legs and braces for each beam 10 and 11 is identical and so will be described for beam 11 only. A pivot bar 18 is secured to the top of beam 11 by U-bolts 19 and is held in position by a link 20 as described in U.S. Patent No. 2,995,094. A pair of legs is pivotally mounted on bar 18 at 21, one leg being shown at 22. The pivotal mounting of each pair of legs; the structure for adjusting the lengths of each leg; and the structure for adjusting the spread of each leg which maintains the casters, such as caster 23, in vertical position is shown in U.S. Patent No. 2,990,788 and need be no further described herein as they form no part of the present invention.

Each leg 22 is provided with a leg brace 24 secured to leg 22 at 25, brace 24 extends upwardly with a turned in and flattened end 26. End 26 is drilled at 27 to slip over reduced end 28 of bar 18. However, a separate leg brace pivot could be used in place of the end of bar 18. The ends of both braces for a pair of legs are held on end 28 by a pin when the legs 22 are disposed toward the ends of beam 13, as in FIG. 2. This pivot construction being shown in U.S. Patent No. 2,990,788.

The length of bar 24 from fastening 25 to end 28 is such that leg 22 will have a camber of about 1.5° from the vertical, as seen in FIG. 2, which figure may be considered as showing the usual disposition of the elements of the present gantry.

When, however, the short beams 10 and 11 are placed with respect to beam 13 as shown in FIG. 1 so that the leg braces extend toward the ends of beam 13, the camber of the legs would be reversed with resulting instability of the gantry unless means are provided to alter the position of the ends 26 of the leg braces to provide the desired outward camber of the legs. This is accomplished by mounting a second pivot 29 on the top of each short beam 10 and 11 with its pivot pin 30 extending in the long axis of bar 18 or in the axis of the leg pivot and the leg brace pivot. The spacing of pin 30 from end 28 is readily determined to provide the corrected camber for the legs. The ends 26 of legs 24 are then mounted on pin 30 and held in place by a cotter key 31, as seen in FIG. 3.

With reference to FIGS. 3-6, it will be seen that second pivot 29 has a base 32 bored at 33 to receive bolts 34 to secure it to the top web of beam 11. A base block

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35 is welded at 36 to base 32 and pivot pin 30 is welded at 37 on top of blade 35. Pin 30 is chamfered at 38 and is through bored at 39 to receive the cotter key 31. As noted above, the long axis of pin 30 extends in the long axis of bar 18.

The above-described embodiment in every way satisfies the objects of this invention and may be modified by one skilled in the art as by using aligned separate spaced leg pivot, leg brace pivot and second pivot without departure from the present inventive concept.

What we claim is:

1. An adjustable span gantry having a bridging beam, two beams disposed above and supporting said bridging beam, a pivot secured to each of said two beams adjacent an end thereof, a leg extending on each side of each of said two beams adjacent an end thereof and pivotally mounted on said pivot, a leg brace secured to each leg and extending upwardly and away from its respective leg, a leg brace pivot secured to each of said two beams and spaced from said pivot, said leg brace being normally pivotally mounted on said leg brace pivot, the braces maintaining an outward camber from the vertical of the plane of the associated legs of about 1.5°, the improvement comprising a second pivot mounted on the top of each of said two beams in the axis of said pivot and said leg brace pivot, and spaced from said leg brace pivot pivotally receiving the ends of the adjacent leg braces for correction of camber of the legs when said leg braces are disposed toward the adjacent end of said bridging beam.

2. A gantry as described in claim 1, each of said second pivots comprising a base, a base block secured to said base and a pivot pin secured on the top of said base block and extending therefrom to receive the adjacent ends of the leg braces, the long axis of said pin lying in the axis of said pivot and said leg brace pivot.

References Cited

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2,436,337	2/1948	Smith	104-126
2,995,094	8/1961	Wallace	104-126

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U.S. Cl. X.R.

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